Federal Aviation Administration
FY 2009 President's Budget Submission

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ADMINISTRATOR'S OVERVIEW

The FAA's FY 2009 budget request follows through on the President's commitment to a safe and efficient National Air Transportation System while continuing to focus on accountability and performance. Our request ensures that the world's best aerospace system becomes even safer and more efficient during a time of increasing demand for FAA services. For several years, we have pushed to manage more effectively, rein in costs, and better respond to our customers. Our FY 2009 request moves FAA further along this continuum, toward the performance-based organization that the taxpayer and Congress demand that we be.

Meeting Today's Challenges

The budget request puts us on firm ground in critical areas that matter most: safety staffing and improving our nation's air traffic control system.

Safety continues to be our number one priority.
The FY 2009 budget includes funding to hire a net increase of 306 new controllers, a level consistent with the targets being developed for the updated staffing plan to be published in March 2008. The FY 2009 request also maintains the staff added to our Aviation Safety workforce in FY 2007—2008 while increasing staffing by 30 positions in FY 2009. This will allow us to continue to meet the safety management demands of a growing industry.

In March 2008, FAA will submit to Congress its annual update to the Controller Workforce Plan, *A Plan For the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce*. As outlined in the Plan, almost three-quarters of the controllers hired after the 1981 PATCO strike will reach retirement age over the next decade. Steps to keep the system moving smoothly are already under way, and we plan on hiring more than 17,000 new air traffic controllers through 2017. We need to maintain a continuous pipeline of recruits and trainees because it takes one to three years of on-the-job training for developmental controllers to achieve certified professional controller (CPC) status.

The FAA's goal is to have the right number of people in the right facilities at the right time. Our 10-year plan recognizes the dynamics of staffing to traffic as well as accounting for workloads at individual facilities. We have made significant progress in refining controller staffing requirements and in effectively staffing facilities by utilizing improved scheduling practices, new automated tools, and better management of leave. In its February 9, 2007 report, the DOT Inspector General found that FAA "has made significant improvements" in the controller hiring process, as well as "made progress in reducing the time and costs to train new controllers." We understand how critical it is to have adequately staffed air traffic control facilities, and will continue to take action at the facility level should adjustments become necessary due to changes in traffic volume, unanticipated retirements, or other attrition.

With the air traffic control system at capacity, the Next Generation Air Transportation System (NextGen) is the only way we can continue to meet demand. NextGen is intended to address today's constraints and comprehensively modernize and transform the air transportation system. NextGen is a complex, comprehensive transformation that is already underway. It will mean new technologies, procedures, standards, as well as new roles for the humans in the system. Given the scope of this undertaking, substantial investment is required now to achieve near-term deployment of mature technologies, develop moderately mature concepts for operational viability, and perform research to better define long-term capabilities.

This multi-agency effort is led by the Joint Planning and Development Office (JPDO). Active participants in JPDO include the Department of Transportation (DOT), FAA, NASA, DoD, DHS, and Commerce along with numerous non-governmental stakeholders.

Over the past year, FAA has positioned itself to lead the implementation of much of the NextGen infrastructure. The new OEP, or Operational Evolution Partnership, is serving as a decision making venue. The OEP involves all major parts of our agency in setting NextGen priorities, as well as the place from which commitments will be shared with industry partners. The FY 2009 budget represents strong collaboration between JPDO and the OEP to define and estimate the budgetary requirements for FY 2009. Moving forward, that collaboration will provide oversight and track progress, ensuring that NextGen objectives are achieved.

In the past year, key NextGen defining documents have matured. JPDO released public versions of the Enterprise Architecture and Concept of Operations in June 2007. In July, the initial baseline of the NextGen Integrated Work Plan was completed. The work plan lays out the progression from the present to the future, with activities and responsible agencies identified. As envisioned, the work plan would guide the formulation of future budgets within partner agencies.

The following table outlines FAA's programs and activities that support NextGen in FY 2009. This NextGen investment portfolio includes programs and activities deemed "transformational," i.e., those that will truly move toward the next generation system. The FY 2009 portfolio consists of $631 million in ATO Capital Programs, $57 million in Research, Engineering & Development, and $704 thousand in Safety & Operations, for a total of $688 million. This funding level includes $19.5 million to directly support the JPDO: $5 million from ATO Capital and $14.5 million from R,E&D. We expect this mix of funding to change in the future as NextGen matures and we capture other elements of FAA investment, such as Grants-in-Aid for Airports. Likewise, in the future we expect to depict not only investments, but operational savings as part of the NextGen transformation.

NextGen Programs
($ in Thousands)

ATO Capital	FY 2008 Enacted	FY 2009 Request
NextGen Network Enabled Weather (NNEW)	7,000	20,000
Data Communications for Trajectory Based Operations	7,400	28,800
Demonstrations and Infrastructure Development	50,000	28,000
NextGen – System Development	-	41,400
NextGen – Trajectory Based Operations	-	39,500
NextGen – Reduced Weather Impact	-	14,400
NextGen – High Density Arrivals/Departures	-	18,200
NextGen – Collaborative ATM	-	27,700
NextGen – Flexible Terminals and Airports	-	37,100
NextGen – Safety, Security and Environment	-	8,000
NextGen – Networked Facilities	-	17,000
NextGen – Integrated Airport	1,960	-
System-Wide Information Management	23,358	41,000
ADS-B NAS Wide Implementation – Segment 1b	85,650	300,000
ADS-B Air to Air	9,350	-
NAS Voice Switch	3,000	10,000
SubTotal ATO Capital	**187,718**	**631,100**
Research, Engineering and Development (RE&D)		
Flight Deck/Maintenance/System Integration Human Factors *	1,000	-
Air Traffic Control/Technical Operations Human Factors *	1,000	-
Wake Turbulence	8,000	7,370
NextGen – Air Ground Integration	-	2,554
NextGen – Self Separation	-	8,025
NextGen – Weather in the Cockpit	-	8,049
NextGen Environmental Research – Aircraft Technologies, Fuels and Metrics	-	16,050
NextGen – JPDO	14,321	14,494
SubTotal RE&D	**24,321**	**56,542**
Safety & Operations		
NextGen – Environmental Performance	-	704
SubTotal Safety & Operations	**0**	**704**
Total NextGen Programs	**212,039**	**688,346**

JPDO Program Management (non-add to NextGen Total)		
RE&D - JPDO Support	14,321	14,494
ATO Capital - JPDO Support	3,500	5,000
SubTotal NextGen- JPDO	**17,821**	**19,494**

* In the FY 2009 Budget FAA has consolidated most NextGen funding in the RE&D appropriation into new line items in order to facilitate tracking NextGen investments. Some funds from the core RE&D Human Factors program in FY 2008 (flight deck ATC) have been moved and integrated into the new NextGen programs for FY 2009 (e.g. Air Ground, Self Separation and Weather Technology in the Cockpit).

FAA Funding Reform and Reauthorization: To support NextGen, our budget request emphasizes the need for a stable funding source, one that is based on our costs and the services we provide. Most of FAA's current funding comes from the Airport and Airway Trust Fund, which in turn is funded primarily through ticket taxes (and other taxes to lesser extents).

As it stands, there is no link between Trust Fund tax revenues and the actual cost to provide service. Since 2000, low-cost carriers and other factors have changed the business of aviation. The airlines also are favoring smaller jets. With the number of passengers increasing, this trend portends for a greater workload. Even general aviation activity is increasing and shifting toward high-performance jet aircraft, which increase FAA workload without a commensurate increase in revenue. The bottom line is that the current system draws little connection between revenue and FAA's workload.

After extensive consultation with our stakeholders, we developed and submitted to Congress early in 2007 an FAA reauthorization proposal that provides a stable, fair, and cost-based funding structure to ensure that our costs and revenues are better aligned and that our stakeholders are treated equitably. Our proposal also maintains a well-supported general fund contribution for public good services and provides strong incentives for FAA to continue to control costs and meet demand efficiently, via ongoing stakeholder consultation. Both the House and Senate have debated the Administration's proposed legislation and developed their own plans. The Administration continues to support the major themes of maintaining safety, building capacity, and facilitating the transformation of the system into NextGen, while helping FAA continue its momentum of operating more like a business. FAA's budget request assumes that FAA will implement it's new financing system starting in 2010.

Implementing DOT's Strategic Goals

Safety: Safety is our primary concern, comprising 67 percent of the FY 2009 request. Our efforts to improve operations have contributed to the safest period in aviation history. Even so, our goal is to continue to improve safety. One major key to our successful safety efforts is cooperation among our stakeholders. We constantly work with stakeholders to meet our safety goal. Each group helps contribute to a safer airspace system through technology, communications, and its own unique expertise. In our responsibility for safety oversight, we work with them to establish their own safety management systems to identify potential areas of risk. Then we work together to address these risk areas.

In FY 2007, serious operational errors declined compared to the number of errors in previous fiscal years. We achieved a rate of 4.06 errors per million activities or 625 for Category A and B errors. Our efforts are helping controllers do their jobs more safely, especially when it comes to tracking and eliminating operational errors. The performance goal for FY 2008 is 2.15 Category A and B operational errors.

In response to a long-standing recommendation by the Department of Transportation Inspector General and the National Transportation Safety Board to improve reports of operational errors, we've established a new initiative to automate data collection. The Traffic Analysis and Review Program — known as TARP — is a state-of-the-art traffic analysis and playback system that will improve operational error identification and quality assurance. The software be completely installed by 2011. The high-fidelity, near-real time playback feature of TARP will also support more effective and efficient air traffic controller training. In addition, the FAA has begun expanding the implementation of the Safety Management System (SMS) beyond the ATO to include AVS and ARP. This system is in use in the ATO with processes and procedures designed specifically to the organization's activities. The *Flight Plan* performance target for FY 2009 is to apply safety risk management to a minimum of seven significant changes in the NAS.

While these technological solutions will help alleviate runway incursions over the long-term, recent incursion activity has highlighted the need for immediate action. On August 15, 2007, FAA met with 40 aviation industry leaders to identify short-term steps that could be implemented within the next 30-60 days, without the need for new regulation. The plan produced by this summit included the following actions to reduce the risk of incursions and wrong-runway departures:

- Send special teams of regulators, airline, and airport personnel to study runway safety over the next two months at more than 20 airports with the most incursions, including airports where wrong-runway departures have been identified as a concern.
- Improve communication and training, including adding taxiway scenarios to flight simulators used to train pilots.
- Urge the 73 large airports under orders to improve painted runway markings complete the work in the next two months rather than by the original September 2008 deadline. The group also will study whether more airports should improve markings, which alert pilots when they are approaching hold short lines so they will not inadvertently enter a runway without a clearance.
- Review cockpit taxi and clearance procedures to reduce the tasks required of pilots while the plane is moving on the ground and to see how the instructions controllers give to planes on the way to takeoff can be improved.
- Add air traffic controllers and safety workers to the groups that can use an FAA voluntary, non-punitive system for reporting safety concerns.

In the longer term, FAA will look toward technological solutions, including the deployment of runway status lights in conjunction with ASDE-X. The agency will also take a close look at the performance of two lower-cost ground surveillance systems currently being tested and evaluated in Spokane. Both systems provide cost-effective alternatives to ASDE-X and can be installed in less than a week. While not as sophisticated as ASDE-X, they provide incremental situational awareness for controllers.

The FAA's Airport Improvement Program (AIP) is also an important tool for enhancing safety. More than 41 percent of our AIP grants go to safety-related projects, such as upgrades to runway safety areas, runway safety action team recommendations, purchase of airport rescue and fire fighting vehicles, and airfield signing, marking and lighting. AIP also supports projects that reduce runway incursions. For example, end-around perimeter taxiways at Atlanta and Dallas-Fort Worth will not only increase capacity, but will also reduce the risk of runway incursions by substantially reducing the number of runway crossings.

The work of the Commercial Aviation Safety Team (CAST), which includes representatives from government, industry, and employee groups, has been instrumental in using data to drive decisions. The team's approach to analyzing accidents and incidents, identifying precursors, and developing targeted implementation strategies contributed to reducing the risk of an airline fatal accident rate by 60 percent in the last 10 years. We are also working with this team to develop new metrics and goals to more effectively measure performance in commercial aviation safety.

We continue our work to safely expand the growing field of commercial space transportation. In 2007, a total of 14 U.S. launches occurred. Of these, 10 involved suborbital reusable launch vehicles. We are now issuing experimental permits and are ready to grant safety approvals of commercial space launch and reentry vehicles, safety systems, processes, services and personnel. We met our commercial space launch target and continued improvement of internal processes and partnerships with the Air Force, other government agencies, and the commercial space transportation industry.

Reduced Congestion: The demand for FAA services has never been greater. We oversee about 50,000 flights per day. In 1996 the system supported 608 million passengers. In 2007, it was 763 million passengers. Forecasts predict that one billion passengers will be flying in 2015. Given the anticipated growth—not only in terms of passengers, but in the number of aircraft operations as well—we know that FAA must adapt to meet the demand. With our current ground based air traffic control system currently stretched to capacity, the need for change becomes obvious.

We also know that the complexity of the future operating environment—with evolving fleet mixes, new aircraft, technology, and environmental constraints—must be approached in partnership with our customers. The preparation for these changes already is well under way, with the federal government's commitment to being ready for the future already gathered under the NextGen vision. This budget demonstrates a long-term commitment to NextGen, not as a pie-in-the-sky vision, but as embodied by tangible systems, processes, and management performance that will lead us to the future. We are also requesting funds to support wake turbulence research, the results of which will allow for greater system capacity without compromising safety.

While many NextGen research projects are long-term, several of the more immediate efforts are directly supported in FY 2009. We are requesting $42 million in research funds to provide continued support for NextGen and $19 million to support the JPDO program management. Several ongoing capital programs directly support NextGen by creating new transformational capabilities (of which, $14.5 million is requested through the RE&D appropriation and $5 million through the ATO Capital appropriation). These programs include Automatic Dependent Surveillance-Broadcast, the next generation surveillance technology; System-Wide Information Management, which will provide a broad range of real-time information to users of the National Airspace System; and NextGen Demonstration and Infrastructure Projects. Our FY 2009 request also funds several major new NextGen initiatives, including Collaborative Air Traffic Management, which is developing how to manage capacity by shifting demand to less desirable alternatives; Trajectory-Based Operations, which is developing initiatives to shift from clearance and sector-based operations to strategic planning and execution of flight trajectories through the airspace; and Flexible Terminal and Airports, which will provide the capability to dynamically change airspace and airports for greater capacity, efficiency, and safety.

In addition to our transformation efforts, the request also supports essential modernization of, and enhancements to our current air traffic control system. Approximately 30 Capital Programs create modern platforms for, enable, or otherwise contribute to future NextGen capabilities. Examples of these programs include: En Route Automation Modernization; the Wide Area Augmentation System, which augments the GPS signal for aviation uses; Airport Surface Detection Equipment-Model X, which reduces runway incursions; and the Next Generation Air/Ground Communications System, which modernizes air-to-ground communications infrastructure. These investments are necessary to modernize the foundation of the system, allowing the eventual integration of a full complement of advanced air traffic management tools. While the majority of these modernization programs existed prior to the NextGen concept, the Joint Planning and Development Office and FAA believe it is important to begin approaching the FAA's capital investments in a holistic manner.

Global Connectivity: The United States is the world leader in aviation with a consistent commitment to making safety our most important export. Today, FAA has operational responsibility for about half of the world's air traffic, certifies more than two-thirds of the world's large jet aircraft, and provides technical assistance to more than 100 countries to improve their aviation systems. In FY 2007 alone, FAA provided technical guidance and training to 59 countries and 6 international organizations. The FY 2009 budget requests $63.0 million for global connectivity activities so FAA can be even more globally focused, in the process ensuring U.S. citizens travel as safely and efficiently around the world as they do at home.

In 2007, the United States negotiated and signed three new or expanded Bilateral Aviation Safety Agreements (BASAs) with Singapore, Japan, and Mexico that will lay the essential groundwork for cooperation between our respective governments and aviation authorities. By building a network of competent civil aviation authorities and concluding agreements with additional countries and/or regional authorities, FAA increases safety on a global scale. Improved global understanding of U.S. safety regulations, processes, and procedures leads to better international regulatory oversight. The BASAs allow FAA to focus on U.S. safety priorities by relying on capabilities and technical expertise of other civil aviation authorities and minimizing duplication of efforts.

Environmental Stewardship: The FAA is committed to managing aviation's growth in an environmentally sound manner. NextGen recognizes the need for technology to reduce levels of aviation noise and emissions, thereby reducing environment as a constraint on capacity. The FY 2009 budget requests $352 million to support environmental stewardship for noise mitigation, air and water quality, fuel efficiency, environmental streamlining, and facility remediation.

We are also working with our Center of Excellence for Aircraft Noise and Aviation Emissions Mitigation to foster breakthrough scientific, operations, and program advances. We call the Center "PARTNER," and it truly is an excellent partnership of government, academic, and industry participants — led by MIT. Our work this year includes Continuous Descent Approaches to airports that can reduce noise, emissions, and fuel use; the feasibility of alternative fuels for aircraft; and assessing fuel burn reduction through en route optimization. Over the next few years, we plan to expand FAA's research to develop and certify lower energy, emissions, and noise engine and airframe technology and alternative fuels. In addition, research funds are directed to better characterize noise and emissions impacts to help us target better solutions, critical to the system. Finally, we are furthering research on unmanned aircraft systems, a part of the fleet mix expected to grow in the future.

Security, Preparedness and Response: While the Department of Homeland Security's Transportation Security Administration (TSA) has primary responsibility for transportation security, FAA works closely with TSA and other federal agencies to support and ensure aviation security. We also have responsibility for the security of FAA personnel, facilities, equipment and data, ensuring the operability of the national airspace. This is essential to the rapid recovery of transportation services in the event of a national crisis. The budget request includes $219 million to continue upgrading and accrediting facilities, procure and implement additional security systems, enhance IT security, and upgrade Command and Control Communications equipment to meet the increased national security demands that have resulted since the September 11, 2001 attacks.

Organizational Excellence: The FAA continues to search for opportunities that allow us to deliver better service more efficiently and at a lower cost. Administratively, we have streamlined operations and eliminated five layers of ATO management since 2003. We have instituted productivity improvement targets for the controller workforce that we continue to meet. Under our old controller labor contract, inefficiencies resulted when shifts were not aligned with traffic and when sufficient overlap of shifts did not provide needed continuity without the expenditure of overtime. New scheduling flexibilities will enable us to better meet operational requirements by allowing us to staff to traffic and to provide better shift overlap.

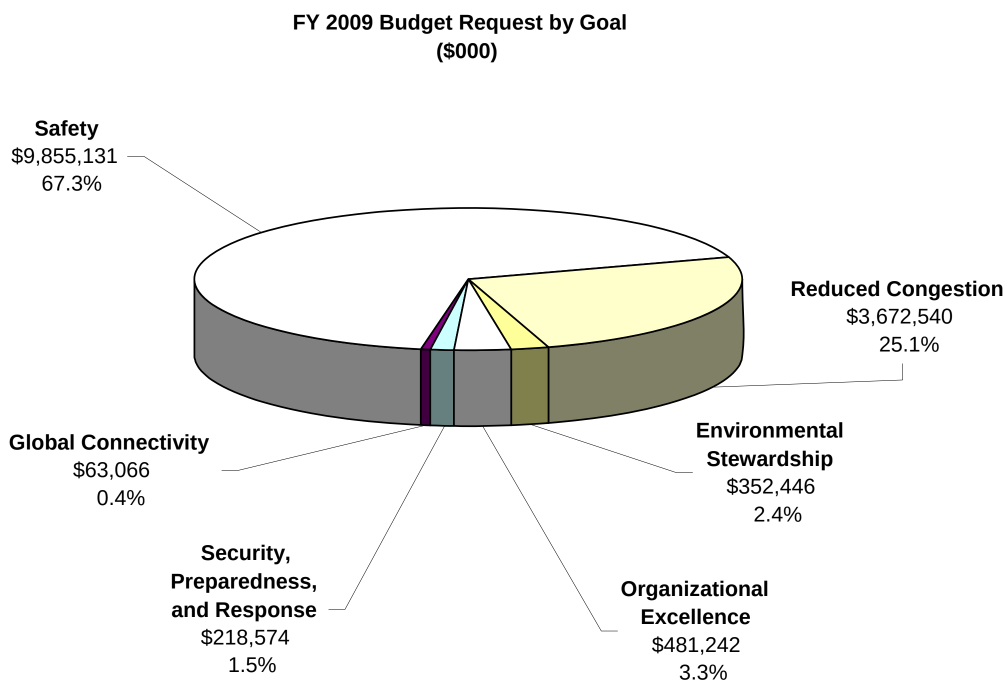
The budget requests $481 million to support our organizational excellence initiatives, furthering this momentum as we pursue other opportunities to maximize efficiencies and control costs. FAA's progress over the past four years has been constant, as we've embraced the President's Management Agenda (PMA) and its strategy to improve management throughout the federal government. Through the *Flight Plan* and PMA, we've made significant management gains relating to human capital, competitive sourcing and consolidations, financial performance — including controlling costs; and in terms of accountability to Congress, the taxpayers, and our customers.

A Responsible Request

The FAA is doing more than ever to manage itself responsibly, and it is paying off. At the same time, airlines continue to face financial uncertainty and evolve their business models. Without question, we must prepare for the future, and the future begins with responsible investments in capital and a highly capable workforce. Given the vital role aviation plays in the Nation's economy and the need to prepare for the future, our funding request is designed to support America's growing demand for aviation-related services.

Moving America safely. It's what we do.

Robert A. Sturgell
Acting Administrator


FY 2009 Budget Request by Goal
($000)
Safety
$9,855,131
67.3%
Reduced Congestion
$3,672,540
25.1%
Global Connectivity
$63,066
0.4%
Environmental
Stewardship
$352,446
2.4%
Security,
Preparedness,
and Response
$218,574
1.5%
Organizational
Excellence
$481,242
3.3%

FAA -- Like A Business with a Public Mission

At FAA, "acting more like a business" isn't just a slogan. We're actively engaging in a comprehensive pay-for-performance program, consolidating operations, improving internal financial management, and increasing benefits to our customers. Our beacon will always be our mission – to provide the safest, most efficient aerospace system in the world. Our bottom line is results for our stakeholders, including the taxpayer and traveling public.

The transformation over the past five years has been steady and relentless, as we've embraced the vision of the President's Management Agenda (PMA) and its aggressive strategy to improve management throughout the federal government. The evolution of the PMA complements the strategic vision of our *Flight Plan*. It contains a number of management performance measures, including a cost control performance measure requiring each organization to contribute cost efficiencies that save money or avoid costs for the agency. Through the *Flight Plan* and PMA, we've made dramatic gains in human capital, competitive sourcing and consolidations, financial performance, and, ultimately, accountability to the bottom line of our customers.

What may be our most difficult challenge in 2010 is upon us. Our proposed financing of Air Traffic Services will radically reform the way FAA is funded. It will also increase the scrutiny, and therefore the transparency, of our services. Providing better links between the costs of services being provided and amounts paid by service beneficiaries is critical. This budget request embarks the agency on this path, and we are ready for the challenge.

Pay-for-Performance – Human Capital Reform

Personnel reform for the agency, granted in 1998, is starting to bear fruit, with conversion from the traditional GS-Schedule pay system to pay for performance. Accountability for results is systemic throughout our organization, with 90 percent of our employees on the pay-for-performance system, including our executives. *Flight Plan* performance targets must be achieved before annual pay raises are calculated. Executives and managers have a good deal of discretion in rewarding high-performing employees, and incentives are present to ensure quality work and innovation are rewarded. Executives are also eligible for short-term incentive increases when specific performance thresholds are met or exceeded. This conversion is allowing the agency to flatten pay bands and tie performance incentives to pay increases.

Major Competitive Sourcing, Consolidations & Asset Management Efforts

In October 2005, we completed the largest non-military A-76 competition in history. The first three years will see cost savings of $66.4 million in FY 2007, $51.7 million in FY 2008, and $14.8 million in FY 2009, for a cumulative cost savings and avoidance of over $317 million by the end of FY 2009. Our network of automated flight service stations, which provide weather guidance and other assistance to the pilots of small airplanes, has been reduced from 58 to 18 in the fourth quarter of FY 2007. The latter comprises 15 previously existing flight service stations and 3 new ones built by Lockheed Martin. The contract not only saves money, it also commits the vendor to modernize and improve the flight services we provide to general aviation pilots. In addition, the employees who left federal service as a result of this transition were given offers to work for Lockheed Martin, the successful bidder of the contract.

In FY 2006, the Air Traffic Organization (ATO) began its Service Area Consolidation effort to consolidate its administrative and staff support functions from nine service areas to three. This will allow us to provide better service to customers while saving an estimated $360 to $460 million over the next 10 years. In FY 2008, we anticipate savings of $13 million from Service Area Consolidation. Also in FY 2006, FAA completed the consolidation of 11 accounting offices.

In FY 2005, we began centralizing responsibilities for real property management into a Real Estate Management System (REMS). In FY 2006, we continued to enhance the REMS for tracking and managing the Department's assets into a newly created Aviation Logistics Organization. We established a baseline for performance metrics and set targets in an Asset Management Plan. This plan will be used to monitor our progress during FY 2009. Cost savings are anticipated through the consolidation and disposal of real property assets, as well as termination and renegotiation of federal property leases.

We will continue to pursue efforts for competitive sourcing, consolidation and asset management as we scrutinize our organization and mission requirements.

Strategic Information Technology (IT) Improvements

As in most businesses, IT investments can be expensive and quickly become obsolete. The FAA is being more proactive about IT decisions. For example, the Server Consolidation project is an FAA-wide initiative overseen by the IT Executive Board (ITEB) to consolidate computer servers as well as the physical facilities that support servers. The approach includes identifying, targeting, and shutting down unnecessary servers, data centers and applications. This endeavor saved $3.8 million during FY 2007.

The renewal of the Oracle Enterprise License Agreement (OELA) brought FAA and DOT extended services (10,000 more seats) and increased Oracle products and services, at reduced costs. The other DOT modes will now contribute to the annual costs in the amount of their existing Oracle license support costs. This will result in a direct cost reduction for Oracle products of approximately $5.5 million over a 6 year period (FY 2005 through FY 2010) for DOT.

The Office of Information Technology (AMI) of the Mike Monroney Aeronautical Center awarded a five-year blanket purchase agreement (BPA) with Dell Corporation for IT commodity equipment for use during FY 2006. The FAA exercised the option to continue the agreement in FY 2007. IT equipment available for purchase in the BPA includes desktops, laptops and servers; and peripherals such as printers and monitors. The BPA was established with a "firm fixed discount" approach securing a guaranteed discount so that equipment can be purchased at a significant discount despite any retail price fluctuations that occur during the year. Administrative costs are minimized by establishing a process for any organization to order directly from Dell under the BPA. In FY 2007, cost savings from this activity totaled $9.6 million.

Based on past studies and reports of best practices, the FAA is pursuing a strategy to consolidate its helpdesk support. The intent is to move from a dispersed set of helpdesk provider organizations with varying practices and levels of maturity to a single provider that aims to provide mature levels of service with effective automated tools. The agency goal is to reduce the cost of helpdesk and call centers through consolidation. Through consolidation, the agency anticipates it will realize cost savings that industry has claimed from similar initiatives. This includes reductions in staffing required for helpdesk support, reduced numbers of level one and two helpdesks, higher reliance on automated tools to enable remote systems administration (at less cost than being physically at the desktop), and greater standardization of helpdesk and desktop support. This consolidation is expected to save approximately $3.4 million in FY 2008.

Improved Financial Management Performance

A major focus for the entire agency is controlling costs. Our strategic and budget planning goals are more closely aligned than ever, and they both include explicit cost savings initiatives. They are integral to FAA's strategy of improving our efficiency by integrating budget and performance planning.

Slowing Growth of Operating Costs -- We know that labor costs drive a significant share of our budget, and we are slowing the rate of growth in labor costs, such as back-filling positions with new employees at lower pay grades when possible. We are also increasing workforce productivity in several ways:

- Through proactive management of our worker's compensation caseload we've slowed the growth of this program, which has resulted in $5.5 million in avoided costs in FY 2005 and $7 million in FY 2006. For example, we now follow up on all newly filed claims to ensure the employee returned to work as soon as practical following a work-related injury or sickness. In addition, the ATO has taken steps to bring back employees who have been on workers compensation rolls for more than one year. In FY 2007, this effort yielded over $20.3 million in avoided costs.

- Over the last several years, ATO reduced its overhead expenses by cutting multiple levels of senior management, reducing its executive ranks by 20 percent. In addition to the Service Area Consolidation noted above, ATO has used an Activity Value Analysis to help streamline its operations, and eliminate and consolidate administrative staffs and support functions. Since FY 2003, the ATO non-safety workforce was reduced by 16 percent. In FYs 2005 and 2006, this reduction resulted in a savings of over $84 million that carries forward to the future. The long-term value of this downsizing exceeds $100 million per year.

Smarter Capital Investment Choices -- A capital investment team was created in 2004 to review financial and performance data. The team completes an evaluation of baseline performance and includes associated variances, obligations, schedule milestones and earned value management (EVM) data. EVM will provide an early warning for potential and actual variances as well as help the program manager develop corrective actions. The team continues to thoroughly evaluate the performance of capital programs. In the past, these business case reviews have identified $460 million in lifecycle savings by restructuring/terminating 10 programs, 6 of them major. To date, over 165 projects were reviewed in various stages of acquisition, capital formulation, and business case development.

SAVES -- The Strategic Sourcing for the Acquisition of Various Equipment and Supplies (SAVES) initiative is an ambitious effort begun in FY 2006 to implement best practices from the private sector in the procurement of administrative supplies, equipment, and IT hardware. It is expected to achieve $9 million in savings annually.

Clean Audit – After five years of unqualified audit opinions, we received a qualified opinion on our FY 2006 financial statements due to lack of documentation supporting our Construction in Progress (CIP) balance. After an intensive, year-long effort to review the balance and restate our FY 2006 financial statements, the auditors issued a revised – now unqualified – opinion for that year. In addition, we received an unqualified opinion on our FY 2007 financial statements, with a material weakness related to the timely processing of transactions and accounting of Property, Plant, and Equipment, including the CIP account.

Performance Improvement Initiative – The main objective of the Performance Improvement PMA initiative (formerly called the Budget and Performance Integration initiative) is to improve program performance. The integration of performance information into budgetary decision-making is one way we do this. In support of this initiative, FAA shows how increases or decreases in our budget affect those activities and drive performance, and how the activities across the six goal areas work together. The initiative uses performance measures to track program viability, which is one of six criteria to reach "green" status on the PMA report card.

Throughout the agency, resources are focused on tracking efficiency measures. As our Cost Accounting System (CAS) data improves with the expansion to all of our Lines of Business, we will be able to capitalize on analysis of how well we're doing, or where we need to improve. Among the efficiency measures developed to track progress are measures for each program assessed through a Program Assessment Rating Tool (PART) review, examples of these include:

- ATO is tracking its overhead rate, comparing non-facility labor dollars to total labor dollars. Targets have been established and provide a compass for future decision-making.

- The Airport Improvement Program (AIP) is making best practice improvements throughout its regions based upon its evaluation of its efficiency measures of grant administration.

- The Research, Engineering & Development's (RE&D) efficiency measure is to maintain a RE&D management workforce comprising no more than 10 percent of its overall RE&D workforce. In FY 2007, this allowed RE&D to redirect $1.2 million into its direct research program.

Enhanced Capacity for Our Customers

America's economic success depends on the efficiency of our transportation network. Every day, our capacity accomplishments, such as Domestic Reduced Vertical Separation Minimum (DRVSM), help provide more economical and efficient aircraft operations. DRVSM created an additional six layers of cruise levels at higher altitudes enabling aircraft to operate at more fuel-efficient cruising altitudes while also increasing system capacity. Implemented in FY 2005, DRVSM was estimated to yield over $5.3 billion in savings from FY 2005 through FY 2016, but with the rise in jet fuel prices, the savings will exceed $13.4 billion, a 152 percent increase.

Advanced Technologies and Oceanic Procedures (ATOPs) are now available in 24 million square miles of airspace. Using ATOPs, the Atlantic routes will save airlines 6.5 million pounds of fuel and $8 million per year.

We also have Required Navigation Performance (RNP) approaches and departures that let aircraft use runways in low visibility conditions that would otherwise have been inaccessible. RNP is truly a game changer for opening up airports in challenging environments and that could mean fewer canceled or diverted flights, thereby resulting in a savings of lost time and money.

In conclusion, our results are not only marked by cost savings and increased capacity in the system, but by an enviable safety record that makes us a model for aviation safety practices throughout the world. We keep in front of us the beacon of our mission and will allow nothing to divert us from our course.

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FEDERAL AVIATION ADMINISTRATION

Office of the Administrator and Deputy Administrator

Corporate Services
FY 2008 28 FTE/ 30 FTP
FY 2009 28 FTE/ 30 FTP

Assistant Administrator for Civil Rights

Corporate Services
FY 2008 79 FTE/ 84 FTP
FY 2009 78 FTE/ 83 FTP

Associate Administrator for Commercial Space Transportation

Safety
FY 2008 62 FTE/ 71 FTP
FY 2009 68 FTE/ 75 FTP

Assistant Administrator for Aviation Policy, Planning & Environment

Environment
FY 2008 45 FTE/ 48 FTP
FY 2009 45 FTE/ 50 FTP
Corporate Services
FY 2008 55 FTE/ 60 FTP
FY 2009 52 FTE/ 57 FTP
Total
FY 2008 100 FTE/ 108 FTP
FY 2009 97 FTE/ 107 FTP

Assistant Administrator for Government & Industry Affairs

Corporate Services
FY 2008 12 FTE/ 15 FTP
FY 2009 12 FTE/ 15 FTP

Assistant Administrator for Human Resource Management

Organizational Excellence
FY 2008 283 FTE/ 286 FTP
FY 2008 112 FTE/ 113 FTP
Corporate Services
FY 2008 327 FTE/ 331 FTP
FY 2009 504 FTE/ 510 FTP
Total
FY 2008 610 FTE/ 617 FTP
FY 2009 616 FTE/ 623 FTP

Office of the Chief Counsel

Corporate Services
FY 2008 245 FTE/ 274 FTP
FY 2009 246 FTE/ 274 FTP

Assistant Administrator for Security & Hazardous Materials

Safety
FY 2008 137 FTE/ 150 FTP
FY 2009 140 FTE/ 153 FTP
Security, Preparedness, and Response
FY 2008 317 FTE/ 348 FTP
FY 2009 325 FTE/ 356 FTP
Total
FY 2008 454 FTE/ 498 FTP
FY 2009 465 FTE/ 509 FTP

Assistant Administrator for Communications

Corporate Services
FY 2008 34 FTE/ 40 FTP
FY 2009 34 FTE/ 40 FTP

Assistant Administrator for Information Services

Security, Preparedness, and Response
FY 2008 76 FTE/ 80 FTP
FY 2009 82 FTE/ 86 FTP
Organizational Excellence
FY 2008 25 FTE/ 26 FTP
FY 2009 19 FTE/ 20 FTP
Total
FY 2008 101 FTE/ 106 FTP
FY 2009 101 FTE/ 106 FTP

Assistant Administrator for International Aviation

Global Connectivity
FY 2008 63 FTE/ 64 FTP
FY 2009 65 FTE/ 66 FTP

Assistant Administrator for Financial Services

Organizational Excellence
FY 2008 37 FTE/ 42 FTP
FY 2009 41 FTE/ 47 FTP
Corporate Services
FY 2008 110 FTE/ 130 FTP
FY 2009 128 FTE/ 149 FTP
Total
FY 2008 147 FTE/ 172 FTP
FY 2009 169 FTE/ 196 FTP

Office of the Administrator and Deputy Administrator

Corporate Services
FY 2008 28 FTE/ 30 FTP
FY 2009 28 FTE/ 30 FTP

Assistant Administrator for Regions and Center Operations

Safety
FY 2008 4 FTE/ 4 FTP
FY 2009 4 FTE/ 4 FTP
Reduced Congestion
FY 2008 9 FTE/ 10 FTP
FY 2009 9 FTE/ 9 FTP
Global Connectivity
FY 2008 4 FTE/ 4 FTP
FY 2009 4 FTE/ 4 FTP
Corporate Services
FY 2008 784 FTE/ 833 FTP
FY 2009 838 FTE/ 884 FTP
Organizational Excellence
FY 2008 5 FTE/ 5 FTP
FY 2009 31 FTE/ 32 FTP
Total
FY 2008 806 FTE/ 856 FTP
FY 2009 886 FTE/ 933 FTP

Associate Administrator for Airports

Safety
FY 2008 155 FTE/ 157 FTP
FY 2009 157 FTE/ 157 FTP
Reduced Congestion
FY 2008 281 FTE/ 281 FTP
FY 2009 282 FTE/ 291 FTP
Global Connectivity
FY 2008 3 FTE/ 3 FTP
FY 2009 3 FTE/ 3 FTP
Environment
FY 2008 82 FTE/ 82 FTP
FY 2009 82 FTE/ 82 FTP
Security, Preparedness, and Response
FY 2008 1 FTE/ 1 FTP
FY 2009 2 FTE/ 1 FTP
Organizational Excellence
FY 2008 18 FTE/ 18 FTP
FY 2009 24 FTE/ 24 FTP
Total
FY 2008 550 FTE/ 558 FTP
FY 2009 550 FTE/ 558 FTP

Associate Administrator for Aviation Safety

Safety
FY 2008 6,237 FTE/ 6,843 FTP
FY 2009 6,251 FTE/ 6,918 FTP
Reduced Congestion
FY 2008 68 FTE/ 75 FTP
FY 2009 68 FTE/ 75 FTP
Global Connectivity
FY 2008 205 FTE/ 225 FTP
FY 2009 204 FTE/ 226 FTP
Environment
FY 2008 68 FTE/ 75 FTP
FY 2009 68 FTE/ 75 FTP
Organizational Excellence
FY 2008 409 FTE/ 450 FTP
FY 2009 408 FTE/ 453 FTP
Total
FY 2008 6,987 FTE/ 7,668 FTP
FY 2009 6,999 FTE/ 7,747 FTP

Air Traffic Organization

Safety
FY 2008 30,458 FTE/ 32,248 FTP
FY 2009 29,820 FTE/ 31,486 FTP
Reduced Congestion
FY 2008 3,051 FTE/ 3,371 FTP
FY 2009 3,790 FTE/ 4,148 FTP
Global Connectivity
FY 2008 26 FTE/ 27 FTP
FY 2009 23 FTE/ 24 FTP
Environment
FY 2008 41 FTE/ 45 FTP
FY 2009 80 FTE/ 86 FTP
Security, Preparedness, and Response
FY 2008 40 FTE/ 45 FTP
FY 2009 22 FTE/ 25 FTP
Organizational Excellence
FY 2008 279 FTE/ 313 FTP
FY 2009 337 FTE/ 375 FTP
Total
FY 2008 33,895 FTE/ 36,049 FTP
FY 2009 34,072 FTE/ 36,144 FTP

Total, FAA
FY 2008 44,164 FTE/ 47,195 FTP
FY 2009 44,485 FTE/ 47,505 FTP

EXHIBIT II-1
COMPARATIVE STATEMENT OF NEW BUDGET AUTHORITY
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
($000)

ACCOUNTS	FY 2007 Actual	FY 2008 Enacted	FY 2009 REQUEST
Operations[1]	$8,374,217	$8,740,000	
Facilities and Equipment[1]	$2,517,520	$2,513,611	
Safety & Operations[2]			$2,052,094
Air Traffic Organization[2]			$9,669,878
Research, Engineering and Development	$130,234	$146,828	$171,028 [3]
Grants-in-Aid for Airports			
(Contract Authority)	$3,700,000	$16,553	$2,750,000
Pop-up contract authority (49 USC 48112)	$592,480		
Rescission of contract authority	($621,000)	($185,500)	
Subtotal Grants-in Aid	$3,671,480	-$168,947	$2,750,000
Obligation Limitation Non-add	$3,514,956	$3,514,500 [4]	$2,750,000
Total, Budget Authority	**$14,693,451**	**$11,231,492**	**$14,643,000**
Mandatory	$3,671,480	-$168,947	$2,750,000
Discretionary	$11,021,971	$11,400,439	$11,893,000
FAA Appropriations + Ob Lims	**$14,536,927**	**$14,914,939**	**$14,643,000**

[1] Starting in FY 2009, this account will no longer receive new appropriations. New funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

[3] In FY 2009, the Research, Engineering, & Development account will be funded by the Airport and Airway Trust Fund and the General Fund.

[4] In FY 2008, the Airport Grants program has an obligation limitation of $3,515 million, but only $17 million in new contract authority. The program cannot award new grants until sufficient contract authority is provides for FY 2008.

EXHIBIT II-2
FY 2009 BUDGET REQUEST BY APPROPRIATIONS ACCOUNT
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
$000

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Operations[1]	**$8,374,217**	**$8,740,000**	
Air Traffic Organization (ATO)	6,739,761	6,966,193	
Aviation Safety (AVS)	1,003,410	1,081,602	
Commercial Space Transportation (AST)	11,696	12,549	
Staff Offices	619,350	679,656	
Facilities & Equipment[1]	**$2,517,520**	**$2,513,611**	
Engineering, Development, Test and Evaluation	236,965	307,478	
Air Traffic Control Facilities and Equipment	1,449,338	1,395,662	
Non-Air Traffic Control Facilities and Equipment	143,000	131,743	
Facilities and Equipment Mission Support	251,500	218,755	
Personnel and Related Expenses	436,717	459,973	
Safety & Operations[2]			**$2,052,094**
Aviation Safety (AVS)			1,186,927
Commercial Space Transportation (AST)			14,094
Staff Offices			851,073
Air Traffic Organization[2]			**$9,669,878**
Salaries & Expenses			7,078,793
Capital Programs			2,591,085
Research, Engineering & Development	**$130,234**	**$146,828**	**$171,028** [3]
Improve Aviation Safety	88,232	96,526	90,763
Improve Efficiency	21,166	30,234	43,254
Reduce Environmental Impacts	16,018	15,469	31,658
Mission Support	4,818	4,599	5,353
Grants-in-Aid for Airports	**$3,514,956**	**$3,514,500** [4]	**$2,750,000**
Grants-in-Aid for Airports	3,401,659	3,395,112	2,628,198
Personnel & Related Expenses	75,426	80,676	87,454
Airport Technology Research	17,870	18,712	19,348
Small Community Air Service	10,000	10,000	0
Airport Cooperative Research Program (ACRP)	10,000	10,000	15,000
TOTAL:	**$14,536,927**	**$14,914,939**	**$14,643,000**

[1] Starting in FY 2009, this account will no longer receive new appropriations. New Funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

[3] In FY 2009, the Research, Engineering, & Development account will be funded by the Airport and Airway Trust Fund and the General Fund.

[4] In Fy 2008, the Airport Grants program has an obligation limitation of $3,515 million, but only $17 million in new contract authority. The program cannot award new grants until sufficient contract authority is provided for FY 2008.

EXHIBIT II-3
FY 2009 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
FY 2009 REQUEST							
SAFETY AND OPERATIONS							
Aviation Safety (AVS)							
A. Reduce the Commercial Air Carrier Fatality Rate	894,654						894,654
B. Reduce the General Aviation Fatal Accident Rate	168,619						168,619
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		11,241					11,241
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		0					0
E. Conclude Bilateral Aviation Safety Agreements			33,724				33,724
F. Reduce Exposure to Significant Aircraft Noise				11,241			11,241
G. Organizational Excellence - Support PMA Goals						67,448	67,448
Subtotal - AVS	**1,063,273**	**11,241**	**33,724**	**11,241**	**0**	**67,448**	**1,186,927**
Commercial Space Transportation (AST)							
A. Maintain Zero Commercial Space Transportation Accidents	14,094						14,094
Subtotal - AST	**14,094**	**0**	**0**	**0**	**0**	**0**	**14,094**
Human Resource Management (AHR)							
A. Organizational Excellence - Support PMA Goals						25,176	25,176
Subtotal - AHR	**0**	**0**	**0**	**0**	**0**	**25,176**	**25,176**
Region and Center Operations (ARC)							
A. Reduce the Commercial Air Carrier Fatality Rate	1,379						1,379
B. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		2,725					2,725
C. Conclude Bilateral Aviation Safety Agreements			2,035				2,035
D. Organizational Excellence - Support PMA Goals						59,050	59,050
Subtotal - ARC	**1,379**	**2,725**	**2,035**	**0**	**0**	**59,050**	**65,189**
Information Services (AIO)							
A. Organizational Excellence - Support PMA Goals						12,295	12,295
B. Security, Preparedness and Response					49,163		49,163
Subtotal - AIO	**0**	**0**	**0**	**0**	**49,163**	**12,295**	**61,458**
Aviation Policy, Planning & Environment (AEP)							
A. Reduce Exposure to Significant Aircraft Noise				5,545			5,545
B. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				52			
Subtotal - AEP	**0**	**0**	**0**	**5,597**	**0**	**0**	**5,597**
International Aviation (API)							
A. Conclude Bilateral Aviation Safety Agreements			526				526
B. Secure a Yearly Increase in External Funding for Global Safety Initiatives			17,382				17,382
Subtotal - API	**0**	**0**	**17,908**	**0**	**0**	**0**	**17,908**
Security and Hazardous Materials (ASH)							
A. Reduce Serious Hazardous Material Incidents	22,366						22,366
B. Security, Preparedness and Response					71,107		71,107
Subtotal - ASH	**22,366**	**0**	**0**	**0**	**71,107**	**0**	**93,473**
Financial Services (ABA)							
A. Organizational Excellence - Support PMA Goals						26,847	26,847
Subtotal - ABA	**0**	**0**	**0**	**0**	**0**	**26,847**	**26,847**
Corporate Services							
A. Reduce the Commercial Air Carrier Fatality Rate	472,494						472,494
B. Reduce the General Aviation Fatal Accident Rate	32,662						32,662
C. Reduce Serious Hazardous Material Incidents	1,479						1,479
D. Maintain Zero Commercial Space Transportation Accidents	914						914
E. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		8,513					8,513
F. Increase Average Daily Airport Capacity for the 35 OEP Airports		18,735					18,735
G. Conclude Bilateral Aviation Safety Agreements			2,706				2,706
H. Secure a Yearly Increase in External Funding for Global Safety Initiatives			1,124				1,124

EXHIBIT II-3
FY 2009 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
I. FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses			45				45
J. Reduce Exposure to Significant Aircraft Noise				1,063			1,063
K. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				610			610
L. Security, Preparedness and Response					5,489		5,489
M. Organizational Excellence - Support PMA Goals						9,592	9,592
Subtotal - Corporate Services	**507,549**	**27,248**	**3,875**	**1,673**	**5,489**	**9,592**	**555,425**
Subtotal Safety & Operations	**1,608,661**	**41,214**	**57,542**	**18,512**	**125,759**	**200,407**	**2,052,094**
AIR TRAFFIC ORGANIZATION (ATO)							
Salaries & Expenses							
A. Reduce the Commercial Air Carrier Fatality Rate	6,324,789						6,324,789
B. Reduce the General Aviation Fatal Accident Rate	325,418						325,418
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		114,800					114,800
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		283,371					283,371
E. Conclude Bilateral Aviation Safety Agreements and F. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			4,644				4,644
G. FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses			680				680
H. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				9,225			9,225
I. Organizational Excellence - Support PMA Goals						15,866	15,866
Subtotal - Salaries & Expenses	**6,650,207**	**398,171**	**5,324**	**9,225**	**0**	**15,866**	**7,078,793**
Capital Programs							
A. Reduce the Commercial Air Carrier Fatality Rate	201,022						201,022
B. Reduce the General Aviation Fatal Accident Rate	179,229						179,229
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		278,954					278,954
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		1,629,157					1,629,157
E. Conclude Bilateral Aviation Safety Agreements			0				0
F. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				28,937			28,937
G. Security, Preparedness and Response					21,137		21,137
H. Organizational Excellence - Support PMA Goals						188,949	188,949
I. Critical Acquisitions on Schedule						31,850	
J. Critical Acquisitions on Budget						31,850	
Subtotal - Capital Programs	**380,251**	**1,908,111**	**0**	**28,937**	**21,137**	**252,649**	**2,591,085**
Subtotal Air Traffic Organization	**7,030,458**	**2,306,282**	**5,324**	**38,162**	**21,137**	**268,515**	**9,669,878**
RESEARCH ENGINEERING AND DEVELOPMENT							
Improve Aviation Safety							
A. Reduce the Commercial Air Carrier Fatality Rate	92,014						92,014
Subtotal - Improve Aviation Safety	**92,014**	**0**	**0**	**0**	**0**	**0**	**92,014**
Mission Support							
A. Reduce the Commercial Air Carrier Fatality Rate	2,674						2,674
B. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		1,680					1,680
C. Reduce Exposure to Significant Aircraft Noise				999			999
Subtotal - Mission Support	**2,674**	**1,680**	**0**	**999**	**0**	**0**	**5,353**
Improve Efficiency							
A. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		42,644					42,644
Subtotal - Improve Efficiency	**0**	**42,644**	**0**	**0**	**0**	**0**	**42,644**
Reduce Environmental Impacts							
A. Reduce Exposure to Significant Aircraft Noise				31,017			31,017
Subtotal - Reduce Environmental Impacts	**0**	**0**	**0**	**31,017**	**0**	**0**	**31,017**
Subtotal - Research, Engineering, & Development	**94,688**	**44,324**	**0**	**32,016**	**0**	**0**	**171,028**

EXHIBIT II-3
FY 2009 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
GRANTS-IN-AID FOR AIRPORTS*							
Grants-in-Aid for Airports							
A. Reduce the Commercial Air Carrier Fatality Rate	444,045						444,045
B. Reduce the General Aviation Fatal Accident Rate	629,785						629,785
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		1,236,832					1,236,832
D. Reduce Exposure to Significant Aircraft Noise				214,009			214,009
E. Streamline the Completion of Environmental Reviews for DOT-Funded Infrastructure				33,454			33,454
F. Security, Preparedness and Response					70,073		70,073
Subtotal - Grants-in-Aid for Airports	**1,073,830**	**1,236,832**	**0**	**247,464**	**70,073**	**0**	**2,628,198**
Personnel & Related Expenses							
A. Reduce the Commercial Air Carrier Fatality Rate	17,933						17,933
B. Reduce the General Aviation Fatal Accident Rate	14,323						14,323
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		29,779					29,779
D. Conclude Bilateral Aviation Safety Agreements			200				200
E. Reduce Exposure to Significant Aircraft Noise				7,971			7,971
F. Streamline the Completion of Environmental Reviews for DOT-Funded Infrastructure				3,322			3,322
G. Security, Preparedness and Response					1,605		1,605
H. Organizational Excellence - Support PMA Goals						8,321	8,321
I. Major Infrastructure Projects on Schedule						2,000	
J. Major Infrastructure Projects on Budget						2,000	
Subtotal - Personnel & Related Expenses	**32,256**	**29,779**	**200**	**11,292**	**1,605**	**12,321**	**87,454**
Airport Technology Research							
A. Reduce the Commercial Air Carrier Fatality Rate	9,821						9,821
B. Reduce the General Aviation Fatal Accident Rate	418						418
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		9,109					9,109
Subtotal - Airport Technology Research	**10,239**	**9,109**	**0**	**0**	**0**	**0**	**19,348**
Airport Cooperative Research							
A. Reduce the Commercial Air Carrier Fatality Rate	5,000						5,000
B. Increase Average Daily Airport Capacity for the 35 OEP Airports		5,000					5,000
C. Reduce Exposure to Significant Aircraft Noise				5,000			5,000
Subtotal - Airport Cooperative Research	**5,000**	**5,000**	**0**	**5,000**	**0**	**0**	**15,000**
Subtotal - Grants-in-Aid for Airports	**1,121,325**	**1,280,720**	**200**	**263,756**	**71,678**	**12,321**	**2,750,000**
TOTAL REQUEST	**9,855,131**	**3,672,540**	**63,066**	**352,446**	**218,574**	**481,242**	**14,643,000**

EXHIBIT II-4
BUDGET AUTHORITY BY APPROPRIATIONS ACCOUNT
($000)

	FY 2007 Actual	FY 2008 Enacted	FY 2009 REQUEST
Operations[1]	**$8,374,217**	**$8,740,000**	
General	$2,746,316	$2,342,939	
AATF	$5,627,900	$6,397,061	
Facilities & Equipment[1]	**$2,517,520**	**$2,513,611**	
Safety & Operations[2]			**$2,052,094**
General			$1,293,533
AATF			$758,561
Air Traffic Organization[2]			**$9,669,878**
General			$1,423,956
AATF			$8,245,922
Research, Engineering & Development	**$130,234**	**$146,828**	**$171,028** [3]
General	$0	$0	$15,025
AATF	$130,234	$146,828	$156,003
Grants in Aid for Airports:	**$3,671,480**	**-$168,947**	**$2,750,000**
Contract Authority	$4,292,480	$16,553	$2,750,000
Rescission	($621,000)	($185,500)	
TOTAL BA:	**$14,693,451**	**$11,231,492**	**$14,643,000**
[Mandatory]	$3,671,480	-$168,947	$2,750,000
[Discretionary]	$11,021,971	$11,400,439	$11,893,000

[1]Starting in FY 2009, this account will no longer receive new appropriations. New Funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

[3] In FY 2009, the Research, Engineering, & Development account will be funded by the Airport and Airway Trust Fund and the General Fund.

EXHIBIT II-5
OUTLAYS BY APPROPRIATIONS ACCOUNT
($000)

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Operations[1]	**$8,082,003**	**$8,839,000**	**$1,093,000**
General	($2,454,036)	($2,440,000)	($1,093,000)
AATF	($5,627,967)	($6,399,000)	
Facilities & Equipment (TF)[1]	**$2,289,913**	**$2,704,000**	**$1,628,000**
-Discretionary	($2,347,975)	($2,696,000)	($1,604,000)
-Mandatory	(-58,062)	($8,000)	($24,000)
Safety & Operations[2]			**$1,744,000**
General			($985,000)
AATF			($759,000)
Air Traffic Organization[2]			**$7,344,000**
General			(-902,000)
AATF			($8,246,000)
Aviation Insurance Revolving Account	**($197,743)**	**($165,000)**	**($38,000)**
Research, Engineering (TF)[3] **& Development**	**$151,997**	**$169,000**	**$84,000**
Research, Engineering[3] **& Development**			**$103,000**
General			(-53,000)
AATF			($156,000)
Grants in Aid for (TF) Airports	**$3,874,013**	**$2,970,000**	**$4,090,000**
Franchise Fund	**-$47,608**	**$11,000**	**$41,000**
TOTAL:	**$14,152,575**	**$14,528,000**	**$16,089,000**
[Mandatory]	-$255,805	-$157,000	-$14,000
[Discretionary]	$14,408,380	$14,685,000	$16,103,000

[1]Starting in FY 2009, this account will no longer receive new appropriations. New funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

[3] In Fy 2009, the Research, Engineering, & Development account will be funded by the Airport and Airway Trust Fund and the General Fund.

Federal Aviation Administration
FY 2009 President's Budget Submission

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE

FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

SAFETY & OPERATIONS

	2008 Enacted[1]	2008 PC&B By Program	2008 FTE By Program	2008 Contracts Expenses	Transfer from Operations[2]	Transfer from F&E[3]	Annualization of 2008 Pay Raises	2009 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2008 Adjusted Base	Program Increases/ Decreases[4]	2009 PC&B Program Increase	2009 FTE Per Program Increase	2009 Contract Expense Program Increases	FY 2009 Request
		Note Non-Add												Note Non-Add			
PERSONNEL RESOURCES (FTE)					9,535	92											9,761
Direct FTE					9,535	92	4					9,631	130		130		9,761
FINANCIAL RESOURCES																	
Salaries and Benefits		---	---	---	$1,163,953	$15,804	$24,938	$34,473				$1,239,168	$18,694	$18,694	130	---	$1,257,862
Benefits for Former Personnel		---	---	---	$737							$737	$36	$36	---	---	$773
Travel		---	---	---	$61,685						$1,419	$63,104	$62	---	---	---	$63,166
Transportation		---	---	---	$4,226						$97	$4,323	$19	---	---	---	$4,342
GSA Rent		---	---	---	$110,314				$2,537			$112,851	$3,723	---	---	---	$116,574
Rental Payments to Others		---	---	---	$34,914						$803	$35,717	$12,731	---	---	---	$48,448
Communications, Rent & Utilities		---	---	---	$14,873						$342	$15,215	($236)	---	---	---	$14,979
Printing		---	---	---	$3,688						$85	$3,773	($6)	---	---	---	$3,767
Other Services:																	
-WCF		---	---	---	$18,596					$1,952		$20,548		---	---	---	$20,548
-Advisory and Assistance Services		---	---	---	$40,814						$939	$41,753	($747)	---	---	($747)	$41,006
-Other		---	---	---	$290,984	$102,993					$6,106	$400,084	$46,356	---	---	$46,356	$446,440
Supplies		---	---	---	$13,194						$303	$13,498	$1,518	---	---	---	$15,016
Equipment		---	---	---	$14,785						$340	$15,125	$3,001	---	---	---	$18,126
Lands and Structures		---	---	---	$23							$23		---	---	---	$23
Grants, Claims and Subsidies		---	---	---	$275							$275		---	---	---	$275
Insurance Claims and Indemnities		---	---	---	$325							$325		---	---	---	$325
Interest & Dividends		---	---	---	$421						$5	$426		---	---	---	$426
Refunds		---	---	---	$0							$0		---	---	---	$0
Admin Subtotal	**$0**	**$0**	**0**	**$0**	**$1,773,807**	**$118,797**	**$24,938**	**$34,473**	**$2,537**	**$1,952**	**$10,440**	**$1,966,944**	**$85,150**	**$18,730**	**130**	**$45,609**	**$2,052,094**
PROGRAMS																	
Aviation Safety (AVS)		---	---	---	$1,081,602	$52,914	$19,813	$22,440		$95	$5,417	$1,182,281	$4,646	$1,123	12	$3,523	$1,186,927
Commercial Space Transportation (AST)		---	---	---	$12,549	$0	$720	$378			$178	$13,825	$270	$270	2	$0	$14,094
Staff Offices		---	---	---	$679,656	$65,883	$4,405	$11,656	$2,537	$1,858	$4,844	$770,839	$80,235	$17,337	116	$42,086	$851,073
Programs Subtotal	**$0**	**$0**	**0**	**$0**	**$1,773,807**	**$118,797**	**$24,938**	**$34,473**	**$2,537**	**$1,952**	**$10,440**	**$1,966,944**	**$85,150**	**$18,730**	**130**	**$45,609**	**$2,052,094**
Govt-wide E-gov initiative					**$369**						**$8**	**$378**	**($159)**				**$219**
GRAND TOTAL	**$0**				**$1,773,807**	**$118,797**	**$24,938**	**$34,473**	**$2,537**	**$1,952**	**$10,440**	**$1,966,944**	**$85,150**				**$2,052,094**

[1] Safety & Operations is a new account starting in FY 2009 that includes both traditional Operations and Facilities & Equipment funds.

[2] Reflects FY 2008 CR amount "transferred" from the Operations appropriation to the new Safety & Operations appropriation.

[3] Reflects FY 2008 CR amount "transferred" from the Facilities & Equipment appropriation to the new Safety & Operations appropriation.

[4] Includes Capital programs and PC&B formerly in the F&E appropriation now in the Safety & Operations appropriation.

Federal Aviation Administration
FY 2009 President's Budget Submission

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE

FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

AIR TRAFFIC ORGANIZATION

	2008 Enacted[1]	2008 PC&B By Program	2008 FTE By Program	2008 Contracts Expenses	Transfer from Operations[2]	Transfer from F&E[3]	Annualization of 2008 Pay Raises	2009 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2008 Adjusted Base	Program Increases/ Decreases	2009 PC&B Program Increase	2009 FTE Per Program Increase	2009 Contract Expense Program Increases	FY 2009 Request
		Note Non-Add												Note Non-Add			
PERSONNEL RESOURCES (FTE)																	
					30,907	2,792											33,871
Direct FTE					30,907	2,792	128					33,827	44		44		33,871
FINANCIAL RESOURCES																	
Salaries and Benefits		---	---	---	$4,858,882	$400,274	$70,400	$153,386				$5,482,942	($64,598)	($64,598)	44	---	$5,418,344
Benefits for Former Personnel		---	---	---	$236							$236		---	---	---	$236
Travel		---	---	---	$62,603	$34,208					$1,440	$98,250	$1,177	---	---	---	$99,427
Transportation		---	---	---	$17,653	$3,698					$406	$21,757	$289	---	---	---	$22,046
GSA Rent		---	---	---	$1,955				$36			$1,991		---	---	---	$1,991
Rental Payments to Others		---	---	---	$12,313	$33,284					$283	$45,879	$1,656	---	---	---	$47,535
Communications, Rent & Utilities		---	---	---	$361,049	$41,604					$8,304	$410,958	$1,440	---	---	---	$412,398
Printing		---	---	---	$1,061	$925					$24	$2,010	$89	---	---	---	$2,099
Other Services:																	
-WCF		---	---	---	$7,621					$208		$7,829		---	---	---	$7,829
-Advisory and Assistance Services		---	---	---	$360,233						$8,285	$368,518	($12,157)	---	---	($12,157)	$356,361
-Other		---	---	---	$1,100,274	$1,460,154					$7,312	$2,567,740	$90,200	---	---	$90,200	$2,657,940
Supplies		---	---	---	$113,918	$32,359					$2,620	$148,897	($768)	---	---	---	$148,129
Equipment		---	---	---	$61,400	$169,191					$1,412	$232,004	$14,951	---	---	---	$246,955
Lands and Structures		---	---	---	$5,314	$215,418					$122	$220,855	$21,946	---	---	---	$242,801
Grants, Claims and Subsidies		---	---	---	$281	$3,698					$6	$3,985	$376	---	---	---	$4,361
Insurance Claims and Indemnities		---	---	---	$1,387						$32	$1,418	($7)	---	---	---	$1,411
Interest & Dividends		---	---	---	$13						$1	$14		---	---	---	$14
Refunds		---	---	---	$0							$0		---	---	---	$0
Admin Subtotal	**$0**	**$0**	**0**	**$0**	**$6,966,193**	**$2,394,814**	**$70,400**	**$153,386**	**$36**	**$208**	**$30,248**	**$9,615,285**	**$54,593**	**($64,598)**	**44**	**$78,043**	**$9,669,878**
PROGRAMS																	
Salaries & Expenses		---	---	---	$6,966,193	$0	$70,400	$153,386	$36	$208	$30,248	$7,220,471	($141,678)	($64,598)	99	($66,482)	$7,078,793
Capital Programs		---	---	---	$0	$2,394,814	$0	$0	$0	$0	$0	$2,394,814	$196,271	($1,081)	(55)	$144,525	$2,591,085
Programs Subtotal	**$0**	**$0**	**0**	**0**	**$6,966,193**	**$2,394,814**	**$70,400**	**$153,386**	**$36**	**$208**	**$30,248**	**$9,615,285**	**$54,593**	**($65,679)**	**44**	**$78,043**	**$9,669,878**
Govt-wide E-gov initiative						**$165**					**$4**	**$169**	**($89)**				**$80**
GRAND TOTAL	**$0**				**$6,966,193**	**$2,394,814**	**$70,400**	**$153,386**	**$36**	**$208**	**$30,248**	**$9,615,285**	**$54,593**				**$9,669,878**

[1] Air Traffic Organization is a new account starting in FY 2009 that includes both traditional Operations and Facilities & Equipment funds.

[2] Reflects FY 2008 amount "transferred" from the Operations appropriation to the new ATO appropriation.

[3] Reflects FY 2008 amount "transferred" from the Facilities & Equipment appropriation to the new ATO appropriation.

EXHIBIT II-6

SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

RESEARCH, ENGINEERING, & DEVELOPMENT

	2008 Enacted	2008 PC&B By Program	2008 FTE By Program	2008 Contracts Expenses	Annualization of 2008 Pay Raises	2009 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2008 Adjusted Base	Program Increases/ Decreases	2009 PC&B Program Increase	2009 FTE Per Program Increase	2009 Contract Expense Program Increases	FY 2009 Request
			Note Non-Add										Note Non-Add		
PERSONNEL RESOURCES (FTE)	298									298	5		5		303
Direct FTE	298									298	5		5		303
FINANCIAL RESOURCES															
Salaries and Benefits	$41,248	$41,248	298		$206	$1,011				$42,465	$750	$750	5		$43,215
Benefits for Former Personnel	$0									$0					$0
Travel	$1,844									$1,844					$1,844
Transportation	$100									$100					$100
GSA Rent	$0									$0					$0
Rental Payments to Others	$0									$0					$0
Communications, Rent & Utilities	$115									$115					$115
Printing	$0									$0					$0
Other Services:	$0									$0					$0
-WCF	$0									$0					$0
-Advisory and Assistance Services	$0									$0					$0
-Other	$81,021			$81,021					$67	$81,088	$22,166			$22,166	$103,254
Supplies	$2,000									$2,000					$2,000
Equipment	$4,500									$4,500					$4,500
Lands and Structures	$0									$0					$0
Grants, Claims & Subsidies	$16,000									$16,000					$16,000
Insurance Claims and Indemnities	$0									$0					$0
Interest & Dividends	$0									$0					$0
Admin Subtotal	**$146,828**	**$41,248**	**298**	**$81,021**	**$206**	**$1,011**	**$0**	**$0**	**$67**	**$148,112**	**$22,916**	**$750**	**5**	**$22,166**	**$171,028**
										$0					
PROGRAMS										$0					
Improve Aviation Safety	$96,526	$32,564	245	$57,118	$167	$820			$46	$97,559	($6,796)			(6,795)	$90,763
Improve Aviation Efficiency	$30,234	$3,530	13	$19,352	$11	$65			$16	$30,326	$12,928	$600	4	$12,325	$43,254
Reduce Environmental Impact	$15,469	$2,297	16	$3,975	$13	$52			$4	$15,538	$16,120	$150	1	$15,970	$31,658
Mission Support	$4,599	$2,857	24	$576	$15	$74			$1	$4,689	$664			$664	$5,353
Programs Subtotal	**$146,828**	**$41,248**	**298**	**81,021**	**$206**	**$1,011**	**$0**	**$0**	**$67**	**$148,112**	**$22,916**	**$750**	**5**	**$22,164**	**$171,028**
Govt-wide E-gov initiative															
GRAND TOTAL	**$146,828**				**$206**	**$1,011**	**$0**	**$0**	**$67**	**$148,112**	**$22,916**				**$171,028**

EXHIBIT II-6

SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

GRANTS-IN-AID FOR AIRPORTS

	*2008 Enacted	*2008 PC&B By Program	* 2008 FTE By Program	* 2008 Contracts Expenses	*Annualization of 2008 Pay Raises	2009 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2008 Adjusted Base	Program Increases/ Decreases	2009 PC&B Program Increase	2009 FTE Per Program Increase	2009 Contract Expense Program Increases	FY 2009 Request
			Note Non-Add										Note Non-Add		
PERSONNEL RESOURCES (FTE)															
Direct FTE	540				2					542	8				550
FINANCIAL RESOURCES															
Salaries and Benefits	$67,919	$67,919	540.0		$1,004	$2,075				$70,998	$814	$814	9.0		$71,812
Benefits for Former Personnel	$0									$0	$0				$0
Travel	$2,531								$58	$2,589	$0				$2,589
Transportation	$43								$1	$44	$0				$44
GSA Rent	$0									$0	$0				$0
Rental Payments to Others	$492								$11	$503	$0				$503
Communications, Rent & Utilities	$137								$3	$140	$0				$140
Printing	$28								$1	$29	$0				$29
Other Services:	$0									$0	$0				$0
-WCF	$0									$0	$0				$0
-Advisory and Assistance Services	$0									$0	$0				$0
-Other	$37,919			$37,919					$640	$38,559	$7,300		1.0	$7,300	$45,859
Supplies	$214								$5	$219	$0				$219
Equipment	$107								$2	$109	$500				$609
Lands and Structures	$0									$0	$0				$0
Grants, Claims and Subsidies	$3,405,110									$3,405,110	($776,914)				$2,628,196
Insurance Claims and Indemnities	$0									$0	$0				$0
Interest & Dividends	$0									$0	$0				$0
Admin Subtotal	**$3,514,500**	**$67,919**	**540.0**	**$37,919**	**$1,004**	**$2,075**	**$0**	**$0**	**$721**	**$3,518,300**	**($768,300)**	**$814**	**10.0**	**$7,300**	**$2,750,000**
PROGRAMS															
Grants-in-aid for Airports	$3,395,112	$0	0.0	$0	$0	$0			$0	$3,395,112	($766,914)				$2,628,198
Personnel and Related Expenses	$80,676	$64,722	518.5	$12,424	$895	$1,977			$366	$83,914	$3,540	$740	9.0	$2,300	$87,454
Airport Technology Research	$18,712	$3,071	20.5	$15,641	$108	$94			$360	$19,274	$74	$74	1.0	$0	$19,348
Airport Cooperative Research	$10,000	$126	1.0	$9,854	$1	$4			($5)	$10,000	$5,000	$0		$5,000	$15,000
Small Community Development Program	$10,000	$0	0.0	$0	$0	$0			$0	$10,000	($10,000)				$0
Programs Subtotal	**$3,514,500**	**$67,919**	**540.0**	**$37,919**	**$1,004**	**$2,075**	**$0**	**$0**	**$721**	**$3,518,300**	**($768,300)**	**$814**	**10.0**	**$7,300**	**$2,750,000**
Govt-wide E-gov initiative	**$426**								**$10**	**$436**	**($76)**				**$360**
GRAND TOTAL	**$3,514,500**				**$1,004**	**$2,075**	**$0**	**$0**	**$721**	**$3,518,300**	**($768,300)**				**$2,750,000**

*** FY08 - assumes enacted authorization with contract authority at or above $3,514,500,000**

EXHIBIT II-6A

WORKING CAPITAL FUND
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, Exempt Obligations and Reimbursable Obligations
($000)

	FY 2008 ENACTED	FY 2009 REQUEST	CHANGE
DIRECT:			
Safety & Operations	**18,595**	**20,548**	**1,953**
Aviation Safety (AVS)	2,008	2,103	95
Commercial Space Transportation (AST)	-	-	-
Staff Offices	16,587	18,445	1,858
Air Traffic Organization	**7,621**	**7,829**	**208**
TOTAL	**26,216**	**28,377**	**2,161**

EXHIBIT II-7
PERSONNEL RESOURCE -- SUMMARY
TOTAL FULL-TIME EQUIVALENTS

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations[1]	39,610	40,442	
Aviation Insurance Revolving Fund	5	5	
Facilities & Equipment[1]	2,738	2,884	
Safety & Operations[2]			9,761
Aviation Insurance Revolving Fund			5
Air Traffic Organization[2]			
Salaries & Expenses			31,134
Capital Programs			2,737
Research, Engineering & Development	262	298	303
Grants-in-Aid for Airports	513	540	550
SUBTOTAL, DIRECT FUNDED	**43,128**	**44,169**	**44,490**
REIMBURSEMENTS/ALLOCATIONS			
Operations[1]	133	124	
Facilities & Equipment[1]	10	55	
Safety & Operations[2]			20
Air Traffic Organization[2]			
Salaries & Expenses			104
Capital Programs			55
Grants-in-Aid for Airports	4	6	6
Administrative Services Franchise Fund	1,293	1,428	1,428
SUBTOTAL, REIMBURSE./ALLOC.	**1,440**	**1,613**	**1,613**
TOTAL FTEs	**44,568**	**45,782**	**46,103**

[1] Starting in FY 2009, this account will no longer receive new appropriations. New funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

EXHIBIT II-8
RESOURCE SUMMARY - STAFFING
FULL-TIME PERMANENT POSITIONS

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations[1]	42,672	43,121	
Aviation Insurance Revolving Fund	5	5	
Facilities & Equipment[1]	3,234	3,234	
Safety & Operations[2]			10,699
Aviation Insurance Revolving Fund			5
Air Traffic Organization[2]			
Salaries & Expenses			32,853
Capital Programs			3,087
Research, Engineering & Development	298	298	308
Grants-in-Aid for Airports	538	542	558
SUBTOTAL, DIRECT FUNDED	**46,747**	**47,200**	**47,510**
REIMBURSEMENTS/ALLOCATIONS			
Operations[1]	350	300	
Facilities & Equipment[1]	55	55	
Safety & Operations[2]			91
Air Traffic Organization[2]			
Salaries & Expenses			159
Capital Programs			55
Grants-in-Aid for Airports	4	4	4
Administrative Services Franchise Fund	1,380	1,566	1,565
SUBTOTAL, REIMBURSE./ALLOC.	**1,789**	**1,925**	**1,874**
TOTAL	**48,536**	**49,125**	**49,384**

[1] Starting in FY 2009, this account will no longer receive new appropriations. New funding is requested in the Safety & Operations and ATO accounts.

[2] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.

EXHIBIT II-9
FY 2009 BUDGET SUMMARY BY ORGANIZATION
OPERATIONS AND FACILITIES & EQUIPMENT APPROPRIATIONS
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
$000

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST*
Air Traffic Organization (ATO)	**$9,123,742**	**$9,361,007**	**$9,669,878**
Operations	6,739,761	6,966,193	7,078,793
Facilities & Equipment	2,383,982	2,394,814	2,591,085
Aviation Safety (AVS)	**$1,058,990**	**$1,134,516**	**$1,186,927**
Operations	1,003,410	1,081,602	1,130,927
Facilities & Equipment	55,580	52,914	56,000
Commercial Space Transportation (AST)	**$11,696**	**$12,549**	**$14,094**
Operations	11,696	12,549	14,094
Facilities & Equipment	0	0	0
Staff Offices	**$697,308**	**$745,539**	**$851,073**
Operations	619,350	679,656	774,648
Facilities & Equipment	77,958	65,883	76,425
Financial Services (ABA)	**$82,332**	**$103,143**	**$114,557**
Operations	76,289	100,593	112,004
Facilities & Equipment	6,043	2,550	2,553
Human Resource Management (AHR)	**$85,738**	**$91,214**	**$96,091**
Operations	85,738	91,214	96,091
Facilities & Equipment	0	0	0
Region & Center Operations (ARC)	**$316,907**	**$323,831**	**$387,344**
Operations	275,797	286,848	336,894
Facilities & Equipment	41,110	36,983	50,450
Information Services (AIO)	**$56,762**	**$54,700**	**$61,458**
Operations	36,002	38,650	48,338
Facilities & Equipment	20,760	16,050	13,120
Office of the Administrator (AOA)	**$4,206**	**$4,344**	**$4,622**
Operations	4,206	4,344	4,622
Facilities & Equipment	0	0	0

EXHIBIT II-9
FY 2009 BUDGET SUMMARY BY ORGANIZATION
OPERATIONS AND FACILITIES & EQUIPMENT APPROPRIATIONS
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
$000

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST*
Civil Rights (ACR)	**$9,018**	**$9,353**	**$9,958**
Operations	9,018	9,353	9,958
Facilities & Equipment	0	0	0
Government & Industry Affairs (AGI)	**$1,382**	**$1,437**	**$1,539**
Operations	1,382	1,437	1,539
Facilities & Equipment	0	0	0
Communications (AOC)	**$6,090**	**$6,336**	**$6,699**
Operations	6,090	6,336	6,699
Facilities & Equipment	0	0	0
General Counsel (AGC)	**$36,885**	**$38,982**	**$43,575**
Operations	36,885	38,982	43,575
Facilities & Equipment	0	0	0
Aviation Policy, Planning, & Environment (AEP)	**$13,161**	**$13,592**	**$13,849**
Operations	13,116	13,542	13,797
Facilities & Equipment	45	50	52
International Aviation (API)	**$14,030**	**$16,012**	**$17,908**
Operations	14,030	16,012	17,908
Facilities & Equipment	0	0	0
Security & Hazardous Materials (ASH)	**$70,797**	**$82,595**	**$93,473**
Operations	60,797	72,345	83,223
Facilities & Equipment	10,000	10,250	10,250
Totals			
Operations	8,374,217	8,740,000	8,998,462
Facilities & Equipment	2,517,520	2,513,611	2,723,510

* Starting in FY 2009, Operations and Facilities & Equipment will no longer receive new appropriations. New funding is requested in the Safety & Operations and ATO accounts instead. For purposes of this exhibit, amounts are displayed by organization, not budget accounts.

SAFETY AND OPERATIONS

For necessary expenses of the Federal Aviation Administration, not otherwise provided for, including aviation regulation and certification; operations and research activities related to commercial space transportation; the operation (including leasing) and maintenance of aircraft, and policy oversight and overall management functions; lease or purchase of passenger motor vehicles for replacement only; acquisition, establishment, technical support services, improvement by contract or purchase, and hire of air navigation and experimental facilities and equipment, as authorized under part A of subtitle VII of title 49, United States Code, including initial acquisition of necessary sites by lease or grant; engineering and service testing, including construction of test facilities and acquisition of necessary sites by lease or grant; construction and furnishing of quarters and related accommodations for officers and employees of the Federal Aviation Administration stationed at remote localities where such accommodations are not available; and the purchase, lease, or transfer of aircraft from funds available under this heading, $1,293,533,000; and in addition $758,561,000, which shall be derived from the Airport and Airway Trust Fund: Provided, That of the total amount provided herein, $115,900,000 shall remain available until September 30, 2011: Provided further, That in addition there may be credited to this appropriation as offsetting collections, funds received from States, counties, municipalities, foreign authorities, other public authorities, and private sources, which shall be available for expenses incurred in the provision of agency services, including receipts from the issuance, renewal or modification of certificates, such as airman, aircraft, and repair station certificates, receipts for tests related thereto, receipts for processing major repair or alteration forms, and receipts for the establishment and modernization of air navigation facilities: Provided further, That funds may be used to enter into a grant agreement with a nonprofit standard-setting organization to assist in the development of aviation safety standards.

Program and Financing
(in millions of dollars)

Identification code: 69-1335-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Aviation Safety (AVS)	....	....	1,174
00.02	Commercial Space (AST)	....	....	14
00.03	Staff Offices	....	....	836
01.00	Subtotal, Direct Program I	....	....	2,024
09.01	Reimbursable program	....	....	50
10.00	Total new obligations	....	....	2,074
	Budget resources available for obligation:			
22.00	New budget authority (gross)	....	....	2,103
23.95	Total new obligations	....	....	-2,074
24.40	Unobligated balance carried forward, end of year	....	....	29
	New budget authority (gross), detail:			
	Discretionary:			
40.00	Appropriation	....	....	1,294
	Spending authority from offsetting collections:			
	Discretionary:			
58.00	Offsetting collections (cash)	....	....	809
70.00	Total new budget authority (gross)	....	....	2,103
	Change in obligated balances:			
73.10	Total new obligations	....	....	2,074
73.20	Total outlays (gross)	....	....	-1,794
74.40	Obligated balance, end of year	....	....	280
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	....	....	1,794
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	....	....	-759
88.00	Federal sources	....	....	-25
88.40	Non-Federal sources	....	....	-25
88.90	Total offsetting collections (cash)	....	....	-809
	Net budget authority and outlays:			
89.00	Budget authority	....	....	1,294
90.00	Outlays	....	....	985

For 2009, FAA proposes a new budget account, Safety and Operations, that better aligns with FAA's lines of business. The Budget request of $2,052 million supports the Office of Aviation Safety, which is responsible for ensuring the safe operation of the airlines and certifies new aviation products. The request also funds regulation of the commercial space transportation industry, as well as FAA policy oversight and overall management functions

Object Classification (in millions of dollars)

Identification code: 69-1335-0-1-402		FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	....	....	950
11.3	Other than full-time permanent	....	....	12
11.5	Other personnel compensation	....	....	12
11.8	Special personal services payments	....	....	1
11.9	Total personnel compensation	....	....	975
12.1	Civilian personnel benefits	....	....	279
13.0	Benefits for former personnel	....	....	1
21.0	Travel and transportation of persons	....	....	64
22.0	Transportation of things	....	....	4
23.1	Rental payments to GSA	....	....	117
23.2	Rental payments to others	....	....	48
23.3	Communications, utilities, and miscellaneous charges	....	....	15
24.0	Printing and reproduction	....	....	4
25.1	Advisory and assistance services	....	....	41
25.2	Other services	....	....	441
26.0	Supplies and materials	....	....	15
31.0	Equipment	....	....	18
32.0	Land and structures	....	....	1
41.0	Grants, subsidies, and contributions	....	....	1
99.0	Direct obligations	....	....	2,024
99.0	Reimbursable obligations	....	....	50
99.9	Total new obligations	....	....	2,074

Employment Summary

Identification code: 69-1335-0-1-402		FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate
	Direct:			
1001	Total compensable work years: Full-time equivalent employment	....	....	9,761
	Reimbursable:			
2001	Total compensable work years: Full-time equivalent employment	....	....	20

EXHIBIT III-1

SAFETY & OPERATIONS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST	CHANGE FY 2008-2009
Aviation Safety (AVS)			1,186,927	1,186,927
Commercial Space (AST)			14,094	14,094
Staff Offices			851,073	851,073
TOTAL	**0**	**0**	**2,052,094**	**2,052,094**
FTEs				
Direct Funded			9,761	9,761
Reimbursable			20	20

Program and Performance Statement

This account provides funds for the administrative and managerial costs for FAA's regulatory, international, medical, engineering and development programs as well as policy oversight and overall management functions. The Safety & Operations appropriation includes the following major activities:

(1) establishment and surveillance of civil air regulations to assure safety in aviation;
(2) development of standards, rules and regulations governing the physical fitness of airmen as well as the administration of an aviation medical research program;
(3) regulation of the commercial space transportation industry; and
(4) headquarters, administration and other staff offices.

EXHIBIT III-2

SAFETY & OPERATIONS

Summary Analysis of Change from FY 2008 to FY 2009
Appropriations, Obligation Limitations, and Exempt Obligations

($000)

Item	Change from FY 2008 to FY 2009	FY 2009 PC&B by Program	FY 2009 FTEs by Program	FY 2009 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2008 Base					
Appropriations, Obligations, Limitations, and Exempt Obligations		0	0	0	$0
Adjustments to Base [include items from Exhibit II-6]					
Base Amount from Operations	1,773,807	1,164,690	9,535	350,394	
Capital Programs (Base Amount from F&E)	102,993			102,993	
Capital Personnel & Related Expenses (Base Amount from F&E)	15,804	15,804	92		
Annualized FTEs	11,480	11,480	4		
Annualized FY 2008 Pay Raise (GS Population)	5,869	5,869			
Annualized FY 2008 Pay Raise (Core Comp Population)	7,589	7,589			
FY 2009 Pay Raise (GS Population)	16,851	16,851			
FY 2009 OSI (Core Comp Population)	19,184	19,184			
FY 2009 SCI	3,103	3,103			
One Less Compensable Day	-4,665	-4,665			
Non-pay Inflation	14,929			8,998	
NAS Handoff Requirements	760			760	
Capital Security Cost Share Program	1,000			1,000	
Financial Systems Upgrades	8,455			6,086	
Capitalization Staffing	0		19		
Facilities Management & Security	4,320	4,320			
Regional Operations Center	99	99	1		
Capitalization	0		4		
Aeronautical Center Facility Management	27,814	4,964	46	12,499	
Aeronautical Center Leased Telecommunications	652				
Worker's Compensation Program Management	108	104	1		
Procurement & Class Action Litigation	2,000	1,000	1		
MMAC Office of Acquisition (AMQ) Positions	225	225	2		
Delphi Asset Tracking Team (DATT)	383	383	3		
FY 2009 Capital Programs	12,907			12,907	
FY 2009 Capital Personnel & Related Expenses	721	721	2		
Subtotal, Adjustments to Base	**2,026,386**	**1,251,720**	**9,710**	**495,637**	**$2,026,386**
New or Expanded Programs					
ATO Oversight (AOV) Staffing	800	800	10		
Human Space Flight	270	270	2		
CMEL Lease and Support Contract	700			175	
Consolidate AVS Offices in Florida	1,900				
Logistics Support Services Contract	1,800			1,800	
Real Property Asset Management	2,200			2,200	
Information Security Enhancement	7,600			4,735	
Class Action Litigation Support	1,078			1,078	
Integrate Environmental Performance into NextGen	704	704			
FAA Offices in Central & South America	386	386	2		
HSPD-12 Implementation	6,270	2,841	11	2,369	
Capitalization	2,000	1,914	26		
Subtotal, New or Expanded Programs	**25,708**	**6,915**	**51**	**12,357**	**$25,708**
Total FY 2009 Request	**2,052,094**	**1,258,635**	**9,761**	**507,994**	**$2,052,094**

SAFETY & OPERATIONS APPROPRIATION

FAA Safety & Operations Summary
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**1,773,807**	**9,605**	**199**	**9,535**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	11,480	0	-1	4
2. Annualized FY 2008 Pay Raise (GS Population)	5,869	0	0	0
3. Annualized FY 2008 Pay Raise (Core Comp Population)	7,589	0	0	0
4. January 2009 Pay Raise (GS Population)	16,851	0	0	0
5. January 2009 OSI (Core Comp Population)	19,184	0	0	0
6. January 2009 SCI	3,103	0	0	0
7. One Less Compensable Day	-4,665	0	0	0
8. Non-pay inflation	14,929	0	0	0
Total Unavoidable Adjustments	**74,340**	**0**	**-1**	**4**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	760	0	0	0
2. Capital Security Cost Sharing Program	1,000	0	0	0
3. Financial Systems Upgrades	8,455	0	0	0
4. Capitalization Staffing	4,320	19	0	19
Total Uncontrollable Adjustments	**14,535**	**19**	**0**	**19**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	800	30	0	10
2. Human Space Flight	270	4	0	2
3. CMEL Lease and Support Contract	700	0	0	0
4. Consolidate AVS Offices in Florida	1,900	0	0	0
5. Logistics Support Services Contract	1,800	0	0	0
6. Real Property Asset Management	2,200	0	0	0
7. Information Security Enhancement	7,600	0	0	0
8. Class Action Litigation Support	1,078	0	0	0
9. Integrate Environmental Performance into NextGen	704	0	0	0
10. FAA Offices in Latin America	386	2	0	2
11. HSPD-12 Implementation	6,270	11	0	11
12. Capitalization	2,000	26	0	26
Total Discretionary Increases	**25,707**	**73**	**0**	**51**
Base Transfers				
1. Workforce Planning	0	0	0	0
2. Regional Operations Center	99	1	0	1
3. Information Technology	0	0	0	0
4. Capitalization (+4 FTE for ARC)	0	4	0	4
5. Aeronautical Center Facility Management	27,814	46	0	46
6. Aeronautical Center Leased Telecommunications	652	0	0	0
7. Worker's Compensation Program Management	108	1	0	1
8. Procurement & Class Action Litigation	2,000	1	0	1
9. MMAC Office of Acquisition (AMQ) Positions	225	2	0	2
10. Delphi Asset Tracking Team (DATT)	383	3	0	3
Total Base Transfers	**31,280**	**58**	**0**	**58**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	115,900	0	0	0
2. Capital Personnel & Related Expenses	16,525	94	0	94
Total Capital Expenses	**132,425**	**94**	**0**	**94**
FY 2009 Request -- Total	**2,052,094**	**9,849**	**198**	**9,761**

SAFETY & OPERATIONS APPROPRIATION

Summary of Capital Programs & Expenses
($ in Thousands)

Aviation Safety (AVS)	
Capital Programs	
1. Airbus Simulator Replacement	400
2. Aircraft Fleet Modernization	3,000
3. Aviation Safety Analysis System (ASAS)	18,900
4. System Approach for Safety Oversight (SASO)	14,300
5. Aviation Safety Knowledge Management Environment (ASKME)	7,900
Subtotal, Capital Programs	**44,500**
Capital Personnel & Related Expenses	11,500
Total, AVS	**56,000**
Region and Center Operations (ARC)	
Capital Programs	
1. Logistics Support Systems and Facilities (LSSF)	9,300
2. Aeronautical Center Infrastructure Modernization	13,500
3. National Airspace System (NAS) Training Equipment Modernization	1,400
4. Distance Learning	1,500
5. Logistics Support Services (LSS)	7,900
6. Mike Monroney Aeronautical Center Leases	15,800
Subtotal, Capital Programs	**49,400**
Capital Personnel & Related Expenses	1,050
Total, ARC	**50,450**
Information Services (AIO)	
Capital Programs	
1. Information Security	12,000
Subtotal, Capital Programs	**12,000**
Capital Personnel & Related Expenses	1,120
Total, AIO	**13,120**
Security and Hazardous Materials (ASH)	
Capital Programs	
1. NAS Recovery Communications (RCOM)	10,000
Subtotal, Capital Programs	**10,000**
Capital Personnel & Related Expenses	250
Total, ASH	**10,250**
Financial Services (ABA)	
Capital Personnel & Related Expenses	2,553
Total, ABA	**2,553**
Policy, Planning, and Environment (AEP)	
Capital Personnel & Related Expenses	52
Total, AEP	**52**
Subtotal, Capital Programs	115,900
Subtotal, Capital Personnel & Related Expenses	16,525
FY 2008 Total	**132,425**

SAFETY & OPERATIONS APPROPRIATION
FY 2009 Base Transfer Summary
(whole dollars)

Title	From	To	PC&B	Other Objects	Total	FTE	EOY
1. Workforce Planning	AEP	AHR	684,985	549,325	1,234,310	5	5
2. Regional Operations Center	ATO	ARC	98,800	0	98,800	1	1
3. Information Technology	ACR	ARC	55,998	0	55,998	1	1
4. Capitalization	ABA	ARC	400,000	0	400,000	4	4
5. Aeronautical Center Facility Management	ATO	ARC	4,964,300	22,849,200	27,813,500	46	46
6. Aeronautical Center Leased Telecommunications	ATO	ARC	0	651,519	651,519	0	0
7. Worker's Compensation Program Management	ATO	AHR	103,979	4,021	108,000	1	1
8. Procurement & Class Action Litigation	ATO	AGC	1,000,000	1,000,000	2,000,000	1	1
9. MMAC Office of Acquisition (AMQ) Positions	ATO	ARC	224,600	0	224,600	2	2
10. Delphi Asset Tracking Team (DATT)	ATO	ABA	383,116	0	383,116	3	3

Aviation Safety (AVS)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**1,081,602**	**6,962**	**110**	**6,823**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	10,900			
2. Annualized FY 2008 Pay Raise (GS Population)	5,233			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	3,680			
4. January 2009 Pay Raise (GS Population)	14,991			
5. January 2009 OSI (Core Comp Population)	9,306			
6. January 2009 SCI	1,503			
7. One Less Compensable Day	-3,360			
8. Non-pay inflation	5,512			
Total Unavoidable Adjustments	**47,765**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	760			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**760**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	800	30		10
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**800**	**30**	**0**	**10**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	44,500			
2. Capital Personnel & Related Expenses	11,500	77		77
Total Capital Expenses	**56,000**	**77**	**0**	**77**
FY 2009 Request -- Total	**1,186,927**	**7,069**	**110**	**6,910**

Detailed Justification for Aviation Safety (AVS)

Aviation Safety	FY 2009 Request: $1,186,927

Overview:

The Associate Administrator for Aviation Safety (AVS) has a singular mission: to provide the safest, most efficient aerospace system in the world.

In 1997, White House Commission on Aviation Safety and Security issued a challenge to FAA and the aviation industry – reduce the air carrier fatal accident rate by 80 percent in ten years. In response, FAA initiated a joint government-industry analysis of causal factors most frequently involved in aviation accidents. The resulting document, Safer Skies – A Focused Agenda, has formed the basis for joint government-industry efforts to reduce the number of accidents in both the commercial and general aviation areas.

This year marks the end of that ten-year period. By the end of FY 2007, we achieved a rate of 0.022 fatal accidents per 100,000 departures – a 57 percent drop. Although we did not achieve the bold target set ten years ago, this achievement is hardly a failure. In the three years prior to setting this goal, the United States averaged about six commercial fatal accidents per year. The average loss of life each year was 266 deaths.

Today, thanks to new technology, revised rules and procedures, and increased training, not only are there fewer commercial fatal accidents each year, but the chances of survival have increased significantly. In the past three years the United States averaged approximately two fatal accidents per year, with an average loss of life of 28 per year.

In addition, our efforts from the past ten years have also improved our goals on reducing general aviation (GA) fatal accidents. In FY 2006 there were 300 fatal general aviation accidents, versus the FY 2006 ceiling of 337. That's the lowest fatal accident number since we started measuring. There were 314 fatal general aviation accidents in FY 2007, again below our ceiling of 331. For FY 2008, we expect to be at or below the ceiling of 325 fatal accidents.

Through the continuing effort and cooperation of all the participants in the aviation industry and FAA, we have achieved the safest period in aviation history.

For this reason, we are unveiling a new performance metric for commercial air carrier safety – Fatalities per 100 Million Enplanements. This new metric is more relevant to the flying public, as it better measures the individual risk, as low as it is, to fly. And the long-term target is no less challenging – we aim to cut this risk in half by 2025. We will continue to work in partnership with industry to make this vision a reality.

AVS's ability to help maintain this exemplary safety record—while providing necessary services to the growing U.S. aviation industry—continues to be a challenge. Facing increased demand for services, AVS must continue to provide the proper surveillance and oversight for a complex, global, and rapidly changing aerospace system. AVS is also challenged with helping the industry grow and compete with new equipment, technologies, and markets.

AVS takes a systems view of safety—using a risk management approach to focus resources efficiently and effectively on significant safety concerns. Safety is a continuum—and the success of the entire safety system depends on effective management in each and every phase. The three phases of the safety continuum are:

1. Continued Operational Safety – AVS's fundamental work is the surveillance and oversight of existing certificate holders. AVS assures original certification requirements are continually maintained. This is the most important element of what AVS does.
2. Setting Standards – AVS develops and establishes the safety and certification standards for the industry. By meeting those standards, the people and organizations that manufacture, operate and maintain the aerospace system have achieved a safety record that is unparalleled.
3. Issuing Certifications – AVS determines compliance with standards and issues certifications. The aviation industry depends on AVS to approve products that enhance safety and increase capacity, while giving the industry the means to succeed in an intensely competitive international market.

AVS aims to provide the highest level of aviation safety while meeting the needs of an extensive customer base, which includes:

- Over 722,000 pilots;
- Over 363,000 mechanics;
- Approximately 6,100 operators;
- Over 1,600 manufacturers of aircraft, equipment, avionics, and other aviation-related items; and
- A fleet of roughly 227,000 active aircraft.

A Program Assessment Rating Tool (PART) review was completed on the Aviation Safety program in 2004. AVS received a score in the "Moderately Effective" category—the second highest rating.

In its review, the PART found that AVS:

- Has a clear purpose and design not duplicated elsewhere in government;
- Creates, measures, achieves and evaluates ambitious long-term and annual performance goals;
- Maintains appropriate financial and management oversight of the program; and
- Issues only those appropriate rules and regulations that are required to meet the goals of the program—without over-regulating—while taking into consideration costs versus benefits and public/stakeholder issues.

AVS is committed to building on this success in future years in part through the implementation of the ISO-9001 certification. ISO-9001 is an internationally recognized program designed to document and standardize business processes through the use of documented procedures, internal and external audits, and consistent review of product, process, and customer measures at all levels of the organization. AVS earned an organization-wide certificate in October 2006, and continues to maintain that certification through semiannual audits by third-party evaluators.

FY 2008 Program:

AVS consists of eight distinct organizational elements employing 6,962 personnel. Five of these organizations—the Office of Accident Investigation, the Office of Rulemaking, the Aviation Safety Analytical Service Office, the Air Traffic Safety Oversight Service, and the Office of Quality, Integration, and Executive Services—are solely Washington Headquarters elements. The other three – Flight Standards Service, Aircraft Certification Service, and the Office of Aerospace Medicine – have extensive field structures (including some overseas offices).

AVS's eight organizations perform the following activities:

Flight Standards promotes aviation safety and ensures compliance with the operations and maintenance safety standards and certification standards for air carriers, commercial operators, air agencies, airmen, and civil aircraft, including aircraft registration.

Aircraft Certification promotes aviation safety by developing and administering safety standards governing the type, production, and original airworthiness certification of aircraft, engines, propellers, appliances and noise level certification.

Aerospace Medicine promotes aviation safety through medical standards and certification for airmen (pilots and air traffic controllers) and compliance and enforcement of drug and alcohol programs for employees in safety-sensitive positions both in the aviation industry and FAA.

Accident Investigation investigates aviation accidents and incidents to identify unsafe conditions and trends in the National Airspace System (NAS) and coordinates the corrective action process.

Aviation Rulemaking directs and manages FAA's rulemaking program and supports the agency's regulatory priorities.

Aviation Safety Analytical Service provides analytical capabilities based on safety management systems principles and sound safety data analysis and process sharing, incorporating future hazardous/emerging risk assessments affecting the entire air transportation system and industry.

Air Traffic Safety Oversight Service provides safety oversight of ATO, including oversight of safety management systems, new acquisitions, air traffic control procedures and operations, technical operations, and personnel certification criteria.

Quality, Integration, and Executive Services provides overall planning, direction, management, and evaluation of AVS programs. This office also directs and manages the implementation of an ISO-9001:2000 based Quality Management System for all AVS services and offices and establishes integration policy and processes for safety systems.

Because the AVS workforce is small in comparison to the industry and public, we leverage our resources through the designee system. FAA has relied on the designee program since 1927 to help meet our responsibility of ensuring that the aviation industry meets FAA's safety standards. The designee program authorizes private persons and organizations to perform many activities acting on behalf of FAA. The use of designees allows AVS to concentrate on the most critical safety areas, while designees conduct more routine functions. Designees also expand AVS access to technical expertise. AVS currently uses over 11,000 designees, plus another 28,000 people involved in programs such as Flight Check Pilots and Mechanics with Inspection Authority.

Much of AVS workload is demand driven. These workload drivers can be grouped into four general areas: (1) growth in aviation activity, both commercial and general aviation, by existing operators; (2) the introduction of new operators, new aircraft, new equipment, and new technology; (3) the introduction of new practices (e.g., the growth in maintenance outsourcing); and (4) the globalization of the aviation industry and the increasing need for international standardization of regulations and safety criteria.

AVS also faces new challenges in the form of aviation industry growth:

- Increased commercial and general aviation activity;
- Introduction of new entrants into the industry (Unmanned Aerial Systems (UAS) and Very Light Jets (VLJs)); and
- Introduction of new equipment (Airbus 380, Boeing 787), both commercial and general aviation, by existing operators.

The economy is driving this growth:

- Low cost carriers are using new aircraft, equipment, and technologies;
- Legacy carriers are in decline, but need more oversight; and
- The industry has experienced rapid growth in maintenance outsourcing.

Safety is our priority, but our approach must change to meet our challenges. AVS has worked diligently over the years to manage budget constraints and workload demands by streamlining work processes and implementing efficiency measures. Therefore, AVS will ensure that adequate resources (staffing and dollars) remain available to support Continued Operational Safety (AVS top priority) while sequencing and prioritizing some new certification activity.

As the aviation environment and industry changes, we must change with it. The processes and systems that have served us well in the past have done a spectacular job of creating the safest aviation system in the world. To achieve the next level of safety, our traditional methods of diagnosing what went wrong during an accident or incident are not enough – we must analyze trends, data, and systems to tackle issues before they become incidents or accidents.

The FAA, with other federal agencies and operators in the NAS, is adopting a system safety approach to safety management. This approach, called a Safety Management System (SMS), relies on developing standardized language, processes, and tools to manage safety risk. SMS relies on four "pillars":

1. Safety Policy – Aligning procedures and processes in an organization to establish and meet safety objectives;
2. Safety Risk Management (SRM) – Assessing risk in the system to identify and mitigate hazards;
3. Safety Assurance – Continuously monitoring and updating the policies and activities to ensure that the processes work as intended; and
4. Safety Promotion – Creating a safety culture that permeates every area of our work at all levels of the organization.

Implementing an SMS approach is a significant business and cultural change in the way we carry out our safety work. New safety positions require additional skills, such as risk management, systems thinking, evaluation, and analysis.

FY 2008 Accomplishments:

In FY 2008, AVS will continue to improve aviation safety through surveillance, compliance, and, when necessary, enforcement actions. AVS will:

- Reduce the Commercial Air Carrier fatal accident rate to no more than 0.010 accidents per 100,000 departures. (Note: FAA plans to phase out this performance target.)
- Reduce the number of commercial air carrier fatalities to no more than 8.88 per 100 million persons on board.
- Reduce the number of fatal general aviation accidents to no more than 325.
- Reduce the number of general aviation and part 135 accidents in Alaska to no more than 104.

With regards to specific programs, AVS will:

- Develop an FAA order establishing the requirement and guiding structure for SMS implementation in the agency.
- Develop, flight inspect, and publish at least 50 Required Navigation Performance (RNP) instrument approach procedures.
- Complete implementation of the Air Transport Oversight System (ATOS) to all Part 121 commercial air carriers.
- Develop the capability to monitor known safety threats through the Aviation Safety Information and Analysis System (ASIAS), including increasing the number of databases available and implementing an enterprise architecture. This system accesses and shares information safety data from a variety of systems.
- Track the implementation of 39 CAST safety enhancements that will mitigate specific causal factors of accidents.
- Conduct System Audits of the Air Traffic Organization (ATO) at various facilities.
- Develop and publish guidance for best practice operations for VLJs.
- Publish a directive for experimental airworthiness certification of UAS.
- Develop a general aviation rate and target to be used in FY 2009. This will replace the current performance target.
- Perform oversight of the AVS Quality Management System to maintain compliance and retain registration to ISO-9000 quality standards.
- Continue to overhaul our systems safety approach to adequately respond to new requirements being created by explosive industry growth, global expansion, and changing business models for producing and selling aircraft.
- Conduct certifications and surveillance activities including production, airworthiness, air operator, and air agency across the U.S.
- Plan and implement continuity of operations including inspection, surveillance, investigation, and enforcement activities.
- Develop guidance for Aviation Safety Inspectors and Certification Specialists on the Electronic Flight Bag approval process.
- Provide regulatory and technical assistance to international civil aviation authorities.
- Provide technical assistance and FAA/AFS seminars to working groups including China, India, Korea, Mexico, Russia, ICAO Groups, and select regional organizations.
- Support the Safe Skies for Africa Program, a Presidential Initiative.
- Provide certification services and support for new operators, agencies, and air carriers through sequencing of applicants.
- Improve oversight of domestic and foreign repair stations, as the repair station industry has grown in both number of repair stations and complexity of the work accomplished.

- Continue implementation of the Cost Accounting System to provide greater insight into the costs of providing specific services.

FY 2009 Budget Request:

For FY 2009, AVS requests $1,186,927,000 and 6,910 FTE to achieve its mission. The request includes $56,000,000 in capital funds.

In FY 2009, AVS will continue to improve aviation safety through surveillance, compliance, and, when necessary, enforcement actions. AVS will:

- Reduce the Commercial Air Carrier fatal accident rate to no more than 0.010 accidents per 100,000 departures.
- Reduce the number of commercial air carrier fatalities to no more than 8.62 per 100 million persons on board.
- Reduce the number of fatal general aviation accidents to no more than 319.
- Reduce the number of general aviation and Part 135 accidents in Alaska to no more than 99.

With regards to specific programs, AVS will:

- Develop a GA Fatal Accident Rate target for FY 2009 based on results of three years of comprehensive surveys of the GA community.
- Track the implementation of 39 CAST safety enhancements that will mitigate specific causal factors of accidents.
- Implement a joint information data sharing plan to aggregate and combine safety data from CAST, VASIS, and NextGen programs.
- Complete transition of all FAR Part 121 air carriers into ATOS.
- Finalize a National Integrated Strategic Safety Plan across multiple government agencies to implement SMS and submit the plan to the Joint Planning and Development Office (JPDO).
- Conduct System Audits of ATO involving ten percent of ATO facilities.
- Create an AVS delegation management system and migrate designee data from current systems into this system.
- Continue to enable the introduction of a new generation of VLJs designed to revolutionize air travel.
- Continue to expand the introduction of civil UAS into the NAS to support national security, defense and public need for this technology, and the U.S industry's economic interests.
- Continued deployment of precision navigation through RNP procedures by creating 25 new approaches each year.
- Perform oversight of the AVS Quality Management System to maintain compliance and retain registration to ISO-9000 quality standards.
- Continue to implement the GA Joint Steering Committee initiatives.
- Provide the JPDO Integrated Product Teams (IPT) with a means to evaluate the effect of proposed changes on the safety of NextGen.
- Continue to overhaul our systems safety approach to adequately respond to new requirements being created by explosive industry growth, global expansion, and changing business models for producing and selling aircraft.
- Conduct certifications and surveillance activities including production, airworthiness, air operator and air agency across the U.S.
- Plan and implement continuity of operations including inspection, surveillance, investigation, and enforcement activities.
- Provide regulatory and technical assistance to international civil aviation authorities.
- Continue development and improvements in instrument approach procedures guidance through the development of a stand-alone CAT II/III obstacle evaluation order.

- Provide technical assistance and FAA/AFS seminars to working groups including China, India, Korea, Mexico, Russia, ICAO Groups, and select regional organizations.
- Support the Safe Skies for Africa Program, a Presidential Initiative.
- Provide certification services and support for new operators, agencies, and air carriers.
- Improve oversight of domestic and foreign repair stations, as the repair station industry has grown in both number of repair stations and complexity of the work accomplished.
- Develop a picture ID system for the issuance of pilot licenses, as required by the National Intelligence Reform Act of 2004 (Public Law 108-458).

FY 2009 Capital Programs:

The FY 2009 budget provides for $56,000,000 for capital programs as outlined below. Of this, $11,500,000 is for pay, benefits, and transportation costs related to these capital programs.

1. Aircraft Fleet Modernization -- $3,000,000

All GA Aviation Safety Inspectors (ASI) must be turboprop qualified to meet their job requirements. GA ASIs will be required to conduct airman certification evaluations using new cockpit technology in turboprop aircraft. In addition, both Air Carrier (AC) and GA inspectors must be qualified and proficient in modern digital avionics displays and usage.

Flight Standards (AFS) currently uses nine small turboprop aircraft to accomplish this mission. This fleet is becoming obsolete due to rapid changes in technology, navigational aids, and avionics. The actual aircraft are 20-28 years old and equipped with old analog avionics and displays, leaving only 4-5 years of useful life. The ASI workforce needs to be better qualified and proficient to provide regulatory oversight with modern avionics. AFS needs to provide required proficiency training to ASIs, allowing them to conduct in-flight testing and certify airmen, pilot instructors, aviation procedures, and future operations, systems and procedures. In summary, the current AFS turboprop fleet used by GA ASIs needs to be modernized to provide relevant and credible pilot currency/proficiency experience and training in the future NAS. The actual operation can only accommodate the GA ASIs and does not meet the needs of the entire ASI population.

FAA plans to replace the nine existing small turboprop aircraft with new small turboprop aircraft equipped with the latest digital avionics and displays. The preferred solution includes the actual piston aircraft operation in conjunction with the modernized turboprop fleet. The combined operation, centralized at convenient locations, will maximize aircraft utilization and accommodate proficiency flying for all ASIs within the modern NAS. In FY 2008, FAA replaced three of the existing aircraft. FAA plans to replace the other six aircraft over the next three years.

In FY 2009, $3,000,000 is requested for the acquisition of one AFS aircraft. State-of-the-art avionics will make this plane more effective for instructing and evaluating the flight proficiency levels of ASIs, thus ensuring proficiency and standardization of airman certification procedures for the modern NAS. In addition, the number of inspector flight hours will be increased to provide proficiency with modern avionics and displays for all (GA and AC) ASIs in the NAS.

2. Aviation Safety Analysis System (ASAS) -- $18,900,000

In FY 2009, FAA will continue system modernization through hardware, software, and communication process upgrades to support the safety workforce.

Regulation and Certification Infrastructure for System Safety (RCISS): For FY 2009, the requested $18.9 million will enable this program to continue consolidating all previous Information Technology (IT) infrastructure programs that support AVS's safety workforce. RCISS will also expand and enhance the current AVS infrastructure while leveraging components across AVS services. RCISS provides all IT infrastructure components to AVS's safety workforce, ensuring standard and reliable accessibility to safety data. The program will design and deploy next generation infrastructure to meet AVS's business needs through addressing its mobile safety workforce needs and changes in the aviation industry. The program will focus on providing safety data to the AVS workforce while they are off-site and conducting safety inspections and investigations of airlines, manufacturers, pilots, accidents, etc. RCISS's enterprise infrastructure will provide the access methods to all AVS national safety applications developed by the System Approach for Safety Oversight (SASO), Aviation Safety Knowledge Management Environment (ASKME), Aerospace Safety Information Management (ASIM), and all other national safety programs developed or currently deployed within AVS.

Over the course of the next several years the RCISS program will design and implement a new enterprise infrastructure that encompasses the following six key components:

1. Devices for AVS's 5,000+ safety workforce (including new mobile devices) – Activities will include lifecycle replacement and procurement of new devices.
    - Provides new equipment designed to meet operational demands.
    - Replaces outdated or malfunctioning devices.

2. Communications (LAN, WAN, and VPN) - Activities will include lifecycle replacement and procurement of new equipment and services.
    - Improves accessibility and speed in utilizing national safety systems.
    - Provides new services for the transmission of safety data.
    - Replaces outdated or malfunctioning equipment.

3. Enterprise Services (hardware and software which allow components of the infrastructure to work together) - Activities will include lifecycle replacement and procurement of new devices and software.
    - Improves management and operation of the infrastructure through enhanced monitoring and consolidation of equipment and data.
    - Improves infrastructure reliability.

4. Application Data Servers (hosting of national AVS safety applications) - Activities will include lifecycle replacement and procurement of new servers.
    - Begin deployment of new application servers, which will support the release of new AVS safety systems.
    - Replace or upgrade outdated or malfunctioning servers.

5. COTS Software (operating system software, database software) - Activities will include upgrade of software licenses.
    - Ensures continued vendor support for software.
    - Maintains ability to efficiently inter-operate with external infrastructures, e.g., other FAA organizations and the airline industry.
    - Evaluate future software to support safety workforce, enterprise management services and all other aspects of the infrastructure.

6. Contractor Support - Activities will include assistance in designing the RCISS enterprise infrastructure.
    - Provides specialized technical expertise in the design and development of select component areas, e.g., enterprise architectural design, wireless LAN design.
    - Provides specialized training to support the implementation of new infrastructure components.

The RCISS infrastructure directly contributes to the success of AVS in meeting its mission goals when it is developed, implemented, and administered as a single system. The infrastructure will become most effective in supporting the safety workforce when all components are optimized.

In FY 2009, the RCISS program will provide technical refreshment of equipment for the existing infrastructure as it continues to develop and implement new IT services. The RCISS program will deploy these new IT services in the following areas:

- Handheld devices;
- Remote connectivity telecommunications;
- Consolidated Server/Storage Area Network (SAN) systems; and
- Enterprise software.

These new services will support the coming integration of AVS safety data when it is no longer associated with a system. In this new environment, safety workers will assemble data as needed from various sources to support new business processes. Data in these data stores will require critical recovery response.

3. System Approach for Safety Oversight (SASO) -- $14,300,000

The White House Commission on Aviation Safety and the National Civil Aviation Review Commission determined that FAA's regulatory and certification programs should be re-engineered to achieve a reduction in aviation accidents. These two aviation safety-related commissions recommended that FAA conduct certification and oversight of all companies performing aviation safety functions, including repair stations located out of the United States. They further recommended that FAA be more vigorous in applying high standards for certification and in using emerging technology, safety reporting, and risk management concepts to help identify aviation safety problems before they result in accidents. Additionally, growth and enhancements to the National Airspace System will introduce a host of new tracking and communications systems, with satellite, ground, and aircraft components. These, in turn, will introduce new operational procedures and training requirements. AFS will need to revise its surveillance and certification procedures to reflect these changes.

Through the SASO Program, AFS will develop and implement a new proactive system safety approach to help identify, regulate, comply, and manage safety risks to eliminate accident causal factors in the aviation industry. The FAA is currently attempting to resolve the reactive, compliance- only nature of its oversight activities with a shift to a proactive approach. A system safety approach would go beyond compliance to identify system-wide safety hazards prior to their occurrence. It entails developing business models, collecting and sharing quality data, and developing new analytical methodologies to assist ASIs in conducting their oversight job tasks. Within this framework, FAA must also integrate human factor considerations, promote information sharing with the aviation community, and allow for continuous improvements that keep pace with and utilize advances in technology.

In FY 2009, FAA will continue to re-engineer AVS business processes and develop integrated, comprehensive system safety business applications. Specific efforts will continue to focus on conducting a complete analysis of current certification and surveillance processes. This will provide the basis for improved procedures, which will aid in the determination of the software tools and databases required to support the processes. Although IT is only one component of the SASO solution, it represents a significant portion of the SASO investment. Existing AFS systems support a compliance-based approach to surveillance, certification, enforcement, and investigation. SASO is responsible for coordinating the realignment of those systems to a system safety approach. To address these problems, SASO has created an IT solution based upon e-Gov principles that integrates government and industry safety systems and data in a virtual extranet architecture. A core set of "system-safety-based" applications will be developed that can be used by both industry and FAA to manage and oversee safety. This core set of applications will provide a common yardstick for measuring aviation safety.

Benefits: This program will produce safety business applications that identify and eliminate causal factors of commercial and general aviation accidents. Information sharing with the air transportation industry will improve the oversight process, which increases FAA's effectiveness in mitigating or preventing aircraft accidents. The combination of business process re-engineering and the integration of better job performance aids will ensure a more efficient workforce performing certification and surveillance activities.

4. Aviation Safety Knowledge Management Environment (ASKME) -- $7,900,000

Within AVS, FAA's Regulation and Certification office (AIR) is responsible for developing, administering, and ensuring compliance to safety standards governing the design, production, airworthiness, and continued operational safety of civil aircraft and related components. Essentially, AIR is responsible for ensuring that civil aircraft are designed and built to operate safely within the NAS.

FAA business activities generate massive amounts of information used in making strategic aviation safety decisions. The data is also used throughout AIR to ensure standardized regulatory compliance, workforce education, trend analysis, and program reporting. As the aviation industry has grown in size and complexity, so has the requirement for additional resources to perform these services. Between FYs 1992 and 2000, the AIR workload increased 40 percent while the number of engineers, inspectors, and support staff grew by only 24 percent. Additionally, within AIR, new security requirements related to terrorist countermeasures have surfaced as a result of the September 11, 2001 terrorist events. Many of those requirements are not fully realized.

AIR's ability to remain responsive to industry growth will be impaired without maximizing the use of automation. The lack of a comprehensive system with new processes and automation would mean AIR could not use information technology to modernize its business practices and maximize the productivity of its workforce. Delays to certification programs, release of new policies and guidance, designee approval or renewal, and response to inquiries will have a long-term detrimental effect on the vitality, safety, and efficiency of the aviation industry.

Without a comprehensive automated system to provide a corporate view of resource utilization, AIR and industry personnel will continue to be dependent on time-consuming, labor-intensive manual processes to store and retrieve required paper documents. Because current paper-based filing systems are local, it will remain difficult for AIR to have single-source information shared among geographically dispersed organizations to ensure consistency of policy application.

Without automated process assistance tools and the ability to provide current and accessible information, designee program effectiveness will be minimized, designees underutilized, and AIR designee oversight and evaluation will be deficient.

Without the ability to capture and manipulate its knowledge base, AIR will continue to lose the corporate history of past decisions and be unable to provide reliable substantiation of previous decisions when requested to identify inconsistent or contradictory information.

Without integrated and automated tracking and work measure tools, AIR will not be able to conduct long-term strategic analyses for better resource allocation.

For FY 2009 the $7,900,000 request will fund the following ASKME requirements:

- Work Tracking Software (WTS) – Design and development activities for the "Risk Based Resource Targeting" (RBRT) technology component based on requirements gathered;
- Monitor Safety Related Data (MSRD) - Design and development activities for the "Monitor Safety & Analyzed Data" (MSAD) technology component based on requirements gathered;
- Designee Supervision / Past Performance (DS/PP) Sub-Function – Finalization of the detailed System Specification Requirements followed by design and development activities for the DS/PP Sub-Function; and
- NAS Handoff F&E for Electronic File System (EFS-A and EFS-I) and MSRD-MSAD.

The FAA will develop an ASKME to electronically store technical documentation and lessons learned identifying aircraft design and manufacturing safety issues so they can be easily found, accessed, and shared. This technical data includes the rationale for design and production certification decisions, interpretations of rules and policies, and audits of aircraft industry manufacturers. In addition, ASKME will provide tools to better identify unsafe conditions by analyzing this documentation along with safety information such as Service Difficulty Reports, NTSB safety recommendations and reports, accident reports, and Maintenance Difficulty Reports. Finally, ASKME will provide electronic tools for capturing key safety related data from business activities for rulemaking and policy development, airworthiness directives, design certification, production/manufacturing certification, airworthiness certification, designee management, evaluation and audit, external inquiries, enforcement, continued operational safety management, and international coordination.

ASKME is a compilation of IT tools designed to enable AIR to meet FAA goals of Safety, Organizational Excellence, and International Leadership.

AIR is responsible for establishing safety standards governing the design, production quality, and continuing airworthiness of aircraft and aircraft products. AIR issues and maintains certificates for design and manufacture of aircraft, aircraft engines and propeller, materials, parts, and appliances. AIR uses industry-paid designees to assist companies to prepare for and maintain their certifications. AIR manages designee qualifications, appointment, and monitoring. AIR monitors safety performance by conducting reviews of aviation products and reviewing safety data for trends; conducting safety inspections and surveillance; investigating possible violations and initiating enforcement actions; and participating in accident and incident investigations. Fundamentally, AIR is responsible for ensuring that civil aircraft are designed and built to operate safely within the NAS.

While AIR has approximately 1,100 staff and 5,000 designees, the business challenges associated with meeting agency goals (Safety, Organizational Excellence, Global Connectivity) require AIR to adopt and implement innovations in IT, hence the requirement for ASKME.

ASKME will:

- Implement a *proactive safety management system*. This system is designed to identify and address safety risks and accident precursors throughout the product lifecycle of design, manufacturing, operation, and maintenance, as well as build automated lessons-learned feedback mechanisms into the safety management process. The risk assessment performed on the safety data may be used for risk management analysis, root cause analysis, corrective actions, and follow-on work in the areas of standards, certification, maintenance, and operations.
- Provide *comprehensive, real-time, organization-wide access* to current and historic digital and paper-based documentation aimed at supporting effective and timely decision-making in standards, certification, and continued operational safety.
- Enable *real-time collaboration* among AIR technical staff, industry, international aviation agencies, applicants, approval holders, and designees to facilitate effective and timely decision-making.
- Automate *the integration of risk management processes* into standards development, certification, and continued operational safety.
- Provide tools to assist with *designee oversight and delegation in certification* through the use of automated risk management tools.
- Provide tools to *enhance resource usage* and performance management and monitoring.

When integrated into our safety management approach and practices, these combined capabilities will enhance aviation safety and promote a culture of system safety.

In order to accomplish the objectives, the ASKME suite of tools will provide the following:

- A web-based knowledge management portal to store AIR's valuable knowledge assets, facilitating management and workforce decision-making, providing a proactive systems safety approach, and improving overall productivity and customer satisfaction.
- Collaboration tools to facilitate real-time communications, decision-making, and management between AIR, FAA designees, aviation industry applicants, and domestic and international partners. This collaboration capability will enhance identification, analysis, management, and resolution of safety issues; certification and production approvals; and oversight of designees. The tools will also support real-time collaboration between AIR and international civil aviation agencies to facilitate decision-making during accident response and regulatory development, allowing for exchange of accident/incident information and aviation supplier audit information with other countries.

- Predictive safety data analysis tools designed to support the full range of continued airworthiness analytical activities including safety data collection, risk assessment and management, prescription of corrective actions, monitoring, and feedback. The tools will access and analyze accident/incident data to uncover potential safety problems and develop solutions. The tools will also integrate and analyze compliance, production, operations, oversight, and regulatory data to aid in identifying safety risks, developing new regulatory material, and approving design modifications. Finally, the tool will support the application of risk management tools to elements of the safety continuum, where applicable.
- Integrated data management and reporting tools to support a standard and integrated data management architecture that can facilitate agency and aviation industry-wide data collection and information sharing.

Benefits: A core concept of ASKME is the integration of people, processes, and technology. Together they can create and sustain a culture of system safety. ASKME's true value comes from the integration of the tools into the business process, enabling our people to provide the highest degree of customer service.

5. Aircraft Related Equipment Simulator Replacement -- $400,000

Every new aviation technology or in-flight operational procedure proposed for air carrier integration within the NAS requires evaluation and certification prior to implementation. These can be achieved only through the use of an appropriate simulator that replicates a realistic in-flight environment and provides the capability for real-time "pilot-in-the-loop" testing. The B737 level D advanced flight simulator is currently being used in the Flight Operations Simulation Laboratory in Oklahoma City. Such evaluations are necessary to support critical flight safety and NAS modernization issues such as: RNP, WAAS, OEP, ADS-B, Free Flight, Wake Vortex, Aeromedical studies, Airport Safety Technology, Surface Technology and Visual Guidance, Pilot Human Factors Studies, etc. To keep up with this advancing technology the simulator will require a technical upgrade in FY 2009.

Explanation of Funding Changes for Aviation Safety (AVS)

	Dollars ($000)	FTE
Aviation Safety (Net change from FY 2008 Enacted)	**$1,186,927**	**6,910**
Overview: For FY 2009, the Associate Administrator for Aviation Safety (AVS) requests $1,186,927,000 and 6,910 FTE to meet its mission of promoting aviation safety in the interest of the American public and the millions of people who rely on the aviation industry for business, pleasure, and commerce. The FY 2009 request level reflects the transfer of the FY 2008 base amount from the Operations appropriation, unavoidable pay raises and inflation, uncontrollable adjustments, discretionary increases, and capital programs, personnel, and related expenses previously included in the Facilities & Equipment appropriation now incorporated into the Safety & Operations account. The FY 2009 request level for FTE consists of the transfer of the FY 2008 base number from the Operations appropriation, annualization of FY 2008 Aviation Safety hiring, increased staffing for additional safety personnel (10 FTE), and capital personnel transferred from the Facilities & Equipment appropriation (77 FTE).		
Transfer from Operations		
FY 2008 Enacted Amount in the Operations Appropriation: The FY 2008 enacted amount includes $1,081.6 million in the Operations appropriation for Aviation Safety. This "base" amount is being transferred into the new Safety & Operations appropriation to align with FAA's proposed account structure and refinancing proposal.	1,081,602	6,823
Unavoidable Adjustments		
Annualized FTEs: This represents the net annualized costs of FY 2008 new hires.	10,900	
Annualized FY 2008 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.5 percent average government-wide pay raise in January 2008. The actual factor used is 4.4 (3.5 percent plus 0.9 percent average of Within-Grade increases). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	5,233	
Annualized FY 2008 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2008. The OSI is 88 percent of the 3.5 percent average government-wide pay raise plus 1.0 percent (3.96 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent	3,680	

	Dollars ($000)	FTE
SCI, and 35 percent receive just the OSI. The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.		
FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 3.8 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 0.9 percent average of Within-Grade increases.	14,991	
FY 2009 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	9,306	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	1,503	
One Less Compensable Day: This decrease is due to the subtraction of one compensable day in FY 2009 (261 in FY 2009 versus 262 in FY 2008).	-3,360	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	5,512	
Uncontrollable Adjustments		
NAS Handoff Requirements: This request is consistent with procedures in FAA for the transition of projects from development under the Facilities and Equipment Account to the Operations Account. These funds cover contract maintenance provided by the manufacturer, including spare parts and supplies. In addition,	760	

	Dollars ($000)	FTE
technical support will provide the expertise to ensure the proper functioning of new aviation technologies installed in the simulator.		
Discretionary Increases		
1. AOV Safety Oversight Staff: Air Traffic Safety Oversight (AOV) is requesting 30 additional positions to conduct risk based modeling, simulation, and analysis of changes necessary to meet increased capacity demands. They will also identify required actions for implementation of NextGen. The positions will provide oversight of the Safety Management System (SMS) process within ATO. SMS is a formal proactive approach to risk management that utilizes an integrated collection of processes, procedures, and programs. Increased staffing will enable AOV to expand credentialing of ATO safety personnel who regulate training and proficiency standards. This ensures all Air Traffic Controllers and Airway Transportation System Specialists meet the agency's safety standards.	800	10
Capital Expenses		
Capital Programs: Consistent with FAA's proposed account structure and refinancing proposal, the Safety & Operations appropriation includes capital programs from the former Facilities & Equipment appropriation. Details on these capital programs are included in AVS's narrative justification section.	56,000	77

AVS Primary Customer Base
(General Public is our Ultimate Customer)

Air Operator Certificates: 6,110
116 Major Air Carriers -- (e.g. United Airlines)
2,350 Commuter Air Carriers/On Demand Air Taxis
161 Commercial Operators (e.g. Baltimore Orioles)
454 Foreign Air Carriers (e.g. Lufthansa)
331 External Load (Logging/Oil Platform)
2,189 Agricultural Operators
509 Public Use Authorities (State/City/Police)

Air Agency Certificates: 5,803
554 Pilot Training Schools
4,957 Repair Stations
171 Maintenance Training Schools
121 Pilot Training Centers

Aircraft: 319,549
7,705 Air Carrier Aircraft
576 Commuter Air Carrier Aircraft
12,504 On Demand Air Taxi Aircraft
207,087 General Aviation Aircraft
91,677 Inactive Aircraft

Aviation Authorities - other countries
30 Bilateral Agreements
105 Foreign Carrier Aviation Authorities
188 Accident Investigation Authorities

Check Airmen: 7,592
5,590 Part 121
201 Parts 121/135
1,801 Part 135

Designees: 11,122
4,656 Aircraft Certification
1,444 Flight Standards
4,990 Aerospace Medicine

Mechanics with Inspection Authority: 20,458

Active Pilots: 722,208
146,507 ATP
129,412 Commercial
231,424 Private
248 Recreational
1,903 Sport
86,290 Student
126,424 Foreign Pilot

Non-Pilot Air Personnel: 707,808
363,217 Mechanics & repairmen
43,084 Control Tower Operator
144,853 Flight Attendant
74,498 ground instructors
82,156 other (dispatchers/flight navigators/ parachute riggers/flight engineers)

Flight Instructors: 92,207

Airmen Medical Examinations: 470,000
16,100 Special Issuances

Approved Manufacturers: 1,647

Aviation Industry Entities Covered by Anti-Drug & Alcohol Programs: 7,200

National Transportation Safety Board
75 Safety Recommendations (5-year average)
30 Major Investigations (avg/yr)(new)

ATCS Medical Clearance Exams: 20,347
17,598 Air Traffic Controller Workforce
2,749 Flight Service Station Workforcce

Occupational/Employee Health Services
48,853 FAA Employees

As of January 15, 2008

Resource Summary

AVS

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	785,095	844,422	57,971	800	903,193
Other Objects					
Travel/Transportation	50,843	53,314	735	-	54,049
Other Services	138,131	148,495	46,377	-	194,872
RCU [2]	16,461	17,318	92	-	17,409
Other [3]	16,530	18,053	(650)	-	17,403
Total	221,965	237,180	46,554	-	283,734
Total	**1,007,060**	**1,081,602**	**104,525**	**800**	**1,186,927**
Staffing					
EOY (FTP)	6,738	6,962	77	30	7,069
OTFTP	108	110	-	-	110
Total FTEs (Includes FTP and OTFTP)	6,647	6,823	77	10	6,910

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary
($ in K)

		FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Change****	FY 2009 Request
Flight Standards	PC&B	539,477	567,997	595,357	41,311	636,668
	O.O.	147,615	127,580	129,046	18,990	148,036
	Total	687,092	695,577	724,403	60,301	784,704
Aircraft Certification	PC&B	140,742	150,852	157,733	9,684	167,417
	O.O.	21,972	21,763	21,823	8,118	29,941
	Total	162,714	172,615	179,556	17,802	197,358
Aerospace Medicine	PC&B	31,687	34,189	36,721	2,336	39,057
	O.O.	10,308	9,241	9,695	97	9,792
	Total	41,995	43,430	46,416	2,433	48,849
Accident Investigation	PC&B	3,889	4,205	4,470	188	4,658
	O.O.	1,597	1,828	2,037	81	2,119
	Total	5,486	6,033	6,507	269	6,777
Rulemaking	PC&B	2,987	3,059	3,322	140	3,462
	O.O.	153	962	984	39	1,023
	Total	3,140	4,021	4,306	179	4,485
Air Traffic Safety Oversight	PC&B	3,590	7,266	8,284	2,714	10,998
	O.O.	952	1,940	2,422	97	2,518
	Total	4,542	9,206	10,705	2,811	13,516
Aviation Safety Analysis*	PC&B	0	0	2,652	133	2,785
	O.O.	0	0	3,416	137	3,552
	Total	0	0	6,068	269	6,337
Suspected Unapproved Parts**	PC&B	1,246	1,454	0	0	0
	O.O.	151	172	0	0	0
	Total	1,397	1,626	0	0	0
Quality, Integration, and	PC&B	12,859	16,073	35,882	2,266	38,149
Executive Services***	O.O.	36,470	58,479	67,757	18,994	86,751
	Total	46,719	74,552	103,639	21,260	124,899
Total, Aviation Safety	PC&B	736,477	785,095	844,422	58,771	903,193
	O.O.	219,218	221,965	237,180	46,554	283,733
	Total	955,695	1,007,060	1,081,602	105,325	1,186,927

As of January 25, 2008

* Includes creation of Aviation Safety Analysis Service
** Includes closing of Suspected Unapproved Parts office
*** Includes information technology employee transfer from AFS, AIR, and AAM to AQS
**** $56M of capital funds were transferred from the F&E account to the Safety & Operations account in FY 2009

Safety Critical / Operational Support Staffing (End-of-Year Employment - FTP)

	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Change	FY 2009 Request
Flight Standards					
Aviation Safety Inspectors	3,662	3,780	3,880	0	3,880
Safety Technical Specialist	414	421	407	0	407
Operational Support	791	624	612	0	612
Capital Personnel****	0	0	0	56	56
Total	4,867	4,825	4,899	56	4,955
Aircraft Certification					
Manufacturing Safety Inspectors	206	221	230	0	230
Pilots, Engineers, and CSTAs	649	668	688	0	688
Safety Technical Specialist	189	152	165	0	165
Operational Support	136	138	141	0	141
Capital Personnel****	0	0	0	19	19
Total	1,180	1,179	1,224	0	1,243
Aviation Medicine					
Physicians, Physician Assistants, Nurses	59	58	66	0	66
Alcohol/Drug Abatement Inspectors	68	70	85	0	85
Safety Technical Specialist	127	130	141	0	141
Operational Support	68	64	65	0	65
Total	322	322	357	0	357
Accident Investigation					
Air Safety Investigators	10	10	10	0	10
Safety Technical Specialist	14	17	15	0	15
Operational Support	4	4	6	0	6
Total	28	31	31	0	31
Air Traffic Safety Oversight					
AOV Safety Inspectors	3	3	8	5	13
Air Traffic Controllers	11	20	30	0	30
Safety Technical Specialist	22	35	62	20	82
Operational Support	1	2	3	5	8
Total	37	60	103	30	133
Rulemaking					
Safety Technical Specialist	20	27	27	0	27
Operational Support	2	3	3	0	3
Total	22	30	30	0	30
Aviation Safety Analysis*					
Safety Technical Specialist	0	9	10	0	10
Operational Support	0	2	6	0	6
Total	0	11	16	0	16
Suspected Unapproved Parts**					
Aviation Safety Inspectors	6	0	0	0	0
Safety Technical Specialist	0	0	0	0	0
Operational Support	4	0	0	0	0
Total	10	0	0	0	0
Quality, Integration, and Executive Services***					
Safety Critical Staff	86	129	134	0	134
Operational Support	10	151	168	0	168
Capital Personnel****	0	0	0	2	2
Total	96	280	302	0	304
Totals					
Safety Critical Staff	5,546	5,750	5,958	25	5,983
Operational Support	1,016	988	1,004	5	1,009
Capital Personnel****	0	0	0	77	77
Total	6,562	6,738	6,962	107	7,069

As of January 25, 2008

* Includes creation of Aviation Safety Analysis Service
** Includes closing of Suspected Unapproved Parts office
*** Includes information technology employee transfer from AFS, AIR, and AAM to AQS
**** 77 FTP of capital personnel were transferred from the F&E account to the Safety & Operations account in FY 2009

Staffing Information

Direct FTEs	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	Proposed Change****	FY 2009 Request
Flight Standards	4,558	4,780	4,875	28	4,903
Aircraft Certification	1,113	1,160	1,194	10	1,204
Medical	312	318	340	5	345
Accident Investigation	26	27	29	0	29
Rulemaking	25	28	29	1	30
Air Traffic Safety Oversight	35	52	67	36	103
Aviation Safety Analysis*	0	0	13	2	15
Suspected Unapproved Parts**	10	12	0	0	0
Quality, Integration, and Executive Services***	90	270	276	5	281
Total	6,169	6,647	6,823	87	6,910

End-of-Year Employment (FTP)	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	Proposed Change****	FY 2009 Request
Flight Standards	4,867	4,825	4,899	56	4,955
Aircraft Certification	1,180	1,179	1,224	19	1,243
Medical	322	322	357	0	357
Accident Investigation	28	31	31	0	31
Rulemaking	22	30	30	0	30
Air Traffic Safety Oversight	37	60	103	30	133
Aviation Safety Analysis*	0	11	16	0	16
Suspected Unapproved Parts**	10	0	0	0	0
Quality, Integration, and Executive Services***	96	280	302	2	304
Total	6,562	6,738	6,962	107	7,069

As of January 25, 2008

* Includes creation of Aviation Safety Analysis Service
** Includes closing of Suspected Unapproved Parts office
*** Includes information technology employee transfer from AFS, AIR, and AAM to AQS
**** 77 FTE and 77 FTP (AFS = 56, AIR = 19, AQS = 2) of capital personnel were transferred from the F&E account to the Safety & Operations account in FY 2009

Workload Indicators

Flight Standards

Workload	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Estimate
Airmen Certification Activities	248,615	245,809	255,879	263,358
Operator Certification/Certificate Management Activities	90,195	94,614	97,323	92,710
Investigation Activities	32,645	34,981	33,214	33,184
Non-ATOS Air Operator/Air Agency Surveillance Activities*	333,197	241,927	186,383	191,237
ATOS Operator Surveillance Activities	35,090	42,536	78,700	82,146
Enforcement Investigation Activities	10,588	11,039	10,934	10,496
Education & Safety	53,671	32,448	35,922	23,348
Aircraft Registration Examinations	214,365	235,219	238,983	242,806
Airmen Certification Examinations	219,818	226,237	233,024	240,015

Percent Change	FY05 - FY06 Actual	FY06 - FY07 Actual	FY07 - FY08 Plan	FY08 - FY09 Estimate
Airmen Certification Activities	5.40%	-1.1%	4.1%	2.9%
Operator Certification/Certificate Management Activities	-3.00%	4.9%	2.9%	-4.7%
Investigation Activities	-4.10%	7.2%	-5.1%	-0.1%
Non-ATOS Air Operator/Air Agency Surveillance Activities*	23.20%	-27.4%	-23.0%	2.6%
ATOS Operator Surveillance Activities	-5.20%	21.2%	85.0%	4.4%
Enforcement Investigation Activities	-9.40%	4.3%	-1.0%	-4.0%
Education & Safety	-25.70%	-39.5%	10.7%	-35.0%
Aircraft Registration Examinations	-3.30%	9.7%	1.6%	1.6%
Airmen Certification Examinations	-29.50%	2.9%	3.0%	3.0%

* Includes other than Part 121 carriers

Aircraft Certification

Workload	FY 2006 Actual	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
Certificated Aircraft Types in Operation	1,008	1,012	1,014	1,016
Airworthiness Directives Issued (NPRM through final rule)	414	177	180	185
Active Representatives of the Administrator	4,850	6,183	6,190	6,200
Inspections/Audits	6,500	3,035	4,000	4,100
New Certifications, Approval, & Appointments	10,910	10,233	10,250	10,300

Percent Change	FY05 - FY06 Actual	FY06 - FY07 Actual	FY07 - FY08 Estimate	FY08 - FY09 Estimate
Certificated Aircraft Types in Operation	0.50%	0.4%	0.2%	0.2%
Airworthiness Directives Issued	-0.70%	-57.2%	1.7%	2.8%
Active Representatives of the Administrator	4.70%	27.5%	0.1%	0.2%
Inspections/Audits	4.00%	-53.3%	31.8%	2.5%
New Certifications, Approval, & Appointments	1.00%	-6.2%	0.2%	0.5%

Workload Indicators (cont.)

Aerospace Medicine

Workload	FY 2006 Actual	FY 2007 Actuals	FY 2008 Plan	FY 2009 Estimate
Applications Processed/Received	569,801	438,644	444,439	450,292
DWI/NDR Applications Processed	11,344	13,856	13,995	14,135
Number of AMEs	4,705	4,194	4,200	4,100
Anti-Drug and Alcohol Registrations Completed	350	321	330	340
Anti-Drug and Alcohol MIS Annual Reports	1,310	1,365	1,900	2,500
Compliance and Enforcement Inspections	1,473	1,236	1,525	1,750
Number of Drug Tests	7,361	11,125	11,500	11,500
Number of Alcohol Tests	2,829	3,351	3,500	3,500

Percent Change	FY05 - FY06 Plan	FY 2007 Actuals	FY 2008 Estimate	FY 2009 Estimate
Applications Processed/Received	32.50%	-23.0%	1.3%	1.3%
DWI/NDR Applications Processed	-4.30%	22.1%	1.0%	1.0%
Number of AMEs	0.10%	-10.9%	0.1%	-2.4%
Anti-Drug and Alcohol Registrations Completed	0.00%	-8.3%	2.8%	3.0%
Anti-Drug and Alcohol MIS Annual Reports	6.90%	4.2%	39.2%	31.6%
Compliance and Enforcement Inspections	1.60%	-16.1%	23.4%	14.8%
Number of Drug Tests	-10.80%	51.1%	3.4%	0.0%
Number of Alcohol Tests	-13.00%	18.5%	4.4%	0.0%

Accident Investigation

Workload	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Estimate
NTSB Recommendations Received	73	72	70	75
Accidents/Incidents Investigated	51	44	45	47
Follow-Up Investigations	155	175	175	170
Special Accidents/Incidents Investigations	93	100	110	110
NTSB Hearings Participated In	2	2	2	3
FAA Recommendations Received	287	207	250	315
NTSB Requests Received	133	164	120	130

Percent Change	FY05 - FY06 Actual	FY06 - FY07 Actual	FY07 - FY08 Plan	FY08 - FY09 Estimate
NTSB Recommendations Received	82.50%	-1.4%	-2.8%	7.1%
Accidents/Incidents Investigated	24.40%	-13.7%	2.3%	4.4%
Follow-Up Investigations	19.20%	12.9%	0.0%	-2.9%
Special Accidents/Incidents Investigations	-17.70%	7.5%	10.0%	0.0%
NTSB Hearings Participated In	100.00%	0.0%	0.0%	50.0%
FAA Recommendations Received	-24.70%	-27.9%	20.8%	26.0%
NTSB Requests Received	22.00%	23.3%	-26.8%	8.3%

Workload Indicators (cont.)

Rulemaking

Workload	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Estimate
Exemptions	512	839	550	550
Petitions for Rulemaking	19	15	20	20
Rulemaking Projects	37	29	35	35
Aviation Rulemaking Advisory Committee:				
Tasks	4	2	3	3
Recommendations	4	3	3	3

Percent Change	FY05 - FY06 Actual	FY06 - FY07 Actual	FY07 - FY08 Plan	FY08 - FY09 Estimate
Exemptions	42.00%	63.9%	-34.4%	0.0%
Petitions for Rulemaking	21.00%	-21.1%	33.3%	0.0%
Rulemaking Projects	-5.00%	-21.6%	20.7%	0.0%
Aviation Rulemaking Advisory Committee:				
Tasks	-26.00%	-50.0%	50.0%	0.0%
Recommendations	-24.00%	-25.0%	0.0%	0.0%

Suspected Unapproved Parts

Workload	FY 2006 Actual	FY 2007 Actual
Cases Opened	239	230
Cased Closed	186	208
Reports Received	280	273

Percent Change	FY05 - FY06 Actual	FY06 - FY07 Actual
Cases Opened	0.40%	-3.8%
Cased Closed	-16.20%	11.8%
Reports Received	0.40%	-2.5%

Air Traffic Safety Oversight

Workload	FY 2006 Actual	FY 2007 Actual	FY 2008 Plan	FY 2009 Estimate
Safety Analysis and Audits	7,792	14,148	32,458	49,690
Safety Incident Investigations	7,952	11,936	25,990	47,590
Air Traffic Change Approvals	3,714	2,422	11,642	21,270
Safety Report Reviews	3,149	6,829	17,408	18,884
Airmen Credentialing/Examination	2,408	8,040	18,683	16,234
Education and Safety	7,536	25,662	40,149	43,159

Percent Change	FY06 - FY07 Estimate	FY07 - FY08 Plan	FY08 - FY09 Estimate
Safety Analysis and Audits	81.6%	129.4%	53.1%
Safety Incident Investigations	50.1%	117.7%	83.1%
Air Traffic Change Approvals	-34.8%	380.7%	82.7%
Safety Report Reviews	116.9%	154.9%	8.5%
Airmen Credentialing/Examination	233.9%	132.4%	-13.1%
Education and Safety	240.5%	56.5%	7.5%

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Commercial Space Transportation (AST)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2008 Enacted	**12,549**	**67**	**1**	**62**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	580			4
2. Annualized FY 2008 Pay Raise (GS Population)	93			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	47			
4. January 2009 Pay Raise (GS Population)	272			
5. January 2009 OSI (Core Comp Population)	119			
6. January 2009 SCI	19			
7. One Less Compensable Day	-32			
8. Non-pay inflation	178			
Total Unavoidable Adjustments	**1,275**	**0**	**0**	**4**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	270	4		2
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**270**	**4**	**0**	**2**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses				
1. FY 2009 Capital Programs	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**14,094**	**71**	**1**	**68**

Detailed Justification for Commercial Space Transportation (AST)

Commercial Space Transportation	FY 2009 Request: $14,094

Overview:

The Associate Administrator for Commercial Space Transportation (AST) is committed to a timely and responsive licensing and regulatory process designed to enable a safe, secure, efficient, and internationally competitive U.S. space transportation industry.

Goals:

- No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed or permitted space launch and reentry activities.
- Encourage and facilitate the growth of commercial space transportation through environmental activities and delivery of products to improve the international competitiveness of the U.S. commercial space transportation industry.
- Manage for results that support achievement of AST's mission and vision.
- AST's goals will be supported by:
    - Regulating commercial space launches, reentries, and operations of launch and reentry sites only to the extent necessary to achieve statutory objectives.
    - Implementing the National Space Transportation Policy.
    - Promoting development of new or improved U.S. commercial space launch vehicle technology.
    - Encouraging public-private partnerships to construct new or improved infrastructure to accommodate increasing demand for commercial space launches.
    - Supporting development and monitoring of agreements to advance fair and equitable international trade in space launches.
    - Analyzing and assessing market trends and forces that impact the international competitiveness of the U.S. industry.
    - Controlling costs, improving customer service, managing resources effectively and efficiently, and carrying out a comprehensive training plan to meet the unique needs of AST's commercial space transportation technical professionals.

FY 2008 Program:

The mission of the Associate Administrator for Commercial Space Transportation is to ensure public safety for licensed and permitted U.S. launch and reentry activities, and to support the continued growth and expansion of the U.S. commercial space transportation industry.

Safety is AST's top priority. AST's core business functions protect uninvolved people from the dangers associated with commercial space launch and reentry operations. These functions include approving license and permit applications, inspecting licensed and permitted operations, and developing rulemaking products related to commercial launch and reentry activities.

AST's processes evolve with the commercial space transportation industry, ensuring public safety. With a focus on the rapid evolution and complexity of new launch vehicles and associated technologies, AST will lead agency efforts to evaluate safety critical launch and reentry vehicle components, systems, and operations. Further, AST will continue to improve its processes and leverage partnerships with other government organizations to improve the safety of launches and reentries occurring from both federal and non-federal launch sites.

The human space flight surge is on the rise as anticipated after Scaled Composites won the Ansari X Prize with SpaceShipOne. The initial regulatory regimes for human space flight and experimental permits were established in FY 2007, and development will continue. Several companies are planning to provide space flight to the public within the 2009 to 2010 time frame. In October 2007, the X Prize Foundation sponsored its third X Prize Cup competition. This annual event gathers many companies and teams to compete in space-related events, several of which involve vehicle flight requiring licenses or experimental permits. AST works with the X Prize Foundation through a new form of industry partnership that promotes communication, with AST receiving information about planned events and assessing their safety impact. Through the X Prize Foundation, AST is better able to ensure participants are aware of regulatory requirements. AST is conducting independent flight safety analyses and safety evaluations of proposed activities for future X Prize Cup events. Some of the X Prize Cup events do not require a launch license or permit, such as amateur rocket launches. However, due to the Lunar Lander Challenge issued by NASA in FY 2006, several applications for permitted flights are in various stages of the evaluation process. In addition, as NASA indicated in their December 2005 procurement for the Commercial Orbital Transportation Services (COTS) Demonstrations, the FAA/AST regulatory process will be followed by the proponents. AST expects its FY 2008 workload to include customers with COTS requirements.

As well as ensuring public safety, AST enables industry through various activities intended to encourage and promote the growth of U.S. commercial space transportation. AST's core business functions in this area include performing environmental projects, publishing reports on industry developments and trends, hosting stakeholder forums, and supporting development of policies that impact the U.S. commercial space launch industry.

AST is committed to working with its stakeholders to identify approaches that will provide greater service and satisfaction, as well as cost savings.

Anticipated FY 2008 Accomplishments:

- Make 100 percent of new license determinations within 180 days of receiving an acceptable application.
- Make 100 percent of license renewal determinations within 90 days of receiving a request.
- Make 100 percent of safety approval determinations within 90 days of receiving an acceptable application.
- Make 100 percent of permit determinations within 120 days of receiving an acceptable application.
- Conduct discussions with seven potential applicants to provide guidance for preparing the appropriate materials for technical evaluations.
- Complete 37 inspections of licensed launch and reentry vehicle operations and licensed launch and reentry sites.
- Select and develop safety-related research projects in support of AST regulatory activities.
- Evaluate the Space and Air Traffic Management System (SATMS) Decision Support Tool (DST) to determine the impact of launch and reentry separation standards on the National Airspace System (NAS).
- Continue development of regulatory efforts, including issuing the final rules for human space flight and experimental permits for suborbital reusable launch vehicles (RLV) and preparing an Explosive Siting Phase III NPRM for internal review.
- Develop and issue advisory documents including an Anomaly Reporting and Corrective Action Advisory Circular, Guide to Safety Culture, and GPS Users Guide for RLV Navigation and Tracking.
- Communicate information useful to the industry by publishing an Industry Developments and Concepts Report, a Commercial Space Transportation Industry Forecast, and four quarterly launch reports and conducting a Commercial Space Transportation Conference.
- Conduct an AST Customer Satisfaction Survey.
- Increase awareness of commercial space transportation by designing an AST educational web page and participating in two major science fairs.
- Implement management, workforce, and resource management improvement plans.
- Reduce the costs of baselined licensing process components.

FY 2009 Budget Request:

For FY 2009, the Associate Administrator for Commercial Space Transportation requires $14,094,000 and 68 FTE to meet its mission. This corresponds to an increase of $1,544,918 (12.3 percent) and six FTE (9.7

percent) above AST's FY 2008 enacted level.

AST projects to have at least seven customers in various phases of the license determination and experimental permitting processes for FY 2009. AST will continue to streamline the environmental review process in its licensing and permitting efforts. Based on the increase in commercial space transportation since the Commercial Space Launch Amendments Act of 2004, AST work with RLV operators will continue to increase in FY 2009. This increased workload begins in the preapplication phase and continues through the environmental assessment, the air traffic evaluation, and the development of memorandums of agreement to aid new operators. In addition, companies taking part in NASA's COTS demonstrations, requiring launch licenses or permits, could be at various stages of flight readiness.

Several companies are planning to offer space flight to the public within the 2009 to 2010 time frame, adding a complicating dimension to permit and license evaluations. To maintain its unblemished safety record, AST is requesting a discretionary increase of $270,000 for four human space flight personnel. These hires will assess the human space flight aspects of safety evaluations of commercial space license and permit applications.

As a follow-up to the license and permit process, AST will conduct safety inspections to ensure adherence to the regulatory requirements. AST conducts at least one annual inspection at each commercial launch site and, at a minimum, an inspection of launch operations at the time of flight. Currently, there are six licensed launch site operators and AST will conduct six site inspections. In addition to inspections of launch operations at the time of flight, AST may conduct inspections before and after the time of flight, verifying launch preparation and post-flight events. The number of expendable launch vehicle (ELV) launches and inspections should remain the same as FY 2008. RLV launches, however, are difficult to predict accurately. By FY 2009 we expect only a few will be conducted under licenses, but many will be under experimental permits as RLV vehicles and operations continue to undergo testing, training, and research and development. Estimates for RLV launches range from 25 to 55 and higher. The FAA expects to conduct 44 inspections of licensed and permitted launch operations during FY 2009.

AST will carry out regulatory development projects such as the Explosive Siting notice of proposed rulemaking for publication in the Federal Register. This rule will add changes in storing liquid propellants to the guidance and align the guidance to Department of Defense (DoD) Explosive Safety Board standards. Also, AST will finalize the guide to trajectory dispersion methodology for piloted RLVs and issue the GPS Users Guide for RLV Navigation and Tracking.

AST will continue collaborating with DoD and NASA through the Common Standards Working Group to maintain common launch safety requirements and to aid DoD's understanding of commercial space entrepreneurial capabilities. AST will continue its collaboration with NASA on the COTS initiative.

AST's research supports development of safety regulations and standards to keep pace with a growing space industry. Each year AST makes a call for new research projects, to be accomplished during the following fiscal year, to the Commercial Space Transportation Advisory Committee (COMSTAC) and RLV and Launch Operations Support Working Groups. COMSTAC members are senior executives from the U.S. commercial space transportation industry, including entrepreneurial firms as well as large aerospace companies; the satellite industry; space-related state government officials; academia; and representatives from space advocacy organizations. AST receives 12-15 project ideas each year and determines if they support its safety and promotion goals. The suggested projects are ranked by likelihood of a successful outcome with topics that may soon be useful in new safety practices. Projects often include reviewing current modeling techniques, determining the current state of technological developments, and evaluating alternative safety methods that may be proposed by the industry. The most promising two to three projects, depending on estimated cost, are pursued.

AST continues to develop the requirements and architecture for Phase 1 of the first automated SATMS DST application in FY 2008. The tool supports launch and reentry mission planning. SATMS represents a conceptual "aerospace" environment in which space and aviation operations are seamless and fully integrated in a modernized, efficient NAS. Demand for access to the nation's airspace by aviation users (civil, military, and general) continues to increase. As a result, the need to improve the safety and efficiency of tools and processes is paramount to the SATMS vision. The SATMS DST will identify space vehicle airspace requirements, plan air traffic reroutes, and enable space vehicles to be tracked through the NAS. Phase 2 of the development will begin in FY 2009 and includes an evaluation of the initial draft requirements.

AST will publish an Industry Developments and Concepts Report, a Commercial Space Transportation Forecast, and four quarterly launch reports to provide information about significant changes in commercial space transportation. In developing forecasts, year-in-review documents and special topic reports, AST gathers information, evaluates the sources of the data, and analyzes and displays the information clearly to inform both the public and industry. These reports are used by industry to measure its performance in the commercial market, by state governments to influence development of new space launch activities, and by the DoD and NASA as they review launch requirements. AST also conducts a public Space Transportation Conference with an agenda based on industry and government feedback.

AST reaches out to students, teachers, and academic administrators with its Education Initiative. This program develops knowledge of the commercial space transportation industry and its career potentials, as well as increase interest in science, math, and engineering. Also, AST will participate in local school career days and educational conferences and develop educational materials for publication and the AST website.

AST designs its Organizational Excellence activities to help it meet the challenges of its primary mission – protect the public, property, and national security and foreign policy interests of the United States – efficiently and effectively. AST seeks to improve its organizational performance in three areas: human resource management, fiscal resource management, and training. AST supports the agency's lead in strategic management areas, including the early dispute resolution system, workforce planning, and performance planning. AST's efforts toward organizational excellence also help it be a responsible steward of public funds. AST will expand its efforts to obtain a broader range of customer feedback in FY 2009 and will continue its scrutiny of budget requirements and spending in its cost control effort.

AST will continue to strengthen the knowledge of its technical and professional staff in areas unique to space transportation. It will use a mix of commercial, government, and internally developed courses to provide at least 1,800 student-hours of professional development and technical training for AST staff.

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Explanation of Funding Changes for Commercial Space Transportation (AST)

	Dollars ($000)	FTE
Commercial Space Transportation (Net change from FY 2008 Enacted)	**$14,094**	**68**
Overview: For FY 2009, the Associate Administrator for Commercial Space Transportation requires $14,094,000 and 68 FTE to meet its mission of protecting the public, property, and national security and foreign policy interests of the United States during a commercial launch or reentry activity and to encourage, facilitate, and promote U.S. commercial space transportation. As this is an entirely new appropriation for FY 2009, this represents a 100 percent increase from the FY 2008 enacted level of zero. However, the FY 2009 request for this activity does correspond to an increase of $1,544,918 (12.3 percent) and six FTE (9.7 percent) from AST's FY 2008 enacted amount in the Operations appropriation. The FY 2009 request level reflects the transfer of the FY 2008 base amount from the Operations appropriation, unavoidable pay raises and inflation, and staffing increases to provide safety inspectors for commercial space launches operating under experimental permits. The FY 2009 FTE request level consists of the FY 2008 base amount from the Operations appropriation, annualization of FY 2008 Space Launch Safety hires (four FTE) and increased staffing for Human Space Flight personnel (two FTE).		
Transfer from Operations		
FY 2008 Enacted Amount in the Operations Appropriation: The FY 2008 enacted amount includes $12.6 million in the Operations appropriation for Commercial Space Transportation. This "base" amount is being transferred into the new Safety & Operations appropriation to align with FAA's proposed account structure and refinancing proposal.	12,549	62
Unavoidable Adjustments		
Annualized FTEs: This represents the net annualized costs of FY 2008 new hires.	580	4
Annualized FY 2008 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.5 percent average government-wide pay raise in January 2008. The actual factor used is 4.4 (3.5 percent plus 0.9 percent average of Within-Grade increases). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	93	
Annualized FY 2008 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2008. The OSI is 88 percent of the 3.5 percent average government-wide pay raise plus 1.0 percent (3.96 percent). The Core	47	

	Dollars ($000)	FTE
Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.		
FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 3.8 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 0.9 percent average of Within-Grade increases.	272	
FY 2009 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.	119	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	19	
One Less Compensable Day: This decrease is due to the subtraction of one compensable day in FY 2009 (261 in FY 2009 versus 262 in FY 2008).	-32	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	178	

	Dollars ($000)	FTE
Discretionary Increases		
Human Space Flight: This requested increase is for additional safety personnel needed to assess the human space flight aspects of the safety evaluations of commercial space license and permit applications. The increase will fund an additional four aerospace engineers (two FTE) and allow AST to perform 11 human space flight evaluations for license, permit, and safety approval determinations. As of April 2007, the United States commercial space transportation industry had 181 licensed launches over the past 21 years without a fatality, serious injury, or significant damage to the uninvolved public. Since October 2006, there have been nine launches under experimental permits, also without a fatality, serious injury, or significant property damage to the uninvolved public. The FAA is committed to maintaining that perfect safety record, a goal this discretionary increase will support. Two recent developments have caused a significant increase in the number of expected human space flight launches. First, the Commercial Space Launch Amendments Act (CSLAA) authorized the issuance of experimental permits and provided for human space flight on commercial launches. The CSLAA promotes entrepreneurial growth by facilitating market entry for smaller companies that have less background, experience, and resources than the major industry players. It also promotes technological development by providing an opportunity for these same small companies to develop and test without having to meet the rigorous standards of the licensing process. The CSLAA has dramatically changed the commercial space transportation landscape and AST's business processes. Second, the human space flight surge anticipated after Scaled Composites won the Ansari X Prize has begun. Several companies announced plans to begin test flights in 2007 and 2008, with passenger flights starting in the 2009 timeframe and possibly occurring weekly by 2010. Others have indicated plans to request safety approvals for various equipment or operations associated with human space flight. AST is currently working with thirteen entrepreneurial companies that are in various stages of development. Safety evaluations in the license and permit determination processes have been the central elements in ensuring vehicle operation safety. Thus far, AST has been able to address the safety issues presented by the wide variety of new technology and designs in the market. However, the human space flight element introduced and encouraged by CSLAA and the X Prize radically increases the scope of these evaluations, as humans in the flight safety system add uncertainties, such as physical conditioning and training, resulting in new work responsibilities. Until now, safety evaluations were oriented to the hard sciences, such as engineering and physics. Software could be tested for performance. Conditions could be simulated and recreated. As outcomes were based on physical laws, vehicle performance could be determined with a high degree of certainty. However, the safety evaluation process must now include methods to address human performance that allow AST to determine whether a vehicle can be operated safely. The resources AST requires for this expanded workload are not available within its base budget. Additionally, several companies have approached AST with plans to develop training for space vehicle pilots and crews. Their intent is to	270	2

	Dollars ($000)	FTE
obtain safety approvals for training programs. To serve these customers, AST requires additional resources to develop evaluation criteria for the training plans and to conduct evaluations for safety approval determinations. Finally, the legislation authorizing the issuance of licenses and experimental permits directed that determinations be made within 180 and 120 days, respectively. Adhering to those legislative mandates while conducting the additional evaluations as a result of humans onboard requires AST to apply additional resources to the evaluation process. To date, the operation of Scaled Composite's SpaceShipOne is the only license determination AST has made that included a crew member as part of the flight safety system and conducted flights. Based on the SpaceShipOne experience and the companies that plan human space flight operations, AST estimates the need to increase its evaluation effort by 30 to 40 percent. AST currently expends over 11 FTE for license and permit determinations, none of which currently includes human space flight evaluation. An additional four EOY staffing will be needed to address human space flight in FY 2009. This budget request responds to the challenge of this changing environment and seeks to assure the continued prevention of fatalities, serious injuries, and significant property damage to the uninvolved public.		

Resource Summary

AST

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	7,173	7,860	1,170	270	9,300
Other Objects					
Travel/Transportation	369	474	51	-	524
Other Services	3,562	4,099	51	-	4,150
RCU [2]	16	16	1	-	17
Other [3]	138	100	3	-	103
Total	4,086	4,689	105	-	4,794
Total	**11,259**	**12,549**	**1,275**	**270**	**14,094**
Staffing					
EOY (FTP)	56	67	-	4	71
OTFTP	1	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	57	62	4	2	68

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

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SAFETY & OPERATIONS APPROPRIATION

Staff Offices Summary
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**679,656**	**2,576**	**88**	**2,650**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0	0	-1	0
2. Annualized FY 2008 Pay Raise (GS Population)	543	0	0	0
3. Annualized FY 2008 Pay Raise (Core Comp Population)	3,862	0	0	0
4. January 2009 Pay Raise (GS Population)	1,589	0	0	0
5. January 2009 OSI (Core Comp Population)	9,759	0	0	0
6. January 2009 SCI	1,581	0	0	0
7. One Less Compensable Day	-1,273	0	0	0
8. Non-pay inflation	9,239	0	0	0
Total Unavoidable Adjustments	**25,300**	**0**	**-1**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0	0	0	0
2. Capital Security Cost Sharing Program	1,000	0	0	0
3. Financial Systems Upgrades	8,455	0	0	0
4. Capitalization Staffing	0	19	0	19
5. Facilities Management & Security	4,320	0	0	0
Total Uncontrollable Adjustments	**13,775**	**19**	**0**	**19**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0	0	0	0
2. Human Space Flight	0	0	0	0
3. CMEL Lease and Support Contract	700	0	0	0
4. Consolidate AVS Offices in Florida	1,900	0	0	0
5. Logistics Support Services Contract	1,800	0	0	0
6. Real Property Asset Management	2,200	0	0	0
7. Information Security Enhancement	7,600	0	0	0
8. Class Action Litigation Support	1,078	0	0	0
9. Integrate Environmental Performance into NextGen	704	0	0	0
10. FAA Offices in Latin America	386	2	0	2
11. HSPD-12 Implementation	6,270	11	0	11
12. Capitalization	2,000	26	0	26
Total Discretionary Increases	**24,637**	**39**	**0**	**39**
Base Transfers				
1. Workforce Planning	0	0	0	0
2. Regional Operations Center	99	1	0	1
3. Information Technology	0	0	0	0
4. Capitalization	0	4	0	4
5. Aeronautical Center Facility Management	27,814	46	0	46
6. Aeronautical Center Leased Telecommunications	652	0	0	0
7. Worker's Compensation Program Management	108	1	0	1
8. Procurement & Class Action Litigation	2,000	1	0	1
9. MMAC Office of Acquisition (AMQ) Positions	225	2	0	2
10. Delphi Asset Tracking Team (DATT)	383	3	0	3
Total Base Transfers	**31,280**	**58**	**0**	**58**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	71,400	0	0	0
2. Capital Personnel & Related Expenses	5,025	17	0	17
Total Capital Expenses	**76,425**	**17**	**0**	**17**
FY 2009 Request -- Total	**851,073**	**2,709**	**87**	**2,783**

SAFETY & OPERATIONS APPROPRIATION

Financial Services (ABA)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**100,593**	**141**	**0**	**141**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	0			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	321			
4. January 2009 Pay Raise (GS Population)	0			
5. January 2009 OSI (Core Comp Population)	811			
6. January 2009 SCI	131			
7. One Less Compensable Day	-70			
8. Non-pay inflation	1,780			
Total Unavoidable Adjustments	**2,973**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	8,455			
4. Capitalization Staffing	0	19		19
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**8,455**	**19**	**0**	**19**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	-400			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	383	3		3
Total Base Transfers	**-17**	**3**	**0**	**3**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	2,553	6		6
Total Capital Expenses	**2,553**	**6**	**0**	**6**
FY 2009 Request -- Total	**114,557**	**169**	**0**	**169**

Detailed Justification for Staff Offices – ABA

Financial Services (ABA)	FY 2009 Request: $114,557

Overview:

The Assistant Administrator for Financial Services/Chief Financial Officer advises the agency of FAA plans and programs for budget, financial management, and performance management.

The Assistant Administrator for Financial Services:

- Provides accounting, financial, and audit liaison services.
- Manages FAA accounting systems.
- Oversees the capitalization of a multi-billion dollar asset base.
- Implements and oversees agency internal control program in compliance with OMB Circular A-123.
- Ensures that agency budgetary needs are identified and justified.
- Ensures that agency funds and resources are utilized effectively.
- Adheres to OMB Circular A-11 regarding apportionment, reapportionment, funds control, and reporting status of funds and budgetary resources.
- Develops policies, programs, standards, systems, and procedures for budget, financial, and performance management.
- Develops and manages the implementation of the organizational structure and issues administrative standards and procedures.
- Provides oversight of the agency's cost reduction efforts.
- Manages cost accounting system.
- Administers OMB Circular A-76, Performance of Commercial Activities.
- Serves as the agency's Chief Financial Officer (CFO).

FY 2008 Program:

The Assistant Administrator for Financial Services/CFO (ABA) will continue to enhance agency financial business processes through improvements to DOT's "Delphi" financial management system. In FY 2009, ABA will centralize major segments of the capitalization process to strengthen financial controls and improve the reliability of financial data. In addition, ABA plans to implement improved automated workflow and document imaging, making the capitalization process more efficient and less labor intensive. ABA will also focus on continuing to achieve a "clean audit" with an emphasis on improved internal controls. In support of the *Flight Plan*, ABA will continue to implement cost efficiency initiatives, delivering on agency goals for cost control.

With the Human Resources organization, ABA co-leads and contributes directly to the Organizational Excellence goal. Secondarily, ABA supports the agency's Safety, Capacity, and International goals.

Anticipated FY 2008 Accomplishments:

- Continue to improve Delphi, including implementation of commitment accounting and DELPHI enhancements to budget execution to better track F&E project authorizations.
- Obtain an unqualified opinion on agency financial statements with no material weaknesses.
- Continuously improve the agency-wide cost control program.
- Provide analytic, resource-based support to the agency's investment processes and negotiations with labor unions.
- Document and test internal controls over key business processes.
- Enhance financial management training agency-wide to ensure that executives and managers understand their fiscal roles and responsibilities.
- Maintain the Cost Accounting System (CAS) to improve the utility of financial information and support the user fee program.
- Ensure Flight Plan initiatives are fully funded by the beginning of FY 2009.
- Initiate agency budget formulation by providing top executives with policy options and recommendations. Guide decisions that establish the constraints and performance framework within which FAA organizations formulate their budgets.
- In collaboration with the Assistant Administrator for Aviation Policy, Planning and Environment, ensure that FY 2009 business plans include financial and budget information and reflect improved goal attribution.
- Continue to ensure agency compliance with the Funds Control Order and the Funds Control Standard Operating Procedures implemented in FY 2007.
- Continue to implement and improve the centralized structure for oversight of reimbursable work.
- Review acquisitions of $10 million or more to ensure the procurement represents a good investment of taxpayer resources and that appropriate alternatives were considered.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Financial Services/CFO requests $114,557,000 and 169 FTEs to meet its mission.

Capitalization: FAA received a Material Weakness and a Qualified Opinion on its FY 2006 Financial Statements as a result of long-standing issues associated with the Construction-In-Progress (CIP) account. In December 2006, FAA developed an aggressive action plan to clear the backlog in the CIP account and implement the recommendations in the audit report for improvement in the capitalization process. Although FAA has made great progress in clearing up the backlog, major changes are needed if FAA is to sustain timely and accurate capitalization of assets.

The current capitalization process is decentralized throughout FAA regions, centers, and headquarters. This has caused difficulty in accomplishing an efficient and effective capitalization program. Since program managers in headquarters spend 85 percent of the money for capital programs, ABA must centralize many of the key capitalization functions in headquarters to gain the necessary financial controls on the process. Ensuring accurate and timely asset accounting in FY 2009 and beyond will require additional resources.

Current capitalization efforts are being supplemented by contract resources. In FY 2009, ABA plans to convert these contract resources into government positions. Converting contractor resources to FTE will help sustain operations and provide a more cost effective solution. With this approach, no additional funds are requested. An increase of 19 FTE will ensure that capitalization operations are performed timely and with proper attention to internal controls and ongoing process improvements. The FAA will also be better able to sustain Clean Audit opinions with no Material Weaknesses. The new FTE will support the following improvements:

- Accurate and timely audit-ready records throughout the year.

- Streamlined processes and elimination of redundant work.
- Consistent application of project setup and the processing of transactions.
- Enhanced internal controls to prevent inaccurate or untimely data.
- Analysis and correction of inaccurate information immediately upon detection.
- Reinforced policies and procedures for an integrated FAA wide system.

Financial Systems Upgrades: ABA will be required to begin the development and implementation of a number of OMB and DOT mandated upgrades to the financial system Delphi to meet Government wide goals and initiatives. Additional funding being requested will be used to acquire the necessary contract support personnel and other resources to assist FAA in accomplishing these upgrades. Some of the major initiatives that will begin in FY 2009 are highlighted below.

The conversion to Oracle 12.FISO is another major initiative. Delphi uses Oracle's federal financial software for the core accounting system. Starting in FY 2009, FAA will work with DOT to upgrade the existing version of Delphi to 12.FISO. The FISO upgrade will require a total reimplementation of the system and complete data conversion. This represents a substantial level of effort to plan for and implement within FAA while having to maintain the existing system. Major benefits include: Federalized Project Accounting Module, Budgetary to Proprietary Accounting, Automated Prior Year Recovery and XML-based data extracts that will replace many standard reports for use with tools like Microsoft Excel, Word or Acrobat.

Business process re-engineering will be required to accommodate these major initiatives. FAA will develop processes to improve data integrity and clean up current data to prepare for the complete re-implementation and data conversion to Oracle 12.FISO.

Other Program Areas: All current executives and managers continue to need the requisite tools and training on how best to use cost data in decision making. ABA will reinforce use of these skills as part of the agency-wide cost control program. ABA will continue to improve Delphi, PRISM, CAS, and Labor Distribution and Reporting (LDR) and will provide timely and accurate CAS reports. ABA will provide configuration management and other policy, procedures, and security for FAA financial management systems; and assure that agency executives and managers are aware of the financial information available for their use in program analysis and decision making.

ABA will lead FAA in monitoring and reviewing contracts. Based upon internal agency and Office of Inspector General recommendations, the Administrator mandated that the Chief Financial Officer approve any proposed acquisition of $10 million or more. The Office of Financial Controls will continue to conduct reviews of these acquisitions to ensure that FAA takes the proper steps to award, administer, and monitor contracts. The Office of Financial Management will oversee the documentation and testing of controls of key business processes such as procurement, property management, and payroll to ensure the integrity of financial data and reduce the risk of cost mismanagement.

ABA will also continue to lead the agency's efforts at reducing costs and implementing business-like practices such as strategic sourcing and performance and efficiency metrics. The use of these types of processes will continue the efforts that have taken place over the last several years to make the agency more efficient and effective.

By FY 2009, after two years of rebuilding its staff, the Office of Budget will have significantly increased its analytical capability. The result is better budgeting, stronger financial oversight, and improved responsiveness to Congress, OMB, GAO, and the IG. The Office's stronger analytical skill strengthens performance integration and improves out-year planning. As the new staff hired since 2005 continue to mature, we are developing new reporting tools and requirements to improve the way resources are managed throughout FAA.

The Office of Budget shares corporate management and support for strategic and business planning with the Assistant Administrator for Aviation Policy, Planning and Environment. The Office determines corporate performance measures and annual targets and works with line and staff organizations to develop core business measures and targets. The Office also monitors performance and provides feedback to performance target leads.

SAFETY & OPERATIONS APPROPRIATION

Human Resource Management (AHR)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**91,214**	**581**	**32**	**610**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	0			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	862			
4. January 2009 Pay Raise (GS Population)	0			
5. January 2009 OSI (Core Comp Population)	2,179			
6. January 2009 SCI	352			
7. One Less Compensable Day	-261			
8. Non-pay inflation	403			
Total Unavoidable Adjustments	**3,535**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	1,234	5		5
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	108	1		1
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**1,342**	**6**	**0**	**6**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**96,091**	**587**	**32**	**616**

Detailed Justification for Staff Offices – AHR

Human Resource Management (AHR)	FY 2009 Request: $96,091

Overview:

The mission of the Assistant Administrator for Human Resource Management (AHR) is to advise and assist the Administrator in directing, coordinating, controlling and ensuring the adequacy of FAA plans and programs for personnel, training, workforce/human capital planning and measurement, and labor relations. AHR also provides leadership, policy, and direction to FAA in Human Resource Management (HRM) policy and activities.

Under today's tight budget constraints, FAA leadership must make wise investments in human capital. We must implement strategies that result in our employees achieving a high level of performance. We must also strive to provide quality human resource management services to support the men and women of FAA charged with getting the flying public safely to their destination.

FY 2008 Program:

People are the foundation for FAA's mission accomplishment. AHR advises on and supports the management of FAA's people. The FAA's corporate vision and goals aim for true organizational excellence as we continue our global aviation leadership role far into the 21st century. The FAA's strategic plan, called the *Flight Plan*, stresses that success will ultimately depend on the capabilities, effectiveness and efficiency of the men and women - the human capital - of FAA, to bring the *Flight Plan* to life.

AHR's human capital strategies must align strategically with FAA Flight Plan goals and vision. People are FAA's most valuable asset. Only a skilled, knowledgeable, talented, and high-performing workforce can handle the demands of achieving FAA's safety, capacity, and international aviation goals. AHR's intention is to support these goals by creating innovative, flexible, and efficient personnel systems and policies.

Anticipated FY 2008 Accomplishments:

- Conduct and analyze the 2008 Employee Attitude Survey (EAS).
- Monitor and evaluate 2006 EAS Action Plans results.
- Improve managerial selection and strengthen oversight and support of probationary managers; pilot recommendations to improve managerial selection procedures and probationary period activities.
- Implement needs assessment tools to guide individual development and design of corporate programs; identify and document critical leadership skill gaps; pilot corporate strategies to identify and develop high-potential leaders.
- Define emerging strategic challenges and brief the Leadership & Development Council on the implications for corporate management training and development; define and communicate new curriculum requirements and set FY 2009 delivery priorities; review cross-agency non-technical training and development for opportunities to reduce duplication and enhance return-on-investment.
- Promote the use of the new Individual Development Plan function in eLearning Management System (eLMS); revalidate the Employee Success Profile to ensure alignment with FAA mission and strategic goals; integrate Employee Leadership Development (ELD) with mission-critical occupation curriculums in eLMS.
- Implement agency-wide senior leadership development by conducting an analysis of all agency Executive (EV) positions to project executive staffing requirements; establish corporate application and selection processes; and establish and initiate development activities.
- Continue effective workers compensation program management and maintenance of cost containment obtained by consolidation of the corporate program; ensure that cost avoidance

measures lead to FAA's chargeback bill increase at a lower rate than the government-wide increase; mitigate workers compensation costs through proactive management and centrally managing claims for the entire FAA.

- Achieve 80 percent compliance with the use of the Strategic Sourcing for the Acquisition of Various Equipment and Supplies (SAVES) contract vehicles.
- Implement programs and processes to attract and retain a qualified FAA workforce.
- Build the leadership capabilities of the executive corps by providing FAA Executive Series seminars, Forum for Executive Excellence, and participating in multi-agency, low-cost executive development opportunities.
- Promote the continuity of senior leadership through executive development and succession planning; review and update succession planning and analysis of executive positions; continue to monitor priority staffing requirements.
- Ensure that human resource policies and processes are kept current and support and attract a strong executive leadership cadre; develop requirements for automating executive recruitment activities; improve the existing automated system and convert to an Oracle environment.
- Develop and provide labor relations training for agency supervisors and managers based on needs assessment for additional training.
- Continue to monitor labor relations service level agreements to ensure that business requirements are met.
- Use the Grievance Electronic Tracking System (GETS) to monitor grievance processing time and reduce processing time by at least five percent in FY 2008.
- Provide oversight and ensure compliance of all bargaining with FAA unions.
- Improve the process for hiring air traffic controllers to ensure the agency has the capacity to achieve anticipated strategic staffing requirements; revise and monitor implementation of the yearly general public announcement schedule.
- Reduce the time it takes to fill mission-critical positions by seven percent from the 2006 baseline.
- In external recruitment efforts, implement corporate strategies that result in attracting high quality candidates to FAA for employment. This will include undertaking activities to cultivate relationships and form partnerships with veterans' organizations, colleges, universities, professional organizations, and other organizations that assist the public in seeking employment opportunities; promoting and partnering with the Department of Veterans Affairs' Vocational Rehabilitation and Employment Service to place disabled veterans in a cooperative education and/or non-paid work experience at FAA.
- Enhance the Selections Within Faster Time (SWIFT) automated suite to expand its ability to accommodate additional alternative hiring methods, and more easily accommodate new job series.
- Manage and enhance the Federal Personnel and Payroll System (FPPS), Consolidated Automated System for Time and Labor Entry (CASTLE), web-based Learning Management System (eLMS) and other supporting subsystems within FAA in accordance with established timelines.
- Sustain and improve agency human capital planning and measurement processes by completing the annual update of the FAA Human Capital Plan; leading and/or participating in FAA and DOT-level workgroups to close workforce gaps in agency mission-critical occupations.
- Conduct the FAA Human Capital Planning Council and provide guidance and tools to sustain and improve the process; review business line and staff offices workforce plans to ensure alignment with FAA human capital needs and the President's Management Agenda (PMA) requirements.
- Manage the national time-to-fill mission-critical positions database; coordinate, analyze, interpret, and report on FAA results from government-wide surveys; continue developing, conducting, and documenting a quality review process of agency human resource management practices and policies.
- Support FAA efforts to prevent workplace injuries and enhance worker safety by ensuring integration of employee safety in FAA management training.
- Facilitate reduction in official time and sick leave usage to meet the government-wide sick leave average through continued oversight and management.

- Develop and implement initiatives to ensure a better understanding of the accountability board and application of corporate policies, in order to foster a professional workplace free of harassment and other types of misconduct that impact the ability to accomplish FAA's mission.
- Hold FAA leadership accountable for responding to allegations falling under the scope of the accountability board order to ensure that management addresses inappropriate workplace conduct fairly and in a timely and consistent manner.
- Provide policy guidance on FAA pay systems, FAA classification process, hiring and employment, leave, performance management and awards to human resource management officers and agency lines of business (LOBs) and staff offices (SOs).
- Provide day-to-day operational support and services to FAA managers. This includes compensation, staffing, labor and employee relations, benefits, awards, training and human resources automation.
- Implement HR operational services improvements, including shared services centers and HR delegations of authority.
- Provide timely and quality employee relations and benefits services.
- Promote and enhance the quality of FAA childcare provisions through program assessments of FAA centers, providing annual training to Program Directors and Boards of Directors; developing a national marketing campaign to increase employee utilization; standardizing, tracking, and reporting childcare information.
- Promote the Employee Assistance Program (EAP) and WorkLife services to FAA employees and their families by sponsoring quarterly promotional events, tracking participation, and assessing the need for ancillary services.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Human Resource Management requests $ 96,091,000 and 616 FTEs to meet its mission.

In FY 2009, the EAS will continue to be administered by AHR in a web-based environment to the maximum extent possible. The FAA has set a goal to increase EAS scores in the areas of management effectiveness and accountability by at least five percent by FY 2010. Based on EAS survey results, AHR will assess agency progress against the EAS performance target in the *Flight Plan*, examine the impact of EAS action plans, and comply with section 1128 of public law 108-136 requirement for an annual survey of employees. AHR will update and continue to implement FAA corporate/LOB/SO EAS action plans based on EAS 2007 results.

In FY 2009, AHR will implement recommendations to improve managerial selection and strengthen oversight and support of probationary managers. This will include methods to identify and close critical leadership skill gaps within the span of the probationary period.

In addition to ongoing activities to utilize opportunities to leverage use of non-technical training programs and to ensure alignment with agency goals, in FY 2009 AHR will promote use of the eLearning Management System (eLMS) to guide individual development and the design of corporate programs. AHR will also continue to identify and develop high-potential leaders; identify the implications of emerging strategic challenges for corporate management training development; and implement oversight processes.

AHR will continue to develop corporate employee training programs to build leadership competence within the FAA workforce, support professional development, and promote continuous learning. This includes revalidating FAA's Employee Success Profile to ensure alignment with FAA mission and strategic goals; integrating Employee Leadership Development (ELD) with mission critical occupational curriculums in eLMS; and promoting individual development planning through eLMS.

Following up on the initiation of agency-wide senior leadership development process, in FY 2009 AHR will evaluate the effectiveness of the process in meeting executive staffing requirements.

AHR will continue to provide Supervisor Skills Training (SST) to improve performance in areas highlighted by the EAS as well as leave management, management of OWCP claims, performance management, and related HR practices. SST modules will be conducted locally in the Regions/Centers, HQ, and nationally using the FAA's Aviation Training Network (ATN).

AHR will continue to provide oversight for ongoing workforce planning and annual human capital plan updates by providing workforce data, updated guidance/requirements, tools and consultation to LOBs and SOs. Updated workforce plans will be reviewed to determine the extent to which plans identify workforce gaps in target workforces and implement strategies/initiatives to close those gaps. The annual update to the FAA Human Capital Plan that is based on analysis of the workforce, mission demands, human capital challenges and initiatives needed to accomplish FAA Flight Plan goals will be completed.

In support of FAA's 10-year workforce plan for hiring air traffic controllers, AHR will participate on the Air Traffic Organization (ATO) workgroup to update the plan and work with other FAA organizations to implement further recommendations for improving the process for hiring air traffic controllers.

AHR will continue to develop opportunities and participate in activities that will increase FAA's visibility as an employer of choice to current and future job seekers. This initiative will be monitored through the use of an FAA separation questionnaire. On a quarterly basis, AHR will work collaboratively with other interested FAA offices in marketing aviation as a career by means of school visits and appearances at other events geared toward educating young people. AHR will also cultivate relationships and form partnerships with veterans' organizations, colleges, universities, professional organizations, and other organizations that assist the public in seeking employment opportunities. In addition, AHR will improve recruitment processes for operational efficiency and reduce the time it takes to fill mission critical positions by five percent over the current FY 2006 baseline.

In FY 2009, AHR will continue to expand and enhance the Selections Within Faster Times (SWIFT) automated suite to all mission-critical positions and those positions that cross organizational lines, i.e., finance, budget, human resources, and information technology. We will reduce duplicate staffing systems that ASAP, or other SWIFT systems, can replace. We will also seek to increase customer satisfaction of ASAP users by at least three percent.

FAA payroll services and the FAA personnel and payroll automated system operation migrated to the Department of Interior (DOI) in October 2005. During FY 2009, AHR will continue to manage the operation and maintenance within FAA of personnel and payroll automated processing by the Federal Personnel and Payroll System (FPPS). We will determine FPPS training requirements for FY 2010 and update the FPPS business portfolio in support of the corporate enterprise architecture approach.

In addition, AHR will oversee and manage the operation and maintenance within FAA of CASTLE, the time collection and labor reporting automated processing system, as well as manage and enhance the web based eLMS. Managing the operation and maintenance of eLMS includes reviewing and revising FY 2008 program plans and schedules; determining FY 2009 enhancements; meeting usage goals established by the Department of Transportation; and implementing FY 2009 system migrations and enhancements.

AHR will continue to monitor nationwide grievance processing time using the Grievance Electronic Tracking System (GETS). AHR's goal is to reduce grievance processing time by 20 percent in FY 2009.

Oversight and compliance of all bargaining with FAA unions is an ongoing endeavor for AHR. AHR will monitor and ensure compliance with all legal requirements in bargaining with FAA unions. Briefings and training on contract administration will be conducted.

Reducing official time and sick leave usage will continue to be two areas of cost containment focus. AHR will facilitate reduction in official time through increased oversight and management. During national term negotiations, AHR will continue to ensure that official time provisions provide an appropriate balance between the union's legitimate need and the agency's operations. To facilitate the reduction in sick leave usage to the government-wide average, AHR will continue to deliver leave administration training as well as provide quarterly sick leave reports to LOBs/SOs to monitor progress.

AHR will develop and implement Accountability Board training for executives, managers and employees in order to ensure compliance with their responsibilities. Various training methods will used to familiarize FAA executives, managers, and supervisors with the Board. Methods for collecting and displaying aggregate data on accountability board allegations will be refined and streamlined in order to provide an accurate reflection of management's accountability and efficacy of discipline as well as identify trends in the nature, scope and frequency of workplace misconduct.

In FY 2009, AHR will continue to provide policy guidance on FAA pay systems, FAA classification process, hiring and employment, leave, performance management, and awards, to human resource management officers and agency lines of business and staff offices. This will be accomplished by providing day to day operational support and services to FAA managers on compensation, staffing, labor and employee relations, occupational workers' compensation program, employee assistance program, benefits, awards, training and human resources automation.

In FY 2009, AHR will continue to support the FAA workforce through timely and quality employee relations services such as the EAP and the childcare program. Support will also be provided through the development and implementation of agency-wide processes to ensure uniform and effective handling of misconduct and poor performance cases in a timely and appropriate manner.

SAFETY & OPERATIONS APPROPRIATION

Region and Center Operations (ARC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**286,848**	**759**	**29**	**801**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	163			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	782			
4. January 2009 Pay Raise (GS Population)	475			
5. January 2009 OSI (Core Comp Population)	1,977			
6. January 2009 SCI	319			
7. One Less Compensable Day	-359			
8. Non-pay inflation	4,525			
Total Unavoidable Adjustments	**7,882**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	4,320			
Total Uncontrollable Adjustments	**4,320**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	700			
4. Consolidate AVS Offices in Florida	1,900			
5. Logistics Support Services Contract	1,800			
6. Real Property Asset Management	2,200			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	2,000	26		26
Total Discretionary Increases	**8,600**	**26**	**0**	**26**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	99	1		1
3. Information Technology	56	1		1
4. Capitalization	400	4		4
5. Aeronautical Center Facility Management	27,814	46		46
6. Aeronautical Center Leased Telecommunications	652			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	225	2		2
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**29,244**	**54**	**0**	**54**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	49,400			
2. Capital Personnel & Related Expenses	1,050	5		5
Total Capital Expenses	**50,450**	**5**	**0**	**5**
FY 2009 Request -- Total	**387,344**	**844**	**29**	**886**

Detailed Justification for Staff Offices – ARC

Region and Center Operations (ARC)	FY 2009 Request: $387,344

Overview:

The Assistant Administrator for Region and Center Operations (ARC) serves as the Administrator's representative on all corporate matters (both internal and external) within the nine regions and the Aeronautical Center. ARC determines and establishes regional organizational objectives and priorities and guides the development of and approves long-range plans; seeks opportunities to implement innovative ways to streamline administrative and operational processes to bring about efficiencies and to enhance productivity; and provides leadership for cross-organizational administrative and operational issues and projects such as the agency's Operational Evolution Partnership (OEP). The Regional Administrators and Center Director serve as the senior agency aviation official in the regions/center, providing cross-functional oversight and integration for the agency, relations with industry, the public, and various governmental organizations, as well as leadership for lines of business support programs.

FY 2008 Program:

ARC plays a pivotal role in supporting the FAA mission by providing cross-organizational leadership at all levels of the organization to ensure operational programs supported by multiple lines of business are efficiently and effectively delivered. ARC has an equally vital role as a provider of high quality, corporately shared services including financial systems and operations; emergency readiness through command, control, and communications; enterprise-wide information services and business application development; technical and management training; and logistics services such as acquisition, real estate, materiel management, and National Airspace System supply and support. Each of these products and services is part of the vital support infrastructure needed to maintain strong, safe, and efficient national and international aviation systems.

In FY 2008, management of FAA's Washington Flight Program (Hangar 6) transferred to ARC from the ATO. This program operates three jet aircraft (an FAA-owned Gulfstream G-IV and two leased Cessnas) housed at Ronald Reagan Washington National Airport's Hangar 6. Twenty FAA employees, including eight pilots, six maintenance technicians, and six support personnel, staff the facility. The aircraft are used for National Transportation Safety Board (NTSB) accident investigations, authorized training/currency flights for FAA headquarters personnel, transporting high-level DOT officials, and some Research and Development (R&D) projects. In addition, Hangar 6 supports eighteen different federal agencies through Memoranda of Agreement. This transfer better aligns the Hangar 6 function with ARC's corporate responsibilities, allowing ATO to focus on its core mission of providing air traffic control services.

FY 2008 Accomplishments

- Through corporate leadership and collaboration, ARC provides aggressive and real-time advocacy and integration activities related to identified issues and solutions serve to reduce the number of accidents in Alaska for general aviation and Part 135 operations.
- Under ARC leadership, the Airport Obstruction Standards Committee (AOSC) performs risk analysis in support of end-around taxiway approach procedures.
- Deliver managerial, executive and technical training and related support services for the agency and other aviation organizations.
- Achieve a year-to-date average of no more than 12 defects per 1,000 through FY 2008 on exchange and repair of in-house assets.
- Serve as the Agency focal point for the Chicago O'Hare International Airport Modernization Program.
- Provide national leadership for the Air Tour Management Plan (ATMP) program and support environmental streamlining efforts and noise issues.
- Provide aviation safety services to the Federated States of Micronesia, the Republic of the Marshall Islands and the Republic of Palau.

- Enhance the safety, security, and capacity of aviation elements in the Russian Far East.
- Establish corporate managerial training programs that ensured resources were effectively used, aligned with agency goals and drove continuous improvement.
- Operate Regional/Center Operations Centers (ROCs) that provide around-the-clock, immediate command, control and communications for all incidents related to the continuity of the NAS.
- Provide information technology services to ARC employees, other parts of the FAA, DOT, and other federal agencies.
- Conduct financial operations and system support for the FAA, the DOT and other federal government agencies through the Enterprise Service Center.
- Enhance procurement, acquisition, and material management support by improving purchase card management and wireless device acquisition.
- Identify excess real property assets that are candidates for disposal, termination, replacement, renovation or transfer.
- Improve the timeliness and accuracy of financial transactions related to asset capitalization, the management of suspense accounts and account reconciliation.
- Conduct the introductory resident training for all ATC new hires and follow-on courses at the FAA Academy consistent with the ATC Workforce Plan's increasing student numbers.
- Redesign selected managerial and executive training to build leadership competencies.
- Conduct instructor development training to prepare instructors to deliver Aviation English training and assessments to ICAO standards.
- Oversee and manage infrastructure operation and maintenance programs in Washington, D.C., regional office facilities, and the Mike Monroney Aeronautical Center.
- Continue International Standards Organization (ISO) implementation with a goal of achieving ARC certifications by 2011.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Regions and Center Operations requests $387,344,000 and 886 FTE to meet its mission, an increase of $100,496,000 from the FY 2008 enacted level.

ARC provides critical leadership and integration in implementing the agency's Capacity enhancing activities such as the Operational Evolution Partnership (OEP), the O'Hare Modernization Program (OMP) the Air Tour Management Program (ATMP) and the activities of the Airport Obstruction Standards Committee (AOSC). ARC will continue to chair the multidiscipline Airport Obstruction Standards Committee (AOSC) which serves as the vehicle to transform outdated, inconsistent obstruction standards practices to future policy that optimally balances operational safety, effectiveness, and economic benefit. This committee develops coordinated standards and action plans for operational improvements such as runway-taxiway separation and end-around taxiways, and also works to enhance databases and data collection tools and models to improve airport flight operations. Successful capacity implementation projects require a strong commitment to integration, collaboration, accountability and a strategic vision from all stakeholders. ARC has a proven track record of successfully delivering complex and critical projects at both OEP airports and airports within major metropolitan areas. Under ARC's cross-agency management of the Runway Template Action Plan (RTAP) process, through the end of FY 2006 the FAA met OEP commissioning commitments on 11 new runways resulting in a system capacity increase of over 1.6 million annual operations. Regional Administrators have established regional Horizontal Integration Teams and cultivated relationships with key stakeholders at OEP airports and other metropolitan areas. ARC has repeatedly facilitated and resolved numerous critical issues that cut across multiple FAA organizations. The results have been increased levels of accountability, resource leveraging, communication and cooperation. ARC's lead role on new runway projects will focus limited agency resources on meeting key milestones needed to deliver full operational capability on these critical capacity improvement efforts. ARC has a proven track record with the advance planning, ongoing accountability and performance reviews required to meet new OEP runway capability commitments established in partnership with stakeholders. Use of the RTAP process continues to be a success, thus far yielding ten OEP runways delivered since 2001 with full operational capability on schedule.

With accident rates and fatalities at an historic low, FAA continues to strive for even greater levels of safety performance. To this end, ARC will provide regional leadership and integration for cross-organizational safety initiatives such as the Weather Cameras program. In addition, ARC is responsible for delivering technical training to FAA employees through resident courses, field-delivered training, and distance learning methods. ARC has contributed significantly to reducing accident rates in Alaska through leadership in the Capstone program, enabling the use of Alaska as a test bed for innovative safety solutions. ARC works closely with the National Association of State Aviation Officials (NASAO), the Aircraft Owners and Pilots Association (AOPA), and other aviation interest groups to provide a continuous outreach program and to further Agency safety objectives and missions.

As designated by the DOT secretary, FAA supports the National Response Plan, ESF-1, Transportation, when activated by FEMA in six of the ten FEMA regions. In response to hurricanes Katrina, Rita, and Wilma in 2005, FAA deployed over 200 employees to various FEMA disaster field offices, staging areas, and distribution centers. This FEMA support responsibility is in addition to FAA's mission to restore the National Airspace System after a disaster.

ARC has significant involvement in international aviation, particularly in the areas of training and technical assistance. The FAA Academy is recognized and respected worldwide as the premier aviation training institution, having served international students in Oklahoma City and abroad since 1946. The FAA Academy will continue to deliver managerial and executive training as well as technical training and related support services for the agency and other aviation organizations, both domestic and international. The unique conditions of the Alaskan Region and its geographic neighbors has resulted in additional international leadership opportunities for the FAA, specifically in accomplishing international outreach on new technology; influencing the setting of international standards; developing transportation and communications infrastructure in the arctic circumpolar region; and providing training and technical assistance to the Russian Far East area. ARC leadership ensures that the agency meets its commitment to provide aviation safety services to the Federated States of Micronesia and the Republic of the Marshall Islands as covered by the Compact of Free Association Act of 1985. Under a separate compact, ARC will provide support between the United States and the Republic of Palau to provide similar aviation safety services. ARC will also support the development of transportation and communications infrastructure in the Arctic Circumpolar region.

Our performance targets for supporting Flight Plan Strategic Initiatives and for assessing the success of our Core Business Functions are aimed at improving our value to those we currently serve through streamlining our business processes, organizing our functions to improve performance, and expanding our services. ARC's Organizational Excellence initiatives reflect our commitment to the President's Management Agenda (PMA) theme of creating a more results-oriented and efficient government. ARC's internal process improvements and activities will enable the agency to realize significant cost savings and accomplish its goal of controlling costs while delivering quality customer service.

ARC has assumed the lead on behalf of the Department of Transportation in implementing the Federal Real Property Asset Management initiative under the President's Management Agenda. The initiative established an FAA Asset Management Office, designating a Senior Real Property Officer, managing department real property investments and existing assets, disposing of real properties, and operating and maintaining a Real Property Management System for the Department. Additional funding is being requested to administer the processing, recording and management of fixed assets in support of agency capitalization efforts -- vital for achieving and keeping an unqualified audit opinion. Improved business management and cost efficiencies will be achieved by at the Aeronautical Center by replacing the primary automation system that supports FAALC service operations, the Logistics and Inventory System (LIS). Expanding and improving system capabilities and performance will reduce operating costs by right-sizing the agency's spares inventory, better managing depot throughput and increasing the visibility into vendor and parts performance.

FY 2009 Capital Programs:

1. Logistics Support Systems and Facilities (LSSF) – $9,300,000

The FAA Logistics Center (FAALC) manages the central NAS inventory warehouse and distribution facility for the FAA. It provides logistics products and services to 5,000 FAA customers at 41,000 facilities and 28,000 sites, as well as to the Department of Defense (Air Force, Navy, Army), state agencies and foreign countries by providing 80,000 parts and services through its facilities.

FAALC services include repair, fabrication, and overhaul of radar, navigation, landing, weather, communication, and automation equipment for the NAS. Services include diagnostic testing, engineering, fabrication, modification, overhaul, repair, and calibration of NAS system equipment and components, also providing emergency on-site repairs to the ARSR and TDWR, and other NAS systems with antennae arrays. The Logistics Center provides inventory management of stock levels, contract management, customer assistance, and special project support for NAS installation and repair. They are an ISO certified distribution, warehousing, and repair facility.

The primary automation system supporting FAALC services is the Logistics and Inventory System (LIS). The Logistics Center Support System (LCSS) will replace the legacy LIS, a 17-year-old customized mainframe system with obsolete system design, technically difficult and expensive to maintain. It is unable to incorporate technology and business changes to meet the accelerating growth in requirements of the National Airspace. Agency logistics decisions are being based on incomplete and dated information. The current means of tracking cost and performance are inadequate to achieve and sustain sound business decisions.

Specifically, LCSS will address:

- Spares planning—The FAALC buys spares to support the NAS based on demand, rather than on knowledge of repair history or part failure, thereby increasing FAA operating costs.
- Limited shop floor automation – Minimum visibility of assets while in the repair cycle, comprising 30,000 assets annually, valued at $241 million or 50 percent of all repairs to the NAS.
- Quality—Limited monitoring of part quality. Limited vendor performance monitoring and metrics to identify poorly performing parts and suppliers. Serial number tracking is not possible. Incomplete data makes it impossible to analyze part failures and adjust inventories.
- Parts obsolescence –Legacy system does not provide information to support continued repair, condemnation, or re-engineering of parts. Some parts are not procurable and have to be re-fabricated, an agency cost. Without a picture of the agency's repairable asset population, purchases for economies of scale cannot be realized.

LCSS will improve logistics support to the NAS.

The Logistics Center Support System (LCSS) will replace LIS and improve FAA efficiencies, enhancing service to reduce inventory costs and increase productivity.

For FY 2009, $9,300,000 is requested for system integration of COTS software and builds interfaces to other FAA systems and external FAA systems.

LCSS will be a web-based system that uses state-of-the-art tools to extend and leverage the existing agency investment in LIS. The new tools will be based on object-driven architecture and will allow interfaces to be integrated in an open systems architecture. LCSS will incorporate the use of COTS applications and enhancements to improve asset visibility, provide serial number tracking, warranty information, shop floor control and spares modeling. These functions will provide a more complete picture of the financial position of logistics within the agency.

Through LCSS, FAA will save an estimated $231.3 million, with a cost-benefit ratio of 1:3. The benefits result from initial and inventory replenishment spares reductions, reduction in parts testing required, reductions in shipping/handing, space and utilities, and labor/production efficiencies.

2. Aeronautical Center Infrastructure Modernization – $13,500,000

The Aeronautical Center Infrastructure Modernization program funds renovation of major building system replacements not provided for by any other funding sources or lease agreements at the Mike Monroney Aeronautical Center (MMAC) in Oklahoma City. Funds are used for renovations that sustain and ensure facilities remain viable for present and future FAA employees, students, and contractors that support Air Operations, Engineering, Training (Radar/Navaids), National Airspace System (NAS) Logistics, and Business Services.

Fifty year old facilities and infrastructure at MMAC are in need of structural upgrade and/or renovation. Many NAS support functions are conducted in outdated structures, and in some cases, in buildings that do not meet current building codes. Deferring renovation and modernization of aging facilities has serious and costly consequences: Leaking roofs, deteriorating plumbing, malfunctioning heating/ventilation/air conditioning systems and non-compliance with life safety codes, can disrupt work, cause NAS automation and technology failures, risk occupants' health and safety, cause loss of productivity and emergency repairs.

The addition of new equipment to FAA's inventory, coupled with existing NAS support requirements, increases the need to maintain suitable space at the Aeronautical Center that house critical mission support personnel. Renovation permits space efficiencies for additional functionality, personnel, and systems. There is a corresponding need for related Center infrastructure, such as storm sewers, water lines, and telecommunications.

The Aeronautical Center Infrastructure Modernization program requests an increase in funding in FY09 to address life safety issues in the Systems Training Building (STB), a facility that supports training for multiple NAS systems where personnel injuries have been reported; and for Hangar 9 fire detection and suppression systems that house FAA aircraft and equipment. The loss of flight inspection aircraft in a fire would significantly impact NAS operations. Given their unique set of instrumentation, replacing these aircraft would be extremely difficult.

There are four primary segments to this program in FY 2009:

- Systems Training Building (STB) renovation design and initial construction: The STB was constructed in 1969 and has not had significant renovation. The STB supports NAS training. The basement houses NAS system training servers. The basement contains raised access flooring that is failing due to deterioration and fatigue. Personnel injuries are being reported. Renovation will repair/replace the basement floor and interior walls, install fire suppression systems for fire egress and separation in open stairwells, new boilers/chillers, upgrade electrical wiring, plumbing, insulation and new windows.
- Fire detection and suppression systems in Hangar 9: Needed to provide protection against loss of damage from fire. Hangars 8 & 9 house approximately $660M in FAA aircraft and equipment. Funding will provide for design/installation (labor and materials) for automatic fire detection and over and under aircraft wing fire monitors. For every dollar spent in installing fire suppression systems, the FAA will avoid significant potential losses.
- Phased storm sewer replacement construction: The current Aeronautical Center Storm Sewer system was constructed in the 1950s and is inadequate for the existing Center size and rainwater run off. An expanded system is needed to connect the existing system with buildings, parking lots, and structures built after the legacy infrastructure was installed and to correct flooding problems in the tunnels and in buildings constructed after 1958.
- The MMAC telecommunications backbone data network upgrades: To improve network security, increase redundancy, reliability, and availability of the system. Upgrades enable MMAC to add ATO data center services and combine regional Accounting Operations to optimize FAA costs. Sustained funding for upgrades reduce the likelihood of deferred compounding of maintenance expenses. The upgrades prevent significant delay or inability to access automated systems used by mission critical flight inspection crews, aviation safety inspectors, Air Traffic and ATO-W students, aero-medical examiners, and others. Electronic communications, information sharing, and web-based systems are used by engineering, air operations: airmen/aircraft records processing, aircraft fleet management, flight procedures development, NAS logistics and NAS operations technical support, FAA and DOT business services that include acquisition, financial operations, accounting, and physical/personnel security.

Funding would be applied in FY 2009 as follows:

- $6,200,000 is requested for Systems Training Building renovation. Funding will provide for Type A design, construction documents for the basement floor, relocation of NAS systems, and to begin replacement of the basement floor and interior partition walls; ceiling, lighting and electrical systems.
- $4,000,000 is requested for Hangar 9 fire detection and suppression systems: Needed to provide protection against loss or damage to aircraft, tools, equipment, and hangars from fire. Hangars 8 & 9 house approximately $660M in uniquely instrumented FAA aircraft and equipment. Funding will provide for design/installation (labor and materials) for automatic fire detection and suppression.

- $2,000,000 is requested to replace approximately 25 percent of the storm sewer system at MMAC. Funding provides for replacement of storm drain inlets (grates in curbs) and replacement pipes for greater water capacity.
- $1,300,000 is requested to upgrade the telecommunications infrastructure. Funding will support implementation of the Cisco network for Center redundancy, reliability, security and availability. Router backplanes will be replaced to support increased bandwidth requirements by FAA data centers and personnel requirements. Funding will provide for hardware/software upgrades to support newer model telephone and replace old hardware with current and single mode fiber for increased redundancy of core routers on the network.

This program sustains the Aeronautical Center as '…US critical infrastructure' identified in Presidential Decision Directive (PDD) 63, also allowing compliance with Executive Order 13327 for the efficient/economical use of Federal resources to maintain Government facilities. Aeronautical Center facilities are cost effective, and lower in cost than comparable GSA metropolitan Oklahoma City leased facilities, FAA Headquarters, and other FAA facility locations. Renovation of Center facilities extends the useful life of renovated buildings by 25 years, ensuring a viable future for FAA at these facilities. In FY 2009, renovation improves facility space and energy utilization, reduces maintenance costs of major systems within renovated buildings, provides for incremental upgrades of telecommunications infrastructure, and improves productivity of personnel using renovated facilities through space efficiencies and improved environmental controls.

3. NAS Training Equipment Modernization – $1,400,000

The FAA is a high technology agency, reliant on a well-trained workforce, and its emphasis on the traveling public's safety is paramount. For these reasons, its training equipment must meet up-to-date standards and be capable of effectively reducing OJT exposure with live air traffic and people. This program purchases and upgrades training delivery equipment for the FAA Academy. As the NAS evolves, so must its training delivery system. These enhancements are essential to properly conduct NAS systems training. Prior to this program, the Academy was unable to fully capture the efficiencies and effectiveness of modern training technologies (simulation, audio-visual, and training platform equipment). The absence of these upgrades increased required instructor and student training time, raising agency cost for student training. Although initial implementation of this program at the Academy will be complete by the end of FY 2008, the program's systems must continue to be refreshed to avoid losing all the gains this program has provided.

The Controller Workforce Plan submitted to Congress in March 2007 indicated that approximately 72 percent of the controller workforce will be eligible to retire within the next 10 years. This potential increase in required hiring of new controllers opens many opportunities for transfers to higher traffic volume towers as well as centers. This poses an on-site training gap for these sites in terms of not having simulation available.

For FY 2009, $1,400,000 is requested for required technical refresh of the core NAS training program for the Academy. Through the refreshing of current technology simulators and equipment, FAA will continue to enhance the effectiveness of technical training for personnel. By technically refreshing equipment to continue to enhance simulation and course presentation, the Academy will continue the reduction in course time, thus reducing training and travel costs.

Air traffic control students will be trained in a safer, simulated, interactive environment, rather than in a live traffic situation, reducing risk to the flying public. This approach ensures training objectives are more fully met before the student transitions to live traffic in the control tower or en route center. This project will result in the following benefits:

- Operational safety will improve, as OJT in live traffic situations is decreased. Necessity for such lengthy OJT will decrease as a result of students experiencing improved simulation prior to leaving the Academy for the field.
- Improvements in controller training will be well timed, keeping pace with the projected retiree attrition rate.
- Instructional efficiency gains will decrease instructor and student training time and costs.

4. Distance Learning – $1,500,000

Distance learning provides FAA with state-of-the-art quality course delivery to geographically dispersed students with a reduced dependency on travel to centralized facilities. Within this overall effort, this project focuses primarily on computer-based instruction (CBI) including web delivery as critical distance learning solutions. The emphasis for FY 2009 is replacing unsupportable platforms to continue this system's high reliability for all of FAA, facilitating courseware compatibility, and maximizing training and operational efficiency. Resident-based training is costly in per diem and travel expenses. The FAA requires cost-effective distance learning alternatives to reduce the current resident-based training load, to accommodate increases in training due to the introduction of new national airspace systems, continue personnel transition/refresher training, support succession training, and provide performance support.

Distance learning will use the existing CBI system including web delivery, coupled with the Aviation Training Network (ATN) satellite network, to provide a cost-effective distance learning delivery system and give the FAA a balanced and blended approach to delivering training to FAA employees. The requested funding will replace obsolete/unsupportable CBI platforms.

The major benefit of distance learning is the substantial reduction in student travel and per diem costs associated with resident-based training. In addition, distance learning delivery methods increase training effectiveness as well as increase training opportunities for all FAA employees, provide flexibility in training schedules through local management control, and decrease the time employees spend away from their work site. The FAA CBI system is required to deliver initial operator, transition and maintenance training for many NAS Programs. Millions of dollars are saved by using this standard system instead of purchasing custom simulators for each program. The FAA CBI system is used to deliver nearly 50 percent of technical training resulting in a savings of over $10,000,000 per year.

5. Logistics Support Services – $7,900,000

The FAA has a serious shortage of government logistics personnel at regions and centers to manage real estate, acquisitions, and materiel for NAS modernization and capitalize agency assets as required by the agency's Flight Plan. Without adequate logistics services, real estate will not be acquired, contracts to buy or upgrade equipment and construct facilities will not be awarded, and modernized equipment and systems will not be efficiently installed and commissioned. Additionally, FAA will not be able to adequately document the capital cost of FAA facilities, or comply with mandatory accounting standards set by the Government Accountability Office (GAO) that could put the achievement of a clean audit opinion at risk.

Through the LSS program, the agency utilizes contractor-supplied services to perform real property acquisition, materiel management, and contracting activities in support of FAA Capital Investment Plan (CIP) projects, and to conduct capitalization and property control-related activities. These services currently provide a significant portion of the workforce for acquisition, real estate, and materiel management at regions and centers. The LSS program is instrumental in establishing new or upgraded facilities, including air traffic control towers and TRACONs, throughout NAS. The logistics personnel services will support the FAA Facility Security Risk Management (FSRM) program. The LSS resources will continue to be used for asset tracking and documentation efforts to obtain and maintain a clean audit opinion.

The LSS program supports the FAA's performance goals of safety and system efficiency by fielding modernized equipment, systems, and facilities within the timeframes established by the programs included in the CIP. The logistics services are used to achieve a clean audit report in compliance with GAO standards. The performance goal of safety is addressed in FAA contracts in support of the FSRM program, which is designed to improve physical protection of employees and facilities in critical infrastructure as required by Presidential Decision Directive 63, "Protecting America's Critical Infrastructure."

6. Mike Monroney Aeronautical Center Leases – $15,800,000

The requested funding supports contractual obligations with the Oklahoma City Airport Trust (OCAT) for the land, buildings, maintenance and insurance of the leased facilities that comprise the Aeronautical Center. The lease provides for all the land and 80 percent of the facility space at the Center, and includes maintenance of the structure and building exteriors, as well as replacement of major building systems within leased buildings. The FAA leases approximately 2.8 million square feet of facilities, 1100 acres of land. The average age of leased facilities at the Center is 42 years. Funding in the amount of $15,800,000 provides for land and building rent, maintenance and insurance on leased facilities at the Aeronautical Center in FY 2009.

Delaying repair and upgrades leads to the risk of structural and environmental system failures in facilities that house air operations, engineering, training (Radar/Navaids), NAS logistics inventory and repair, business services, and aviation research.

The leases are a contractual obligation through FY 2012, with automatic renewal without increase in base rent, through 2028. Funding for this program also sustains the Aeronautical Center as '…US critical infrastructure' identified in Presidential Decision Directive (PDD) 63, also allowing compliance with Executive Order 13327 for the efficient/economical use of federal resources to maintain government facilities, and Executive Orders to strengthen federal environmental, energy, and transportation management through goals in energy efficiency and renewable energy, toxic reductions, sustainable buildings, and water conservation. The Aeronautical Center lease reduces FAA annual operating costs by providing facilities that are cost effective and lower in cost than Oklahoma City GSA lease prices and national averages, FAA Headquarters, and other FAA facility locations.

Capital Personnel & Related Expenses:

For FY 2009, $1,050,000 is requested to fund five FTE's for personnel and related expenses at the Aeronautical Center.

SAFETY & OPERATIONS APPROPRIATION

Information Services (AIO)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**38,650**	**95**	**6**	**95**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	0			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	305			
4. January 2009 Pay Raise (GS Population)	0			
5. January 2009 OSI (Core Comp Population)	772			
6. January 2009 SCI	125			
7. One Less Compensable Day	-59			
8. Non-pay inflation	946			
Total Unavoidable Adjustments	**2,088**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	7,600			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**7,600**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	12,000			
2. Capital Personnel & Related Expenses	1,120	6		6
Total Capital Expenses	**13,120**	**6**	**0**	**6**
FY 2009 Request -- Total	**61,458**	**101**	**6**	**101**

Detailed Justification for Staff Offices – AIO

Information Services (AIO)	FY 2009 Request: $61,458

Overview:

The mission of the Office of Information Services/Chief Information Officer (AIO) is to improve managing the agency's more than $2 billion dollar investment in Information Technology (IT). AIO is also responsible for protecting FAA's critical information systems, networks, and administrative systems from cyber terrorism and malicious activities.

FY 2008 Program:

The FAA is responsible for providing a safe and efficient national aviation system. Within FAA, AIO has the primary responsibility to develop agency IT policy and strategy, to protect agency IT assets from cyber-attacks, to ensure alignment between IT investment and agency business needs, and to improve agency IT processes. The FAA spends more than $2.0 billion yearly on IT, the largest cost item after salaries and benefits.

Developed in concert with the agency's CIO Council and Information Systems Security Managers (ISSMs), AIO's FY 2008 Business Plan supports the FAA Flight Plan. Meeting the Business Plan targets and Flight Plan goals takes a collaborative effort from the lines of businesses and staff offices.

FY 2008 capital funding supports developing information systems security architecture as an integrated part of FAA enterprise architecture. It funds corrections of NAS vulnerabilities discovered during prior year Security Certification and Authorization Packages (SCAP) as well as the Government Accountability Office (GAO) and Inspector General (IG) findings targeting access control vulnerabilities for the NAS and networks. Funding will allow the agency to develop pilot programs for presidential security directives, improve testing of air traffic control and NAS support systems for ISS vulnerabilities, and expand exploration of cyber attack scenarios and develop an FAA ISS early warning capability.

IT also funds four critical programs to improve response to and prevention of security incidents: Adaptive Quarantine, Software Reliability Engineering (SRE) and Software Fault Tolerance, Certification of High Integrity Systems, and Improved Security Metrics.

Anticipated FY 2008 Accomplishments:

- Achieve zero cyber security events that significantly disable or degrade FAA service.
- Complete certification and accreditation of FAA IT systems.
- Ensure that all operational and deployed systems on the IT systems inventory have completed current certification and authorization.
- Recertify 33 percent of the IT systems inventory by September 30, 2008.
- Remediate 20 percent of high vulnerabilities as identified in the DOT portal with a completion date of FY 2008.
- Develop FAA policy to direct full compliance with the e-authentication and logical access control (LAC) requirements of the Federal Information Processing Standards Publication (FIPS) 201. Develop an FAA LAC implementation plan and incorporate LAC into the information systems security architecture.
- Develop FAA policy to direct full compliance with FIPS 201, Personal Identification Verification-1 (PIV-1), and PIV-2. Develop an FAA LAC implementation plan that ensures authentication mechanisms are in operation to achieve required degree of confidence in the identity of the PIV cardholder. Incorporate LAC into the information systems security architecture.
- Provide specialized training for 100 percent of FAA key information systems security personnel.

- Provide awareness training for all FAA employees and direct support contractors.
- Achieve evaluation levels in the DOT and Federal Information Security Information Act (FISMA) annual report that allow us to remain "green" on the President's Management Agenda e-Government (e-Gov) scorecard.
- Improve a Security Information Management (SIM) solution that will provide the Cyber Security Management Center (CSMC) greater situational awareness through real time processing of information systems security alerts.
- Append an existing memorandum of cooperation with a major international air traffic management authority to share cyber-security technical and operational data, techniques, tactics, and procedures, and to work cooperatively towards better business practices.
- Reduce the time it takes to fill mission critical positions by 20 percent over the FY 2003 baseline.
- Increase Employee Attitude Survey scores in the areas of management effectiveness and accountability by at least five percent.
- Directly relate 100 percent of all employee performance plans to FAA strategic goals and their organization's performance plans.
- Continuously improve processes that are critical to performing FAA mission, business functions, and acquisition programs.
- Continue controlling IT costs and identifying savings for potential reinvestment.
- Continue creating agency-wide metrics tracking contribution to business value and IT unit costs.
- Maintain "green" on e-Gov initiatives in the President's Management Agenda scorecard.
- Carry out the agency FY 2006-2008 IT strategy that was completed in FY 2005.
- Implement the agency FAA Process Improvement Plan.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Information Services and Chief Information Officer (AIO) requests $61,458,000 and 101 FTEs to meet its mission. The request includes $13,120,000 in capital funds and six FTEs. This request supports the following activities:

Management of the Agency's More Than Two Billion Dollar IT Investment. The IG, GAO, OMB and Congress have strongly suggested FAA improve the management of its more than $2 billion investment in IT. The efforts below address this important issue.

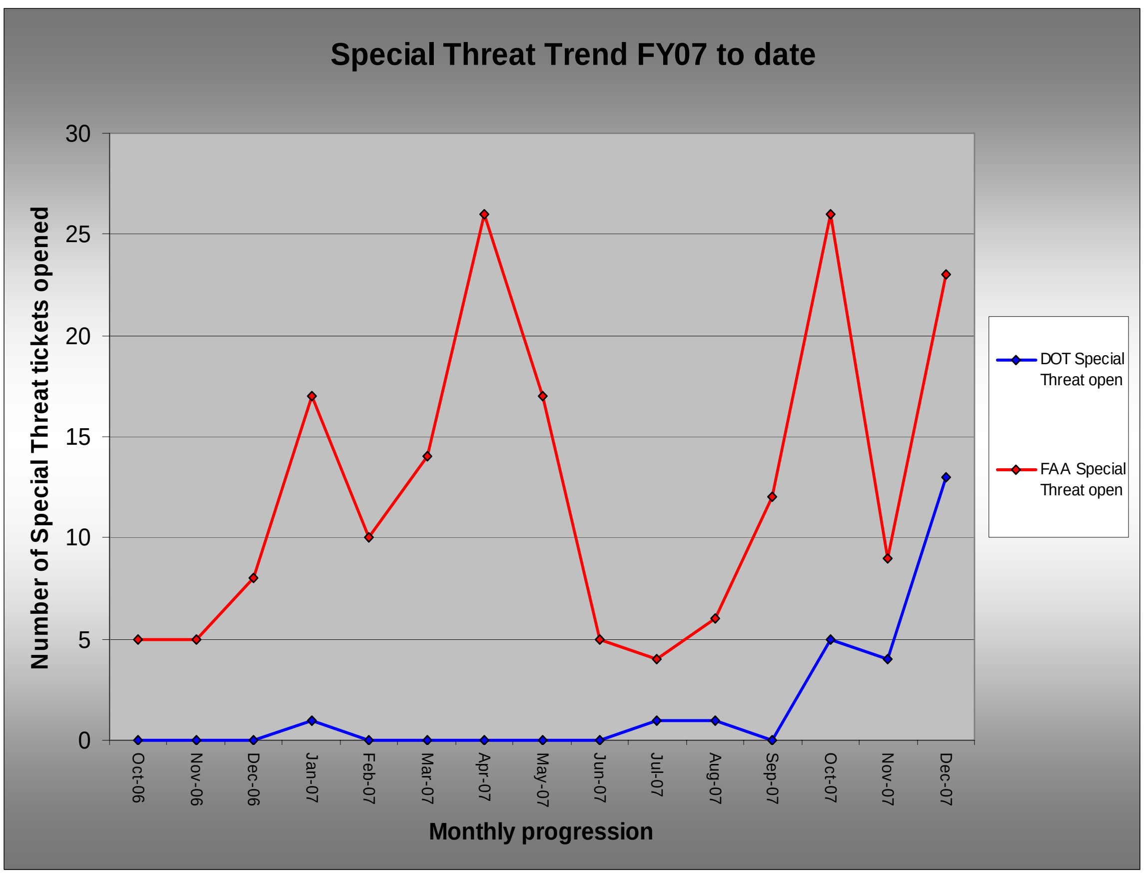
- Continue efforts to bring IT cost under control and identify savings for potential reinvestment.
- Continue creating agency-wide metrics tracking contribution to business value and IT unit costs.
- Maintain "green" on e-Gov initiatives in the President's Management Agenda scorecard.
- Carry out the agency's FY 2007-2011 IT strategy that was completed in FY 2007.
- Enhance and maintain the non-NAS Enterprise Architecture (EA) to support IT investment decisions through the Capital Planning and Investment Control (CPIC) process.
- Implement FAA data management program and continue to build the framework to manage FAA's data to improve the efficiency, effectiveness and security of the agency's data resources.
- Develop and publish data standards in accordance with the non-NAS data standards approval process established in FY 2005.
- Consolidate logical access to secure data repositories, working toward data standardization, and implementing an agency-wide adaptation data management program, which will reduce the total life cycle cost of software adaptation for legacy NAS systems.
- Promote Information Assurance, Chief Information Officer and/or e-Gov certification for FAA personnel via the Information Resources Management College (IRMC).

Information Systems Security (ISS) Program. In the Homeland Security Presidential Directive/HSPD 7, dated December 17, 2003, FAA was directed to protect and ensure the confidentiality, integrity and availability of all National Airspace Information Systems as well as federal information. Under the Federal Information Security Management Act (FISMA) of 2002, FAA must ensure that all information systems identify and provide information security protection equal to the risk and magnitude of the harm resulting from unauthorized access, use, disclosure, disruption, modification, or destruction of information that support the agency, aviation safety and security, and the NAS.

In FY 2005 GAO conducted an audit of cyber security controls in the NAS. Significant shortfalls were highlighted in the areas of remediation, certification and accreditation. The FAA will complete the recommendations in that audit. The FISMA requires the IG to perform annual assessments on the agency's ISS program. The FAA continuously works on these annual recommendations. Each year Congress provides a letter grade assessment of the cyber security program. While DOT/FAA has improved its grade in recent years (FY 2007 C minus to B), there is much more to do.

This program directly supports the FY 2008-2012 FAA Flight Plan, Organizational Excellence Goal, Objective 3, and Performance Target: Achieve zero cyber security events that disable or significantly degrade FAA service. Without sufficient funding in this area, FAA is in danger of not meeting its goal of zero cyber security events that disable or significantly degrade FAA services. The sharp increase in "Special Threat" events and the number of alerts is proof that FAA is becoming more of a target.

Special Threat events are targeted attacks on federal government systems which pose a serious and imminent threat to those systems. These are events specific in nature, objective and patterned, and by design are hostile in intent. To date FAA has had 81 such attacks. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the target (in this case FAA or other agencies) is capable. The development of the term "Special Threat" was initiated as an indirect route to allow the communication of these events and the identification and mitigation of systems that have been compromised or affected by these sophisticated attacks. The chart below identifies open monthly Special Threat events that were reviewed for May 2006 through April 2007.



AIO's work continues with a strategy which is a comprehensive, proactive approach to preventing and isolating intrusions in the agency's computer networks. This cyber defense strategy involves hardening of the individual system and network elements, isolating those elements and backing up those elements to avoid services disruptions. The following efforts support system security:

Maintain and Improve the Cyber Security Management Center (CSMC). CSMC monitors NAS and administrative systems to detect intrusions. In FY 2009, CSMC will continue to increase its monitoring of local area networks and desktops. In the event of an intrusion, CSMC works with the impacted organization to assess damage and restore the system. Funding is needed to add licenses, refresh software, update equipment, and provide subject matter experts to the center to keep pace with cyber terrorists and hackers who are employing increasingly sophisticated means to compromise government information systems. In addition, the Department of Transportation (DOT) will join with FAA to protect the cyber assets of the Department. DOT and FAA have agreed to merge operations and management of the DOT Transportation Cyber Incident Response Center and FAA Computer Security Incident Response Center into the Cyber Security Management Center to protect information technology assets. This will require funding for contract support, hardware and software. A disaster recovery site for the CSMC operation has been established which requires funding for leases, utilities, hardware and software.

A new requirement which supports FAA Telecommunications Infrastructure (FTI) is the monitoring and analysis of Harris sensors (72). This new task includes incident handling responsibility, remediation coordination, second-level analysis, signature creation, sensor tuning and ArcSight configuration. Also, CSMC will monitor the following new sensor systems for ERAM, Common ARTS, and NAIMES and an additional 620 sensors for wireless. Also, sensor monitoring for ATO, ARC, ARP and all en route centers has increased by 600 percent. There is an increase in Special Threat activity affecting administration and operations networks, and ATO date exfiltration.

Correct Vulnerabilities Discovered During the Certification and Authorization Process. The FAA plans to examine security vulnerabilities discovered during prior year certification and authorization activity, prioritize the vulnerabilities, and remediate as much vulnerability as possible. The FAA plans to correct the targeted vulnerabilities as identified in the DOT portal. The inability to complete these remediation actions will severely jeopardize the flight plan goal of zero cyber events. Several of these systems, *High* and *Moderate* vulnerabilities are in mission critical NAS systems, critical AVS safety and medical applications, and essential business and security systems. In addition, every major investment has several *High* and *Moderate* vulnerabilities scheduled for remediation in FY 2009. All overdue *High* and *Moderate* remediation actions are identified and tracked by DOT Chief Information Officer (CIO).

Recertify IT Systems Inventory. FAA policy stipulates that all information systems must be recertified every three years. The FAA has 288 legacy information systems that need to be certified and authorized as secure. The certification and authorization (C&A) process addresses all threats and documents the actions needed to address any vulnerability. In FY 2009, 90 systems require recertification. The FAA will put compliance verification teams into place to conduct and implement the C&A process according to National Institute of Standards and Technology standards. The FAA will conduct compliance verification at the regional headquarters as well as NAS facilities. Each year, Congress provides each agency a letter grade assessment of their cyber security program. While DOT/FAA has improved its grade in recent years (FY 2007 C minus to a B), there is much more to do.

The inability to complete re-certifications would severely jeopardize the flight plan goal of zero cyber events. Thirty of those re-certifications fall under ATO. The remaining re-certifications include critical AVS safety applications, as well as several other essential business related applications from ABA, ARC, ARP, AEP, and AHR. The obligation to complete these re-certifications is an FISMA requirement. All overdue re-certifications are identified and tracked by the DOT CIO.

For those systems that are not undergoing certification and accreditation (either an initial or a recertification), an annual assessment is required under FISMA and DOT policy. The inability to complete the self-assessments and subsequently, the contingency plan testing will severely jeopardize the flight plan goal of zero cyber events. As with the re-certifications, several of these systems are mission critical NAS systems, critical AVS safety and medical applications, and essential business and security systems. All overdue annual assessments and contingency plan tests are identified and tracked by the DOT CIO.

Provide Security Training and Raise the Security Proficiency of FAA IT Workforce. The Computer Security Act requires all federal employees to receive security training. The FAA must provide general and specialized security training to its more than 100,000 Federal employees and contractors who work in the information security field as well as those who have day-to-day use and access to FAA systems. Specialized information systems security training is also important to raise the security proficiency of employees responsible for identifying and fixing system vulnerabilities. The FY 2009 funding will pay for the specialized training of key FAA information systems security personnel as well as generalized security awareness training for all FAA employees.

Funding is also requested to enable the agency to comply with HSPD-7 and HSPD-12, and meet its flight plan goal to defend FAA's NAS information systems and networks against increased cyber terrorism and malicious activities by hackers and other unauthorized personnel.

Expanded Electronic Government. AIO provides funding ($322,527 for FY 2008 and $200,006 for FY 2009) to DOT to support government-wide e-Gov initiatives. The main objective under the e-Gov goal is to assure that critical electronic services and information delivered to the users (the air traffic controllers, airline pilots, and the public) are valid and efficiently delivered. This will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at the key customer groups, as well as projects dedicated to improving internal efficiency and effectiveness. Specific e-Gov initiatives include enterprise architecture (EA) and IT capital planning, and continued agency participation in the PMA Quicksilver program, and continued implementation of consolidated enterprise IT services. FY 2009 activities will involve integrating the EA into the agency IT investment process in accordance with the EA policy, which was published in FY 2005, and implementing consolidated help desk and support services.

FY 2009 Capital Programs:

1. Information Security - $12.0 million

Remediation includes $6.0 million of capital funding to correct NAS system vulnerabilities discovered during prior year Security Certification and Authorization Packages (SCAP). The FAA completed SCAPs on all NAS systems in prior years. The Designated Approval Authorities accepted the risk associated with the discovered vulnerabilities from the SCAPs with the expectation the fixes would be put in place according to the Plan of Actions and Milestones.

NAS Information Systems Security Transformation support includes $4.0 million of capital funding in support of the Joint Planning Development Office (JPDO) and the NextGen efforts, to complete the concept of operation and implement a strategy for automated recovery. Automated recovery involves isolating those systems affected by a virus, instituting the fix, and making sure that affected systems get back online as soon as possible. It also funds architecture and engineering efforts for alternative solutions to ensure new NAS systems will be developed (NSure concept). The NAS IT systems will be monitored and all necessary actions will be taken to ensure the systems are not interrupted and are always available. The FAA will acquire and implement enhanced tools for the CSMC to address complex and rapidly changing vulnerabilities. The tools include Security Information Management (SIM) tool, Host Intrusion Prevention System (HIPS), Wireless Intrusion Detection System (IDS), Modeling and Simulation, Starlight and NAS Gateway. Also, funding will support the development of the capability to do predictive analysis of events that could cause a service outage to the NAS.

Internet Protocol Version 6 (IPv6) Transition support includes $0.75 million of capital funding to develop plans and provide management support to integrate the network connections from the lines of business and staff offices into the FAA IPv6 compliant backbone. The FAA will continue to develop and modify policy and guidance to ensure that future FAA systems leverage IPv6 features and capabilities, and ensure network performance and quality of service is not adversely impacted by the IPv6 transition.

Enterprise Architecture/interoperability support includes $0.5 million of capital funding for FAA to continue refining its enterprise architectures (EA) and to ensure the various enterprise architectures being refined and developed are interoperable. To achieve this objective, FAA has instituted a policy that all major NAS and non-NAS EA are formally evaluated for compliance with FAA EA standards. Funding is required to support LOBs and SOs efforts to ensure conformance to IT Enterprise Architecture, and the integration of standards in system development and configuration management.

Technology Insertion support includes $0.75 million of capital funding for activities that help FAA leverage commercial research and development to meet future security needs, including:

a. Academia and National Science Foundation (NSF) Technology: Continue to collaborate with the NSF, universities, and other government agencies to sponsor research on promising IT and IT security technologies that can satisfy FAA requirements and be transitioned into FAA operational networks to increase capabilities, mitigate risks, or reduce operating costs.

b. William J. Hughes Technical Center (WJHTC): Provide continuing support for a rapid prototyping laboratory at the technical center for developing secure mobile solutions for aircraft and administrative uses. The lab supports rapid configuration changes for vendor evaluation, system and security architecture development and general research.

c. Advanced Concept Technology Demonstrations (ACTD): Partner with DoD and participate in ACTD. These demonstrations and experiments leverage existing technology and show its applicability to meet ongoing operational requirements. Artifacts from the demonstrations are in turn transitioned into FAA networks and facilities.

Capital Personnel & Related Expenses:

For FY 2009, $1,120,000 is requested to fund six FTE's for personnel and related expenses at the Aeronautical Center.

SAFETY & OPERATIONS APPROPRIATION

Office of the Administrator (AOA)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**4,344**	**24**	**4**	**28**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	26			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	43			
4. January 2009 Pay Raise (GS Population)	75			
5. January 2009 OSI (Core Comp Population)	109			
6. January 2009 SCI	18			
7. One Less Compensable Day	-16			
8. Non-pay inflation	22			
Total Unavoidable Adjustments	**278**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**4,622**	**24**	**4**	**28**

Detailed Justification for Staff Offices – AOA

Office of the Administrator (AOA)	**FY 2009 Request: $4,622**

Overview:

The office of the Administrator and Deputy Administrator leads the agency, with a vision to continuously improve the safety and efficiency of aviation, while being responsive to customers and accountable to the public.

FY 2008 Program:

In leading the FAA, the Administrator oversees its employees in maintaining, operating, and overseeing the largest and most complex aviation system in the world—a system with a safety record that surpasses all others. The agency determines the regulatory and operational standards for the United States, and effectively sets the benchmark for aviation safety around the world.

Goals include:

Increased Safety – achieving the lowest possible accident rate and to constantly improve safety; reducing the number of fatal accidents in General Aviation; and enhancing the safety of FAA's air traffic systems.

Greater Capacity – working with local governments and airspace users to provide increased capacity in the U.S. airspace system that meets projected demand in an environmentally sound manner.

International Leadership – increasing the safety and capacity of the global civil aerospace system in an environmentally sound manner.

Organizational Excellence – ensuring the success of FAA's mission through stronger leadership, a better trained workforce, enhanced cost-control measures, and improved decision-making based on reliable data.

Anticipated FY 2008 Accomplishments:

- Reduce the commercial airline fatal accident rate.
- Reduce the number of fatal accidents in general aviation.
- Enhance the safety of FAA's air traffic systems.
- Increase airport capacity to meet projected demand and reduce congestion.
- Make air traffic flow over land and sea more efficient.
- Promote improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners.
- Make FAA more effective with stronger leadership, increased commitment of individual workers to full organization-wide goals, and a better prepared, better trained, and diverse workforce.
- Improve financial management while delivering quality customer service.
- Enhance our ability to respond to crisis rapidly and effectively, including security-related threats and natural disasters.

FY 2009 Budget Request:

In FY 2009, the Administrator's office requests $4,622,000 and 28 FTEs to meet its mission. This is an increase of $278,000 from the FY 2008 requested level. Throughout FY 2009, AOA will continue to lead FAA toward achieving the agency's performance goals and targets. The net dollar increase is due to unavoidable pay raise and inflation.

SAFETY & OPERATIONS APPROPRIATION

Civil Rights (ACR)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**9,353**	**75**	**4**	**79**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	5			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	158			
4. January 2009 Pay Raise (GS Population)	13			
5. January 2009 OSI (Core Comp Population)	400			
6. January 2009 SCI	65			
7. One Less Compensable Day	-33			
8. Non-pay inflation	54			
Total Unavoidable Adjustments	**661**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	-56	-1		-1
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**-56**	**-1**	**0**	**-1**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**9,958**	**74**	**4**	**78**

Detailed Justification for Staff Offices — ACR

Civil Rights (ACR)	FY 2009 Request: $9,958

Overview:

The Office of Civil Rights (ACR) is committed to maintaining a model Equal Employment Opportunity (EEO) program throughout FAA in accordance with the EEO Commission Management Directive 715. ACR also provides leadership and direction in support of external program initiatives to increase Disadvantaged Business Enterprise (DBE) participation, Americans with Disabilities Act (ADA), and Title VI (prohibition of discrimination) compliance.

FY 2008 Base:

FAA employees maintain, operate and oversee the largest and most complex aviation system in the world, with a safety record that is second to none.

Equal opportunity in the federal workplace is critical to accomplishing this goal. It requires leadership, integration of EEO into the agency's strategic mission, management and program accountability, proactive prevention of unlawful discrimination, efficiency and responsiveness, and legal compliance to EEO mandates. The FAA federally-operated and assisted transportation programs must also ensure equal opportunity for all beneficiaries and potential beneficiaries of our programs.

ACR's performance goals focus on the strategic goal areas of Organizational Excellence and Capacity. Within the goal of Organizational Excellence, ACR will ensure that FAA maintains a Model EEO Program as required by the EEOC Management Directive on Equal Employment Opportunity. Within the goal of Capacity, ACR provided technical assistance as well as review and approve airport plans for fostering participation in the construction and concession arena by businesses owned by disadvantaged persons.

Anticipated FY 2008 Accomplishments:

- Ensure equal opportunity for all beneficiaries and potential beneficiaries in federally operated and assisted aviation transportation programs by managing the DBE program and investigating equal access complaints against grantees under the Airport Improvement Program (AIP).
- Support airport sponsors and DBEs by conducting consultations, training and briefings on the DBE program, ADA, Title VI, Limited English Proficiency (LEP) and other civil rights regulations so that the aviation community is aware of civil rights requirements.
- Ensure airport compliance with ADA, Title VI, LEP, and other civil rights regulations by providing technical assistance to stakeholders, monitoring airport efforts and assessing complaints, measured by processing and reviewing 100 percent of complaints received in a timely manner.
- Review plans developed by airport grant recipients to ensure equal opportunities for DBE participation in AIP contracting and concession projects. The measure of success is ensuring 100 percent approvals of DBE goal methodologies that have been submitted with all appropriate information.
- Support a timely and effective corporate approach to conflict management by providing support to the Center for Early Dispute Resolution (CEDR) in order to resolve conflicts before they enter an established process.
- Support the CIO and delegated offices of primary interest (OPI) efforts to improve protection for FAA's information infrastructure.
- In compliance with OMB guidance, document and test internal controls to help program and financial managers achieve results by identifying, documenting, and testing key ACR business

processes that support summary dollar entries in FAA financial statements by April 30, 2007.

- Manage the EEO Counselor Program by maintaining an adequate active pool of counselors to process 100 percent of the pre-complaints by conducting basic and advanced EEO counseling training, as needed, to ensure a sufficient number of well-trained counselors to process 100 percent of the pre-complaints.
- Manage the EEO Mediation Program by maintaining an adequate active pool of mediators to process 100 percent of the requests for mediation by conducting basic and refresher EEO mediation training, as needed, to ensure a sufficient number of well-trained mediators to process 100 percent of the requests for mediation.
- Provide policy guidance, technical assistance and direct intervention to the lines of business and staff offices to assist them to resolve EEO complaints.
- Increase managerial and employee awareness with regard to EEO responsibilities and appropriate behaviors by conducting ten briefings for managers and employees per quarter.
- Conduct EEO recognition process for the FAA Administrator. Prevention includes recognizing significant contributions towards creating a Model EEO Program and reinforcing positive behavior in support of equal opportunity.
- Manage the National Federal Women's Program, National Hispanic Employment Program and the People with Disabilities Program that were created for the purpose of ensuring equal opportunity.
- Oversee the MD-715 Process for developing the annual EEO plan and monitoring agency accomplishments.
- Conduct ten on-site surveys to determine the extent to which facilities are maintaining a Model EEO Program under MD-715.
- Implement additional actions to enhance customer satisfaction with services provided by ACR.
- Work in collaboration with the Aviation and Space Education (AVSED) outreach programs and support AVSED by providing staff assistance.
- Ensure strong leadership and a well-trained, efficient ACR workforce.
- Evaluate each non-supervisory specialist vacancy as an opportunity to hire at the entry level, provided hiring at the lower level does not reduce required customer services, jeopardize MD-715 compliance, or diminish ACR's ability to accomplish activities under the Organizational Excellence Flight Plan goal.
- The ACR management team will support FAA's corporate focus on improving future Employee Attitude Survey results in the areas of communication and performance rewards and recognition.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Civil Rights requests $9,958,000 and 78 FTEs to meet its mission. The following Core activities represent the FY 2009 budget request:

- Manage the DBE program and investigate equal access complaints against Airport Improvement Program (AIP) grantees.
- Ensure equal opportunities for DBE participation in AIP contracting and concession projects.
- Support airport sponsors in implementing an airport DBE concession rule by acquainting them with the requirements of the rule. ACR will conduct field technical assistance briefings to the approximately 100 large and medium hub primary airport sponsors that are required to submit revised concession programs.
- Consult with airport sponsors and the public on civil rights regulations and process external complaints.
- Ensure an EEO discrimination program that can process 100 percent of the allegations and inquiries regarding EEO complaints by having adequate counseling, mediation and consulting services.
- Increase managerial and employee awareness with regard to EEO responsibilities and appropriate

behaviors.

- Oversee the process for implementing an FAA Model EEO Program by assisting the agency to identify barriers to EEO and eliminating them, in compliance with MD-715.

SAFETY & OPERATIONS APPROPRIATION

Government & Industry Affairs (AGI)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**1,437**	**12**	**0**	**12**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	2			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	24			
4. January 2009 Pay Raise (GS Population)	7			
5. January 2009 OSI (Core Comp Population)	61			
6. January 2009 SCI	10			
7. One Less Compensable Day	-6			
8. Non-pay inflation	3			
Total Unavoidable Adjustments	**102**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**1,539**	**12**	**0**	**12**

Detailed Justification for Staff Offices – AGI

Government & Industry Affairs (AGI)	FY 2009 Request: $1,539

Overview:

The Office of Government and Industry Affairs (AGI) serves as the administrator's principal adviser and representative on matters concerning relationships with the congress, aviation industry groups, and other governmental organizations. In concert with other agency organizations, AGI develops and reviews various plans and strategies involving these groups enhancing the promotion of aviation safety. These activities are conducted in close coordination and consultation with the Assistant Secretary for Governmental Affairs.

FY 2008 Program:

AGI represents the first impression and indeed, sometimes the only contact members of congress and their staffs have with FAA. This customer-oriented office, small by comparison to most other FAA organizations, works directly for the Administrator and is the principal linkage between the agency and the legislative branch of government.

AGI works with other staff organizations to coordinate and present FAA's legislative message. AGI works with other organizations within FAA to facilitate their relations with congress. AGI consistently monitors and gauges the interest and needs of the Members and leadership on Capitol Hill. This relationship also extends to coordinating our legislative initiatives and responses with the Department of Transportation.

This vigorous outreach is not limited to congress. AGI also serves as liaison with the aviation industry, from manufacturers to carriers, and with other aviation related organizations. Additionally, AGI serves as the principal point of contact for state and local governments.

Anticipated FY 2008 Accomplishments:

- Participate in weekly meetings with Lines of Businesses (LOBs) and Staff Offices (SOs) to discuss and stay current on major safety policies, initiatives, and significant rulemaking activities.
- Provide appropriate and timely notification of all major notices to congressional members and their staff before it becomes public.
- Research legislation to determine directed actions from the congress to identify reports to be completed by FAA.
- Determine and assign the appropriate FAA organization responsible for compiling reports to congress.
- Develop and assign LOB and SO report timelines to ensure due dates are met.
- Review and edit draft reports, facilitate agency and departmental coordination, and forward final reports to the Office of the Administrator (AOA) for review and approval.
- Facilitate, coordinate and participate in all congressional briefings on major policy, safety initiatives, rulemaking, and other issues of concern, some of which are regularly scheduled by AGI. AGI's role is to foster a better understanding of the agency's policies and programs by members of congress and their staff, and afford them the opportunity to interact directly with key FAA policy and decision-making officials. This proactive approach also enhances congressional Members and their staffs' confidence in the agency's policies and programs.
- Continue to maintain and improve daily communications with OST Government Affairs.
- Provide daily activity reports on congressional contacts to AGI management officials.
- Provide weekly congressional activities report to the Administrator and senior DOT officials.
- Provide congressional activities input for inclusion in the Administrator's weekly White House Report.

- Review all agency congressional correspondence responses to ensure completeness, responsiveness, accuracy, and consistency with administration, departmental and agency policies.
- Provide on-demand status to congressional offices inquiring and/or seeking the status of agency responses to congressional correspondence.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for Government and Industry Affairs requests $1,539,000 and 12 FTEs to meet its mission. The following core activities represent the FY 2009 budget request:

- Communicate to congress on behalf of the Administrator and management board.
- Enhance AGI's daily interaction with LOBs and SOs, and senior management officials by proactively soliciting LOB and SO information sharing in order to improve communication on areas of interest or concern to congress.
- Inform key members of congress and their staff on FAA safety policies and initiatives.
- Manage the Reports to Congress program, and function as the agency's Report to Congress liaison with congressional authorizing and appropriations staffs to clarify definitions of congressional intent. Also manage the coordination process between FAA, OST, and OMB, and encourage timely LOB and SO responses to targeted deadlines.
- Assist in preparing agency officials for congressional meetings and briefings.
- Provide OST Governmental Affairs with factual, concise, and complete information from significant AGI congressional contacts and activities.
- Serve as focal point for congressional follow-up on written agency responses.
- Foster strong partnerships with key industry stakeholders.
- Meet with aviation industry representatives to strengthen industry relationships.
- Communicate the administration's position on key aviation issues.

SAFETY & OPERATIONS APPROPRIATION

Communications (AOC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**6,336**	**34**	**1**	**34**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	30			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	56			
4. January 2009 Pay Raise (GS Population)	89			
5. January 2009 OSI (Core Comp Population)	141			
6. January 2009 SCI	23			
7. One Less Compensable Day	-21			
8. Non-pay inflation	46			
Total Unavoidable Adjustments	**363**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**6,699**	**34**	**1**	**34**

Detailed Justification for Staff Offices – AOC

Communications (AOC)	FY 2009 Request: $6,699

Overview:

The Office of Communications (AOC) serves as the focal point for news media inquiries, speaking for the FAA and initiating both internal and external communication programs covering the breadth of FAA issues. The office also provides advice to the Administrator, Deputy Administrator, and Associate/Assistant Administrators on communication strategy and products, and prepares senior FAA officials to take part in public appearances and media interviews. Regional offices are maintained in seven locations to provide the same services to FAA leadership in the regions in support of public affairs work and national leadership. AOC also supports internal FAA communications through various web-based publications.

FY 2008 Program:

AOC works with the news media to provide the public with accurate, timely, useful and important information about the agency's goals, policies, activities and operations. As part of that mission, AOC actively promotes FAA activities that deal with Safety, Capacity, International Leadership and Organizational Excellence.

In addition, AOC serves as the internal voice of FAA, providing staff and employees with daily, weekly, and periodic communication tools and news programs. It also provides graphics and communications services to the agency at large.

Anticipated FY 2008 Accomplishments:

- Hold at least two media roundtables to highlight FAA safety initiatives with three or more national print or television outlets.
- Work with reporters to place at least one article, news story or editorial in national publications or television coverage that advance runway safety or highlight runway safety improvements.
- Respond to media calls about the FAA's safety messages within 24 hours when they inquire about any type of safety issue.
- Hold at least two national media roundtables on capacity and efficiency issues with three or more national or print media outlets.
- Work with at least two airport operators to publicize new runway openings.
- Work with reporters to place at least one article, news story or editorial in national publications or television coverage of aviation safety improvements.
- Respond to media calls about the FAA's capacity and efficiency messages within 24 hours when they inquire about any type of airspace or air traffic issue.
- Hold at least two media roundtables to educate reporters about international leadership initiatives.
- Develop a media plan to increase international media coverage by May 31, 2008.
- Begin implementing the international media coverage plan by June 30, 2008.
- Respond to media calls about the FAA's roles as the world leader on aviation issues within 24 hours when responding to media questions about international trips by senior executives or any other press calls related to international issues.
- Have 25 percent of all supervisors/managers onboard more than one year participate in a Conflict Management Awareness Session by August 15, 2008.
- Average 95 percent of labor distribution reporting hours charged to valid projects and activities.
- Reduce cost per issue of FocusFAA.
- Provide quarterly updates to Financial Services.
- Office of Communications will update its infrastructure and application inventory by December 31,

2007.

- Improve the overall score to 73 on the Web Customer Satisfaction Index by September 30, 2008.
- Update Lines of Business and Staff Office web strategies and action plans in writing to the FAA Web Manager by November 30, 2007. AOC will review action plans and progress reports within 15 days. If not approved, insure Lines of Business and Staff Offices submit revised plans within 15 days after AOC notification of required changes.
- Brief FAA Web Council on the Lines of Business and Staff Office plans by January 31, 2008.
- Submit web progress reports to the FAA Web Managers by March 31, 2008 and June 30, 2008.
- Certify to the Administrator that 90 percent or more of Lines of Business and Staff Offices' web pages comply with FAA web standards, policies and requirements by September 30, 2008.
- Ensure that the database has the relevant information to answer 90 percent of the questions through self service.
- Provide guidance and assistance for distributing employee safety information in a variety of formats, including interviews, employee web site enhancements, broadcast messages, FocusFAA, etc. by June 23, 2008.
- Analyze data from reports to ensure Aviation Policy, Planning and Environment perform quarterly reviews of inactive Office of Communications' obligations within 90 days of the end of the quarter.
- Publish real time news on a daily basis during the Fiscal Year.
- Read and evaluate all employees' feedback and respond within 24 hours.
- Conduct at least 12 webcast interviews during the Fiscal Year.

FY 2009 Budget Request:

For FY 2009, the Office of Communications requests $6,699,000 and 34 FTEs to meet its mission. This increase will provide for unavoidable pay raises and inflation. The following activities represent the FY 2009 budget request:

- AOC will work with the news media to provide the public with accurate, timely, useful and important information about the agency's goals, policies, activities and operations. As part of that mission, AOC will actively promote FAA activities that deal with Safety, Capacity, International Leadership and Organizational Excellence.
- Hold at least two media roundtables to highlight FAA safety initiatives with three or more national print and television outlets.
- Respond to media calls about the FAA's safety messages within 24 hours when they inquire about any type of safety issue.
- Provide information to reporters to enhance their ability to place at least one article, news story, or editorial in national publications or television coverage that advances runway safety or highlights runway safety improvements in each quarter of the fiscal year.
- Hold at least two media roundtables on capacity and/or efficiency with at least three or more national or print media outlets during the fiscal year.
- Work with at least two airport operators to publicize new runway openings.
- Respond to media calls about the FAA's capability and efficiency messages within 24 hours when they inquire about any type of airspace or air traffic issue.
- Hold at least two media briefings on international leadership initiatives during the fiscal year.
- Develop a media plan to increase international media coverage by May 31, 2009.
- Begin implementing the international media coverage plan by June 30, 2009.
- Respond to media calls about the FAA's role as the world leader on aviation issues within 24 hours when responding to media questions about international trips by senior executives or any other press calls related to international issues.
- Have 25 percent of all supervisors/managers onboard more than one year participate in a Conflict Management Awareness Session by August 15, 2009.
- Average 95 percent of labor distribution reporting hours charged to valid projects and activities.

- Deliver cost accounting reports to Office of Communications with in 30 days of the end of the quarter.
- Reduce cost per issues of FocusFAA.
- Provide quarterly updates to Financial Services.
- Update AOC infrastructure and application inventory by December 31, 2009.
- Sustain the overall score of 73 or better on the Web Customer Satisfaction index by September 30, 2009.
- Update Lines of Business and Staff Office web strategies and action plans in writing to the FAA Web Manager by November 30, 2009. Review action plans and progress reports within 15 days. If not approved, insure Lines of Business and Staff Offices submit revised plans within 15 days after AOC notification of required changes.
- Brief FAA Web Council on the Lines of Business and Staff Office plans by January 31, 2009.
- Submit web progress reports to the FAA Web Managers by March 31, 2009 and June 30, 2009.
- Certify to the Administrator that 90 percent or more of Lines of Business and Staff Offices' web pages comply with FAA web standards, policies and requirements by September 30, 2009.
- Ensure that the database has the relevant information to answer 90 percent of the questions through self service.
- Provide guidance and assistance for distributing employee safety information in variety of formats, including interviews, employee web enhancement, broadcast messages, FocusFAA, etc. by June 23, 2009.
- Analyze data from reports to ensure Aviation Policy, Planning and Environment perform quarterly reviews of inactive Office of Communications obligation within 90 days of the end of the quarter.
- As a result of positive outreach, ensure that at least two articles, news stories or editorials appears in national press, trade press or TV coverage that positively highlight agency cost saving initiatives.
- Publish real time news on a daily basis during the Fiscal Year.
- Read and evaluate all employees' feedback and respond within 24 hours.
- Conduct at least 12 webcast interviews during the fiscal year.
- Post news update to FAA employee homepage at least three times a week through out the fiscal year.

SAFETY & OPERATIONS APPROPRIATION

Chief Counsel (AGC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**38,982**	**241**	**9**	**245**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	120			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	272			
4. January 2009 Pay Raise (GS Population)	351			
5. January 2009 OSI (Core Comp Population)	686			
6. January 2009 SCI	111			
7. One Less Compensable Day	-137			
8. Non-pay inflation	111			
Total Unavoidable Adjustments	**1,515**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	1,078			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**1,078**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	2,000	1		1
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**2,000**	**1**	**0**	**1**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**43,575**	**242**	**9**	**246**

Detailed Justification for Staff Offices – AGC

Chief Counsel (AGC)	**FY 2009 Request: $43,575**

Overview:

The Chief Counsel has primary responsibility for providing legal services and support to the FAA Administrator, all program offices, regional offices, and agency organizations worldwide. The office provides strategic counsel to FAA's senior management and represents the agency in federal court and before various administrative law forums.

FY 2008 Program:

AGC provides legal services to the FAA Administrator and all agency organizations. Principal legal practice areas include: enforcement; regulations; litigation; procurement and fiscal law; airports and environmental law; personnel and labor law; international affairs; and dispute resolution (including adjudication of bid protests through the Office of Dispute Resolution for Adjudication). AGC also provides legal practice in general law applicable to the executive branch, such as Freedom of Information Act and Ethics and Privacy Act compliance. AGC attorneys represent the agency before United States federal courts and administrative forums, including the National Transportation Safety Board (NTSB), the Merit Systems Protection Board (MSPB), and the Equal Employment Opportunity Commission (EEOC).

The office's principal legal practice areas and program responsibilities integrally tie to the goals of the FAA Flight Plan. AGC supports the agency's safety goals through its role in enforcement of federal aviation regulations and support of voluntary compliance programs; drafting, review and interpretation of regulations; and litigation activity (including defense of ATC tort claims). In the capacity arena, AGC plays a significant role in both applying agency policy designed to relieve congestion at key airports and supporting the related competition goals of the DOT. AGC also plays a critical role in advising Airports and ATO about the legal and environmental implications of runway expansions, terminal improvements, and redesign of the national airspace. Further, AGC provides procurement legal services essential to getting the safety and capacity enhancing equipment and technology needed to support the national airspace system and the agency's Flight Plan. In the international goal area, AGC develops the agency position on international law issues and serves as a liaison for FAA international aviation legal matters with other government agencies and industry. Finally, in support of the agency's overall goal of achieving organizational excellence, AGC provides advice and guidance to key agency officials on personnel, labor law, and civil rights matters and the various general law disciplines applicable to all federal agencies.

Anticipated FY 2008 Accomplishments:

- Support Flight Plan initiative relating to third-party development of RNP Procedures
- Prioritize and prosecute enforcement actions in accordance with FAA's safety goals.
- As part of the Compliance Review Team, implement program evaluation plan to assess targeted enforcement initiative and use of enforcement decision tool.
- Provide training to enforcement investigative personnel.
- Support FAA rulemaking activities and improvements by ensuring rules meet legal standards and conduct monthly outreach to primary client offices.
- With the Office of Rulemaking (ARM), complete 80 percent of critical safety rules within 90 days of first OST due date.
- Complete 50% of new requests for interpretations within 120 days of receipt.
- Ensure timely representational legal services and, as necessary, keep administrator apprised of

quarterly contingent liability matters.

- Support Flight Plan initiative related to maintaining average daily capacity at 7 metropolitan airports.
- Support Flight Plan initiative relating to capacity enhancing policies, including reinstitution of capacity restrictions at LaGuardia.
- Support Flight Plan initiative to maintain scheduled progress for Environmental Impact Statements at West Palm Beach, South Suburban (Chicago), Ft. Lauderdale, and Philadelphia Airports.
- Support Flight Plan initiative to increase annual service volume of the 35 OEP airports by at least one percent annually.
- Support Flight Plan initiative to ensure established milestones and completion dates for Southern Nevada Supplemental Airport, Houston George Bush Intercontinental, and Portland International EIS studies are met in FY 2008.
- Generally, docket or dismiss Part 14 complaints within 20 calendar days.
- Refine criteria used to measure effectiveness and timeliness of environmental projects and to evaluate environmental streamlining initiatives.
- Review all procurement documents sent for legal review within 10 days and conduct monthly outreach meetings with primary procurement client offices.
- With ATO and ABA, improve management and oversight of support service contract practices by implementing, monitoring and evaluating policy changes and actions.
- Provide legal services supporting drafting and negotiation of international agreements; prepare the U.S. position on matters before ICAO; support the Aviation Insurance Program; assist API initiative relating to regional safety oversight system in the Caribbean; and support the DOT mission relating to technical assistance in Iraq.
- Support Flight Plan initiatives relating to improvement of the score on Employee Attitude Survey measures and support the Early Dispute Resolution Center.
- Establish a formal NO FEAR reporting system within the Office of the Chief Counsel.
- Identify a dedicated funding source for complex employment law litigation (e.g. class actions). Evaluate effectiveness of employment case settlement procedures and complete changes, if any.

FY 2009 Budget Request:

For FY 2009, the Office of the Chief Counsel requests $43,575,000 and 246 FTEs to meet its mission.

AGC practice areas and program responsibilities integrally support the four goals of FAA's Flight Plan: increased safety; greater capacity; international leadership; and organizational excellence. In the safety arena, the legal enforcement program is a core activity. AGC shares program responsibility for the agency's enforcement policies and programs with several offices, including AVS, Security and Hazardous Materials (ASH), and the Office of Airports (ARP). AGC attorneys prosecute all manner of enforcement actions and represent FAA on such matters before the National Transportation Safety Board (NTSB), the FAA decision maker, and the federal courts. AGC also supports the development and implementation of voluntary programs to gain safety information, which provides the basis for interventions to prevent accidents from happening.

FAA regulations are one of the agency's primary means of ensuring safety in air commerce and commercial space. AGC plays a key role in supporting the agency's rulemaking activities by ensuring that rules meet legal standards and maintaining agency rulemaking schedules. AGC also provides legal services to FAA and its employees in aircraft accident investigations and associated litigation, helps the agency in assessing and responding to NTSB safety recommendations, and supports the administrator's Civil Penalty Program.

AGC supports the agency's increased capacity goal in two critical ways. First, AGC plays a vital role in

FAA's environmental streamlining efforts by providing critical advice, document review, and litigation support to the Office of Airports to reduce the legal risks associated with FAA capacity enhancement activities and FAA-funded airport development projects. Further, AGC supports OST and FAA activities designed to relieve congestion at key airports such as Chicago O'Hare and New York LaGuardia. Second, AGC's procurement legal staff helps FAA to obtain the safety and capacity enhancing equipment, services, and intellectual and real property required to meet Flight Plan objectives, including services needed to support the agency's information security and president's management agenda goals.

In the international arena, AGC provides legal services required for drafting and negotiating international agreements on safety oversight, air traffic airworthiness, technical help, and other areas related to aviation safety. AGC also develops the agency position on international law issues and serves as a liaison for FAA international aviation legal matters with other government agencies and industry.

In support of the agency's overall goals of achieving organizational excellence, AGC will again focus its efforts on improving the agency's employment practices and supporting FAA labor-management objectives.

The Chief Counsel (AGC) is currently engaged in seven class action lawsuits on behalf of FAA. These class actions are based on disparate impact claims of discrimination as contrasted with individual claims alleging intentional discrimination and involve numerous complainants and significant potential monetary liability for the agency. To defend against disparate impact claims the agency must engage in the extensive use of experts including labor economists, organizational experts, industrial psychologists, and document management firms. Legal experts with experience in defending against large document volume disparate impact claims also provide assistance with experts and other unique aspects of disparate impact cases. This $1.1 million increase is necessary to fund the costs associated with the use of the experts, documentation management specialists, and legal experts as these suits continue. Given the diverse client base involved in the various cases, centralized funding is the most efficient mean to ensure proper funding and adequate defense of the litigation.

In addition to our base funding, the agency's ongoing transition to the Next Generation Air Transportation System (NextGen) will continue to generate an increasingly significant future workload. Under NextGen the agency is moving to a system that is more heavily dependent upon the type of aircraft and avionics, software applications for the avionics, and more performance-based air navigation systems. Likewise, increasing levels of congestion, which NextGen will partially address, may result in additional operational caps at congested airports through out the National Airspace System (NAS). All of these changes will generate more rules, related interpretations and air space redesign activity.

In addition to the activities described above, the following represents the FY 2009 budget request:

- Support Flight Plan initiative relating to third-party development of RNP Procedures
- Prioritize and prosecute enforcement actions in accordance with FAA's safety goals.
- Support the development and implementation of voluntary safety programs.
- Bring timely enforcement actions, measured by taking first legal enforcement action on 80 percent of the cases referred during the period July 1, 2007 and August 31, 2008.
- As part of Compliance Review Team, recommend changes, as proper, to the Targeted Enforcement Policy and Enforcement Decision Tool based on the FY 2007 evaluations.
- Conduct training sessions for enforcement investigative personnel.
- With the Office of Rulemaking (ARM), complete 80 percent of critical safety rules within 90 days of first OST due date.
- Provide timely provision of service by complete 50 percent of new requests for interpretations within 120 days of receipt.
- Ensure timely representational legal services and, as necessary, keep administrator apprised of

quarterly contingent liability matters.

- Support Flight Plan initiative relating to capacity enhancing policies, including reinstitution of capacity restrictions at LaGuardia.
- Support Flight Plan initiative to maintain scheduled progress for Environmental Impact Statements at West Palm Beach, South Suburban (Chicago), Ft. Lauderdale, and Philadelphia Airports.
- Support Flight Plan initiative commissioning new runway projects to increase annual service volume of the 35 OEP airports by at least one percent annually, measured as a five-year moving average, through FY2010.
- Support Flight Plan initiative to ensure established milestones and completion dates for Southern Nevada Supplemental Airport, Houston George Bush Intercontinental, and Portland International EIS studies are met in FY2009.
- Generally, docket or dismiss Part 14 complaints within 20 calendar days.
- Review all procurement documents sent for legal review within 10 days and conduct monthly outreach meetings with primary procurement client offices.
- Improve acquisition services by developing and conducting training at ATO Business Service Centers. Also establish and implement a plan to contract oversight partnerships with ATO Service Centers.
- Provide legal services supporting drafting and negotiation of international agreements; prepare the U.S. position on matters before ICAO; support the Aviation Insurance Program; assist API initiative relating to regional safety oversight system in the Caribbean; and support the DOT mission relating to technical assistance in Iraq.
- Support Flight Plan initiatives relating to improvement of the score on Employee Attitude Survey measures and support the Early Dispute Resolution Center, as well as other initiatives.

SAFETY & OPERATIONS APPROPRIATION

Aviation Policy, Planning & Environment (AEP)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**13,542**	**87**	**1**	**88**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	140			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	52			
4. January 2009 Pay Raise (GS Population)	408			
5. January 2009 OSI (Core Comp Population)	130			
6. January 2009 SCI	21			
7. One Less Compensable Day	-47			
8. Non-pay inflation	82			
Total Unavoidable Adjustments	**785**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	704			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**704**	**0**	**0**	**0**
Base Transfers				
1. Workforce Planning	-1,234	-5		-5
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**-1,234**	**-5**	**0**	**-5**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	52			
Total Capital Expenses	**52**	**0**	**0**	**0**
FY 2009 Request -- Total	**13,849**	**82**	**1**	**83**

Detailed Justification for Staff Offices – AEP

Aviation Policy, Planning, & Environment (AEP)	FY 2009 Request: $13,849

Overview:

The Office of Aviation Policy, Planning and Environment (AEP) provides critical support to the Administrator and FAA organizations in planning and policy development, and environment, energy and employee safety programs.

FY 2008 Program:

AEP accomplishes its goals by: 1) being the agency's focal point for strategic plan development and coordination; 2) by identifying policy issues; and 3) by developing, recommending and coordinating national aviation policy related to FAA authority concerning national airport and airway system development, operation, and finance as well as environmental, energy, and employee safety matters. AEP is responsible for forecasting aviation activity to be incorporated in FAA plans and evaluating proposed and final FAA rules for costs and benefits. AEP also supports the Management Advisory Council (MAC) and the Air Traffic Services committee in their statutory oversight of FAA and the performance-based ATO in particular. It is responsible for developing national aviation policy relating to environmental and energy matters. This includes representing the United States in development of international standards relating to aircraft noise and engine emissions in international forums. AEP is also responsible for providing policy guidance and technical assistance for FAA compliance with environmental, occupational safety, health and energy statutes and regulations prescribing federal environmental protection, worker protection, and energy conservation policies. AEP does this in close coordination with other FAA organizations and, where appropriate, external stakeholders.

Anticipated FY 2008 Accomplishments:

- By September 30, 2008, at least 80 percent of the rules approved by the Rulemaking Management Council should be out of the agency no later than 90 days after the scheduled date. For a significant rule, out of the agency is when the rule is sent to OST. For a non-significant rule, out of the agency is when the rule is issued.
- Complete the Environmental Working Group FY 2008 work goals and plan for NextGen.
- Complete an Environmental Management System (EMS) framework for NextGen.
- Publish report on alternative fuels feasibility.
- Complete integrated system level analyses of NextGen scenarios and strategies.
- Deliver Aviation Environmental Design Tool (AEDT) and Aviation Portfolio Management Tool (APMT) versions for NextGen and International Civil Aviation Organization (ICAO)/Committee on Aviation and Environmental Protection (CAEP) applications.
- Complete an environmental policy document for long-term aviation environmental improvements.
- Within 120 days after receiving authorizing language, begin development of market-based measure for use at LaGuardia Airport. If FAA does not receive authorizing language, provide policy recommendations for a draft proposed rule (e.g. Notice of Proposed Rulemaking or Supplemental Notice of Proposed Rulemaking), as appropriate.
- Initiate development of policy recommendations regarding congestion management initiatives at capacity-constrained airports.
- Convene an intra-agency group to re-baseline the appropriate metro areas to reflect changes in growth and capacity.
- Demonstrate the benefit of environmental cost-benefit analyses with a significant example.
- Complete annual assessment of number of people nationally exposed to significant aircraft noise.

- Work with stakeholders on environmental needs for the Airport Cooperative Research Program.
- Plan potential comprehensive noise annoyance survey, complete peer review of noise annoyance data, and publish report on noise annoyance metrics, including new metric for supersonic aircraft.
- Chair Airport Compatibility Planning Committee, and publish guidance on land use best practices.
- Scope candidate airports to demonstrate Continuous Descent Arrival (CDA) (RNAV+) for potential night time/low capacity operations, and identify capacity threshold for efficient CDA procedures.
- Draft work program to demonstrate enroute and surface operations that reduce noise/emissions.
- Amend the Environmental Management Program to call for reductions of energy intensity, water consumption intensity, chemicals and toxic materials, and increases in total purchases of renewable energy from new renewable energy sources to implement Executive Order 13423.
- Provide policy and oversight for FAA's EMS implementation, including EMS external audits and the Administrator's EMS review.
- Assess and reduce aviation's contribution to climate change, including methods to compute greenhouse gases in airport environment, relative effect of various emissions on climate forcing functions, and uncertainty of aviation impact with special emphasis on effects of contrails.
- Enhance air quality modeling and guidance.
- Assess whether unique health effects are associated with particulate matter (PM) emissions and hazardous air pollutants (HAPs) from aviation sources, with specific focus on the aircraft engine.
- Complete assessment of aviation impacts on regional air quality.
- Hold a forum on environmental process modernization issues.
- Publish the annual Aerospace Activity Forecast.
- Publish the Long Range Aerospace Forecast.
- Provide interim update to the Office of Air Traffic for input into the 2008 controller workforce plan.
- Publish the Terminal Area Forecasts.
- Publish the Air Route Traffic Control Center (ARTCC) Forecasts.
- Publish US Airmen Statistics.
- Publish 95 percent of daily and monthly reports from Operational Network (OPSNET), Air Traffic Activity Data System (ATADS), Enhanced Traffic Management System Counts (ETMSC), and Terminal Area Forecast (TAF) on time.
- Publish and distribute monthly report highlighting aviation industry traffic and revenue trends to internal AEP and/or FAA customers.
- Issue premium and non-premium insurance policies no later than the effective date of the policies.
- E-business electronic access to insured air carriers and Department of Defense (DoD) will be available 90 percent of the time.
- Insurance policy reconciliations will be initiated within the time conditions set forth in each air carrier's policy of insurance and a refund or additional collection implemented no later than 120 days after receipt of reconciliation data from each air carrier or the availability of allotted budget, whichever is later.
- Manage Grand Canyon and other national parks aviation environmental issues.
- Complete Benefit-Cost Analysis (BCA) for contract towers and approaches as requested by ATO.
- Complete 85 percent of the Office of Airports (ARP) BCA within the timeframe agreed upon in Service Level Agreements (SLA).
- To the extent possible, ensure economic policies and guidance adopted by the ICAO reflect U.S. reviews.
- Lead U.S. participation on ICAO's Aviation Navigation Services Economics Panel (ANSEP).

- Develop guidance to implement environmental provisions enacted in FAA reauthorization.

FY 2009 Budget Request:

For FY 2009, the Office of Aviation Policy, Planning and Environment requests $13,849,000 and 83 FTEs to meet its mission. This request includes a discretionary increase of $704,000 to manage the effective integration of environmental performance into the NextGen air traffic system.

In FY 2009, AEP will continue supporting agency initiatives in all of the goal areas, while concentrating our major efforts in Capacity and Organizational Excellence. Environmental efforts will focus heavily on work to provide for a quieter, cleaner, more energy efficient aviation future under NextGen. Under the Safety and Capacity goal areas, AEP plans to assure that FAA policy and economic analysis programs support safety and capacity-enhancing initiatives of the agency, and that the agency benefits from superior decision support tools and innovative mitigation approaches that it needs to ensure responsive strategies that allow aviation to grow in an environmentally responsible manner. Our activities under the goal of Organizational Excellence will revolve around supporting agency initiatives to help employees see the link between their jobs and agency goals. The following Core activities represent the FY 2009 budget request:

- By September 30, 2009, at least 80 percent of the rules approved by the Rulemaking Management Council should be out of the agency no later than 90 days after the scheduled date. For a significant rule, out of the agency is when the rule is sent to OST. For a non-significant rule, out of the agency is when the rule is issued.
- Complete the Environmental Work Group FY 2009 work goals and plan for NextGen.
- Continue phased development of EMS' to manage environmental impacts of NextGen components.
- Conduct assessments and measure performance of drop-in (e.g., coal-derived liquids) alternative fuels for commercial aircraft, and establish potential of using renewable alternative fuels.
- Develop framework for analyzing NextGen environmental targets.
- Develop policy for effective integrated use of interdependent models for aviation noise/emissions.
- Design environmental logic for surface management systems (SMS) that optimize aircraft sequencing and timing to reduce emissions, and for Traffic Management Advisor (TMA) that optimizes aircraft procedures in the terminal areas to reduce emissions, fuel burn, and noise.
- Determine noise, local air quality and fuel burn reduction technologies to pursue under the Consortium for Lower Energy Emissions and Noise (CLEEN) initiatives.
- Develop a rulemaking proposal to replace the Congestion Management Order for LaGuardia Airport within 120 days after the LaGuardia Team reaches agreement on the substantive elements of the draft proposed rule, as appropriate.
- Convene an intra-agency group to re-baseline the appropriate metro areas to reflect changes in growth and capacity.
- Complete annual assessment of number of people exposed nationally to significant aircraft noise.
- Complete beta version of Aviation Environmental Design Tool (AEDT) for airport planning use.
- Develop framework for analyzing NextGen environmental targets.
- Work with stakeholders on environmental needs for Airport Cooperative Research Program.
- Conduct comprehensive noise annoyance survey.
- Initiate effort to measure the impact of noise around airports for new operating paradigms (e.g., very light jets, supersonic aircraft).
- Initiate effort to establish metrics that characterize human health and welfare impacts to better inform policy decisions and environmental assessments.
- Advance noise propagation models to better capture air turbulence, meteorology, terrain, and wave nature of low-frequency noise.

- Plan for demonstrations of CDA (RNAV+) night time/low capacity operations, and report on efficient CDA procedures over the range of airport operational densities.
- Plan work for demonstrating en route and surface operations that reduce noise or emissions.
- Refine EMS to conform to Executive Order 13423.
- Roll-up the Lines of Business cost and performance baseline developed in FY 2008 to set targets for future years.
- Conduct two EMS External Audits and compile the Administrator's EMS management review.
- Conduct campaign to collect PM and HAPs profiles and measurements to isolate sources.
- Complete assessment of the relative effect of various emissions on climate forcing functions to apply to ICAO/CAEP analyses.
- Continue assessing whether there are unique health effects, particularly for NextGen scenarios, associated with PM emissions and HAPs from aviation sources, with specific focus on the aircraft engine.
- Continue assessment of uncertainty of impact of aviation on climate change with special emphasis on the effects of contrails.
- Complete assessment of aviation impacts on regional air quality.
- Continue development of guidance on dispersion modeling (i.e., assessment of aviation-related emission concentrations that affect local air quality).
- Hold a forum on environmental process modernization issues.
- Publish the annual FAA Aerospace Activity Forecast.
- Publish Long Range Aerospace Forecast.
- Publish the Terminal Area Forecasts.
- Publish the ARTCC forecasts.
- Publish US Airmen Statistics.
- Publish 95 percent of daily and monthly reports from OPSNET, ATADS, ETMSC, and TAF on time.
- Publish and distribute quarterly report highlighting aviation industry traffic and revenue trends to internal AEP and/or FAA customers.
- Respond to agency customer requests for information and insights with regard to analyses, statistics, and recommendations on aviation industry issues.
- Issue premium and non-premium insurance policies no later than the effective date of the policies.
- E-business electronic access to insured air carriers and DoD will be available 90 percent of the time.
- Insurance policy reconciliations will be initiated within the time conditions set forth in each air carrier's policy of insurance and a refund or additional collection implemented no later than 120 days after receipt of reconciliation data from each air carrier or the availability of allotted budget, whichever is later.
- Complete a Grand Canyon overflights plan, and manage aviation issues at other national parks.
- Complete BCA for contract towers and approaches as requested by ATO.
- Complete 85 percent of ARP BCA within the timeframe agreed upon in SLA.
- Conduct policy option analyses for CAEP/8.
- Complete significant demonstration of clean and quiet operations with an international partner.
- Provide inputs on assigned Interagency Group on International Aviation (IGIA) items.
- To the extent possible, ensure economic policies and guidance adopted by ICAO reflect U.S. reviews.

SAFETY & OPERATIONS APPROPRIATION

International Aviation (API)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**16,012**	**60**	**2**	**63**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0		-1	
2. Annualized FY 2008 Pay Raise (GS Population)	58			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	49			
4. January 2009 Pay Raise (GS Population)	170			
5. January 2009 OSI (Core Comp Population)	124			
6. January 2009 SCI	20			
7. One Less Compensable Day	-41			
8. Non-pay inflation	129			
Total Unavoidable Adjustments	**510**	**0**	**-1**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	1,000			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**1,000**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	386	2		2
11. HSPD-12 Implementation	0			
12. Capitalization	0			
Total Discretionary Increases	**386**	**2**	**0**	**2**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	0			
2. Capital Personnel & Related Expenses	0			
Total Capital Expenses	**0**	**0**	**0**	**0**
FY 2009 Request -- Total	**17,908**	**62**	**1**	**65**

Detailed Justification for Staff Offices – API

International Aviation (API)	FY 2009 Request: $17,908

Overview:

The Assistant Administrator for International Aviation (API) is responsible for coordinating U.S. leadership in the international aviation community and advancing safety internationally by broadening our strategic relationships, providing targeted technical assistance, and promoting harmonized safety solutions in an environmentally friendly manner.

The United States has long been a leader in the international aviation community. The FAA operates the largest and most complex aviation system in the world, controlling almost half of the world's air traffic. The FAA certifies more than two-thirds of the world's large jet aircraft and provides direct or indirect aviation assistance to more than 130 countries. Over 130 domestic and 118 international air carriers serve the United States daily. U.S. industry is continuously developing and implementing new technologies to create a safer, more efficient, global airspace system. The United States is also the largest contributor of technical and financial support to the International Civil Aviation Organization (ICAO), which represents 190 of the world's civil aviation authorities.

FY 2008 Program:

API has identified four performance targets to ensure that FAA remains the world leader in aviation. These performance targets are:

<u>Aviation Safety Leadership</u>: While the worldwide commercial accident rate has improved over the past decade, the rate is higher in certain markets with significant future growth. API will cooperate with key international partners to ensure the highest levels of safety and efficiency in the global system.

<u>Global Positioning System (GPS) Based Technologies</u>: Expand the use of GPS technologies to improve safety of flight operations and optimize efficiencies. API will cooperate with key international partners to implement the concepts of the NextGen.

<u>Bilateral Safety Agreement</u>: Conclude agreements that will facilitate an increase in the ability of key partners to exchange aviation products, services, and technologies with the United States. API will help negotiate and conclude agreements bilaterally and multilaterally.

<u>External Funding</u>: Increase funding to support aviation safety and infrastructure programs. API will conduct outreach efforts to obtain funding for foreign technical assistance and aviation capacity building programs from other U.S. government agencies, multilateral development banks, and industry.

To achieve these performance targets, API will coordinate FAA international activities among the lines of business, with our bilateral partners, regional multinational aviation safety organizations, and ICAO. The ultimate objective is to make air travel as safe and efficient abroad as it is at home.

Anticipated FY 2008 Accomplishments:

- Expand the capabilities of the Civil Aviation Assistance Team in Kabul, Afghanistan, with funding from other U.S. government (USG) and international lending sources.
- Establish an effective partnership with the European Union and European Aviation Safety Agency to ensure the highest level of cooperation for aviation safety and an efficient exchange of products, services, and technologies.
- Continue implementation of presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.
- Provide continued support to develop a regional safety oversight organization with the East African Community.

- Work through ICAO and regional aviation organizations in the Western hemisphere to promote harmonized implementation of area navigation and required navigation performance.
- Administer programs that continue and expand external funding for international aviation infrastructure projects.
- Support creation of government industry partnerships to facilitate the transfer of aeronautical products, services and technologies to key developing regions.
- Expand the use of United States, NAS technologies and procedures to five priority countries.
- Develop a plan that implements key priorities for approval to the ICAO Standards and Recommended Practices (SARPS) at the 37th ICAO Assembly.
- Coordinate all pre-audit activities in preparation for the ICAO Universal Safety Oversight Audit Program (USOAP) audit of the United States scheduled for FY 2008.
- Establish a permanent FAA presence in one Latin American location.

FY 2009 Budget Request:

For FY 2009, the Assistant Administrator for International Aviation requests $17,908,000 and 65 FTEs to meet its mission. This includes $1.0 million for FAA's share of the Capital Security Cost Sharing program, a multiyear effort to upgrade existing or build new U.S. foreign service posts to meet heightened physical security requirements. The following activities represent the FY 2009 budget request:

- Complete the establishment and staffing of a second location in Latin America.
- Support the Civil Aviation Assistance Team in Kabul, Afghanistan, with funding from other U.S. government and international lending sources.
- Correlate essential USG SARPS change objectives to the ICAO budget.
- Continue implementation of presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.
- Provide continued support for the development of a regional safety oversight organization with the East African Community.
- Work through ICAO and regional aviation organizations in the western hemisphere to enable member countries to reach greater compliance with ICAO safety standards through training and technical assistance.
- Administer programs that continue and expand external funding for international aviation infrastructure projects.
- Support creation of government and industry partnerships to facilitate the transfer of aeronautical products, services, and technologies to key developing regions.
- Expand the use of GPS technologies and procedures to five more priority countries.

SAFETY & OPERATIONS APPROPRIATION

Security and Hazardous Materials (ASH)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**72,345**	**467**	**0**	**454**
FY 2008 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2008 Pay Raise (GS Population)	0			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	937			
4. January 2009 Pay Raise (GS Population)	0			
5. January 2009 OSI (Core Comp Population)	2,368			
6. January 2009 SCI	387			
7. One Less Compensable Day	-223			
8. Non-pay inflation	1,139			
Total Unavoidable Adjustments	**4,608**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. Capital Security Cost Sharing Program	0			
3. Financial Systems Upgrades	0			
4. Capitalization Staffing	0			
5. Facilities Management & Security	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. ATO Oversight (AOV) Staffing	0			
2. Human Space Flight	0			
3. CMEL Lease and Support Contract	0			
4. Consolidate AVS Offices in Florida	0			
5. Logistics Support Services Contract	0			
6. Real Property Asset Management	0			
7. Information Security Enhancement	0			
8. Class Action Litigation Support	0			
9. Integrate Environmental Performance into NextGen	0			
10. FAA Offices in Latin America	0			
11. HSPD-12 Implementation	6,270	11		11
12. Capitalization	0			
Total Discretionary Increases	**6,270**	**11**	**0**	**11**
Base Transfers				
1. Workforce Planning	0			
2. Regional Operations Center	0			
3. Information Technology	0			
4. Capitalization	0			
5. Aeronautical Center Facility Management	0			
6. Aeronautical Center Leased Telecommunications	0			
7. Worker's Compensation Program Management	0			
8. Procurement & Class Action Litigation	0			
9. MMAC Office of Acquisition (AMQ) Positions	0			
10. Delphi Asset Tracking Team (DATT)	0			
Total Base Transfers	**0**	**0**	**0**	**0**
Capital Expenses (Transfer from F&E)				
1. Capital Programs	10,000			
2. Capital Personnel & Related Expenses	250			
Total Capital Expenses	**10,250**	**0**	**0**	**0**
FY 2009 Request -- Total	**93,473**	**478**	**0**	**465**

Detailed Justification for Staff Offices – ASH

Security and Hazardous Materials (ASH)	FY 2009 Request: $93,473

Overview:

The Office of Security and Hazardous Materials (ASH) has the primary responsibility for protecting employees, contractors, facilities, and assets; emergency operations; contingency planning; and the safe transportation of hazardous materials in air commerce.

FY 2008 Program:

Protecting FAA's critical infrastructure is a national and homeland security concern that continues to receive high-level attention. ASH develops and implements policy to protect FAA employees, contractors, facilities, and assets. ASH conducts assessments and inspections at facilities to determine compliance with facility security, communications security, and classified and sensitive information orders and directives. ASH manages the ID Media Program for the agency and conducts suitability investigations of employees and contractors, as well as investigations of employees, nonemployees, contractors and airmen suspected of violating FAA orders and regulations. Also, ASH develops and implements national policy on transport of hazardous materials by air through regulatory inspections, training, and outreach to those involved in the hazardous materials industry worldwide.

ASH provides crisis management support by employing an integrated system of policy, procedures, personnel, facilities, and communications to ensure that FAA officials have timely and adequate information to plan, direct, and control all aspects of essential operations. Serving as the hub of the national network of operations centers, the Washington Operations Center Complex (WOCC) collects information, provides decision support, and coordinates activities essential to the daily conduct of FAA activities. In times of national emergencies, natural disasters and major incidents, WOCC functions as an action center for concentrated and accelerated agency efforts. Finally, ASH issues policy and guidance for Continuity of Operations (COOP) planning and implementation, serves as the command authority for secure telecommunications (secure telephone equipment, secure fax and defense message system) for all FAA offices, and supports the national security responsibilities of FAA.

Anticipated FY 2008 Accomplishments:

- Continue implementation of the multiyear strategic plan with the Pipeline and Hazardous Materials Safety Administration (PHMSA) and provide support with studies, rulemaking, and other documentation.
- Conduct 579 outreach efforts to shippers of critical HAZMAT commodities.
- Conduct over 7,000 hazardous materials regulatory inspections as follows:
  - 5,094 shipper and repair station assessments, and
  - 2,129 air carrier station inspections.
- Conduct the following inspections at FAA facilities:
  - 33 facility security assessments,
  - 207 facility security inspections,
  - 14 Communication Security (COMSEC) inspections,
  - 27 classified information inspections, and
  - 3 Technical Surveillance Countermeasures (TSCM) surveys or inspections.
- Implement a web-based incident reporting system for use by FAA personnel.
- Build and test the core infrastructure data processing and storage capabilities to support the FAA Identification Management System (IDMS) as envisioned in the Federal Information Processing Standards (FIPS) 201-1. This will provide required validation of Personal Identity Verification (PIV)

cards issued to FAA employees and contractors.

- Establish PIV card issuing station at FAA Headquarters and issue PIV cards to selected test populations within ATO and AVS, to all ASH personnel (federal and contractor) countrywide, and to key FAA COOP Cadre personnel.
- Process 95 percent of all employee investigations for newly hired air traffic controllers (est. 2,200) and non-controllers (est. 3,500) by September 30, 2008.
- Process 90 percent of all contractor employee investigations (est. 7,000) by September 30, 2008.
- Complete all investigations with a potential impact on safety, accountability board investigations, and hotline complaints within 30 workdays excluding those prolonged for reasons beyond the investigators control.
- Initiate regulatory investigations on all airmen involved in the sale or distribution of illegal drugs, and aircraft involved in illegal activity, within 30 days of knowledge of that activity.
- Support law enforcement investigations involving airmen and aircraft.
- Ensure a national emergency operations plan and structure exists to support national and regional operations during any Incidents of National Significance.
- Ensure that COOP facilities and procedures are continually available and regularly exercised to maintain continual facility operational capability.
- Maintain the WOCC to ensure a 24/7 agency-wide integration of critical, time sensitive information support of FAA senior leadership, the NAS and National Security Emergency Preparedness.
- Ensure the availability of command and control communications support to WOCC and regional entities FAA-wide.
- Deliver international dangerous goods courses as requested on International Civil Aviation Organization (ICAO) requirements for shipping hazardous materials by air transport.
- Improve cyber security by ensuring 100 percent of operational and deployed systems in inventory have completed current certification and accreditation (C&A) and undergo a self-assessment if C&A is not needed.

FY 2009 Budget Request:

For FY 2009, Security and Hazardous Materials requests $93,473,000 and 465 FTEs to meet its mission. This request includes $10 million of capital funds. This funding request is needed to support the following initiatives:

Security and Hazardous Materials will enforce the hazardous materials regulations in the aviation sector issued by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and execute a strategic plan with PHMSA to strengthen those regulations. Security and Hazardous Materials will also prioritize outreach efforts to target shippers of critical commodities to ensure the public, industry, and air carrier operators are educated on regulations about shipping hazardous materials by air. Finally, ASH will conduct inspections of:

- Shippers of hazardous materials that were identified during routine air carrier assessments.
- Air carriers that ship hazardous materials by air.
- Repair stations that ship hazardous materials by air.
- Shippers of hazardous materials by air that have been prioritized into risk-based categories using information shared with all DOT modal administrations.

ASH will also coordinate efforts with the Transportation Security Administration to address hazardous materials discovered as the indirect result of increased baggage and cargo security screening at airports.

ASH develops and implements policy and establishes requirements to protect FAA federal and contractor workforces, FAA facilities, systems, and operations. ASH will standardize and automate employee and contractor identification media issuance agency wide, strengthen procedures and processes for identity proofing, investigation, and media issuance affecting all FAA worksites and provide Public Key Infrastructure

(PKI) and Card Management System (CMS) services in support of all Personal Identity Verification (PIV) cards in use throughout the agency.

ASH will ensure that employment, or continued employment of persons in FAA will promote the efficiency of the service and safeguard national security. This program ensures all employees, applicants, and contractors have the appropriate background investigation as required by Executive, DOT, and FAA Orders. It also ensures that they receive fair and equitable treatment; are granted national security clearances when needed; and serves as the adjudicative authority in all agency security clearance denials and revocations.

ASH will investigate all allegations of misconduct by FAA employees and contractors. ASH will also conduct regulatory investigations on all airmen and aircraft involved in illegal drug activity or in threatening national security by using the NAS to commit criminal acts. ASH will provide support to law enforcement investigations involving airmen and aircraft.

The FAA is the largest contributor of technical and financial support to ICAO, which represents 190 of the world's civil aviation authorities. ASH will work with our international partners to disseminate our experience, expertise, and new technologies to ensure a safer and more secure global airspace while implementing presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.

ASH will conduct facility security assessments and inspections at FAA staffed facilities to determine status of the facility security management program and compliance with FAA Order 1600.69. ASH will conduct COMSEC inspections at FAA facilities to determine their compliance with FAA Order 1600.8, and National Security Agency (NSA)/United States Air Force (USAF) directives. ASH will inspect all areas that store classified national security information to determine compliance with FAA Order 1600.2 and other applicable directives; conduct TSCM surveys and inspections to determine compliance with FAA Order 1600.12.

ASH will ensure that all FAA Special Compartmented Information Facilities (SCIF) and all classified information networks and communications systems, located within the SCIF, meet all required national intelligence regulations.

ASH will ensure that a national emergency operations program and structure exist to support national and regional operations during any Incidents of National Significance (natural or technological disasters, pandemic influenza outbreaks, terrorism incidents, widespread communications outages). ASH will ensure the structure provides national level management, training, exercises and policy guidance on emergency readiness and response. ASH will also ensure the availability of command and control communications support through the WOCC and regional entities. This will be accomplished through:

- Planning, procurement, engineering, design, testing, and implementation of FAA-wide command and control communications, including classified messaging equipment.
- Ensuring that continuity of operations facilities and procedures, for example communications and logistics, are continually available and regularly exercised through readiness exercises and training, maintaining continual facility operational capability, and COOP Cadre management.
- Directing and providing guidance for the development, testing, and implementation of the agency-wide plan to sustain essential government services during a pandemic influenza outbreak.
- Ensuring that all personnel have adequate access to and training in the operation of secure communications equipment by providing national level management, training and policy guidance on the FAA-wide secure voice and facsimile program, and support various classified programs.
- Providing comprehensive response during national emergencies to include natural disasters, terrorist events, military mobilizations, and pandemic influenza.

ASH will further improve its cyber security by assuring the confidentiality, integrity, and availability of information and information systems. This will be accomplished by ensuring that all newly developed systems have completed current C&A and undergo a self-assessment if C&A is not required; recertify systems in the inventory; and remediate high vulnerabilities as identified in the Enterprise Security Portal (ESP).

FY 2009 Capital Programs:

1. NAS Recovery Communications (RCOM) – $10.0 million

This program provides FAA the minimum command and control communications (C3) capability necessary to direct the management, operation, and reconstruction of the National Airspace System (NAS) during local, regional, or national emergencies when normal common carrier communications are disrupted. The C3 program provides minimum capabilities for Continuity of Operations (COOP) for FAA. Where applicable, C3 is an OMB SAFECOM compatible program that encompasses multiple independent procurement projects, which are at various stages in the acquisition life cycle.

In 1995, the National Telecommunication and Information Administration (NTIA) required a decrease in the frequency bandwidth used by the current VHF/FM network. As a result, the older VHF/FM radios that are configured to the outdated frequency separation requirements cannot be used. In addition, the current system lacks coverage and integration with current VHF/FM equipment. This makes it difficult, and often impossible, to communicate over long distances. Network hardware has been fielded for about 20 years, long past its expected life cycle. For example, it would cost more to repair one module than to buy a new modern radio, yet for compatibility reasons, the repair of outdated equipment continues.

The Department of Defense (DoD) has phased out the Automated Digital Information Network (AUTODIN) and has incorporated secure organizational electronic messaging with the more capable Defense Message System (DMS). The FAA uses DMS as a means of sending and receiving secure message traffic in support of national security within air traffic, DoD, and FAA command and control areas. Other efforts within the C3 program relate to national security and are classified. Included in these efforts is the classified version of the Automated Detection and Processing Terminal (ADAPT) program. There are several operational command and control centers within the Washington area and around the country that need modernization. Since September 11, 2001, the C3 program responsibilities have increased to meet current national security demands.

The High Frequency (HF) radio network is the oldest of the C3 equipment. The system is over 20 years old (past its life cycle expectancy) and needs to be replaced. Also, there is a continued requirement for secure, fax, telephone, and conferencing capabilities. Two new secure conference bridges are required to increase nationwide secure communication capabilities.

For FY 2009 the RCOM program is requesting:

- $5.86 million to continue procurement of VHF/FM radio equipment supporting the modernization of the current VHF/FM network. Existing regional networks will continue to operate in the 25 kHz mode until all antiquated infrastructure equipment has been replaced with 12.5 kHz equipment.

- $0.40 million to continue implementation of the DMS. Upgrading from the outdated TACLANES, which were purchased in 2004, and upgrading the DMS system will enable FAA to continue to use DoD's robust secure organizational network. DMS will serve as a single system supporting administrative, operational, and command and control functions in providing connectivity between the FAA and vital federal agencies including the Department of Homeland Security, Department of State and other intelligence organizations.

- $2.01 million to fund other critical emergency communications, including HF radio equipment, secure communication equipment (such as secure conference bridge), automated notification system replacement/upgrade, Communication Support Team (CST) replacement and satellite communication.

- $1.73 million to continue modernization of operational COOP facilities.

New C3 equipment directly benefits FAA by reducing periodic and correctional maintenance costs of the old, technologically obsolete C3 equipment in the field. The C3 program also provides FAA with OMB and DHS SAFECOM compatible emergency communication systems, ensuring interagency interoperability. The C3 program office provides critical communications for both daily NAS operations and disaster and crisis management by providing:

- Increased command and control by national leaders in FAA and other agencies.
- Quicker response to natural and wartime disasters thereby helping avoid loss of life and property.
- Increased efficiency of flying time by FAA flight inspection aircraft and other public and private aircraft.
- Ensure COOP will be maintained.
- OMB and DHS SAFECOM compatibility.

Cost Estimate of Work Funded in FY 2009:

Activity Tasks	Locations / Quantity	Estimated Cost ($000)
1. VHF/FM Implementation	North Carolina, South Carolina, Pennsylvania, New York, Maine	5.86
Radio Replacement	402	
Base Stations Replacement	117	
Repeaters Replacement	128	
Mobile Radio Telephone Interconnect Units	336	
2. DMS Equipment		0.40
3. Procurement and Technical Refresh of Critical Emergency Communication Secure Telephones Secure Faxes HF Radios Automated Notification Secure Conferencing System Communications Support Team		2.01
4. Other C3 Efforts and Supporting Tasks		1.73
TOTAL		$10.0

Explanation of Funding Changes for Staff Offices

	Dollars ($000)	FTE
Staff Offices (Net change from FY 2008 Enacted)	**$851,073**	**2,783**

Overview:

For FY 2009, the Assistant Administrators for the 12 staff offices request $851,073,000 and 2,788 FTE to meet their respective missions. As this is an entirely new appropriation for FY 2009, this represents a 100 percent increase from the FY 2008 enacted level of zero.

The FY 2009 request level reflects the transfer of the FY 2008 base amount from the Operations appropriation, unavoidable pay raises and inflation; other uncontrollable adjustments such as security upgrades to U.S. foreign service posts overseas, financial systems upgrades, and user fee implementation costs; discretionary increases needed to consolidate offices, improve real property asset management, logistics, and capitalization, and enhance information and physical security of FAA systems and facilities; and base transfers from the ATO line of business. In addition, the staff offices request includes capital programs, personnel, and related expenses previously included in the Facilities & Equipment appropriation now incorporated into the Safety & Operations account.

The FY 2009 FTE request level consists of the transfer of the FY 2008 base amount from the Operations appropriation, an additional 45 for capitalization, five to integrate environmental performance into NextGen, two to set up FAA offices in Latin America, 11 to assist in HSPD-12 implementation, and a net gain of 58 due to base transfers.

	Dollars ($000)	FTE
Transfer from Operations		
FY 2008 Enacted Budget Level, Operations Appropriation: The FY 2008 enacted budget level includes $679.7 million in the Operations appropriation for Staff offices. This "base" amount is being transferred into the new Safety & Operations appropriation to align with the FAA's proposed account structure and reauthorization proposal.	679,656	2,650
Unavoidable Adjustments		
Annualized FY 2008 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.5 percent average government-wide pay raise in January 2008. The actual factor used is 4.4 (3.5 percent plus 0.9 percent average of Within-Grade increases). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	543	
Annualized FY 2008 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2008. The OSI is 88 percent of the 3.5 percent average government-wide pay raise plus 1.0 percent (3.96 percent). The Core Compensation system	3,862	

	Dollars ($000)	**FTE**
awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.		
FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 1.0 percent average of Within-Grade increases.	1,589	
FY 2009 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.	9,759	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	1,581	
One Less Compensable Day: This decrease is due to the subtraction of one compensable day in FY 2009 (261 in FY 2009 versus 262 FY 2008).	-1,273	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2008 GDP price	9,239	

	Dollars ($000)	FTE
index (year over year) of 2.3 percent.		
Uncontrollable Adjustments		
Capital Security Cost Share: This increase represents FAA's share of the Capital Security Cost Sharing program, a multiyear effort to build and upgrade foreign service posts to make them meet increased security needs.	1,000	
Financial Systems Upgrades: The Assistant Administrator for Financial Services (ABA) will begin the development and implementation of several OMB and DOT mandated upgrades to the Delphi financial system to meet Government wide goals and initiatives. In particular, ABA will need to upgrade its system to convert from the old DOT accounting structure to the new Common Government-wide Accounting Code (CGAC). CGAC will simplify the process of financing and accounting for interagency and public-private partnerships. By removing some of the major administrative obstacles to financing cross-agency initiatives, FAA will be able to make use of specialized expertise elsewhere in government while lending our own talent and expertise to other agencies. Without financial system upgrades, these opportunities will be lost. CGAC will also make analysis of agency resources and expenditures much easier. With a standard accounting system, FAA's financial performance can be benchmarked against other agencies. With an updated, integrated system, FAA will also be able to easily adapt budget execution and reporting tools being developed by other agencies, saving the agency the cost of developing these tools in house. By upgrading our systems to meet the requirements of CGAC, FAA will also be able to use extensible markup language-based data extraction software. This software will improve our reporting capabilities, allowing us to interface accounting system data directly with data analysis and reporting programs such as Microsoft Excel and Adobe Acrobat. These benefits are not without cost however. ABA will need to overhaul FAA's core financial system and all of its feeder systems, including our acquisition system PRISM. ABA will also have to convert FAA's financial management systems to Oracle 12.Financial Information Standards Office (FISO). Delphi uses Oracle's federal financial software for the core accounting system. Starting in FY 2009, FAA will work with DOT to upgrade the existing version of Delphi to Oracle 12.FISO. The FISO upgrade will require a complete overhaul of the system, forcing ABA to convert all the agency's financial data and re-implement the DELPHI system. Throughout this process ABA will still need to	8,455	

	Dollars ($000)	FTE
maintain the legacy system, resulting in the creation of two separate operating environments. ABA will also need to re-engineer its business processes to accommodate these major initiatives. The FAA will develop processes to improve data integrity and clean up current data to prepare for the complete re-implementation and data conversion to Oracle 12.FISO.		
Capitalization Staffing: The FAA received a Material Weakness and a Qualified Opinion on its FY 2006 Financial Statements as a result of long standing issues associated with the Construction-In-Progress (CIP) account. In December 2006, FAA developed an aggressive action plan to clear the backlog in the CIP account and implement the recommendations in the audit report for improvement in the capitalization process. Although FAA has made great progress in clearing up the backlog, major changes are needed if FAA is to sustain timely and accurate capitalization of assets. The current capitalization process is decentralized throughout FAA regions, centers, and headquarters. This has caused difficulty in implementing an efficient and effective capitalization program. Since program managers in headquarters spend 85 percent of the money for capital programs, ABA must centralize many of the key capitalization functions in headquarters to adequately oversee the process. Ensuring accurate and timely asset accounting in FY 2009 and beyond will require additional resources. ABA proposes converting existing contract resources being used to assist capitalization efforts into 19 FTE. This increase in staff will ensure that capitalization operations are performed in a timely manner. These FTE's will also be responsible for developing internal controls and ongoing process improvements. These positions will help the FAA to sustain Clean Audit opinions with no Material Weaknesses. These positions will provide the following improvements: • Maintenance of accurate and timely audit ready records throughout the year. • Streamlined processes and elimination of redundant work. • Consistent application of project setup and the processing of transactions. • Enhanced internal controls to prevent inaccurate or untimely data. • Analysis/correction of inaccurate information immediately upon detection.	0	19
Facilities Management and Security Administrative space leases were base transferred from the Air Traffic Organization (ATO), the Aviation Safety Organization (AVS) and the Security and Hazardous Materials Organization (ASH) to	4,320	

	Dollars ($000)	FTE
the Associate Administrator for Regions and Center Operations (ARC) during the FY 2007 appropriations process. These leases support a broad range of agency operations including Flight Standards District Offices, Aircraft Certification Offices, System Maintenance Offices, Airport District Offices and the agency's Regional and Headquarters Offices. Commercial office rental costs have steadily risen throughout the country, and jumped an average of 3.1 percent nationwide during the third quarter of FY 2007 alone. An additional $4,320,000 is requested to address the cost increase.		
Discretionary Increases		
CMEL Lease and Support Contract: The FAA Center for Management and Executive Leadership (CMEL) is responsible for development and delivery of management, executive leadership, and general training, along with related training support services, for the FAA. CMEL also provides these products and services to other aviation customers, both domestic and international on a fee for service arrangement. CMEL provides mission critical training and support services to DOT and FAA. The curriculum at CMEL has recently been restructured to support FAA's managerial workforce plan and other required management development training programs. CMEL supports the Agency's continuing efforts to ensure a safe, more efficiently managed National Airspace System. The current lease and maintenance contract with Embry Riddle Aeronautical University (ERAU) was awarded almost 20 years ago, and expired on August 21, 2007. Although negotiations are ongoing, we feel safe to assume the cost of renting this facility will have increased at a rate similar to those in the rest of the country. The contract includes costs for space, utilities, general maintenance and operations, janitorial services, security, central desk, grounds maintenance, food, maid and linen service and swimming pool support. A short-term bridge lease is being established for up to five years until a new long-term lease and maintenance contract using competitive procedures can be awarded. The bridge contract will have one base year and four option years. Without funding for a lease, the CMEL program may not be able to maintain the facilities necessary to carry out its mission. This would stymie FAA's efforts to train the emerging aviation leaders both within and outside the agency.	700	
Consolidate AVS offices in Florida: The AirTran Certification Management Office (CMO) and North Florida Flight Service District Office (FSDO) are located within the same physical facility under two separate leases. There are South Florida CMO Remotely Sited Employees (RSE) physically located within the North Florida FSDO. Their current space does not adequately meet the needs of the employees and there is no room for growth. The North Florida FSDO anticipates adding another	1,900	

	Dollars ($000)	FTE
eight inspectors, and without consolidation there will be inadequate space for them. The FAA needs funding to support a relocation that will provide the facilities necessary to support the growth of the CMO's and FSDO's. In addition, the North Florida FSDO needs replacement systems furniture. Their furniture is over 20 years old and there are continued problems with the electrical connections in the bottom of the panels. The electrical connections are causing problems with the telecommunications system and office equipement. Unless replaced, the faulty electrical connections will continue to cause disruptions in operations and a fire safety hazard. The $1.9 million increase is the net cost of consolidating the Orlando facilities (including the North Florida Flight Service District Office (FSDO), AirTran Certification Management Office (CMO), the South Florida Certification CMO, and the South Florida FSDO (including the Fort Lauderdale physical location, Miami International Field Office, and South Florida CMO). This consolidation is consistent with the President's Management Agenda goals. By consolidating these offices, AVS will be able to pool certification staffing and facility resources. Shared resources will include a breakroom, large conference room to house various types of meetings, and LAN room, to allow for a more effective utilization of overall space. Consolidating the CMO's will also allow AVS to coordinate its efforts, providing greater consistency of service and standards in its certification operations.		
Logistics Support Services Contract: The Logistics Support Services Contract (LSSC) program allows the agency to acquire contractor-supplied services to perform real property acquisition, contracting activities, and materiel management services in support of FAA Capital Investment Plan projects, and to conduct capitalization and property control-related activities. These services currently account for a significant portion of the workforce for acquisition, real estate, and materiel management in the regions and centers. The LSSC program is instrumental in establishing new or upgraded facilities, including air traffic control towers and TRACONs, throughout the NAS. LSSC program resources are required to conduct asset tracking and documentation efforts to obtain and maintain a clean audit opinion. These services will also be used to implement the FAA Facility Risk Management Program. The additional funding represents the annual increase in labor prices based on the contractual wage increases agreed upon with the vendor of the services. The FAA is already acquiring these services at or below market rates for labor. Also, the FY 2007 and FY 2008 funding levels will not cover the project program funding requirements so additional funding in FY 2009 and beyond will be required to overcome the shortfalls and work backlogs generated by the FY 2007 and FY 2008 shortfalls.	1,800	

	Dollars ($000)	FTE
Increased Government-wide reporting and oversight (e.g. enhanced use of OMB-300's) requires the FAA to ensure the accuracy of its real and personal property management. The LSSC program is an essential part of these efforts (e.g. the FAA's cost accounting and capitalization effort).		
Real Property Asset Management: During FY 2006, FAA was selected to lead the Department of Transportation's efforts to support the PMA initiative for federal real property management. The FAA's Aviation Logistics Office maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 69,500 buildings, structures, and land parcels. This increase will provide contractor support to address the need for hard to staff logistics experts in the regions, and to plan, track, acquire, and dispose of the agency's real property. Funding for this program will allow FAA to acquire and maintain the real property necessary to make capital projects possible and support ongoing NAS operations at existing sites. Additionally, the regions and centers will not be able to develop and maintain the statutory documentation (e.g. capitalization and financial reporting) necessary as part of the FAA's reporting requirements to OMB and Congress. The FAA has a shortage of Government logistics personnel at regions and centers for real estate, acquisition management, and materiel management to modernize the NAS and capitalize agency assets. Without adequate logistics services, real estate, such as the land required for NAVAIDs will not be acquired, contracts to buy or upgrade equipment and construct facilities such as consolidated TRACONS or ATCTs will not be awarded, and modernized equipment and systems will not be efficiently installed and commissioned. The FAA will also be unable to adequately document the capital cost of F&E facilities or comply with mandatory accounting standards set by the Government Accountability Office.	2,200	
Information Security Enhancement: Under the Federal Information Security Management Act (FISMA) of 2002, FAA is required to ensure that all information systems identify and provide information security protection equal to the risk and magnitude of the harm resulting from unauthorized access, use, disclosure, disruption, modification, or destruction of information that support the agency, aviation safety and security, and the NAS. The FAA must protect the integrity and availability of all its critical	7,600	

	Dollars ($000)	**FTE**
information systems, networks, and administrative systems under conditions of increased cyber terrorism and malicious activities by nation states, hackers and other unauthorized personnel. In the Homeland Security Presidential Directive HSPD- 7, dated December 17, 2003, FAA was directed to protect and ensure the confidentiality, integrity and availability of all National Airspace Information Systems and all federal information. Funding will be used for the following activities: <u>Maintain and improve the Cyber Security Management Center (CSMC) capabilities – $3,900,000</u> CSMC monitors FAA networks and systems in the NAS and administrative systems to detect intrusions by cyber-terrorists and other unauthorized personnel. In FY 2009 CSMC will continue to increase its monitoring of local area networks and desktops within FAA. In addition, the Department of Transportation will join the FAA's CIO to protect the cyber assets of the Department. DOT and FAA have agreed to merge operations and management of the DOT Transportation Cyber Incident Response Center and FAA CSIRC into the Cyber Security Management Center (CSMC) to protect information technology assets. This merger will require additional funding for contract support, hardware and software. Also, a disaster recovery site for the CSMC operation has been established which will require funding for leases, utilities, hardware and software. <u>Correcting vulnerabilities discovered in the NAS - $2,700,000</u> It is imperative that FAA correct system vulnerabilities. Several of these systems, *High* and *Moderate* vulnerabilities are in mission critical NAS systems, critical AVS safety and medical applications, and essential business and security systems. In addition, every major capital investment has several *High* and *Moderate* vulnerabilities scheduled for remediation in FY 2009. Without correction, these vulnerabilities will continue to threaten systems that represent crucial components of the NAS and major taxpayer investments. <u>Recertification of IT systems - $1,000,000</u> The Federal Information Security Management Act (FISMA) requires the IG to perform annual assessments on the agency's Information System Security (ISS) program. The FAA continuously strives to implement the recommendations from these reports. Each year Congress provides a letter grade assessment of the cyber security program. While DOT/FAA has improved its grade in recent years, there is much more to do. Failure to complete recertification activities could delay activities until vulnerabilities are addressed. As we upgrade our equipment, data systems, and telecommunications, we must upgrade our ability to secure our		

	Dollars ($000)	FTE
networks, or face the risk of compromising information that could allow malicious users to sabotage or even hijack FAA systems.		
Class Action Litigation Support: The Chief Counsel (AGC) is engaged in seven class action lawsuits on behalf of FAA. These suits are complicated, involving disparate claims of discrimination and involving numerous complainants. This $1.08 million increase is needed to fund the costs associated with the use of labor economists, organization experts, industrial psychologists, documentation management specialists, and legal experts as these suits continue. The client base involved in these suits is diverse, as nearly every organization in FAA is somehow affected. Given the diversity of the client base, it is infeasible to assess fees to clients directly. A direct source of funding will be required. The potential financial liability to the federal government is huge. If FAA manages to win these suits, it can help to dissuade future lawsuits. If FAA loses, it will open the door for more suits, creating an ongoing legal crisis that will drain millions from the public coffers. It is imperative the agency has access to the legal resources it needs to adequately defend itself.	1,078	
Integrate Environmental Performance into NextGen: The National Park Service (NPS) has become increasingly active in opposing aircraft over flights of national parks by challenging FAA's environmental methodologies and criteria, and attempting to substitute extremely sensitive NPS environmental determinations (e.g., audibility of noise to human ear, inconsistency of park values with sight and sound of aircraft, adverse cultural effects). This affects a broad array of FAA programs including airport development proposals, airspace redesign, and air tour management programs where FAA and NPS share legislative responsibilities at Grand Canyon and other national parks. Funds being requested will be used to conduct in-depth studies on the impact of any proposed flight routing, airport development, or NAS improvements. With these resources, FAA will be able to streamline the environmental review process. This will help avoid delays in constructing new airports, such as occurred with St. George airport, which took an additional 3.5 years and $3 million to complete because of delays in completing an environmental impact study. Analysis conducted will also allow FAA to reject impacts identified by others that have no sound scientific basis. By providing our own studies as a counterpoint, the agency will be able to counter the constraints placed on the growth of aviation, in small communities, by unfounded conclusions and hypersensitive	704	

	Dollars ($000)	FTE
requirements derived from studies by outside entities.		
FAA Offices in Latin America: Funding would support two senior representatives in Latin America, a region of increasing economic and political importance to the United States. These individuals would be tasked with supporting several key agency initiatives: supporting international aviation agreements, providing technical assistance to our allies, encouraging the adoption of safety policies and procedures that are in sync with U.S. practices, and promoting U.S. aviation technologies and services. The FAA is setting up these offices, but only with bare bones staffing. Senior leadership is essential if FAA is to carry out its mission in Latin America. The FAA's request reflects the importance of U.S. leadership to the countries of the region. The Senior FAA Representatives would be responsible for pursuing FAA's overall strategy to develop and implement the Next Generation Transportation System. The FAA representatives will: • Support the adoption of Global Navigation Satellite System (GNSS) technologies and procedures in Latin America • Develop regional aviation cooperation, and support the growth trend of aviation activity in a safe, efficient and environmentally friendly manner • Strengthen working relationships between technical and operational personnel by sharing data, expertise, and training • Provide a counterbalance to growing European and Asian influence in the region. The FAA now has the opportunity to work with the newly created National Civil Aviation Agency, located in Brazil, in addition to continuing the partnerships established with the Department of Air Traffic Control (DECEA). Having an on-site FAA representative in Brazil will be important to the work FAA and Brazil is pursuing regarding the recently expanded 2004 Bilateral Aviation Safety Agreement's Implementation Procedures for Airworthiness. This agreement defines the civil aeronautics products parts and appliances eligible for import into the U.S. and Brazil, fosters the exchange of information on the implementation of Safety Management Systems, as it relates to airport operations, establishes the requirements for an agreement related to a Ramp Inspections database system, and continues nurturing the FAA and DECEA partnership to implement GNSS and promote this technology as the alternative to Europe's Galileo. The U.S. aviation industry needs a strong government partner in this region of the world. Without U.S. government support, it risks losing out to European aviation companies, which are already making considerable inroads into what is an important emerging market. The FAA representatives will also promote U.S. safety practices and standards. This will help to improve the safety of air	386	2

	Dollars ($000)	FTE
travel for American citizens traveling in and out of the region.		
HSPD-12 Implementation: The protection of FAA's critical infrastructure is a national security concern that continues to receive a high level of attention in light of the continued threats, hostile terrorist activity within the U.S. as well as against U.S. interests abroad. The Assistant Administrator for Security and Hazardous Materials (ASH) develops and implements policy and establishes requirements that are met by other FAA elements to protect the agency's federal and contractor workforce and facilities, systems, and operations. Protection of the NAS and FAA activities pertaining to it, in turn, contributes to the safety of the traveling public and to national and homeland security. To protect our infrastructure, FAA is developing and implementing the ID Media Program. The objective of the ID Media Program is to ensure that only authorized personnel are allowed access to critical FAA facilities and systems. New program requirements, which will now be automated and institutionalized by the new system and smartcards include: • more stringent identity-proofing of prospective cardholders • government-wide standardization of minimum investigative requirements for access to federal facilities and data • standardization of government-wide identification media appearance • incorporation of biometric identification factor data and PIN numbers within the smartcard's chip In FY 2009, ASH will build upon the HSPD-12 Common Identification Standard, Identification Management System (IDMS) and PIV-II smartcard-issuing system created in FY 2007. In FY 2008 the PIV-II cards will be put into large scale production to replace the PIV-I cards currently issued to FAA personnel. ASH will use its own field staff, as well as designated, trusted, part-time agents provided for use in identification media enrollment and PIV issuance at local sites. This will allow FAA to issue another 35,000 PIV-II smartcards by the end of FY 2009, laying the groundwork for full system deployment. FY 2009 funding will permit the establishment of enrollment and issuing stations to issue PIV-II smart cards to employees and contractors at all the facilities within several FAA regions and centers. Thirty five thousand (35,000) smartcards will be issued during FY 2009, and the groundwork and processes to issue 10,000 more cards to achieve full deployment will be accomplished by the end of calendar year 2009. Funding cannot be pulled from other ASH projects to complete the program without severe, adverse impact to those projects. This infrastructure is vital to the implementation of the PIV program. Without this requested increase, FAA will not be able to	6,270	11

	Dollars ($000)	**FTE**
deploy PIV-II smartcards. Without the capacity to create and issue new cards, FAA facilities and networks will not be able to meet the security standards required in HSPD-12, and FAA facilities and networks may become vulnerable to infiltration.		
Capitalization: The FAA received a Material Weakness and a Qualified Opinion on its FY 2006 Financial Statements as a result of long standing issues associated with the Construction-In-Progress (CIP) account. In December 2006, FAA developed an aggressive action plan to clear the backlog in the CIP account and implement the recommendations in the audit report for improvement in the capitalization process. Although FAA has made great progress in clearing up the backlog, major changes are needed if FAA is to sustain timely and accurate capitalization of assets. Ensuring accurate and timely asset accounting in FY 2009 and beyond will require additional resources. To complement the efforts being carried out by the Assistant Administrator for Financial Services (ABA), the Assistant Administrator for Region and Center Operations (ARC) requests an increase of $2.0 million and 26 FTE for enhanced capitalization activities. The ARC organization has assessed the impacts of ABA's newly established capitalization requirements and determined that additional resources and staffing are necessary for their implementation. These requirements are: a) Future efforts are to follow the ABA "To Be" process. This will implement changes in roles and responsibilities, organizational structures, business processes, automation, and policies and procedures so the agency will be able to successfully sustain the timely capitalization of assets. b) Future audit samples are to be given quarterly and will follow a new standard operating procedure format. c) Clean-up efforts are required to address the current backlog. d) Clean audit efforts are required for mass additions work. e) Sustaining efforts are required for mass additions work. This requested increase is based on historical audit resource staffing, the projected number of audit samples, and average time spent on each sample per year.	2,000	26
Base Transfers		
Workforce Planning: The Office of Energy, Planning and the Environment (AEP) will transfer $1,234 and 5 FTE to the Office of Human Resources (AHR). This move will help the agency consolidate human resource policy and planning functions. As both organizations are included under Staff Offices, this transfer results in no change to the Staff Offices budget line item.	0	0

	Dollars ($000)	FTE
Regional Operations Center: The Air Traffic Organization (ATO) will transfer $99,000 and one FTE to the Assistant Administrator for Region and Center Operations (ARC). This accommodates the movement of a regional operator in FAA's Eastern Region to the Regional Operations Center.	99	1
Information Technology: Within FAA's Great Lakes Regional Office in Chicago, IL, $55,998 and one FTE will be transferred from the Assistant Administrator for Civil Rights (ACR) to the Information Technology Office of the Assistant Administrator for Region and Center Operations (ARC). The employee is on detail in ARC and has requested a permanent transfer. As both organizations are included under Staff Offices, this transfer results in no change to the Staff Offices budget line item.	0	0
Capitalization: As a component of the agency's enhanced capitalization process, the Assistant Administrator for Financial Services (ABA) will transfer $400,000 to the Assistant Administrator for Region and Center Operations (ARC). These resources will allow ARC to hire one additional FTE in Headquarters and one additional FTE in each of FAA's three service centers (Atlanta, Fort Worth, and Seattle) to manage regional capitalization activities. As both organizations are included under Staff Offices, this transfer does not change the dollars requested, but does add four positions and FTE in ARC.	0	4
Aeronautical Center Facility Management: The Mike Monroney Aeronautical Center (MMAC) in Oklahoma City employs approximately 5,000 government and contract personnel, the largest concentration of Department of Transportation staff outside of Washington, DC. Its 1,100 acres encompass 55 occupied buildings and 71 unoccupied facilities. While facility management functions for FAA Headquarters were consolidated under the Assistant Administrator for Region and Center Operations (ARC) in FY 2007, management of the MMAC remained in the ATO. This transfer of $27.8 million and 46 FTE further consolidates the agency's facility management responsibilities within ARC by incorporating the Aeronautical Center. This agreement covers the resources for the efficient operation and maintenance of the MMAC facilities, including the following functions: • Physical plant operations and maintenance • Architecture, engineering, and space planning • Furniture and moving services	27,814	46

	Dollars ($000)	**FTE**
• Environmental, safety, and health program management • Employee services management		
Aeronautical Center Leased Telecommunications The Aeronautical Center has its own Private Branch Exchange (PBX), a Nortel SL-100 Digital Telephone System. AMI-400 is the Telecommunications Service Group responsible for managing all telecommunications requirements for the Mike Monroney Aeronautical Center. Telecommunications funding for this activity is currently requested within the Air Traffic Organization. This transfer would align funding with management responsibility.	652	0
Worker's Compensation Program Management: The ATO will transfer $108,000 and one FTE to the Assistant Administrator for Human Resource Management (AHR). This transfer furthers the consolidation under AHR of FAA's worker's compensation program management.	108	1
Procurement & Class Action Litigation: This transfer of $2 million from the ATO to the Chief Counsel (AGC) covers ATO-related legal services generated primarily by increases in procurement activity and class action litigations. The transfer consists of $1 million required to cover PC&B costs for six personnel hired by AGC for ATO-related legal support and $1 million needed to cover contract support for anticipated class actions. The one position and FTE included in this transfer is for the law librarian.	2,000	1
Aeronautical Center Acquisition Positions When the National Aeronautical Charting Office (NACO) was transferred from the Department of Commerce and the National Oceanographic and Atmospheric Administration in October 2000, these two positions were provided to the Aviation System Standards (AVN) organization. The positions represent the increased level of support AVN requires from the Office of Acquisitions (AMQ) to conduct acquisition activities.	225	2
Delphi Asset Tracking Team (DATT) The ATO will transfer $383,116 and three FTE to the Assistant Administrator for Financial Services (ABA). This transfer will help to improve internal controls and data reliability of the capitalization process of headquarters facilities and equipment.	383	3
Capital Programs		
FY 2009 Capital Programs:	76,425	

	Dollars ($000)	FTE
Consistent with FAA's new account structure under the financing reform proposal, the Safety & Operations appropriation includes capital programs from the former Facilities & Equipment appropriation. The staff offices with these funds include:		

	Dollars ($K)
Financial Services (ABA)	2,553
Region and Center Operations (ARC)	50,450
Information Services (AIO)	13,120
Aviation Policy, Planning & Environment (AEP)	52
Security and Hazardous Materials (ASH)	10,250
Total, Staff Offices	76,425

A summary table of these programs is provided on page four of this section, with details on these capital programs included in each staff office's narrative justification section.

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Resource Summary

Staff Office Total

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	291,152	314,882	17,394	5,845	338,122
Other Objects					
Travel/Transportation	10,754	12,123	1,114	-	13,237
Other Services	184,348	195,325	109,006	12,357	316,688
RCU [2]	120,732	142,767	17,822	1,986	162,575
Other [3]	17,767	14,558	1,443	4,450	20,451
Total	333,601	364,774	129,385	18,793	512,951
Total	**624,753**	**679,656**	**146,779**	**24,638**	**851,073**
Staffing					
EOY (FTP)	2,445	2,576	94	44	2,714
OTFTP	90	88	(1)	-	87
Total FTEs (Includes FTP and OTFTP)	2,490	2,650	94	44	2,788

Resource Summary

ABA

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	16,134	16,995	4,714	-	21,709
Other Objects					
Travel/Transportation	182	185	4	-	189
Other Services	57,855	79,590	9,166	-	88,757
RCU [2]	288	294	6	-	300
Other [3]	1,503	3,528	74	-	3,602
Total	59,827	83,598	9,250	-	92,848
Total	**75,962**	**100,593**	**13,964**	**-**	**114,557**
Staffing					
EOY (FTP)	121	141	28	-	169
OTFTP	-	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	120	141	28	-	169

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AHR

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	61,392	64,610	3,455	-	68,065
Other Objects					
Travel/Transportation	1,624	1,709	91	-	1,801
Other Services	20,860	21,973	1,175	-	23,147
RCU [2]	246	259	14	-	273
Other [3]	2,548	2,663	142	-	2,805
Total	25,278	26,604	1,422	-	28,026
Total	**86,670**	**91,214**	**4,877**	**-**	**96,091**
Staffing					
EOY (FTP)	565	581	6	-	587
OTFTP	31	32	-	-	32
Total FTEs (Includes FTP and OTFTP)	589	610	6	-	616

Resource Summary

ARC

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	80,326	90,110	3,143	1,914	95,167
Other Objects					
Travel/Transportation	4,260	4,553	266	-	4,818
Other Services	63,575	49,254	68,522	4,175	121,951
RCU [2]	118,339	140,585	17,663	1,986	160,233
Other [3]	8,968	2,347	2,303	525	5,175
Total	195,142	196,738	88,753	6,686	292,177
Total	**275,467**	**286,848**	**91,896**	**8,600**	**387,344**
Staffing					
EOY (FTP)	741	759	59	26	844
OTFTP	29	29	-	-	29
Total FTEs (Includes FTP and OTFTP)	747	801	59	26	886

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AIO

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	12,558	14,300	1,549	-	15,849
Other Objects					
Travel/Transportation	720	858	2	-	860
Other Services	21,453	22,761	16,515	4,735	44,011
RCU [2]	36	37	3	-	40
Other [3]	1,198	694	(2,861)	2,865	699
Total	23,408	24,350	13,659	7,600	45,609
Total	**35,966**	**38,650**	**15,208**	**7,600**	**61,458**
Staffing					
EOY (FTP)	78	95	6	-	101
OTFTP	7	6	-	-	6
Total FTEs (Includes FTP and OTFTP)	85	95	6	-	101

Resource Summary

AOA

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	3,390	3,789	163	-	3,951
Other Objects					
Travel/Transportation	133	136	18	-	154
Other Services	254	279	94	-	373
RCU [2]	39	40	1	-	41
Other [3]	299	101	2	-	103
Total	725	555	115	-	671
Total	**4,115**	**4,344**	**278**	**-**	**4,622**
Staffing					
EOY (FTP)	21	24	-	-	24
OTFTP	2	4	-	-	4
Total FTEs (Includes FTP and OTFTP)	25	28	-	-	28

[1] FY 2007 derived from actual obligations.

[2] Rents, Communications, Utilities.

[3] Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

ACR

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	7,475	8,021	330	-	8,351
Other Objects					
Travel/Transportation	429	522	107	-	629
Other Services	696	648	74	-	722
RCU [2]	29	25	5	-	30
Other [3]	382	138	90	-	227
Total	1,536	1,333	275	-	1,607
Total	**9,011**	**9,353**	**605**	**-**	**9,958**
Staffing					
EOY (FTP)	64	75	(1)	-	74
OTFTP	9	4	-	-	4
Total FTEs (Includes FTP and OTFTP)	72	79	(1)	-	78

Resource Summary

AGI

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	1,286	1,363	113	-	1,476
Other Objects					
Travel/Transportation	9	12	0	-	12
Other Services	18	20	(17)	-	4
RCU [2]	17	19	2	-	21
Other [3]	39	23	4	-	27
Total	83	74	(11)	-	63
Total	**1,369**	**1,437**	**102**	**-**	**1,539**
Staffing					
EOY (FTP)	10	12	-	-	12
OTFTP	2	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	11	12	-	-	12

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AOC

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	4,643	5,163	203	-	5,366
Other Objects					
Travel/Transportation	84	75	2	-	77
Other Services	1,134	987	156	-	1,143
RCU [2]	36	21	1	-	22
Other [3]	186	90	1	-	91
Total	1,440	1,173	160	-	1,333
Total	**6,083**	**6,336**	**363**	**-**	**6,699**
Staffing					
EOY (FTP)	32	34	-	-	34
OTFTP	-	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	29	34	-	-	34

Resource Summary

AGC

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	32,336	34,135	2,904	-	37,039
Other Objects					
Travel/Transportation	611	666	99	-	765
Other Services	3,445	3,781	248	1,078	5,107
RCU [2]	82	97	13	-	110
Other [3]	283	304	251	-	555
Total	4,420	4,848	611	1,078	6,537
Total	**36,756**	**38,982**	**3,515**	**1,078**	**43,575**
Staffing					
EOY (FTP)	235	241	1	-	242
OTFTP	7	9	-	-	9
Total FTEs (Includes FTP and OTFTP)	237	245	1	-	246

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AEP

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	10,951	11,520	(473)	704	11,751
Other Objects					
Travel/Transportation	124	124	53	-	178
Other Services	1,529	1,756	21	-	1,777
RCU [2]	31	31	0	-	31
Other [3]	123	111	1	-	112
Total	1,808	2,022	76	-	2,098
Total	**12,758**	**13,542**	**(397)**	**704**	**13,849**
Staffing					
EOY (FTP)	83	87	(5)	-	82
OTFTP	1	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	85	88	(5)	-	83

Resource Summary

API

	FY 2007 Actual [1]	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	9,883	10,397	280	386	11,063
Other Objects					
Travel/Transportation	983	1,108	18	-	1,125
Other Services	2,373	3,692	1,111	-	4,803
RCU [2]	431	459	91	-	550
Other [3]	338	356	11	-	366
Total	4,125	5,615	1,230	-	6,845
Total	**14,008**	**16,012**	**1,510**	**386**	**17,908**
Staffing					
EOY (FTP)	58	60	-	2	62
OTFTP	2	2	(1)	-	1
Total FTEs (Includes FTP and OTFTP)	61	63	-	2	65

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

ASH

	FY 2007 Actual [1]	FY 2008 Enacted	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	50,778	54,480	1,014	2,841	58,335
Other Objects					
Travel/Transportation	1,595	2,175	455	-	2,630
Other Services	11,157	10,585	11,941	2,369	24,895
RCU [2]	1,159	900	23	-	923
Other [3]	1,900	4,205	1,425	1,060	6,690
Total	15,810	17,865	13,844	3,429	35,138
Total	**66,588**	**72,345**	**14,858**	**6,270**	**93,473**
Staffing					
EOY (FTP)	437	467	-	11	478
OTFTP	-	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	429	454	-	11	465

1 FY 2007 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

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AIR TRAFFIC ORGANIZATION (ATO)

For necessary expenses of the Federal Aviation Administration, not otherwise provided for, including administrative expenses for research and development; establishment of air navigation facilities; subsidizing the cost of aeronautical charts and maps sold to the public; lease or purchase of passenger motor vehicles for replacement only; acquisition, establishment, technical support services, improvement by the contract or purchase, and hire of air navigation and experimental facilities and equipment, as authorized under part A of subtitle VII of title 49, United States Code, including initial acquisition of necessary sites by lease or grant; engineering and service testing, including construction of test facilities and acquisition of necessary sites by lease or grant; construction and furnishing of quarters and related accommodations for officers and employees of the Federal Aviation Administration stationed at remote localities where such accommodations are not available; and the purchase, lease, or transfers of aircraft from funds available under this heading; $1,423,956,000 and in addition, $8,245,922,000, which shall be derived from the Airport and Airway Trust Fund: Provided, That of the total amount provided herein, not to exceed $7,078,793,000 shall be available for Salaries and Expenses, and not to exceed $2,591,085,000 shall be available for Capital Programs, of which $2,147,110,000 shall remain available until September 30, 2011: Provided further, That in addition, there may be credited to this appropriation, as offsetting collections, funds received from States, counties, municipalities, other public authorities, and private sources, which shall be available for expenses incurred in the provision of agency services, including receipts for the maintenance and operation of air navigation facilities, receipts for the establishment and modernization of air navigation facilities.

Program and Financing (in millions of dollars)

Identification code: 69-1336-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
00.01	Salaries & Expenses	....	....	7,079
00.02	Capital Programs	....	....	2,073
01.00	Subtotal, Direct Program	....	....	9,152
09.01	Reimbursable program	....	....	300
10.00	Total new obligations	....	....	9,452
	Budget resources available for obligation:			
22.00	New budget authority (gross)	....	....	9,970
23.95	Total new obligations	....	....	-9,452
24.40	Unobligated balance carried forward, end of year	....	....	518
	New budget authority (gross), detail:			
	Discretionary:			
40.00	Appropriation	....	....	1,424
	Spending authority from offsetting collections:			
	Discretionary:			
58.00	Offsetting collections (cash)	....	....	8,546
70.00	Total new budget authority (gross)	....	....	9,970
	Change in obligated balances:			
73.10	Total new obligations	....	....	9,452
73.20	Total outlays (gross)	....	....	-7,644
74.40	Obligated balance, end of year	....	....	1,808
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	....	....	7,644
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	....	....	-8,246
88.00	Federal sources	....	....	-200
88.40	Non-Federal sources	....	....	-100
88.90	Total, offsetting collections (cash)	....	....	-8,546
	Net budget authority and outlays:			
89.00	Budget authority	....	....	1,424
90.00	Outlays	....	....	-902

For 2009, FAA proposes a new budget account, Air Traffic Organization that better aligns with FAA's lines of business. This account provides funds for the operation, maintenance, communications, and logistical support of the air traffic control and air navigation systems, including the deployment of communications, navigation, surveillance and related equipment and technology. As a performance-based organization, ATO is designed to provide cost-effective, efficient, and, above all, safe air traffic services. In 2009, this account includes funding for FAA initiatives related to the Next Generation Air Transportation System, a joint effort between FAA, NASA, and other agencies to design the future operating environment. The funding request for 2009 is also in accordance with FAA's comprehensive plan for modernizing and improving air traffic control and airway facilities services.

Object Classification (in millions of dollars)

Identification code: 69-1336-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	....	....	3,750
11.3	Other than full-time permanent	....	....	36
11.5	Other personnel compensation	....	....	377
11.9	Total personnel compensation	....	....	4,163
12.1	Civilian personnel benefits	....	....	1,246
21.0	Travel and transportation of persons	....	....	98
22.0	Transportation of things	....	....	22
23.1	Rental payments to GSA	....	....	2
23.2	Rental payments to others	....	....	49
23.3	Communications, utilities, and miscellaneous charges	....	....	412
24.0	Printing and reproduction	....	....	2
25.1	Advisory and assistance services	....	....	356
25.2	Other services	....	....	2,156
26.0	Supplies and materials	....	....	147
31.0	Equipment	....	....	256
32.0	Land and structures	....	....	238
41.0	Grants, subsidies, and contributions	....	....	4
42.0	Insurance claims and indemnities	....	....	1
99.0	Direct obligations	....	....	9,152
99.0	Reimbursable obligations	....	....	300
99.9	Total new obligations	....	....	9,452

Employment Summary

Identification code: 69-1336-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct:			
1001	Total compensable work years: Full-time equivalent employment	....	....	33,871
	Reimbursable:			
2001	Total compensable work years: Full-time equivalent employment	....	....	159

EXHIBIT III-1

AIR TRAFFIC ORGANIZATION

Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST	CHANGE FY 2008-2009
Salaries & Expenses			7,078,793	7,078,793
Capital Programs			2,591,085	2,591,085
TOTAL	**0**	**0**	**9,669,878**	**9,669,878**
FTEs				
Direct Funded			33,871	33,871
Reimbursable			159	159

Program and Performance Statement

This account provides funds for the operation, maintenance, communications, and logistical support of the air traffic control and air navigation systems. The ATO appropriation includes the following major activities:

(1) operation on a 24–hour daily basis of a national air traffic system;
(2) establishment and maintenance of a national system of aids to navigation;
(3) administration of the acquisition, research and development programs; and
(4) development, printing, and distribution of aeronautical charts used by the flying public.

EXHIBIT III-2

AIR TRAFFIC ORGANIZATION

Summary Analysis of Change from FY 2008 to FY 2009
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Item	Change from FY 2008 to FY 2009	FY 2009 PC&B by Program	FY 2009 FTEs by Program	FY 2009 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2008 Base					
Appropriations, Obligations, Limitations, and Exempt Obligations		0	0	0	$0
Adjustments to Base [include items from Exhibit II-6]					
Base Amount from Operations	6,966,193	4,859,118	30,907	1,468,128	
Capital Programs (Base Amount from F&E)	1,994,540			1,460,154	
Capital Personnel & Related Expenses (Base Amount from F&E)	400,274	400,274	2,792		
"One-time" FTI Costs in FY 2008	-69,000			-69,000	
Annualized FTEs	11,050	11,050	128		
Annualized FY 2008 Pay Raise (GS Population)	3,748	3,748			
Annualized FY 2008 Pay Raise (Core Comp Population)	55,602	55,602			
FY 2009 Pay Raise (GS Population)	10,956	10,956			
FY 2009 OSI (Core Comp Population)	140,505	140,505			
FY 2009 SCI	22,697	22,697			
One Less Compensable Day	-20,772	-20,772			
Non-pay Inflation	30,492			15,796	
NAS Handoff Requirements	43,183			43,183	
Contract Tower Program	3,710			3,710	
Contract Weather Observation Program	2,109			2,109	
AFSS A-76 Cost Savings	-14,800			-14,800	
ATC Salary & Productivity Savings	-68,000	-65,498		-2,502	
Administrative Overhead Efficiencies	-18,863			-16,707	
Regional Operations Center Base Transfer	-99	-99	-1		
Aeronautical Center Facility Management	-27,814	-4,964	-46	-12,499	
Aeronautical Center Leased Telecommunications	-652				
Worker's Compensation Program Management	-108	-104	-1		
Procurement & Class Action Litigation	-2,000	-1,000	-1		
MMAC Office of Acquisition (AMQ) Positions	-225	-225	-2		
Delphi Asset Tracking Team (DATT)	-383	-383	-3		
FY 2009 Capital Programs	197,352			144,558	
FY 2009 Capital Personnel & Related Expenses	-1,081	-1,081	-55		
Subtotal, Adjustments to Base	**9,658,615**	**5,409,825**	**33,718**	**3,022,130**	**9,658,615**
New or Expanded Programs					
Air Traffic Controller Hiring	11,263	8,755	153		
Subtotal, New or Expanded Programs	**11,263**	**8,755**	**153**	**0**	**$11,263**
Total FY 2009 Request	**9,669,878**	**5,418,580**	**33,871**	**3,022,130**	**$9,669,878**

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AIR TRAFFIC ORGANIZATION APPROPRIATION

Salaries & Expenses
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
Transfer from Operations (FY 2008 Enacted)	**6,966,193**	**30,476**	**760**	**30,907**
FY 2008 One-Time Items	**-69,000**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	11,050			128
2. Annualized FY 2008 Pay Raise (GS Population)	3,748			
3. Annualized FY 2008 Pay Raise (Core Comp Population)	55,602			
4. January 2009 Pay Raise (GS Population)	10,956			
5. January 2009 OSI (Core Comp Population)	140,505			
6. January 2009 SCI	22,697			
7. One Less Compensable Day	-20,772			
8. Non-pay inflation	30,492			
Total Unavoidable Adjustments	**254,278**	**0**	**0**	**128**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	43,183			
2. Contract Tower Program	3,710			
3. Contract Weather Observation Program	2,109			
Total Uncontrollable Adjustments	**49,002**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	11,263	306		153
Total Discretionary Increases	**11,263**	**306**	**0**	**153**
Cost Savings and Adjustments				
1. AFSS A-76 Cost Savings	-14,800			
2. ATC Salary & Productivity Savings	-68,000			
3. Administrative Overhead Efficiencies	-18,863			
Total Cost Savings and Adjustments	**-101,663**	**0**	**0**	**0**
Base Transfers				
1. Regional Operations Center	-99	-1		-1
2. Aeronautical Center Facility Management	-27,814	-46		-46
3. Aeronautical Center Leased Telecommunications	-652			
4. Worker's Compensation Program Management	-108	-1		-1
5. Procurement & Class Action Litigation	-2,000	-1		-1
6. MMAC Office of Acquisition (AMQ) Positions	-225	-2		-2
7. Delphi Asset Tracking Team (DATT)	-383	-3		-3
Total Base Transfers	**-31,280**	**-54**	**0**	**-54**
FY 2009 Request -- Total	**7,078,793**	**30,728**	**760**	**31,134**

Detailed Justification for ATO Salaries & Expenses

Salaries & Expenses	**FY 2009 Request: $7,078,793**

Overview:

The Air Traffic Organization (ATO) is the global leader in delivering the world's safest, most secure air traffic services. As a Performance Based Organization (PBO), ATO measures its success in terms of safety, reliability, and cost effectiveness. ATO:

- Provides safe, secure, and cost-effective air traffic services.
- Creates a professional workplace for its employees in which they can excel and innovate an environment where all members of the ATO team embrace the organization's mission and vision with enthusiasm and pride.
- Accounts for its performance by measuring achievements against clear, specific goals.
- Effectively aligns its resources with programs that provide value to the flying public.

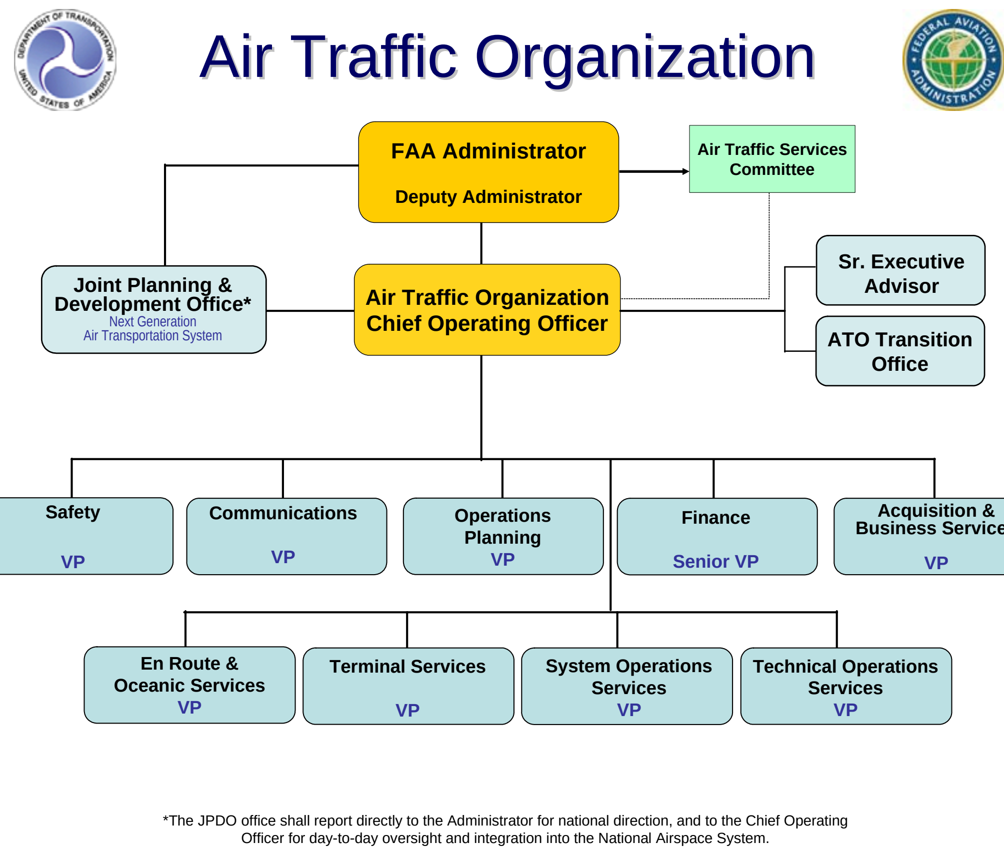
The FY 2009 Salaries & Expenses budget request reflects these values. Consistent with the Controller Workforce Plan (CWP), ATO plans to hire a net increase of 306 air traffic controllers to keep planes moving safely and efficiently in the face of rising air traffic levels throughout the country. This budget request supports the deployment of new equipment and programs and also funds much needed maintenance of existing systems in the National Airspace System (NAS). This request also covers anticipated increases in pay and inflation. Cost savings and avoidances are being sought throughout the system as well. Most notable of these in FY 2009 are the $68 million for ATC salary and controller productivity, $14.8 million in new savings resulting from the Flight Service Station A-76 action and $18.9 million resulting from administrative overhead efficiencies. In addition, the request reflects $31.3 million in base transfers to other FAA lines of business to continue to realign programs to the appropriate organizations.

In order to advance efficiency, safety, security, and customer service, new pieces of equipment are being installed and commissioned. This equipment is designed to improve overall operations, which will continue to streamline airline industry operations that are anticipated to increase—possibly tripling over the next 20 years—and enhance the experience for the air traveling public. Each of these systems will need to transition from the Capital Programs budget to the Salaries & Expenses program. Called NAS Plan Handoff (NPHO), these resources ($43.2 million in FY 2009) cover the day-to-day cost of operating and maintaining these new systems.

The FY 2009 budget proposes a new budget account, Air Traffic Organization, to align with FAA's lines of business. This new account includes two separate program activities—Salaries & Expenses and Capital Programs. In FY 2009, this account will be funded 85 percent from the Airport & Airway Trust Fund and 15 percent from the General Fund. The General Fund request funds the costs of providing air traffic control services to public users and other ATO activities that have a public benefit.

The congressionally mandated National Civil Aviation Review Commission, chaired by former Secretary of Transportation Norman Mineta, first articulated the need for ATO in 1997. In 2000, Congress directed FAA to establish a performance-based organization (PBO) that would maintain the viability of the air traffic control system and control rising operating costs. In 2003, FAA created ATO in direct response to requests from the White House and Congress.

The transition of Air Traffic management from a disparate array of entities to a PBO began with the hiring of a Chief Operating Officer in August 2003, followed by the realignment of services by function, and the reduction of management layers in November 2003. On February 8, 2004, FAA officially established the Air Traffic Organization under 10 Vice Presidents: En Route & Oceanic Services, Terminal Services, Technical Operations Services, System Operations Services, Safety, Communications, Operations Planning, Finance, Acquisition & Business Services, and Flight Services (beginning with FY 2007, Flight Services was incorporated into the Systems Operations Service Unit). At that time, the Air Traffic Services (ATS), Research & Acquisition (ARA), and Free Flight (AOZ) organizations were dissolved. The next step was to create three field operating service areas for each of the four operational service units: Terminal, En Route, Technical Operations, and Flight Services (for a total of 12). These were collocated with FAA's nine regional offices. This was accomplished in the spring of 2004.



In December 2005, after 15 months of study, FAA announced its plans to simplify the ATO service area structure. The ATO consolidated its administrative and support staff functions wherever possible, reducing overhead and increasing productivity. The ATO consolidated administrative functions located in the nine service areas into shared service centers in just three regions. The three Service Centers (listed below) became operational in June 2006 and most of the affected personnel have already been transferred.

- The Eastern Service Area Office and Service Center is located at FAA regional office in Atlanta, Georgia.
- The Central Service Area Office and Service Center is located at FAA regional office in Fort Worth, Texas.
- The Western Service Area Office and Service Center is located at FAA regional office in Seattle, Washington.

The ATO is grouping expertise in a simplified, shared-service structure. All branches of the organization will be able to access the knowledge and skills they need centrally. Shared services will reduce duplication of effort while increasing efficiency, productivity, and consistency in the support provided to field facilities.

As a result of this restructuring, FAA will provide higher quality, more consistent service to its customers while avoiding an estimated $360 to $460 million in costs over the next 10 years. Most of the savings will result from reductions in staffing requirements under a shared services environment and productivity gains realized by providing specialized skills and knowledge to different parts of the organization.

The FAA is working to reduce costs and improve performance by fundamentally changing the way it does business. The agency has slowed the growth of expenses by implementing several resource management initiatives, including a cost accounting system, and a pay-for-performance compensation structure. In 2005, FAA launched an agency-wide cost control program and ATO remains focused on:

- reducing overhead costs
- investing in projects that will yield long-term savings
- improving financial and project reporting
- holding managers accountable for controlling the cost of their programs

To become better stewards of taxpayer funds, ATO:

1. Developed a budget execution tool to help managers plan and track the costs of their programs. This tool provides a complete financial picture, integrating costs, performance and personnel data at every level of the organization, from the service delivery point manager all the way up to the Chief Operating Officer. Managers can compare actual and planned costs and can adjust their programs in response to changes in program needs or resource availability quickly and effectively. This tool also allows managers to monitor key costs and performance indicators, marginal service production costs, direct versus indirect costs, activity volumes, and travel and training costs.
2. Developed financial and productivity metrics to measure performance and track the cost of operations. The ATO is now tracking and analyzing the service cost per flight paying particular attention to variations in per unit costs among the various service centers.
3. Spent the last few years training management in financial management best practices. The ATO also put standardization information on its web site that outlines the Agency's standard financial management policies and procedures.
4. The ATO Capital Investment Team (CIT) continues to thoroughly evaluate the performance of capital programs. In the past, these business case reviews have identified $460 million in lifecycle savings, by restructuring/terminating 10 programs, six of them major. To date the CIT has reviewed over 180 projects.

One of the biggest success stories in cost management was the largest non-defense competitive sourcing initiative in the federal government — the contracting out of FAA's flight services function. That action will save the agency an additional $14.8 million in FY 2009, with a cumulative, 13-year projected savings and cost avoidance totaling almost $2.2 billion.

In order to succeed, FAA has to run more like a business—in all respects. A significant step towards that end is reforming how the agency compensates controllers, its largest single group of employees. In 2006, we negotiated a new labor contract with the largest labor union in FAA. The new contract contains new work rules and a pay plan that will yield substantial savings while creating a long-term affordable controller cost structure.

In March 2008, FAA will distribute the updated Air Traffic Controller Workforce Plan entitled "A Plan for the Future." This plan will contain estimates of staffing requirements and highlights initiatives to improve the hiring and training program. The following table represents the controller workforce staffing for FYs 2006 – 2009.

	Actual On Board FY 2006	FY 2007 Actual On Board	FY 2008 Projected Controller Workforce	FY 2009 Projected Controller Workforce
Air Traffic Controllers				
Fully-Qualified	12,912	11,988	11,514	11,566
En Route	5,588	5,233	5,089	5,098
Terminal	7,324	6,755	6,425	6,468
Developmental	1,706	2,886	3,616	3,870
En Route	1,290	1,572	1,696	1,925
Terminal	416	1,314	1,920	1,945
Total ATCT	**14,618**	**14,874**	**15,130**	**15,436**
Operations Supervisors				
En Route	810	808	N/A	N/A
Terminal	977	980	N/A	N/A
Total Operations Supv	**1,787**	**1,788**	N/A	N/A

(1) Actual distribution between Terminal and En Route may change based on acual attrition and operational needs.
(2) Air Traffic Controller numbers include all employees, FTP, PTP, LWOP, FTT and Trainees.
(3) Operations Supervisor numbers include all employees
(4) Fully-Qualified category includes Certified Professional Controllers In Training (CPCIT)
(5) Operations Supervisor numbers are not forecasted; therefore numbers for FY 2008 and FY 2009 are unavailable.

Significant accomplishments achieved in FY 2007 include:

- Our controller workforce target for FY 2007 was 14,807. We ended the year exceeding the target with 14,874 controllers.

- Added state-by-state vacancy announcements to our national military recruitment effort to enable us to make better placement decisions.

- Attended recruitment fairs in both Seattle, Washington, and Ft. Rucker, Alabama, to reach military controllers preparing to leave their duty assignments.

- Added personnel in St. Louis, Missouri, to expedite security clearances; in Atlanta, Georgia, to expedite medical clearances; and in Oklahoma City, Oklahoma, to expedite the interview process. All of these efforts have helped reduce the clearance process timeframes greatly.

- For security, we developed a conditional suitability concept based on a review of the appropriate background questionnaire, a fingerprint check, and credit check. These reviews take 48 hours and allow us to bring new hires on-board while the formal OPM investigation is pending. Prior to implementing this concept, we had to wait 45 days or more until the OPM formal investigation was completed before bringing people on-board for training at the Academy. The OPM investigation still takes a minimum of 45 days and is usually completed while the new hires are at Academy training and before they need it at a facility. This OPM investigation timeframe is not under FAA control.

- The medical clearance process has been streamlined due to additional staff acting as liaison between the candidates and the agency. They conduct follow-up and tracking of medical clearance status. As a result, the timeframe has been reduced from about 6 months to 60-90 days.

- The interview process has been reduced from 6 weeks to about 2 weeks due to staff follow-up, tracking, and the implementation of electronic communication and tracking.

- In addition, for FY 2008 we are creating a new approach to processing new hires through Pre-Employment Processing Centers (PEPC) which compress the overall hiring process to about

1 week. Applicants can be on-board as soon as 4 weeks after completing the PEPC process. Up to 10 PEPCs will be conducted in FY 2008.

- Instituted a $20,000 Veterans Readjustment Appointment (VRA) recruitment bonus to encourage military controllers to continue as civilian employees.
- Added new vacancy announcements (reinstatement, Control Tower Operations certificate holders) to help refresh our applicant pools.
- Instituted payment of per diem for new hire trainees at the academy with the expectation that it will reduce declinations.
- Increased Academy training to maximum capacity by adding classes and simulation resources for both tower and en route training.
- Terminal tower simulators in the field are reducing on-the-job training time and providing a more streamlined training process for developmental controllers. Four prototype systems were previously acquired and deployed in Chicago O'Hare, Miami, Ontario (CA), and Phoenix. Based on further analysis from the benefits from these four sites, the FAA has contracted to acquire additional simulators to be placed at the Academy and at various field sites around the country.
- The FAA has made significant progress in refining controller staffing requirements and in effectively staffing facilities across the NAS by utilizing improved scheduling practices, new automated tools, and better management of leave. Air traffic controller workload and traffic volume are dynamic, so are staffing needs. Our goal is to base staffing on traffic, which takes into account changes in demand and fluid workload at individual facilities.
- In the 2007 staffing report, we presented authorized staffing ranges for each of FAA's 314 staffed facilities across the country, which gives us greater flexibility to match the number of controllers with traffic volume and workload. The ranges were developed by incorporating data points from industrial engineering staffing models, past productivity, peer productivity, and service unit input. These ranges are published in Appendix A of the report and will be updated annually.

As authorized in the Aviation and Investment Reform Act for the 21st Century, FAA and airport sponsors can now share the cost of modernization projects through a cost share program. As a result, Olive Branch, Mississippi and Eagle County, Colorado have new air traffic control towers. In addition, Tampa, Florida Minneapolis, Minnesota and Chicago, Illinois have improved precision landing capabilities. In all of these projects, FAA's financial contribution did not exceed 33 percent of the total cost.

FY 2008 Program:

The ATO provides essential services to the nation's aviation industry, which independent studies have estimated accounts for more than 9 million jobs and $640 billion in annual economic activity—5.4 percent of the Gross Domestic Product. More than 30,000 ATO employees support the operations that help move about 48,600 aircraft through U.S. airspace each day. Our employees are service professionals, providing the worlds' safest airspace and handling more than six times the traffic of the next largest air traffic control organization in the world. Air traffic controllers keep planes moving safely and efficiently while technicians, engineers, and support specialists maintain and repair critical equipment and facilities. Leaders at every level work to ensure that these services are provided in a cost-effective manner.

In FY 2008 FAA will hire new controllers for a net increase of 256. This hiring target will be included in the March 2008 update to the Controller Workforce Plan, and will bring the total controller workforce up to 15,130 (from 14,874 at the end of FY 2007). ATO's hiring efforts will increase the total controller workforce to a level at which traffic at all facilities will be more than adequately covered.

Anticipated FY 2008 Accomplishments:

Operational Improvements:

- Assemble information on near-term and envisioned weather information requirements for air transport and GA cockpits, assessing weather products currently available or entering the marketplace, documenting maturity and use of products, and identifying gaps between product capabilities and information needs with a completed report by September 30, 2008.
- Improve collecting, consolidating and analyzing safety data to enhance reporting and assessments.
- Sustain NAS Power Systems and Infrastructure and implement and assure compliance with Environmental and Occupational Safety and Health (EOSH) programs. By September 30, complete the following sustainment projects: 75 Engine Generator, 7 Uninterruptible Power Supply (UPS), 50 batteries, and 7 Lightning Protection, Grounding, Bonding, and Shielding (LPGBS).
- Provide flight inspection resources to complete periodic and special checks (scheduled and unscheduled) that enhance the safety of the NAS and provide timely response to restore NAS operations.
- Maintain and sustain Weather and Radar Processor (WARP) service.
- Monitor the performance of the ECG system and produce quarterly Sustainment Technology Evolution Plan (STEP) and Operational Analysis (OA) Reports to identify and mitigate performance and obsolescence issues.
- Upgrade and sustain the NAS Aeronautical Information Management Enterprise Systems (NAIMES) by providing weekly reports of NAIMES activities, including: program management, configuration management, technical and operational issue resolution, help desk support, fielded hardware maintenance, and project control support.
- Sustain Direct User Access Terminal Service (DUATS), while also reviewing requirements on both April 30, 2008, and August 15, 2008. Evaluate the need for DUATS service for FY 2009 by June 30, 2008. Implement a contract extension by September 15, 2008, if needed.
- Mitigate the impact that deteriorating facilities in Alaska have on the delivery of Flight Services.

Safety:

- By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.
- Continue to optimize weather camera benefits and explore alternative technologies.
- Installed, deployed, and made operational 12 new weather camera sites in FY 2008 to include six highly traveled remote mountain passes.
- Improve training, procedures, evaluation, analysis, testing, and certification to reduce the risk of runway incursions resulting from errors by pilots, air traffic controllers, and pedestrians, vehicle operators, tug operators, and mechanics conducting aircraft taxi operations.
- Conduct a minimum of 50 Runway Safety Action Team (RSAT) meetings. Interim deadline of 20 RSATs completed by June 30, 2008. Targeted completion of more than 50 RSATs by August 31, 2008.
- Limit Category A and B (most serious) operational errors to a rate of no more than 2.15 per million activities through FY 2008.
- Improve collecting, consolidating, and analyzing safety data to enhance reporting and assessment.
- Support the safe, efficient and expeditious flow of air traffic, and issue safety alerts and advisories.
- Achieve the annual safety performance targets for Category A&B Runway Incursions of no more than 0.509 incursions per million operations by September 2008.
- Conduct on-site investigations of accidents and incidents, as needed.
- Continue to provide Flight Services in Alaska by maintaining infrastructure and sustaining

automation equipment used to support the delivery of Flight Services in Alaska. This will be accomplished through continued operation of OASIS.

- Reduce Technical Operations vehicle operator/pedestrian surface incidents which occur during maintenance and restoration operations.
- Create a 30 minute training movie on recognizing safety risk factors that have been identified over the last 5 years of operations error analysis.
- Develop and implement Required Navigation Performance (RNP) approach procedures. Through FY 2011, we will publish at least 200 RNP approach procedures. Based on the benefits and priorities for RNP implementation recommended by the Performance-Based Aviation Operations Rulemaking Committee (PARC) and the Roadmap for Performance-Based Navigation guide the development and implementation of at least 25 RNP Special Aircraft and Aircrew Authorization Required (SAAAR) instrument approach procedures by September 2008.
- In FY 2008 continue the development and deployment of Traffic Analysis and Review Program (TARP) with a targeted completion of NAS-wide implementation by September 30, 2011.

Capacity:

- Publish 300 Wide Area Augmentation System (WAAS)/Lateral Precision with Vertical (LPV) Guidance Performance approaches by September 30, 2008.
- Sustain Adjusted Operational Availability at 99 percent for reportable facilities that support the National Airspace System (NAS).
- Redesign terminal and en route airspace and change procedures to increase capacity. Efforts will include airspace changes in Chicago, Washington, DC, New York/New Jersey/Philadelphia and Houston.
- In support of achieving an average daily airport capacity for the 35 OEP airports of 104,338 arrivals and departures per day by FY 2011, redesign airspace to support new runways expected in late 2008.
- Complete review of completed Q-routes (previously implemented under the High Altitude Redesign) and develop a plan to complete, correct or add new routes to add additional efficiency and capacity to airspace connecting major metropolitan areas.
- Increase arrival and departure rates through operation procedures and controller spacing tools at one additional site, using the Traffic Management Adviser (TMA) system.
- Achieve an average daily airport capacity for the seven major metropolitan areas of 39,484 arrivals and departures per day by FY 2009, maintain through FY 2012.
- Implement oceanic redesign, leveraging ATOPS in New York, Anchorage, and Oakland Air Traffic Control Centers (ARTCC) and implementing oceanic/offshore redesign in Gulf of Mexico at Houston ARTCC.

Organizational Excellence:

- Continue to provide FAA controller staffing requirements as outlined in the FAA hiring plan titled, "A Plan for the Future, 2007-2016: The FAA's 10-Year Strategy for the Air Traffic Control Workforce."
- Expand the use of High Fidelity simulation to improve ATC Training for local facilities.
- Conduct monthly and quarterly reviews of controller training data base to assess hiring and training status. Determine targets (time to certification) for controllers and report monthly.
- Provide on-site investigation training to the lines of business and the academy.
- Continue to refine and improve the content of the information collected in reports of Operational Errors (OE) and Runway Incursions (RI).
- Continue to implement cost efficiency initiatives including, but not limited to: savings for strategic sourcing for selected products and services; consolidating facilities and services, such as service areas, real property management, and web services; eliminating or reducing obsolete technology;

reductions in help desk operating costs through consolidations; and reductions in Information Technology operating costs.

- Reduce the agency's printing and distribution costs association with ATO publications and directives by replacing hard copy distribution with electronic access, when practical.
- Support FAA regions in conducting an accurate inventory of 30 percent of the real property assets for manned and unmanned facilities including the proper recording of real property assets where FAA organizations are on site or have a requirement to visit the site for maintenance.
- Complete and deliver four SOPs from the following areas: purchase cards, travel, reporting, logistics, cuff records, LDR reconciliation, conferences, capitalization, PA issuance, eLMS financial plans, and reports calendar.
- Develop CM processes and procedures for non-NAS applications, hardware, and systems software with IT standards integrated into the CM process.
- Standardize FAA websites making them more useful for exchanging information and conducting business.
- The ATO managers will continue to distribute and discuss with employees information concerning the importance of safety in the workplace. The ATO managers will use at least two means of communication to inform employees of available OSH policies and safe work practices by July 26, 2008.
- The ATO will continue to integrate specialized crisis response capabilities such as the hurricane coordination cells into its core air navigation services (ANS) elements (e.g., the ATCSCC). ATO will also develop and refine operational coordination tools used for crisis management with relevant external partners (e.g., DoD and DHS/FEMA).
- Award at least five percent of direct contracts to women-owned businesses, award three percent of direct contract awards to service disabled veteran-owned small businesses, and at least 10 percent of direct FAA contracts to small disadvantaged businesses. The ATO will report contract awards to these target groups to the FAA Administrator, the Office of the Secretary of Transportation, and Congress as required.

FY 2009 Budget Request:

The Chief Operating Officer for the Air Traffic Organization requests $7,078,739,000 and 31,134 FTEs in Salaries & Expenses to meet its mission in FY 2009. This is an increase of $112,600,000 (1.62 percent) above the FY 2008 enacted amount. The FY 2009 budget requests a funding increase to hire a net increase of 306 new controllers, a level consistent with the targets being developed for the updated staffing plan, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce,* published in March 2008.

Specific goals for FY 2009 include:

Operational Improvements:

- Develop a plan to accommodate spectrum requirements in support of possible World Radio Communications Conference. Continue technical studies to identify appropriate spectrum for Unmanned Aircraft Systems (UAS) by September 30, 2009.
- Provide current level of weather services with the Weather and Radar Processor (WARP) System through the end of September 2009.
- In FY 2009, monitor the performance of the ECG system and produce quarterly Sustainment Technology Evolution Plan and Operational Analysis Reports to identify and mitigate performance and obsolescence issues.
- Maintain an aggressive quality assurance program to monitor Flight Service performance in Alaska and through the Lockheed Martin FS21 contract, addressing reduction of operational deficiencies in all areas.

- Further develop the animated training environment improvement by producing one animation feedback event per month for each option (terminal and en route), with an associated interactive training event.
- Improve measurement and analysis of safety performance by implementing automated performance tracking tools (Traffic Analysis and Review Program) and developing new safety metrics.
- Provide Notices to Airmen (NOTAM) by disseminating scheduled and unscheduled broadcasts with ready access to domestic and international meteorological and aeronautical information. Relay clearance for centers, towers, and TRACONS. Coordinate restricted airspace, emergency services, along with search and rescue operations. Provide support to other service units and federal agencies, sustain automated equipment, and manage technology changes for NAS systems.
- Expand FAA's existing Operational Evolution Plan to incorporate critical NEXTGEN operational concepts and changes, and detailed milestones of key NAS modernization programs through 2025.
- Achieve an average daily airport capacity for the seven major metropolitan areas of 64,060 arrivals and departures per day by FY 2009.
- Reduce the number of people exposed to significant noise by 1 percent each year through FY 2011, as measured by a 3-year moving average, from the 3-year average for calendar years 2000-2002. FY 2009 Target: -1 percent.

Safety:

- Limit the 3-year rolling average fatal accident rate to 0.010 fatal accidents per 100,000 departures.
- Continue research to identify human factors that may contribute to accidents. Develop and implement strategies, methods, and technologies that reduce safety risk.
- By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).
- Report results of proactive risk and safety data analyses that might be available or developed for general aviation (GA). Recommend methods of analyzing future GA events, so that investigators may better learn from incidents, improve correction of involved personnel, and generate interventions to prevent future events.
- By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.
- Continue to optimize weather camera benefits and explore alternative technologies.
- Install, deploy, and make operational 13 new weather camera sites in FY 2009.
- Improve training, procedures, evaluation, analysis, testing, and certification to reduce the risk of runway incursions resulting from errors by pilots, air traffic controllers, and airport authorized pedestrians, vehicle operators, tug operators, and mechanics conducting aircraft taxi operations. Conduct a minimum of 50 Runway Safety Action Team (RSAT) meetings by September 30, 2009.
- Modify the evaluation process to facilitate the reduction of operational errors by disseminating initial evaluations and audit data derived from FAA Safety Assessment System (FSAS) to Terminal Services, ATO-T, and En Route and Oceanic Services ATO-E.
- Achieve the annual safety performance targets for Category A&B Runway Incursions of no more than 0.472 incursions per million operations by September 2009.
- Continue Crew Resource Management training to foster a culture of teamwork designed to help the controller detect and correct controller and pilot mistakes before they result in operational errors or collisions.
- Maintain the baseline of no more than two operational errors and six operational deviations in Alaska annually.
- Reduce operational errors in the terminal environment by focusing on basic control principles and

procedures by creating a series of DVDs that will highlight "best practices" in terminal air traffic control. The initial installment will focus on surface safety, i.e., reducing runway incursions.

- Analyze information collected on operational errors and runway incursions to identify coincident factors and potential mitigation strategies with a draft report due August 31, 2009.
- Based on benefits and priorities for Required Navigation Performance (RNP) implementation recommended by the Performance-Based Aviation Operations Rulemaking Committee (PARC) and the Roadmap for Performance-Based Navigation, guide the development and implementation of at least 50 RNP SAAAR instrument approach procedures by September 2009.
- Empower additional third party vendor(s) to develop and implement RNP SAAAR instrument approach procedures.

Capacity:

- Publish 300 Wide Area Augmentation System/Lateral Precision with Vertical (LPV) or Lateral Precision (LP) approaches at non-ILS runways or ILS runways if sufficient qualifying runways do not exist by September 30, 2009.
- Publish 10 RNAV (GPS) instrument approach procedures with LPV/LP minimums to runways in Alaska by September 30, 2009. Completion of this activity is contingent upon at least 10 qualifying runway/obstacle surveys being approved and delivered to the National Fight Procedures Office no later than September 30, 2008.
- In FY 2009 continue the development and deployment of Traffic Analysis and Review Program (TARP) with a targeted completion of NAS-wide implementation by September 30, 2011.
- Continue to implement RNAV routes (Q-routes, Tango routes, and GPS MEAs) in support of Airspace Management Program and Industry requests, implementing at least 10 routes by September 30, 2009.
- Achieve an average daily airport capacity for the 35 OEP Airports of 103,328 by the end of September 2009.
- Redesign terminal and en route airspace and change procedures to increase capacity. Efforts will include airspace changes in Chicago, New York/Philadelphia, Houston, and Western Corridor (including Southern California, Phoenix, and Las Vegas Valley).
- In support of achieving an average daily airport capacity for the 35 OEP airports of 104,338 arrivals and departures per day by FY 2001, redesign airspace to support new runways.

Organizational Excellence:

- Develop yearly hiring requirements and analyze productivity and training improvements as outlined in the FAA hiring plan *"A Plan for the Future 2007-2016: The FAA's 10-Year Strategy for the Air Traffic Control Workforce."*
- Hire controllers at levels consistent with the Controller Workforce Plan by the end of September 2009.
- Complete targeted Information System Security (ISS) program reviews for ATO by September 30, 2009. Participate in the ISS Compliance Program Plan activities and implement compliance review checklists by March 31, 2009.
- Conduct cost benefit/efficiency analysis to identify cost efficiencies and improvements in our service. Track progress in meeting expected cost savings/avoidance resulting from A-76 activity.

<u>NAS Plan Handoff Requirements</u>

NAS Plan Handoff (NPHO) funding requirements are driven by operations and maintenance (O&M) bills for new acquisition programs being commissioned in FY 2007. While the Facilities & Equipment appropriation will be paying these bills through FY 2008, agency policy dictates that they be subsequently transitioned to the Salaries & Expenses program of ATO's appropriation in FY 2009. These costs include recurring telecommunications installations and upgrade expenses, contractor support for preventative maintenance, funding to buy parts and pay for repairs, software maintenance updates and fixes, infrastructure repairs, field maintenance support, and training. The ATO is requesting $43.2 million for NAS Plan Handoff costs in FY 2009.

The NAS continues to grow in size and complexity as new systems are procured and fielded. In 1998 the NAS had 38,209 operational facilities and as of May 31, 2007, there were 40,393 facilities, an increase of 2,184 and an average of an additional 243 systems per year.

The NPHO request is a direct result of capital acquisition programs (formerly in the F&E appropriation now in the ATO appropriation) fielding systems that are becoming operational and varies each year depending on the number of systems being deployed. The Salaries & Expenses program is required to pick up the additional recurring O&M expenses for newly commissioned NAS systems.

Although most replacement systems are more efficient and reduce O&M costs by replacing older systems, this is not always the case. Some replacement systems are more expensive than the systems being replaced and require additional funding to maintain. For example, when a consolidated TRACON facility is built, the towers co-located with the TRACONs being consolidated do not actually shut down, but stay open and continue to have an operational requirement for utilities, grounds maintenance, custodial, guard services, and general maintenance. Therefore, the Salaries & Expenses funding for these facilities cannot be transferred to the new consolidated TRACON, so additional resources are frequently required to pay the recurring bills to support the new TRACON. In addition, a new or replacement system often provides additional features making both the hardware and software more complex, and thus more difficult and expensive to maintain.

An example of this is the En Route Automation Modernization (ERAM) Program. ERAM replaces the existing Host Computer System with Release 1; the Host Computer System's backup system with the new Enhanced Backup Surveillance; and portions of the display system infrastructure, including the technical refresh of the Radar Position Display Processor. This will enable improvements in airspace capacity, efficiency, and safety that cannot be realized with the current 30 year-old Host system, which can only be maintained through 2012. ERAM also deploys the En Route Information Display System, a tool that electronically distributes information to air traffic controllers, providing for improved productivity and efficiency. Designed to handle traffic growth through the year 2020, ERAM enables controllers to better handle unplanned events, offers flexible routing options, and provides safety alerts to prevent collisions and congestion.

The FAA Standard Work Breakdown Structure (WBS) is used to identify O&M costs associated with both new and replacement systems. Below is a brief description of each WBS element:

- Preventive Maintenance/Certification – All activities associated with preventive maintenance of hardware and software, including activities specific for certification.
- Corrective Maintenance – All activities associated with corrective maintenance of hardware and software. This also includes activities related to packaging and shipping components to depot level repair facilities.
- Modifications – All activities associated with implementation of modifications to in-service hardware and software.
- Maintenance Control – All activities associated with providing oversight and coordination in operating and maintaining the NAS infrastructure, including NAS Operation Managers.
- Technical Teaming – All activities associated with the investigation and resolution of general technical issues relating to system performance.
- Watch Standing Coverage – Watch standing coverage beyond stated staffing requirements.
- Program Support – All administrative activities associated with planning, organizing, managing, and directing actions required in support of operating and maintaining the solution.
- Logistics – All activities associated with depot level support to NAS prime mission equipment and associated support equipment.
- In-Service Training – All activities associated with on-the-job training and refresher training of personnel who directly operate, maintain, or provide support functions of the solution. This

includes contractor provided costs associated with specific training. Training costs include course conduct (including instructor and facilities costs), travel, and per diem costs for students.

- Second-Level Engineering – All engineering activities in support of the delivery of service, to include development of modifications, documentation, testing, and configuration management. It includes the evaluation, prototype, testing, and implementation of technology refresh initiatives, as well as contractor staffing and travel as applicable.
- Infrastructure Support – All activities associated with maintenance, operations, and security of leased and owned buildings, structures, grounds, roads, and support vehicles for operational systems or people who support or operate those systems. Also includes physical security personnel.
- Flight Inspections and Standard Instrument Approach Procedures Development – All activities associated with the development, NAS integration, and maintenance of standard instrument flight procedures, flight inspection procedures, and the compilation, replication, and dissemination of charts and related paper and digital products.
- System Performance Assessment – All activities associated with assessing equipment and system performance and trends, including metrics development, data collection, and trend analysis.
- System Operations – All non-maintenance activities associated with directly operating or monitoring the solution. This includes computer operations, system administration, system security administrators, information security assessments, audits, etc.
- Travel to and from sites – Travel time to and from sites to perform any type of In-Service Management work.

Cost Savings Initiatives

In FY 2009, ATO will realize a total of $101.7 million in new cost savings. These savings are derived from the following initiatives:

- A-76 Outsourcing of Flight Services – One of the biggest success stories in cost management is the largest non-defense outsourcing initiative in the federal government. This action will save the agency an additional $14.8 million in FY 2009, with a cumulative 13-year projected savings and cost avoidance totaling almost $2.2 billion.
- ATC Salary & Productivity – ATO will realize an additional $68 million in cost savings from air traffic control salary and productivity savings resulting from implementation of the June 5, 2006, NATCA contract. This is the second year ATO identified savings and cost avoidance in air traffic control salary and productivity, for a cumulative total of $108.6 million. Savings are expected from the establishment of new pay bands aligned with FAA's core compensation program, the phasing-out or elimination of two ineffective premium pay elements, and management flexibility in staffing and scheduling at air traffic control facilities.
- Administrative Overhead Efficiencies – ATO is confident that we can continue recent efforts to streamline operations and achieve a $18.9 million reduction. Business process reengineering efforts at the Service Centers, consolidation of overhead function in headquarters, and savings in the procurement of supplies and equipment should generate these additional savings.

Strategic Management Plan

The ATO is working to become a performance-based organization (PBO). As a PBO ATO works diligently to measure performance. The ATO has implemented a Strategic Management Plan (SMP) to identify those activities that we believe are needed to measure our progress. In addition to the various operational measures ATO collects such as flights handled, on time arrival rates, and various safety related performance metrics, ATO manages against financial performance metrics. The ATO's SMP financial metrics are reported monthly and are used by managers to measure their progress against agency goals and to identify areas in need of improvement.

These metrics compel ATO to focus on managing the cost of delivering services rather than on managing budgets. Metrics such as overtime use have multiple benefits—less leave abuse, more employees available for work, easier shift management, and in the long run an overall reduction in labor costs.

Improved labor distribution reporting also has several benefits. Labor costs are more accurately tied to the cost of providing services, and with better labor data, managers can make more informed decisions on how and where to allocate staffing.

Budget Request by Service Unit and Staff Office

The ATO is organized into four operational service units (En Route and Oceanic Services, Terminal Services, Systems Operations, and Technical Operations Services) and five staff offices (Safety, Communications, Operations Planning, Finance, and Acquisition and Business Services). The request shows the Salaries & Expenses costs for each of these service units and staff offices as described below.

Service Unit	FY 2009 Estimate	End of Year	FTE
En Route and Oceanic Services, ATO-E*	$1,780,887	8,977	8,797
Terminal Services, ATO-T*	$1,997,236	10,217	10,716
System Operations Services, ATO-R	$565,235	1,273	1,299
Technical Operations Services, ATO-W	$1,989,208	8,591	8,593
Acquisition and Business Services, ATO-A	$564,251	1,323	1,342
Other ATO Staff Offices	$181,976	347	387
TOTAL	**$7,078,793**	**30,728**	**31,134**

* Actual distribution of staffing between Terminal and En Route may change based on actual attrition and operational needs.

Resource Summary - Air Traffic Organization (ATO)

	FY 2007 Actual	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000):					
PC&B	4,637,073	4,859,119	223,785	-63,516	5,019,388
Other Objects					
Travel/Transportation	78,772	80,255	1,445	-2,000	79,700
Other Services	1,454,105	1,468,129	-1,012	-49,664	1,417,453
Rent/Communications/Utilities	382,573	375,316	6,758	-1,000	381,074
Other	181,597	183,374	3,304	-5,500	181,178
Subtotal	2,097,047	2,107,074	10,495	-58,164	2,059,405
Total	6,734,120	6,966,193	234,280	-121,680	7,078,793
Staffing					
En Route & Oceanic Services*	8,531	8,717	0	260	8,977
Terminal Services*	10,213	10,171	0	46	10,217
System Operations Services	1,273	1,273	0	0	1,273
Technical Operations Services	8,640	8,640	0	-49	8,591
Acquisition & Business Services	1,324	1,324	0	-1	1,323
Other ATO Staff Offices	351	351	0	-4	347
Total	30,332	30,476	0	252	30,728
FTE's					
En Route & Oceanic Services*	8,575	8,687	110	0	8,797
Terminal Services*	10,233	10,545	171	0	10,716
System Operations Services	1,287	1,299	0	0	1,299
Technical Operations Services	8,684	8,642	0	-49	8,593
Acquisition & Business Services	1,318	1,343	0	-1	1,342
Other ATO Staff Offices	385	391	0	-4	387
Total	30,482	30,907	281	-54	31,134

* Actual distribution of staffing between Terminal and En Route may change based on actual attrition and operational needs.

En Route and Oceanic Services (ATO-E)

En Route and Oceanic Services (ATO-E) provides air traffic control operations, systems and facilities necessary to operate, maintain, and improve the U.S. National Airspace System. From 23 service delivery points in the U.S., Puerto Rico, and Guam, ATO-E controls more than 29 million square miles of airspace over the continental United States and the Atlantic and Pacific Oceans. Every day ATO-E ensures that thousands of positively controlled aircraft at high altitudes en route from one terminal area to another are directed on the safest, most efficient path to their destinations. Customers include domestic and international airlines, general aviation, the Department of Defense, and the Department of Homeland Security.

ATO-E's almost 12,000 pieces of equipment help maintain air traffic control operations utilizing complex voice and data switching equipment, radio and microwave transmission systems, local and remote located radio, and radar systems. Headquarters and Technical Center employees are responsible for acquisition program management, engineering, production, logistics, testing, training, and systems and procedures implementation. Since the mid-1990s, ATO-E has fielded modern communications, display, and weather systems for controller use. Major acquisition programs such as En Route Automation Modernization (ERAM) and Broadcast and Surveillance Services (ADS-B) are replacing yesterday's equipment with flexible, resilient, scalable, and adaptive systems that will provide the platform for the next generation air transport system (NextGen). In addition, new en route separation standards, navigation procedures, and innovative routing are reducing flight time and saving fuel. ATO-E's efforts are saving fuel, and reducing the airspace congestion. ATO-E is saving money for air carriers and general aviation, reducing delays for passengers, and cutting airplane emissions.

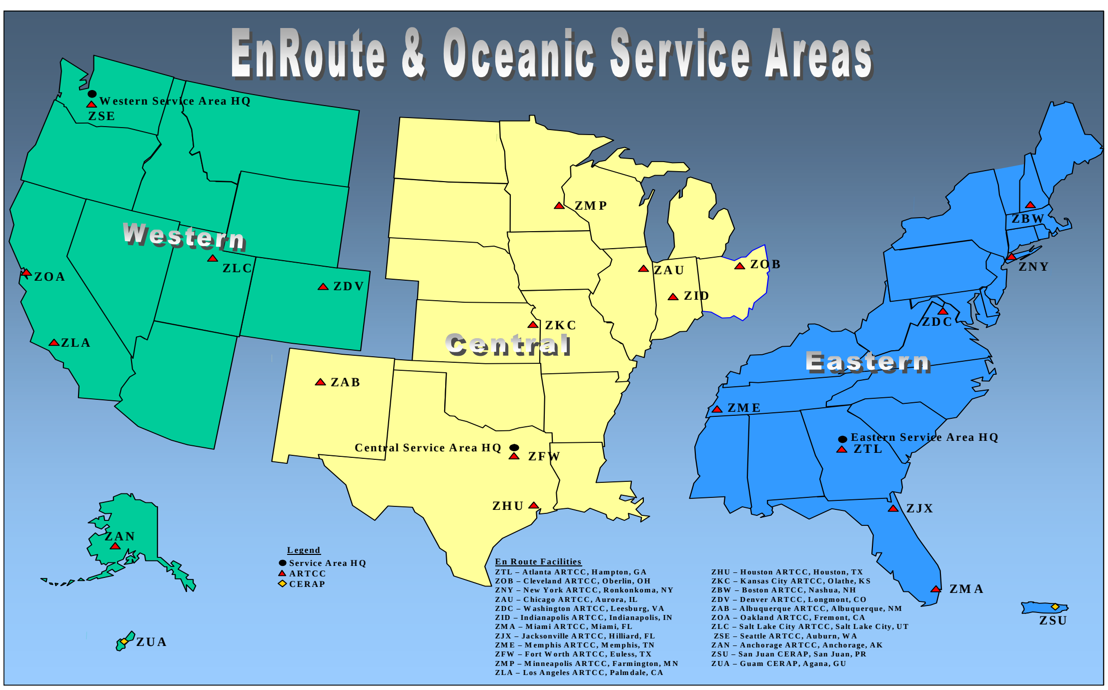
Through innovative training techniques and efficient database tracking, ATO-E is also ensuring that a consistent progression of air traffic controllers is available to staff its facilities now and in the future. ATO-E is deploying high fidelity simulation systems that will provide realistic training that will reduce the time it takes a student to reach professional controller status.

En Route and Oceanic Services (ATO-E)

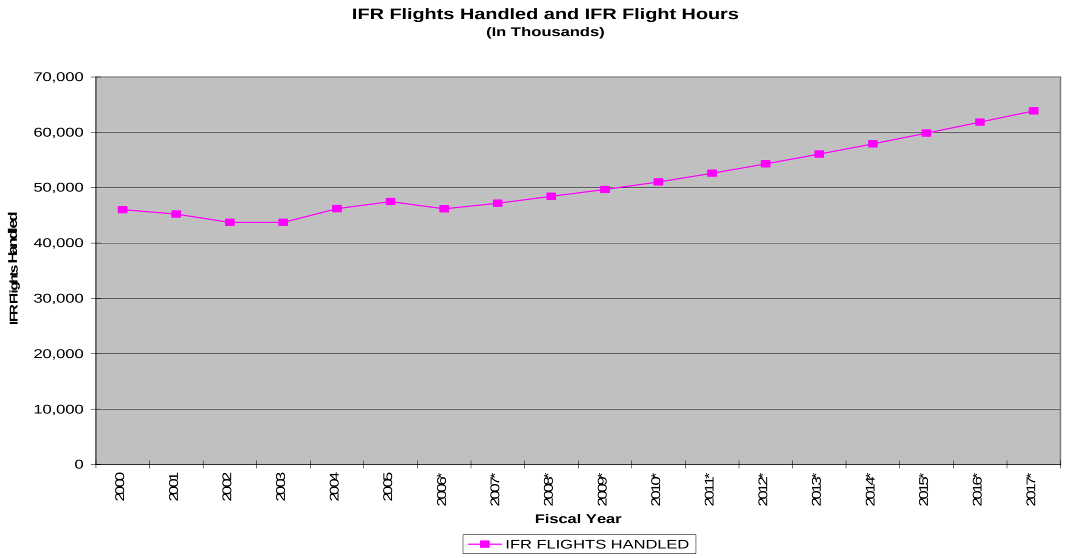
	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	1,534,158	1,554,786	66,400	-23,035	1,598,151
Other Objects					
Travel/Transportation	2,336	2,697	48	0	2,745
Other Services	134,377	155,195	15,762	-500	170,457
Rent/Communications/Utilities	450	519	9	0	528
Other	8,509	9,828	178	-1,000	9,006
Subtotal	145,672	168,239	15,997	-1,500	182,736
Total	1,679,830	1,723,025	82,397	-24,535	1,780,887
Staffing					
End-of-Year*	8,531	8,717			8,977
Full-time Equivalent Employment*	8,575	8,687			8,797

* Actual distribution of staffing between Terminal and En Route may change based on actual attrition and operational needs.

Below is a map of ATO's En Route and Oceanic Service Areas and the locations of the En Route centers.



The chart below depicts the number of Instrument Flight Rules (IFR) flights handled and IFR flight hours. The number of IFR flights handled is calculated by multiplying the number of IFR departures (an en route IFR flight which originates in the center's area and enters that center's airspace) by two, then adding the number of en route IFR overs (an IFR flight that originates outside the center's area and passes through the area without landing).



En Route and Oceanic has a NPHO requirement of $13,171,000. This covers the following programs:

A01.10-01 En Route Automation Modernization (ERAM/ERIDS/EBUS) – The En Route Automation Modernization Program (ERAM) replaces the existing Host Computer System with Release 1; the Host Computer System's backup system with the new Enhanced Backup Surveillance (EBUS); and portions of the display system infrastructure, including the technical refresh of the Radar Position Display Processor. This will enable improvements in airspace capacity, efficiency, and safety that cannot be realized with the current 30 year-old Host system, which can only be maintained through 2012. ERAM also deploys the En Route Information Display System (ERIDS), a tool that electronically distributes information to air traffic controllers, providing for improved productivity and efficiency. Designed to handle traffic growth through the year 2020, ERAM enables controllers to better handle unplanned events, offers flexible routing options, and provides safety alerts to prevent collisions and congestion.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance in the amount of $4,970,000 for second-level engineering. Second-level engineering for ERIDS will be provided by Lockheed Martin/CSC. Second-level support is needed to maintain electronic access by controllers to Notices to Airmen (NOTAMS), aeronautical information, and other ATC information controllers provide to our customers such as significant weather data (SIGMET/Convective SIGMET). Without this electronic transmission, FAA would need to reinstitute costly and inefficient paper products (personnel manually printing the information and carrying it over to the controller) and manual distribution processes. Planned upgrades will maintain and improve NOTAMS transmission from the ERIDS, ensuring that the data is accurate and timely. ERIDS services deliver electronic air traffic control documentation (i.e., graphical and textural aeronautical data products; ATC documents, message products, meteorological data, locally generated data, and relational databases; and search engine for real-time access to data and products) to ARTCC personnel.

This NPHO funding is for the En Route Information Display System (ERIDS) at the following eight locations:

Location	Date Commissioned	Description
Seattle, Washington	12/15/06	New
Los Angeles, California	02/09/07	New
Indianapolis, Indiana	04/06/07	New
Houston, Texas	06/04/07	New
Cleveland, Ohio	07/02/07	New
Chicago, Illinois	07/30/07	New
Oakland, California	08/27/07	New
Miami, Florida	09/24/07	New

A10.03-00 Advanced Technologies and Oceanic Procedures (ATOP) – The FAA's oceanic mission is to ensure the safe and efficient transport of aircraft and passengers in our allocated airspace, keeping pace with growth and other civil aviation authorities' capabilities and services, resulting in seamless global air traffic for air carriers and the flying public. Although oceanic flights comprise only 4 percent of total U.S. air carrier operations, they provide 49 percent of the international cargo revenue and 20 percent of the passenger revenue (ATADS Reports Calendar Year 2001). Since its implementation at Oakland and New York Centers in 2005, ATOP has reduced aircraft separation from 50 nautical miles lateral/10 minutes longitudinal to 30 nautical miles lateral/30 nautical miles longitudinal (equates to 4 minutes). Ninety percent more altitude change requests were granted at Oakland and New York Centers in September 2005 than in September 2004. The ATOP automation has increased oceanic capacity and efficiency, mitigated the potential cost of delays, and allowed for the use of new routes from South America to New York, saving between 2,000-4,000 pounds of fuel per flight. Additionally, there is enhanced communication and surveillance and increased sector capacity. Annual U.S. transoceanic revenues are projected to increase significantly by the year 2010. Oceanic automation systems will improve market growth and increase the profitability of transoceanic flights.

Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses activity for recurring operations and maintenance in the amount of $7,957,000, primarily for second-level engineering and site maintenance. Lockheed Martin Transportation and Security Solutions (LMTSS) support provides configuration management of the operational baseline, help desk for the field, problem determination and resolution of software and hardware issues, approved safety critical design changes, and testing and deployment of maintenance builds. This engineering support allows ATO-E to continue the planned deployment of safety improvements and fixes to problem resolutions (PTR) for the ATOP system and to maintain a staff to address emergency issues. Critical deployment of safety improvements and fixes to problem resolutions for the ATOP System Problem Trouble Reports (PTR) must be fixed in a timely manner to keep the system stable and available. Licensing under the ATOP contract requires that only LMTSS can make modifications to source code. In addition, funding is required for site maintenance at Oakland, New York, and Anchorage Centers.

This NPHO funding is for the ATOP system at the following location:

Location	Date Commissioned	Description
Anchorage, AK	March 2007	New install

S02.03-00 Air Traffic Control Beacon Interrogator Replacement (ATCBI-6) – The Air Traffic Control Beacon Interrogator Replacement (ATCBI-6) is a secondary radar used for en route and oceanic air traffic control. The ATCBI-6 provides aircraft position information and identification to air traffic control facilities, for separation assurance, and traffic management. The ATCBI-6, in conjunction with co-located primary long-range radar, also provides back-up radar approach surveillance service to numerous terminal radar approach control (TRACON) facilities in the case of lost terminal radar services or scheduled maintenance downtime. ATCBI-6 is part of the agency's continuing effort to upgrade equipment to improve system capability and reliability. ATCBI-6 will also serve as the backup system for ADS-B in mitigating the impact of a loss of GPS positioning source in the en route domain. The ATCBI-6 replacement program will replace existing en route ATCBI-4/5 equipment and establish new beacon-only sites. The ATCBI-6 program will upgrade the current beacons with compatible surveillance systems, to sustain NAS safety, efficiency, and to avoid incurring unmanageable maintenance and supportability costs.

Beginning in FY 2009, FAA will incur additional costs for ATCBI-6 recurring operations and maintenance in the amount of $244,000:

- $180,000 for second-level engineering. This provides one contractor FTE to support FAA second-level engineering in development of software modifications, documentation, integration and regression testing, and configuration management for all operational and support systems at NAS facilities. It includes technical support to all NAS facilities to assist NAS personnel in the restoration of facilities directly via telephone, remote entry, or on-site travel as required. Additional activities include configuration management, maintenance, and control of the operational baseline of NAS systems by authorizing and releasing all modifications of systems, subsystems, component equipment, and software programs to operational systems and facilities in the NAS. It includes ensuring that appropriate documentation is developed and delivered to establish and maintain the system/service baseline.
- $17,000 for telecommunication service for radar data at new sites.
- $22,000 for utilities service at new sites.
- $10,000 for depot logistics support for new sites.
- $15,000 for one training class conduct to support systems being commissioned in FY 2009.

This NPHO funding is for the Air Traffic Control Beacon Interrogator (ATCBI-6) at the following locations:

Location	Date Commissioned	Description
Kenai, AK	10/31/06	Replacement
Mill Valley, CA	11/07/06	Replacement
Gibbsboro, NJ	11/27/06	Replacement
Kirksville, MO	01/11/07	Replacement
Oilton, TX	03/06/07	Replacement
Mt. Santa Rosa, GU	04/03/07	Replacement
Lake Charles, LA	04/05/07	Replacement
Bozeman, MT	04/26/07	New
Finley, ND	05/28/07	Replacement
Eagle County, CO	06/01/07	New
Caribou, ME	07/27/07	Replacement
Ft. Green, FL	08/17/07	Replacement
Lakeside, MT	08/31/07	Replacement

Terminal Services (ATO-T)

The Terminal Service Unit provides terminal air traffic control (ATC) services. It provides ATC services daily, develops ATC capabilities, monitors operational performance, manages programs in support of these services, and serves as a liaison to customers, airports, and service area operations personnel.

Terminal ATC services include both airport surface operations and terminal area operations. Airport surface operations are conducted by controllers at 496 federal and contract towers located at the nation's busiest airports. Aircraft and many other vehicles share the airport surfaces, creating a challenging environment at these airports. Terminal area operations are conducted by controllers at 168 terminal radar approach control facilities, which routinely handle aircraft within 40 or more miles of an airport. In many cases these facilities are combined with operations personnel shared between the facilities.

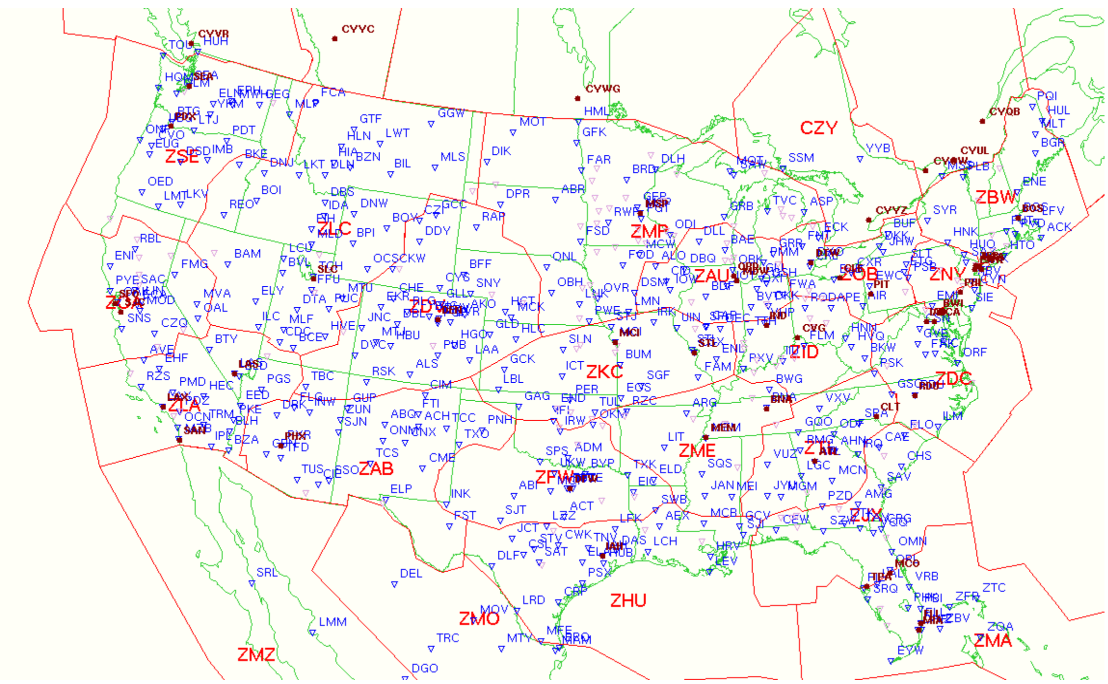
The Terminal Service Unit is divided into three geographical service areas (Eastern, Central, and Western) to better manage the delivery of terminal ATC services. The primary function of each service area is to oversee ATC operations within its geographical area, and to ensure that quality standards established for safety, capacity, and organizational excellence are met.

Terminal Services (ATO-T)

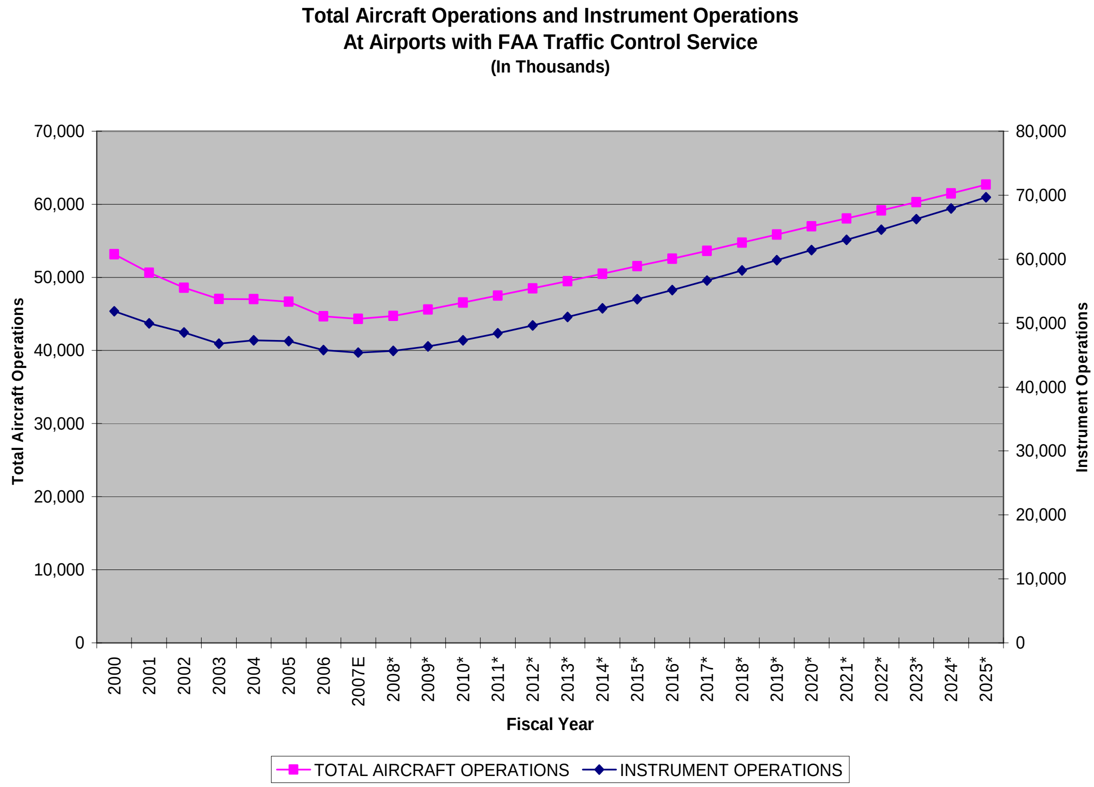
	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	1,618,318	1,693,244	86,771	-33,702	1,746,313
Other Objects					
Travel/Transportation	5,525	6,559	118	-500	6,177
Other Services	178,669	212,099	18,719	0	230,818
Rent/Communications/Utilities	2,052	2,436	45	-500	1,981
Other	10,300	12,227	220	-500	11,947
Subtotal	196,546	233,321	19,102	-1,500	250,923
Total	1,814,864	1,926,565	105,873	-35,202	1,997,236
Staffing					
End-of-Year*	10,213	10,171	0	46	10,217
Full-time Equivalent Employment*	10,233	10,545	171	0	10,716

* Actual distribution of staffing between Terminal and En Route may change based on actual attrition and operational needs.

The map below shows the airports where FAA provides terminal services.



The chart below shows the total aircraft operations and instrument operations at airports with FAA traffic control services.



Terminal has a NPHO requirement of $9,245,000. This covers the following programs:

A04.01-00 Standard Terminal Auto Replacement System (STARS) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $3,503,000:

- $2,312,000 for Second-Level Field Support. Funds required are to support STARS Operational Field Support facilities (OSF) and their associated infrastructure. This funding will provide the support personnel and hardware required to fully transition these STARS operations and maintenance (O&M) life-cycle operations activities from F&E to O&M. This effort will be provided under APPTIS Contract No. DTFAA03-02-D-00015.
- $1,191,000 for Program Management associated with second-level maintenance support. Additional contractor program support personnel are required to assist in preparation of OMB Operational Analysis (for steady state programs) and conduct Acquisition Management System (AMS) required Post Implementation Reviews (PIR). These funds will also provide the support personnel required to manage the technical and financial second-level maintenance activities. This effort will be provided under APPTIS Contract No. DTFAA03-02-D-00015.

STARS is a state-of-the-art, digital, radar and flight data processing and display system consisting of new air traffic control workstations, complete with color displays and robust commercially-available processors. STARS replaces the aging legacy air traffic control hardware and software found in 47 terminal air traffic control facilities. At completion, STARS will be in operation at 18 of the 35 OEP airports.

Location	Date Commissioned	Description
Houston (I90)	10/01/06	Replacement
Phoenix (P50)	01/27/07	Replacement
Norfolk (ORF)	07/28/07	Replacement

Full O&M funding will be required in FY 2009 due to the completion of STARS capital (F&E) funding of all second-level support activities. Without the requested NPHO funding in FY 2009, second-level maintenance and the associated infrastructure will be significantly degraded, impacting operations at the operational STARS sites and possibly leading to system outages.

A04.01-02 Terminal Enhancements (TAMR Phase 1) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for recurring operations and maintenance expenses in the amount of $195,000 for Program Management associated with second-level software maintenance support. Additional contractor program support personnel are required to assist in management and resolution of recurring software fixes associated with Problem Trouble Reports (PTR) for steady state programs. This effort will be provided under APPTIS Contract No. DTFAA03-02-D-00015.

C05.02-00 Terminal Voice Switch Replacement (TVSR) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $136,000:

- $53,000 for logistics support. FAA technicians maintain the systems and rely on contractor support to provide labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.
- $83,000 for second-level engineering contractor personnel support for the development of modifications, documentation, testing, and configuration management.

Even though TVSR is primarily a replacement system, there are a few new sites that have been fielded with new switches. This net increase is required to support these new systems and the replacement systems until all the legacy systems are replaced. The current Salaries & Expenses base will be used to support the legacy systems that have not been replaced.

Air traffic controllers require a reliable voice switching capability in order to communicate with pilots and/or other air traffic controllers. The integrated air traffic control terminal voice switch provides the means through which voice communication paths are selected and established. The FAA established the TVSR program to replace the obsolete electromechanical and aging analog voice switches before they jeopardize the safe and efficient control of air traffic. Many of the systems currently installed are unsupportable and replacement switches are required to ensure the continuation of effective control services.

Location	Delivery	Description
Deer Valley, Phoenix, AZ - ETVS	1/07	New
Ft. Wayne, IN – RDVS IIA	1/07	New
Phoenix, AZ - RDVS IIA	1/07	New
Poughkeepsie, NY – ETVS	1/07	Replacement
Lihue, HI - RDVS IIA	2/07	Replacement
Newport News, VA – ETVS	2/07	New
Bangor, ME – IVSR	3/07	Replacement
Houston ATCT, TX – ETVS	3/07	New
Spokane, WA – RDVS IIA	3/07	New
Dulles, VA – ETVS	4/07	New
Falmouth TRACON, MA - ETVS	4/07	Replacement
Clearwater, FL – ETVS	5/07	Replacement
Fayetteville, NC – ETVS	6/07	Replacement
Columbus, GA – IVSR	7/07	Replacement
LaGuardia, NY – ETVS	8/07	Replacement
Greer, SC – IVSR	9/07	Replacement
Lake Front, LA - ETVS	9/07	Replacement

F02.11-01, Houston Area Air Traffic System (HAATS) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for recurring operations and maintenance in the amount of $1,702,000:

- $98,000 for infrastructure program support for utilities and other infrastructure support costs.
- $1,604,000 for telecommunications services to support the transition of HAATS to NAS Operation.

HAATS is the focal point for all FAA activities associated with the expansion of the en route and terminal airspace. The Houston airspace plan is part of the National Airspace Redesign Program. HAATS has provided the infrastructure, system improvements, and implementation of the new en route and terminal procedures associated with the redesigned en route airspace. System improvements include the establishment of new air/ground communications at Bryan, Beaumont, Jasper, and Lufkin, Texas and additional arrival/departure routes to service the future expanded airspace east and north of Houston, which will require infrastructure and telecommunications support in FY 2009.

Without the requested NPHO funding, air traffic system delays will increase significantly in the Houston area airports and will increase delays and restrictions in the outlying en route centers (Cleveland, Indianapolis, Memphis, and Ft. Worth).

S03.01-05, Terminal Radar - ASR-9 Modifications – Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance in the amount of $338,000 for second-level engineering. This would provide contract engineers to provide direct operational support via telephone technical assistance and/or on-site restoration efforts to resolve problems with the commissioned ASR-9 facilities. These engineers also design modifications and perform system optimization to improve the operational performance of the NAS ASR-9 facilities. Additional workload consists of engineers developing test plans and procedures to conduct system level testing of the performance of the software upgrades. Lastly, these engineers staff the program support facility (PSF) for organic software and hardware support.

The Airport Surveillance Radar Model 9 (ASR-9) provides aircraft target and weather information to air traffic controllers, which helps reduce delays and improve safety at high activity airports. The ASR-9 system was designed and deployed in the 1980s/1990s and is experiencing an increase in failures. As a result of these failures, reliability and performance levels have degraded. A service life extension of the ASR-9 hardware is necessary to continue system operation, improve reliability and maintain the current level of safety.

The Mode S beacon system provides aircraft surveillance and communications services necessary to support air traffic control in high density air traffic environments through the use of Selective Interrogation (SI) and Traffic Information Service (TIS), respectively. The Mode S contract was awarded October 1984 with the first system commissioned in March 1994. Technology has since significantly improved and some components of the Mode S system are becoming obsolete. Replacement parts and/or redesign of appropriate assemblies are required to prevent further degradation of Mode S performance, which if allowed to take place would adversely impact NAS operations and decrease safety margins.

The FAA developed a two-phased strategy to provide aircraft surveillance services to the 135 highest traffic airports. Phase 1 immediately addresses the highest risk physical equipment repair and replacement in order to sustain operations. Phase 2 is a long-term strategy that will reduce overall service risk through 2025. The FAA continues to perform the business case analysis for the long-term solution. This two-phased approach is more affordable and lowers risk.

Phase 1 was broken down into two elements, Phase 1A and Phase 1B. Phase 1A consists of the following: (1) external antenna modifications to mitigate risk of structural collapse; (2) replacement of the obsolete ASR-9 Remote Monitoring System (RMS) and Mode-S Maintenance Data Terminals (MDT) which mitigates technical obsolescence risk (unavailability of spare parts); and (3) modifications to the waveguide and pedestal to address additional OSHA issues. The Joint Resources Council approved the investment required for performing the work under Phase 1A in September 2004. Phase 1B consists of modifications to the ASR-9 transmitter to improve reliability and maintainability. A final investment decision for Phase 1B was obtained in June 2005.

Without the requested NPHO funding, the ability and readiness of the second-level engineering to provide support to field sites to maintain NAS prime mission equipment in the field could be reduced. The worst case would be that an operational ASR-9 system would be out of service for an extended period of time.

S03.02-01 Terminal Radar Program (ASR-11) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $778,000:

- $390,000 for logistics support. FAA technicians maintain the systems and rely on the depot to provide labor, facilities support equipment, material, packing, handling, storage, and transportation or depot level repair and support.

- $188,000 for telecommunications. This adds kilobytes per second (kbps) of services to sites.
- $200,000 for infrastructure support to fund utility and other infrastructure support costs.

The ASR-11 is the integrated primary and secondary radar deployed at terminal sites. The mission of the ASR-11 investment is to replace our aging airport radar systems with a single integrated digital primary and secondary radar system. In the terminal environment around airports, air traffic controllers use radars to detect, locate, and track aircraft. Primary radars locate all aircraft, commercial and general aviation, with and without onboard transponders. Secondary radars locate aircraft that have transponders (usually commercial aircraft). Currently, FAA has 225 terminal facilities that have both primary radar (ASR-9, ASR-8, or ASR-7), and a collocated, secondary radar (Mode-S, ATCBI-4, or ATCBI-5). The ASR-9 and Mode-S systems (average age 10 years) were deployed in the 1990's; ASR-8 (average age 20 years) and ATCBI-5 systems (average age 25 years) were deployed in the 1980s; and ASR-7 (average age 24 years) and ATCBI-4 systems (average age 30 years) were deployed in the 1970's.

The ASR-11 replacement combines four separate radar systems (ASR-7, ASR-8, ATCBI-4, and ATCBI-5) into one system that uses modern digital technology to support the air traffic control automation system in use today. New capabilities include digital vs. analog output, LAN architecture for data distribution, remote certification and control, and both analog and digital solid-state components (i.e., no electron tubes). An additional feature is the six-level NWS calibrated weather capability—an improvement upon the very limited weather capability in the ASR-7/8 systems. ASR-11 radars detect and track aircraft and provide superior performance including ease of maintenance, increased system availability and reliability, and improved operational performance.

Location	Date Commissioned	Description
Santa Maria, CA	10/02/06	Replacement
Santa Barbara, CA	11/01/06	Replacement
Colorado Springs, CO	11/01/06	Replacement
Pensacola South, FL	05/03/07	Replacement
Pensacola North, FL	05/03/07	Replacement

Without the requested NPHO funding, the ability and readiness of the depot to provide support to field sites to maintain this newly commissioned NAS prime mission equipment in the field could be reduced. The worst case would be that an operational ASR-11 system would be out of service for an extended period of time.

S08.00-00 Precision Runway Monitor (PRM) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $526,000:

- $241,000 for logistics support. FAA technicians maintain the systems and rely on the contractor to provide labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.
- $126,000 for second-level engineering. This provides engineering guidance to the technicians for trouble shooting problems pertaining to software and hardware issues those technicians may encounter during preventative maintenance actions on the system.
- $151,000 for new telecommunications service at the site listed below.
- $8,000 for watch standing coverage. This includes planning for all activities associated with meeting watch standing coverage beyond stated staffing requirements. Backfill overtime is required when air traffic controllers and technicians are away from their normal duty station for an extended period of time for training, site preparation, and participation on user teams as consultants or advisors.

The PRM system is a highly accurate electronic scan (E-Scan) radar that tracks and processes aircraft targets once per second (as opposed to 4.8 seconds with conventional radars). PRM provides the controller with automatic alerts and high resolution displays that enable independent, simultaneous approaches to parallel runways spaced less than 4,300 feet. Airports with parallel runways can use those runways independently during Visual Meteorological Conditions (VMC). However, during Instrument Meteorological

Conditions (IMC), closely-spaced runways cannot be used for independent or simultaneous approaches without PRM. Installing PRM radars and displays can return a portion of the lost capacity and also reduce delays.

Location	Date Commissioned	Description
Atlanta, GA	April 2007	New

If funding is not provided, the program would use capital dollars to accomplish activities normally performed with NPHO funds. This would reduce the capital funding available to begin implementation activities at new sites and result in program schedule delays.

S09.01-00 Airport Surface Detection Equipment – Model X (ASDE-X) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $1,092,000:

- $86,000 for logistics support. FAA technicians maintain the systems and rely on the contractor to provide labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.
- $638,000 for second-level engineering. Contract engineers provide direct operational support via telephone technical assistance and/or on-site restoration efforts to resolve problems with the commissioned ASDE-X facilities. These engineers also design modifications and perform system optimization to improve the operational performance of the NAS ASDE-X facilities. Additional workload consists of verifying that the proposed software changes made by the prime contractor do not impact the operational capabilities of the system. The engineers develop test plans and procedures to conduct system level testing of the performance of the software upgrades. Lastly, these engineers staff the program support facility for organic software and hardware support.
- $327,000 for additional training classes for controllers at the Academy.
- $41,000 for new telecommunications service at the sites listed below.

These recurring costs are for three ASDE-X Upgrade systems. The ASDE-X multilateration system includes remote units installed strategically throughout the airport to provide target position and identification reports for all aircraft and vehicles equipped with transponders. Multilateration is the process of determining a target's location in two or three dimensions by triangulating the transponder signal.

The ASDE-X system is designed to aid in the prevention of accidents resulting from runway incursions. ASDE-X is capable of processing three types of sensor data providing a robust surveillance picture consisting of three dimensional target locations, target identification, and universal time. The three sensor types of ASDE-X are independent (primary surface radar), cooperative (multilateration and secondary surveillance radar), and dependent (ADS-B) surveillance sources. Radar is used to provide the independent surveillance for all non-transponder equipped targets in line-of-sight of the radar antenna. Multilateration will provide target position and identification reports for all aircraft and vehicles having operational transponders. Automatic Dependent Surveillance - Broadcast (ADS-B) will provide accurate global positioning system position reports for equipped aircraft. ASDE-X improves surface safety by providing surface situational awareness and positive identification of targets on the surface. ASDE-X benefits ATC by providing a collaborative decision-making tool base that will alert controllers to potential conflicts and provide solutions to situations that might compromise safety. Funding will support enhancements to increase the capabilities provided by the current ASDE-3/AMASS system, and will improve the accuracy and timeliness of surveillance data. ASDE-X will reduce the risk of runway collisions, preventing fatalities, injuries, and aircraft damage. The system will also reduce taxi delays, resulting in operating cost savings for air carriers and time savings for passengers. The ASDE-X system will be implemented at airports with no surface surveillance systems and airports with ASDE-3/AMASS systems.

Location	Date Commissioned	Description
Charlotte, NC	August 2007	Upgrade
Louisville, KY	September 2007	Upgrade
Chicago, IL	September 2007	Upgrade

W07.01-00 Integrated Terminal Weather System (ITWS) – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $584,000:

- $17,000 for logistics support. FAA provides labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.
- $200,000 for second-level engineering. This provides engineering guidance to the technicians for trouble shooting problems pertaining to software and hardware issues those technicians may encounter during preventative maintenance actions on the system.
- $97,000 for infrastructure support to fund utility and other infrastructure support costs.
- $195,000 for telecommunications. This adds 1,536 kilobytes per second (kbps) service and DDC and VG services.
- $75,000 for systems operations. Volpe distributes weather products to approved FAA and non-FAA users not directly connected to the FAA system.

ITWS is an automated terminal-area weather data processor, which provides a unified set of safety and planning weather products to air traffic supervisors, traffic management specialists, and others on a local and regional basis. The ITWS information depicts current conditions and near-term (up to half an hour) forecasts. ITWS information is disseminated to the respective tower, en route center, TRACONS, and other users. ITWS integration and display of data from terminal weather sensors, remote weather sensors, and external processors provide analyses and short-term forecasts.

Location	Date Commissioned	Description
New York	November 2006	New
Memphis	January 2007	New
Dallas-Fort Worth	April 2007	New
Orlando	June 2007	New
Detroit	August 2007	New
Pittsburgh	September 2007	New

If the requested funding is not received, logistics support for New York and other ITWS systems would be reduced, increasing the risk of service disruptions. Without telecommunications services, the ITWS systems will be inoperable.

W09.01-00 Weather System Processor (WSP) Technology Refresh – Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance in the amount of $88,000:

- $26,000 for logistics support. FAA technicians maintain the systems and rely on the contract support to provide labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.
- $12,000 for infrastructure support to fund utility and other infrastructure support costs.
- $39,000 for site maintenance activities associated with corrective maintenance of hardware and software.
- $11,000 for systems operations. This funds non-maintenance activities associated with directly operating or monitoring the solution. This includes computer operations, system administration, system security administrators, information security assessments, and audits.

The WSP program provides an alternative to the Terminal Doppler Weather Radar at non-OEP airports and in locations where the traffic volume is moderate. WSP provides weather information for tower and TRACON ATC personnel. WSP also provides products that include gust front, thunderstorm, precipitation, and wind shear/microburst events which make the WSP critical to the operation of the NAS in the prevention of catastrophic weather induced aircraft accidents.

If the requested funding is not received, logistics support for WSP systems would be reduced, increasing the likelihood of service disruption. Without telecommunications services, the WSP systems will be inoperable.

Z0T.04-00, Integrated Display System (IDS) Model 4 – Beginning in FY 2009, FAA will incur costs in the Salaries & Expenses program for a recurring operations and maintenance bill in the amount of $303,000 to cover second-level engineering support to provide direct operational support via telephone technical assistance and/or on-site restoration efforts to resolve operational IDS 4 system or equipment outages, and software configuration issues, when technical issues are beyond the maintenance technician's expertise.

Without the requested NPHO funding, second-level support of fielded systems would be eliminated. Without second-level engineering, Technical Operations (ATO-W) will be unable to return equipment to operating status, resulting in a loss of system services to the air traffic controller. Loss of system services eliminates the automated delivery of weather data, and immediate access to critical control information, which in turn will decrease controller productivity, increase airspace congestion and increase the risk of operational errors.

System Operations Services (ATO-R)

Critical to each day's successful air traffic flow, the conversations held every two hours between the major airlines and specialized FAA personnel located at the Air Traffic Control Systems Command Center (ATCSCC) were the result of decades of lessons learned. System demand outstrips capacity on many days as weather, airport delays, special use restrictions, and security inflates and contracts airspace corridors all over the country. ATCSCC personnel maneuver streams of aircraft over and around these obstacles by an almost constant flow of available data being provided to controllers, while also closely coordinating their actions and recommendations with the airline home offices. ATO-R balances situation specific airflow needs with issues of altitude, noise abatement, speed, and direction, ensuring optimum use of airports with minimum public concern.

Equally important are the requirements for ATO-R to coordinate with the Departments of Homeland Security and Defense on all issues of air security. ATO-R is responsible for Notices to Airmen (NOTAMS), a notification system relating airspace closings, airport reconfigurations, and security conditions to general aviation pilots, making ATO-R the pivot point in flow management and coordination of security measures.

Flight Services (formerly ATO-D), which provides vital safety information to the general aviation community, was incorporated into ATO-R in FY 2007. Flight Service Stations (FSS) collect and disseminate aeronautical and meteorological information, providing customized pre-flight and in-flight services to the domestic and international general aviation communities, as well as to military, air carriers, and federal and local law enforcement. These services are provided to pilots via telephone, radio, the Internet, and face-to-face meetings.

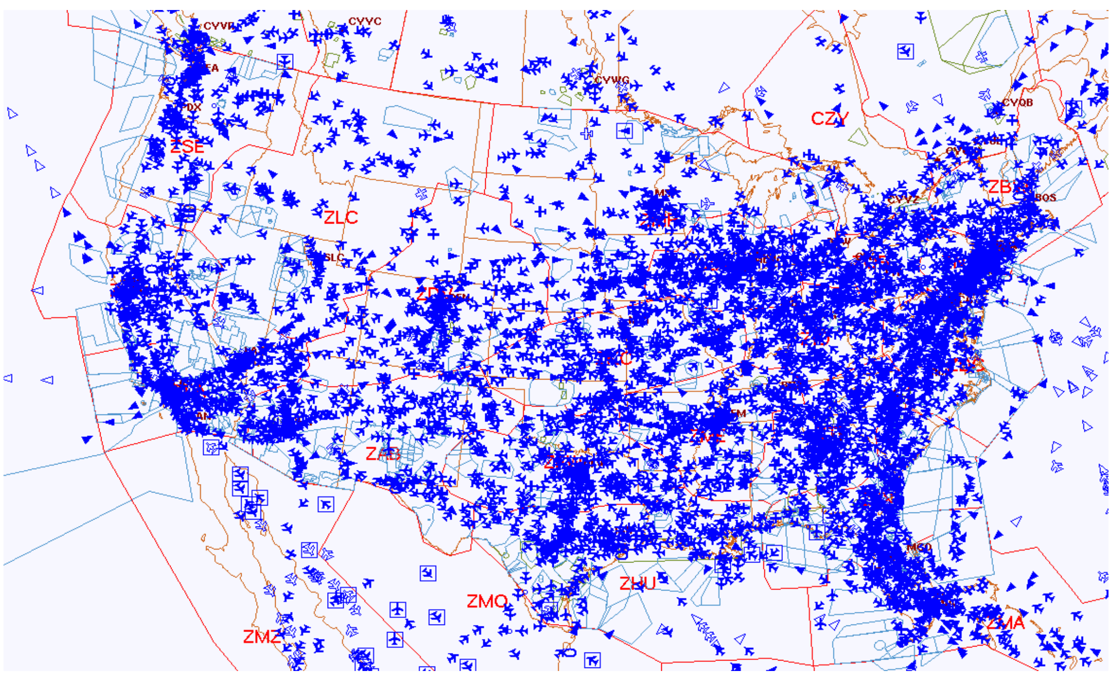
In FY 2006, Lockheed Martin began providing these services (funded by FAA) for the continental U.S., Hawaii, and Puerto Rico. Equipment maintenance for all government furnished equipment (GFE) continues to be provided by FAA through 2007. Starting in FY 2008, FAA will provide maintenance only on mandatory GFE, which includes FAA Telecommunications Infrastructure (FTI), the remote communication outlets, and direction finders. The FAA will also continue to support the eight FAA-owned flight service buildings in which the service provider will maintain a presence. Three Automated Flight Service Stations (AFSS) and 14 non-automated FSS in Alaska remain government-operated. The automation system was enhanced in Alaska in FY 2007 to mitigate information security and data integrity issues, and there are plans for a software technical refresh in FY 2009 to replace the operating system. This enhancement will provide a bridge to Alaska Flight Service Modernization (AFSM) which is currently within the Acquisition Management System process.

AFSS contract costs will be $4.9 million lower in FY 2009, the third year of the Lockheed Martin contract. This represents almost 34 percent of the $14.8 million in total FY 2009 savings resulting from this competitive sourcing effort. Lockheed Martin contract costs will account for $858.5 million (over the remaining 7 years of the contract) of the estimated $2.2 billion in total savings and cost avoidance over 13 years of this effort.

System Operations Services (ATO-R)

	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	228,944	237,325	10,369	0	247,694
Other Objects					
Travel/Transportation	3,906	3,864	69	-500	3,433
Other Services	316,745	313,376	8,870	-10,900	311,346
Rent/Communications/Utilities	207	205	3	0	208
Other	2,536	2,509	45	0	2,554
Subtotal	323,394	319,954	8,987	-11,400	317,541
Total	552,338	557,279	19,356	-11,400	565,235
Staffing					
End-of-Year	1,273	1,273	0	0	1,273
Full-time Equivalent Employment	1,287	1,299	0	0	1,299

The chart below displays a snapshot of controlled aircraft in the system at a typical moment in time.



System Operations has a NPHO requirement of $3,459,000. This covers the following programs:

A05.01-06 Air Traffic Management – Traffic Flow Management Infrastructure – The Traffic Flow Management (TFM) system is a component of the NAS Architecture and provides the decision support systems and tools that help balance growing flight demands with NAS capacity within a dynamic environment. The TFM system hosts the software tools that are used to manage the efficiency of air traffic, to reduce delays and make maximum use of system capacity. The present TFM system has evolved through several generations of hardware and software. Its software has become increasingly difficult to maintain and modify and will not support emerging system requirements. The architecture platform is overly complicated, congested with multiple communication and network threads. The Traffic Flow Management Modernization (TFM-M) investment will modernize the Enhanced Traffic Management System (ETMS) hardware and software architecture.

This NPHO funding of $1,094,000 is needed to fund new equipment maintenance costs and software licenses as legacy equipment transitions out of the field.

TFM second-level engineering support and testing are currently provided by Volpe Labs in Massachusetts. The program office has determined that these functions can be provided at a lower cost by the WJHTC in New Jersey. The program office intends to transition TFM support in FY 2009 to the WJHTC. During the transition, dual operations will be required at both sites. NPHO funds in the amount of $689,000 are needed to accomplish the transition.

A08.01-00 NAS Airspace System Resource (NAIMES) – The NAS Aeronautical Information Management Enterprise System (NAIMES) provides aeronautical information portal capabilities and data distribution delivery to air traffic control towers, terminal radar approach control facilities, combined center radar approach control facilities, automated flight service station sites, air route traffic control center facilities, Department of Defense Base Operations (BASEOPS) sites, and other NAS users such as airlines and the general aviation community. NAS systems are able to access aeronautical information directly from NAIMES by standard interfaces and protocols without relying on other copies of data stored on other NAS systems. NAIMES will be upgraded with new Sun servers, enhanced security devices (routers, switches, firewalls, etc.), and will upgrade the Herndon NAS Internet Access Point (IAP) Internet connection to two T-3 circuits to improve reliability. This NPHO funding of $900,000 is needed for telecommunication costs.

A08.01-01 Notice to Airmen (NOTAMS) – The NOTAMS Distribution Program (NDP) will provide automated NOTAM delivery to terminal, en route, and remaining AFSS facilities. NOTAMS automation provides receipt, acknowledgement, and dedicated distribution for the distribution of all classes of NOTAMs (domestic, International Civil Agency Organization, Flight Data Center, military, and local). The FAA Telecommunications Infrastructure (FTI) will provide the communications infrastructure for the NDP solution. In the terminal domain, the automation process will involve software development and integration, hardware procurement, telecommunications Internet Protocol service, site surveys, site preparation, system installation, system familiarization/orientation, and site acceptance testing. In the en route domain, activities will involve software interface development, installation, and testing. NOTAMS telecommunications costs are projected to rise by $456,000 due to increased FTI costs. NPHO funds are needed to pay for the increase.

F28.01-01 Air Traffic Control System Command Center (ATCSCC) Infrastructure Planning – The ATCSCC Infrastructure Planning project will move the ATCSCC from its leased location in Herndon, Virginia to a site shared with the Potomac TRACON in Warrenton, Virginia. As part of the start-up for the new facility, telecommunications must be purchased for $46,000 in FY 2009. The lease at the old facility will still be in force during construction of the new facility.

Z0R.01-00 Aeronautical Information Management (AIM) Programs – The AIM Program is a new program that consolidates NAIMES, NOTAMS, and MILOPS into integrated systems and services. AIM is an "enabler," providing customers and stakeholders with "one-stop" access to critical products and services. AIM facilitates the transition of NAS operations from the legacy system-centric (point-to-point) to network-centric (point-to-cloud) by utilizing both new and existing infrastructure, and developing associated policies and standards. Unlike other NAS-wide "middleware" efforts, AIM provides full connectivity support for legacy customers. AIM equipment will be located at the FAA Headquarters, Air Traffic Control System Command Center (ATCSCC) in Herndon, VA and a remote site located at the National Network Control Center in Salt Lake City, UT. AIM will collect, validate, manage, store, and disseminate aeronautical, flight plan, and weather information. When fully implemented, AIM systems will provide a single entry point into various databases of aviation resources such as NOTAMS, weather, Special Use Airspace, and other types of aeronautical information. AIM will collect information at its source and disseminate accurate and timely aeronautical information to all users. AIM will provide high-speed and reliable access using modern communication technologies and protocols. This NPHO funding of $274,000 is needed for telecommunications costs associated with AIM.

Technical Operations Services (ATO-W)

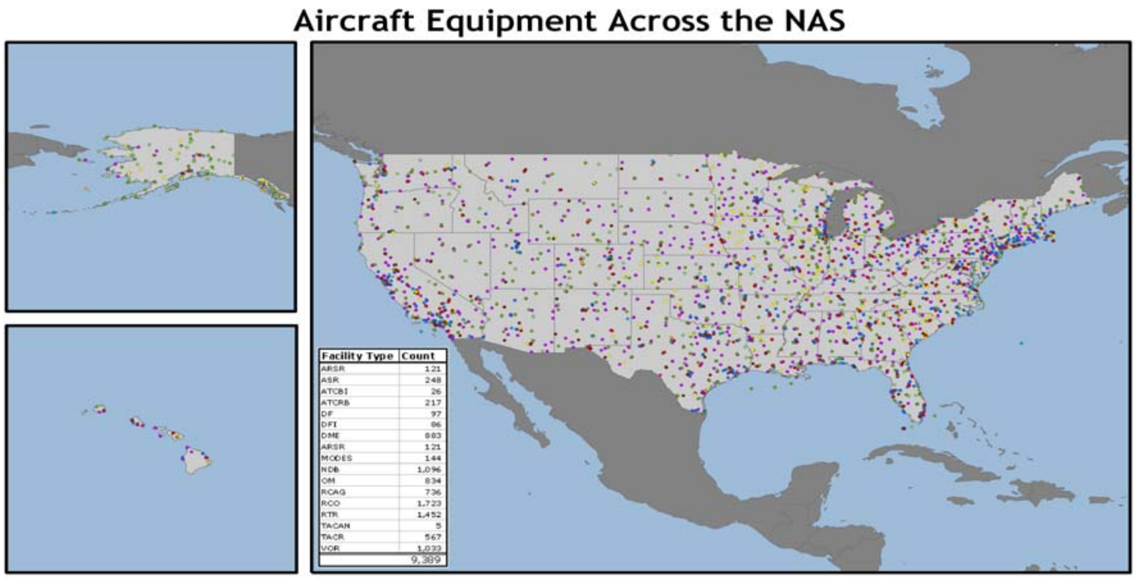
The Technical Operations Service Unit (ATO-W) manages the infrastructure of the NAS. Its daily mission is to maintain more than 17,000 existing systems as well as install hundreds of replacement and new systems throughout the United States. Technicians, trained in the upkeep and maintenance of these machines, are the heartbeat of ATO-W, providing the expertise to ensure that all systems necessary for the public to fly safely and on schedule are functioning properly. When implementing a new system, the legacy system must be maintained while the new equipment is installed and integrated into the NAS. Failure to properly maintain or upgrade systems could make the controller screens go dark. Experienced personnel are critical in maintaining system integrity.

Acquisitions are also a part of ATO-W, with program offices involved in the development and purchase of communications and navigation systems. Technical Operations is on the cutting edge of Air Traffic Technology, providing some of the most technologically advances system upgrades in the world. One example is FAA FTI, a critical upgrade to the entire NAS communications structure, is being implemented to replace an older MCI contract system. FTI will provide continuous high-quality telecommunications services to ATC facilities.

From the pilots that fly the navigation test runs on new or upgraded equipment, to the program manger trying to make their program more cost effective, or the managers trying to make sense of future spectrum allocations, ATO-W is the most varied service unit in the ATO.

Technical Operations Service (ATO-W)

	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	989,559	1,051,503	45,930	-5,288	1,092,145
Other Objects					
Travel/Transportation	37,348	36,826	663	-500	36,989
Other Services	468,530	461,666	-49,493	-37,264	374,909
Rent/Communications/Utilities	366,066	360,703	6,493	0	367,196
Other	119,849	118,093	2,126	-2,250	117,969
Subtotal	991,793	977,288	-40,211	-40,014	897,063
Total	1,981,352	2,028,791	5,719	-45,302	1,989,208
Staffing					
End-of-Year	8,640	8,640	0	-49	8,591
Full-time Equivalent Employment	8,684	8,642	0	-49	8,593



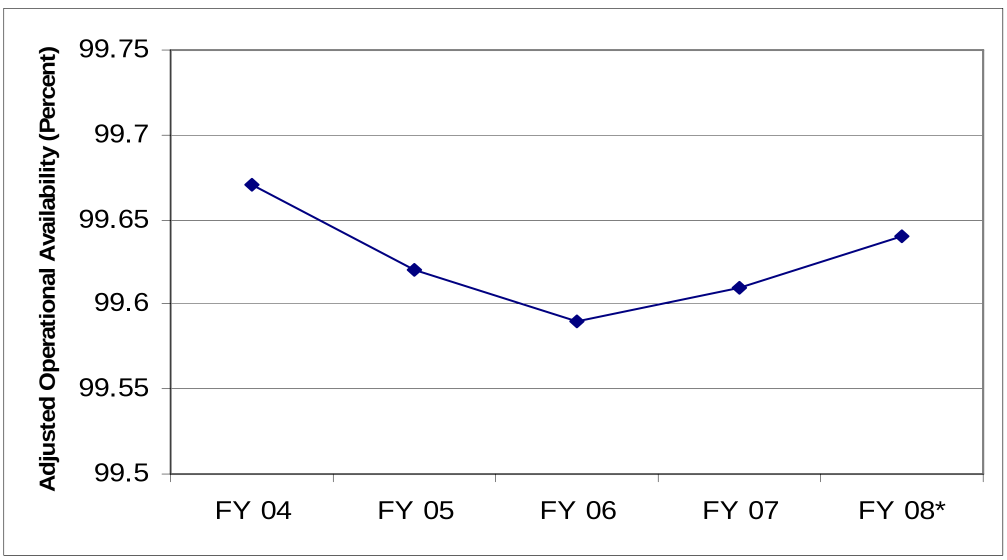
These graphics represent 9,389 of 64,312 facilities and equipment maintained by the FAA.

Produced by FAA Aeronautical Information Management (AJR-32)
May 25, 2006

The NAS is an inherently complex system with multiple levels of redundancy to assure availability of key services. Technical Operations Service has established the following target for this performance goal:

- Sustain Adjusted Operational Availability at 99 percent for reportable facilities that support the NAS.

Adjusted Operational Availability of NAS Capabilities:



Systems Maintenance Field Maintenance Performance Indicators

Fiscal Year	Number of Facilities**	Adjusted Operational Availability	Reliability
2004	22,561	99.67%	99.89%
2005	22,792	99.62%	99.90%
2006	22,860	99.59%	99.85%
2007	22,637	99.62%	99.84%
2008*	22,513	99.64%	99.86%

Notes: *FY 2008 data thru November 30, 2007
**Operational facilities deemed reportable in FAA Order 6040.15, "National Airspace Performance Reporting System."

Technical Operations has a NPHO requirement of $13,610,000. This covers the following programs:

A14.02-01 Instrument Flight Procedures Automation (IFPA) – Instrument Flight Procedures Automation (IFPA) is an automation system used to create new Instrument Flight Procedures (IFP) and sustain existing IFP. IFP provides pilots with an approach path into and out of an airport clear of obstacles such as cell towers, buildings, and trees. They are defined operational rules for executing defined maneuvers, which provides safety without direct control from air traffic personnel. The current automation used by the National Flight Procedures Group within Aviation System Standards, includes a system first implemented in the 1970s. The system is technically obsolete and inefficient. IFPA is a suite of tools, which focuses on increasing productivity in Aviation System Standards' (AVN) four primary products: Instrument Flight Procedures, Amendments to IFP, obstacle evaluations, and Notice to Airmen. The IFPA Program is an acquisition investment. Each software system component can be divided further into sub-components called modules, which will be delivered in phases. This investment supports the agency goals for the Wide Area Augmentation System program, the Required Navigation Performance program, and the Commercial Aviation Safety Team plan.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $750,000. The NPHO funds will provide IT contract support for the IFP and Procedures Tracking System (PTS) applications, which are components of our IFPA application suite.

C04.01-01 Radio Control Equipment (RCE) – The RCE Program sustains the current radio signaling and tone control equipment, improves operational performance and reduces maintenance costs. The legacy tone control equipment included obsolete tube/relay devices that had functional system deficiencies, such as push-to-talk keying delays, false transfers of equipment, no main/standby equipment status read-back, improper impedance switching, and low unit reliability. The legacy system did not adequately address user demands and reconfigurations, creating inefficiencies. RCE equipment meets current and future requirements of air route traffic control centers, terminal radar approach control facilities, center and radar approach control facilities, air traffic control towers, and automated flight service stations. This equipment is also utilized at remote center air/ground communications sites, back up emergency communications sites, remote transmitter/receiver (RTR), and remote communications outlet sites.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $5,000. NPHO funds for RCE are needed to support corrective maintenance, logistics supply support, logistics repair (includes loop back testing and repair for broken units), and hardware/software engineering support due to the increased number of RCE units across 21 facilities.

C06.01-00 Communications Facilities Enhancement - Expansion (CFE) – The growth in air traffic operational requirements has historically dictated the need for greatly increased air/ground communications coverage. In response, this program was established to provide additional air/ground communications frequencies by establishing new, relocating existing, and/or expanding remote communications facilities (RCF). The CFE program is responsible for establishing, expanding, or relocating air-ground radio communication facilities required to increase NAS capacity and improve NAS efficiency. The CFE program conducts communications facilities work, purchases required equipment, and implements grounding, bonding, and testing to meet FAA facility specifications. The CFE program provides the necessary equipment to upgrade and sustain RCF, provides additional frequencies in support of the creation of new validated sector requirements, and supports the relocation of Remote Communications Outlets (RCO) for the Flight Service Provider Transition program.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $488,000. NPHO funds for CFE - Expansion are needed to support logistics supply support, logistics repair, second level hardware/software engineering support, and infrastructure support (utilities, grounds upkeep, and maintenance), due to the increased number of facilities and equipment (26 facilities transitioned to Ops).

C06.04-00 Communications Facilities Enhancement (CFE) UHF Replacement – The UHF Radio Replacement Program replaces radios at Remote Communications Air/Ground sites and Back-Up Emergency Communications locations. The transmitters and receivers will be deployed concurrently with the NEXCOM VHF Multimode Digital Radio to minimize implementation costs. The Federal Aviation Act of 1958 requires the Administrator to provide necessary facilities for the regulation and protection of Air Traffic. For national security reasons, the Department of Defense (DoD) must have access to the NAS. In order for air traffic controllers to communicate with some DoD aircraft, FAA must operate and maintain the Ultra High Frequency Radio infrastructure. DoD reaffirmed this requirement in August 2001.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $70,000. NPHO funds for CFE – UHF Replacement are needed to support logistics supply support, logistics repair, second level hardware/software engineering support, and infrastructure support (utilities, grounds upkeep, and maintenance), due to the increased population of UHF Radios.

C17.01-00 Alaskan NAS Interfacility Communications Systems Phase II (ANICS) – The ANICS replaces leased commercial communications circuits in Alaska with FAA-owned satellite earth stations and leased satellite transponders to provide reliable telecommunications services in locations where FAA has experienced poor telecommunications performance. The increase of telecommunications availability provided by implementing ANICS corresponds to a direct increase in the availability of the NAS and improves air safety in Alaska.

ANICS Phase II facilities are designed to provide communications available 99.99 percent of the time (less than eight hours of outage per facility, per year) by using one set of equipment and one satellite. This level of service is used for aircraft pilot-to-flight service station communications, for transmission of weather information, and remote maintenance monitoring and control of air navigational aids. These services are considered essential for the successful control of airspace and aircraft.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $1,097,000. NPHO funds for ANICS – Phase II are needed to bring the network up to FAA performance standards for availability and reliability, reduce or eliminate outages, ensure that Internet Protocol networking equipment would support field connectivity to Anchorage Air Route Traffic Control Center for administrative and operational systems (e-mail, RMM, SAL/MMS, NEXRAD etc), realize cost avoidance in maintenance and operations costs, including technician travel and overtime, and ensure that equipment/parts would be supportable by the manufacturer. Several of the equipment parts are no longer being manufactured.

C18.00-00 NAS Recover Communications (RCOM) – The RCOM program provides FAA the minimum command and control communications capability necessary to direct the management, operation, and reconstruction of the NAS during regional and local emergencies, when normal common carrier communications are interrupted.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for Recovery Communications/C3 (Command & Control Communications recurring operations and maintenance bills in the amount of $624,000. NPHO funds for RCOM are required to support the following preventative and corrective maintenance projects:

- $95,000 for preventative maintenance and certification. Major systems are located in FAA facilities in and around the Washington D.C. Metropolitan Area and include the systems associated with the Communication Support Vehicle and the Washington Operations Center Complex as well as the Secure Telephone Equipment, the Secure Fax, the Defense Messaging System (DMS), the Very High Frequency/Frequency Modulated (VHF/FM) system and the High Frequency (HF) system.

- $43,000 for System Management Office (SMO) Overhead. Major systems requiring field support from the SMO include the Secure Telephone Equipment, the Secure Fax, the Defense Messaging System (DMS), the Very High Frequency/Frequency Modulated (VHF/FM) system and the High Frequency (HF) system.
- $287,000 for corrective maintenance. First-level field maintenance support will be required to provide corrective maintenance on DMS, the Secure Conference units, the VHF/FM, and the fixed Satellite Telephone Network.
- $19,000 for program support and contract management. An increase is required for activities associated with modifying, monitoring, and managing logistics contracts, service management contracts, service level agreements and equipment repair and maintenance contracts.
- $7,000 for second-level program management and infrastructure support. An increase is required for second level field maintenance support for software, hardware, firmware, and for analyzing and resolving national and system-wide problems.
- $18,000 for second-level NAS Field support and restoration. An increase is required to establish a funding base for additional technicians to maintain new NAS equipment that will be transitioning from facilities and equipment to the operational appropriation.
- $94,000 for utilities, buildings, grounds upkeep, and maintenance. An increase is required to support the previously modernized Regional Operations Centers (ROC) and Emergency Operations Facilities (EOF) in the Southern New England Region and the Washington Metropolitan Area. The routine maintenance and upkeep of the grounds and building façades requires more effort as the number of modernized sites has increased.
- $44,000 for logistics repair. There will be an increase in depot-level stock repair of equipment and replenishment of spare parts. A recent upgrade to the equipment being spared for the VHF/FM program will require the FAA Depot to spare both generations of equipment at sites that were installed earlier. An increase is required for activities associated with CDLS contracts that provide additional support not covered by regular logistics repair functions.
- $17,000 for telecommunications. An increase is requested for telecommunication costs for new systems and responsibilities for the programs that are transitioning from facilities and equipment to the operational appropriation. Though there is an effort to co-locate equipment in FAA facilities, there is a need to provide for the new systems recently installed in the NAS.

C21.01-01 Next Generation VHF A/G Communication System (NEXCOM) - Segment 1a – The Next Generation Air/Ground Communications (NEXCOM) program replaces FAA's aging, inadequate VHF analog system used by pilots and air traffic controllers, with a modern air/ground communications system. NEXCOM will:

- Provide direct pilot/controller voice communications for air traffic control voice channels for aircraft flying above 24,000 feet in the en route environment;
- Allow for the allocation of spectrum available to support data communications in support of NextGen; and
- Increase security by reducing the risk of unauthorized system access.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $130,000. NPHO funds for NEXCOM – Segment 1a are needed to support corrective maintenance, logistics repair, second level hardware/software engineering support, system management support, and NAS field support and restoration (utilities, grounds upkeep, and maintenance), due to the increased number of multi-directional radios transitioned to Ops.

C26.00-00 FAA Telecommunications Infrastructure (FTI) – The FAA must replace the existing telecommunications infrastructure that supports critical air traffic operations. FTI established the framework for FAA's migration to an all-digital architecture that is capable of supporting bandwidth intensive, high availability telecommunications services across the NAS. FY 2008 funding will be used to complete the deployment of the FTI network at 167 sites. Full transition is expected by December 2008.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $3,500,000. NPHO funds for FTI are needed to operate and maintain the FTI network to support decommissioning of 11 remaining A-nodes in the first quarter of FY 2009. The scheduled FTI transition end date is December 2008.

F13.02-00 NAS Facilities OSHA & Environmental Standards Compliance - Environmental Cleanup (HAZMAT) – The FAA has identified more than 700 areas of concern (AOC) contaminated sites at 208 locations nationwide that require investigation, remediation, and closure activities under Federal, state, and local mandates. The Eastern Service Area has 67 locations; Central Service Area has 45; and the Western Service Area has 96.

To manage and remediate these contaminated sites, FAA developed the Hazardous Materials Management program, to comply with all applicable federal, state, and local environmental cleanup statutes. These statutes include the Resource Conservation and Recovery Act of 1976, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and the Superfund Amendments and Reauthorization Act of 1986. The FAA's program activities include continuing site investigations, managing hazardous waste materials including waste accumulation, handling, and disposal, installing groundwater monitoring wells, remediating site contamination, and controlling air pollution.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $1,600,000. NPHO funds for HAZMAT are needed for the operation and maintenance of treatment facilities at William J. Hughes Technical Center which is a Superfund Site. This funding provides essential support to environmental protection at the Technical Center. This request ensures that Superfund cleanup operations at the Technical Center continue. Failure to maintain these operations would result in significant regulatory actions against FAA including the possibility of fines and penalties and may result in the contamination of the drinking water supply for Atlantic City, NJ.

F17.01-01 Computer Aided Engineering Graphics (CAEG) Modernization – The FAA possesses different versions of Computer Aided Engineering Graphics (CAEG) system components, a portion of which needs to be refreshed annually; a software suite of commercial off-the-shelf software that is leased annually; and specialized applications that are further developed to meet parochial needs. Hardware replacements are needed to meet the increasing demands for disk space, memory requirements and processing speed to keep pace with software enhancement demands. Software upgrades are necessary to keep pace with industry standards to avoid costly engineering drawing conversions and to improve versatility of access. The system serves as an indispensable engineering tool for facility and transition plan development, power management, site selection and planning, radio frequency coverage and interference analysis, and maintaining the accuracy of engineering designs in a fluid environment. The specialized engineering tools are upgraded to provide more meaningful analyses as per employee requirements. Without CAEG services, the construction and implementation of new facilities will be severely delayed and costly analyses necessary for site and transition planning and radio frequency coverage analysis and interference source isolation will have to be procured.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $121,000. NPHO funds for CAEG are required to fully fund the Bentley Select Agreement. The Bentley Select Agreement provides for computer aided design (CAD) and drawing management services. The services give ATO the ability to pool our licenses, hotline support, on-line documentation and reduced training rates at the Bentley Select conferences. The CAD services support approximately 1,400 F&E engineers and drafters, analysts, configuration managers, and security engineers. The Bentley Select Agreement has been expanded over time to include additional licensing as the need required.

M17.00-00 Test Equipment Modernization/Replacement – The Test Equipment Modernization and Replacement Program plans for and manages the replacement of obsolete test equipment, standardization, and optimization of modern test equipment used by the field specialists in the repair and certification of operational NAS Systems. The Test Equipment Program serves as the agency's focal point for all test equipment requirements used to maintain critical operational NAS facilities/services.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $10,000. NPHO funds for test are needed to handle the increase in calibration of test equipment. (A good example is the additional cost for calibration of the Monopulse Beacon Test Set

(MBTS). There are approximately 400 units fielded with an additional cost of $33 per unit for a total of $13,200 in cost for calibration. Also, Capstone (ADS-B) has 23 sets (PXI-5660 and PXI-5670) that cost a total of $75,500 for which funding was not provided for calibration. Although it shows $10,000 in NPHO funds for FY 2009, test equipment actually requires at least $90,000. Most program offices do not provide funding for the calibration of test equipment which would be on WBS 5.8.5. All activities associated with replenishing, repairing, maintaining, and calibrating support equipment.

N03.01-00 Instrument Landing Systems (ILS) – The ILS program buys and installs partial and full Category I, II, and III instrument landing systems and associated precision approach equipment at qualified airports. An ILS precision approach relies on navigation devices (i.e., localizers, glide slopes, distance measuring equipment, etc.) and ancillary aids (i.e., approach lighting systems, runway visual range indicators, etc.) to provide landing approach guidance and visual aid information. This capability enables aircraft to land in weather conditions where visibility is very limited.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $1,810,000. NPHO funds for ILS are needed to support the NAS impact of the projected installation of the ILS 420 systems, the NPHO funds are required to support additional second level engineering support, site level maintenance training, leased telecommunications, flight inspection, supply support, and contractor depot logistics support.

N04.01-00 Visual NAVAIDS - Visual NAVAIDS for New Qualifiers – This program supports the procurement, installation, and commissioning of Precision Approach Path Indicator (PAPI) systems and of Runway End Identification Light (REIL) systems. A PAPI provides visual approach glide slope information to pilots and enables them to make a stabilized descent with a safe margin of approach clearance over obstructions. The PAPI consists of four lamp housing assemblies arranged perpendicular to the edge of the runway. The PAPI projects a pattern of red and white lights along the desired glide slope so a pilot can tell whether or not he is on the glide slope.

A REIL is a non-precision visual aid that provides rapid and positive identification of the approach end of a runway to the pilot. The REIL is a system consisting of two simultaneously flashing white lights, one on each side of the runway landing threshold.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $128,000. NPHO funds for Visual NAVAIDS are required to support the deployment efforts of the new REIL 19900 and new PAPI system. The estimated NPHO funds will provide needed second-level engineering support, leased telecommunications, flight inspection, EOSH requirements, and supply support.

N04.02-00 Visual NAVAIDS - Replace VASI with PAPI – The International Civil Aeronautical Organization (ICAO) has recommended that all International airports replace the Visual Approach Slope Indicator (VASI) lights with PAPI lights to standardize on the visual vertical guidance information. This program supports the procurement, installation, and commissioning of PAPI systems in order to comply with this ICAO recommendation.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $186,000. NPHO funds for Visual NAVAIDS are required to support the new PAPI installation by providing second-level engineering support and leased telecommunications. Of the total estimate, $40,000 is required just to increase much needed PAPI second-level engineering support.

N04.03-00 Visual NAVAIDS - ALSIP Continuation – The intent of the program is to bring approach lighting systems, built before 1975, up to current standards and to reduce the severity of landing accidents by retrofitting rigid structures with lightweight and low impact resistant structures that collapse or break apart upon impact. High Intensity Approach Lighting System with Sequenced Flashing Lights Model 2 (ALSF-2) provides visual information on runway alignment, height perception, roll guidance, and horizontal reference for Category II and III Precision Approaches. Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) provides visual information on runway alignment, height perception, roll guidance, and horizontal references for Category I Precision Approaches.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $279,000. NPHO funds for ALSIP (including ASLF-2 and MALSR NPHO) are identified to provide necessary supply support, second-level engineering support and leased flight inspection for the projected installations.

N04.04-00 Visual NAVAIDS - Sustain, Replace, Relocate – This program modernizes and replaces visual navigation aids (NAVAIDS) at sites where reliability availability and maintainability are trending below FAA standards for precision approach systems. Visual NAVAIDS include: MALSR for Category I approaches, ALSF-2 for Category II/III approaches, and PAPI lights and REIL.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $48,000. The NPHO funds are required to supply support and infrastructure and also provide second-level engineering support.

N06.00-00 Very High Frequency Omni directional Range Co-located Tactical Air (VORTAC) – This program replaces, relocates, or converts VOR and VORTAC facilities to improve NAS efficiency and capacity. VOR, Tactical Air Navigation (TACAN), and VORTAC (combination VOR and TACAN) systems provide navigational guidance for civilian and military aircraft in both en route and terminal areas. The FAA navigation roadmap indicates the decisions will be made in 2007 (VOR) and 2015 (TACAN) regarding whether these systems will remain in service or be shut down. If they are retained, they will continue to provide satellite navigation backup and define VOR routes and procedures for legacy users.

Currently VORTAC supports the transition to both Area Navigation (RNAV) and the Next Generation Air Transportation Systems (NEXTGEN) by maintaining the present level of en route and terminal navigation service. If the VORTACs remain in service indefinitely, they must be relocated, technologically refreshed, or replaced. Currently 60 percent of the VORTAC systems are beyond their service life. It is projected that within 10 -15 years all existing VORTAC systems will be beyond their service life.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $575,000. The NPHO funds are required to provide second-level engineering support, leased telecommunications, flight inspection, EOSH requirements, and supply support.

N08.02-00 Runway Visual Range (RVR) – The Runway Visual Range (RVR) provides pilots and air traffic controllers with a measured value for the horizontal visibility at key points along a runway and that data is used to decide whether it is safe to take off or land during limited visibility conditions. The new-generation RVR is also safer because the equipment is mounted on frangible, low-impact-resistant structures that break away if hit by aircraft during takeoff or landing. Replacement decisions are prioritized based on the level of activity at the airport where they are located and life-cycle issues (such as reliability, availability, and maintainability). This project also provides the equipment for new sites, including new runways and existing runways that have recently qualified for an Instrument Landing System installation.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $289,000. Essential to support the installation impacts of the PC-Based RVR 420 system, the NPHO funds are required to support additional second-level engineering support, site level maintenance training, leased telecommunications, flight inspection, supply support, and contractor depot logistics support. Of the required $289,000, $181,000 is required to provide initial site level maintenance training in support of the system deployment schedule.

N09.00-00 Distance Measuring Equipment (DME) – The DME program replaces obsolete, tube-type DME with modern technology electronics that will improve operations and facility performance. Replacement equipment reduces maintenance expense and repair downtime required for DME systems. Low Power DME (LPDME) will replace older marker beacons at existing ILS locations and be implemented at new ILS established locations. DME provides the distance component of navigation information that pilots use to determine aircraft position.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $132,000. The DME NPHO funds are required to provide second-level engineering support, training, and supply support to address the NAS impact of projected LPDME 415SE equipment installations.

N12.01-00 Wide Area Augmentation System (WAAS) – WAAS is an extremely accurate navigation system for aviation, providing precise navigation and landing guidance to equipped aircraft in any weather. WAAS provides coverage to the entire U.S., overcoming limitations to ground-based systems, such as mountainous terrain. WAAS improves safety and capacity in the national airspace and will reduce FAA operations costs by removing some of the legacy ground-based navigation infrastructure. WAAS uses a network of precisely located ground reference stations across the U.S., Canada, and Mexico to monitor GPS satellite signals. This information is processed and sent to user receivers via leased navigation transponders on geostationary satellites. The WAAS-provided messages improve the accuracy, availability, and safety of GPS-derived position information. WAAS addresses the following performance gaps: lack of precise navigation capabilities that can handle continued air traffic growth, lack of stable vertical guidance in all weather conditions, and aging navigation systems that are expensive to maintain.

WAAS became operational July 10, 2003. Following commissioning, WAAS began the Full LPV Performance segment, which is a mixed life cycle of development, modernization, and enhancement in conjunction with operations and maintenance scheduled to be completed in 2008. In 2009, WAAS will have two remaining segments: 1) Operations and Maintenance/Technical refresh from 2009 – 2028 and 2) Dual Frequency Operations (formerly known as the GLS upgrade) 2013 – 2018 to leverage the improvements the DoD will make as part of its GPS modernization program.

The Dual Frequency portion of the program was initially scheduled to begin in 2009. The WAAS program is rebaselining in 2007 to align this portion of the program with the DoD GPS modernization program. Dual Frequency operations will significantly improve availability and continuity of precision approach service during periods of severe solar storm activity and provide additional protection against interference to the GPS enabling FAA to decommission additional ground-based navigation aids. Following the dual frequency operations development, WAAS will enter the operations and maintenance phase which includes technical refreshes to sustain the COTS system hardware and software.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $1,528,000. NPHO funds for WAAS are required to provide necessary supply support, second-level engineering support, and leased flight inspection for the satellite based segments.

N12.01-06 Wide Area Augmentation System (WAAS) - Surveys and Procedures – In order to develop an LPV (Localizer Performance with Vertical guidance) Instrument approach procedure, a survey is required. This survey is specific to the approach and provides detailed obstacle information used to ensure aircraft spatial separation from the obstructions and establish minimums when constructing the LPV approach. Additionally, the survey information can be used for other purposes such as development of other instrument approach procedures (Required Navigation Performance (RNP), Lateral Navigation/Vertical Navigation (LNAV/VNAV), Lateral Navigation (LNAV), etc.). Survey data provides valuable information about the existing surroundings of an airport. Because of the unknowns due to lack of survey data, not all surveys will yield an LPV approach. Historical data suggests 20-30 percent of surveyed approaches will not be capable of supporting an LPV. This number will likely be higher in future years because the good candidates get selected first, leaving airports with less data available to determine feasibility, as the only remaining candidates. Airport runway ends that do not qualify for an LPV procedure due to obstacles or terrain may qualify for an LP (Localizer Performance) approach procedure. LP approaches will utilize WAAS and benefit the user by offering potentially lower minimums not possible from other non precisions approaches.

Development of LPV procedures contributes to a significant part of the benefits case for WAAS. The flight plan goal calls for development of 300 new procedures in FY 2009 and FY 2010. Based on the historical data, it is estimated that 450-500 approach surveys will be required yearly to support this production. LPV and LP procedures developed in the current fiscal year require surveys from the previous year. Hence, surveys acquired in FY 2009 will be used to support procedure development in FY 2010.

In addition to survey costs, there is a cost associated with development and publication of the LPV procedures. Funding is needed to support the actual procedure development, flight inspection, and charting of each procedure.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $240,000. NPHO funds for WAAS – Surveys and Procedures are required to cover the five new international reference stations which go operational in FY 2007 ($700,000), 300 procedures will have maintenance costs of $658,000 for procedure analysis updates, and $200,000 for airport obstruction verification of 662 airports which will have LPV procedures in FY 2007.

Acquisition and Business Services (ATO-A)

The Air Traffic Organization's vision is to be the global leader in delivering the safest, most secure air traffic services while providing the greatest value to its customers, owners, and employees. The Acquisition and Business Services organization supports this vision by delivering internal services that enable ATO to effectively accomplish that mission. Products and services include: Acquisition Policy and Contracting; Information Technology; Workforce Services; Leadership and Professional Development; Technical Training and Development; Finance, Planning, and Administration; Model Workplace and Diversity Services; and Small Business Development.

Acquisition and Business Services (ATO-A)

	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	216,216	261,893	11,741	-108	273,526
Other Objects					
Travel/Transportation	21,935	27,267	491	-500	27,258
Other Services	188,950	218,299	5,136	0	223,435
Rent/Communications/Utilities	4,966	5,249	94	-500	4,843
Other	34,335	36,286	653	-1,750	35,189
Subtotal	250,186	287,101	6,374	-2,750	290,725
Total	466,402	548,994	18,115	-2,858	564,251
Staffing					
End-of-Year	1,324	1,324	0	-1	1,323
Full-time Equivalent Employment	1,318	1,343	0	-1	1,342

Acquisition and Business Services has a NPHO requirement of $1,410,000. This covers the following program:

M20.01-00 Training Simulators – Starting in FY 2006 and continuing until FY 2007, FAA fielded four tower simulators as part of a Proof of Concept initiative. The initiative not only showed the reduction in training time achievable by using high fidelity simulation, but also revealed the current need for one full time person to support the operation of the simulator at each facility. The program office will use capital funds through FY 2008 to support t0he operation and maintenance costs. Now that the systems have been fully implemented and the Proof of Concept phase has reached a successful conclusion, it is appropriate to change the funding source from capital funds to operating funds for the steady state life cycle.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $1,410,000. NPHO funds for Acquisition and Business Services are required for software maintenance and infrastructure costs.

ATO Staff Offices

Other ATO Staff Offices*

	FY 2007 Allowance	FY 2008 Estimate	Unavoidable Changes	Discretionary Changes	FY 2009 Request
Funding ($000)					
PC&B	49,878	60,368	2,574	-1,383	61,559
Other Objects					
Travel/Transportation	7,722	3,042	56	0	3,098
Other Services	166,834	107,494	-6	-1,000	106,488
Rent/Communications/Utilities	8,832	6,204	114	0	6,318
Other	6,068	4,431	82	0	4,513
Subtotal	189,456	121,171	246	-1,000	120,417
Total	239,334	181,539	2,820	-2,383	181,976
Staffing					
End-of-Year	351	351	0	-4	347
Full-time Equivalent Employment	385	391	0	-4	387

* Other ATO Staffic Offices includes: Safety, Finance, Communications, and Operations Planning

Operations Planning Services (ATO-P)

Operations Planning Services develops ATO's business plan, operating commitments, and the operations service strategy in alignment with the FAA Flight Plan, the Joint Planning and Development Office, the NEXTGEN, and the OEP. This service unit provides leadership as the Chief Architect for the NAS, Chief Scientist for Research and Development activities, and world-class laboratory services at the William J. Hughes Technical Center. The Operations Planning Service also serves as ATO's focal point for the Strategic Management Process, international operations and partnerships, new technology evaluation and demonstrations, weather activities, NAS performance metrics analysis, and liaison to provide updates and the current status on FAA's Flight Plan.

Operations Planning has a NPHO requirement of $2,288,000. This covers the following programs:

M08.28-00 System Capacity – The Performance Data Analysis and Reporting System (PDARS) is a fully integrated performance measurement tool. This system extracts radar data from the HOST or Automated Radar Terminal System (ARTS) computers and processes and distributes this data to FAA facilities via a secure Intranet. PDARS provides analysts with a set of interactive tools that can access the distributed database of operational data to measure, analyze, and report system performance.

In FY 2009, FAA will incur contractor salaries & expenses costs for recurring operations and maintenance bills in the amount of $1,450,000. NPHO funds for System Capacity are required for software maintenance and infrastructure costs.

M08.31-00 Alaska Weather Cameras – This program provides an improved infrastructure that furnishes pilots better information about the location and severity of hazardous weather. Pilots and flight service specialists routinely use weather camera images before and during flight. When used to corroborate current and forecasted weather, pilots make informative "go or no go" decisions.

Beginning in FY 2009, FAA will incur Salaries & Expenses costs for recurring operations and maintenance bills in the amount of $838,000. NPHO funds for Alaska Video Camera are required for software maintenance, infrastructure costs and field maintenance support & training.

Safety Services (ATO-S)

The Safety Services Unit is the focal point for setting the target level for safety, auditing safety, quality assurance, and quality control in the ATO and reporting findings to improve safety performance. Safety Services integrates the functions, data, and information of investigations, evaluation, independent operational testing and evaluations, safety risk management, runway safety and operational services, in order to identify collision risks, influence their resolution, and provide information on assessments of operational and safety performance in the NAS. The Safety Service Unit is the focal point for the application of FAA's safety management system principles. It acts as the liaison to FAA's Aviation Safety Office (AVS), and also undertakes special projects in support of increasing the safety of the NAS.

Finance Services (ATO-F)

Finance Services provides financial planning services, investment and business case evaluation, financial analysis services, identification and implementation of performance-based solutions for the agency, financial systems services (cost accounting), and budget services for all appropriations in ATO. It also sets ATO-wide standard operating procedures and serves as ATO liaison to FAA Chief Financial Officer. Financial Services also presents financial analysis services, financial metrics, comparative analysis, productivity measurements, investment, and business case evaluation and life cycle costing. It oversees and evaluates competitive sourcing activities.

Communications Services (ATO-C)

Communications Services provides centralized communications services for ATO. These services provide clear, reliable, consistent and factual information and media resources that meet the needs of its customers, which include the flying public, airlines, industry associations, and employees. This two-way communication channel keeps employees, owners, and customers informed about and supportive of ATO's objectives and plans. Consolidation of the communications functions leads to consistency of communications and messages and reduction in overall communications costs.

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Explanation of Funding Changes for Salaries & Expenses

	Dollars ($000)	FTE
ATO Salaries & Expenses (Net change from FY 2008 Enacted)	**$7,078,793**	**31,134**
Overview: For FY 2009, ATO requests $7,078,793,000 and 31,134 FTEs in the Salaries & Expenses program activity to meet its mission of moving air traffic safely and efficiently. As this is an entirely new appropriation for FY 2009, this is technically a 100 percent increase from the FY 2008 enacted level of zero. The FY 2009 request for this activity does correspond to an increase of $112,600,000 (1.6 percent) and an increase of 227 FTE (0.7 percent) from ATO's FY 2008 enacted level in the Operations appropriation. The FY 2009 request level reflects unavoidable pay raises and inflation; other uncontrollable adjustments such as NAS Handoff requirements, contract costs for the Contract Tower and Contract Weather Observation Programs, and staffing increases to prepare for the air traffic controller "retirement bubble;" cost savings from the A-76 Flight Service Station contract and air traffic controller contract; and seven base transfers to other FAA organizations. The FY 2009 FTE request level consists of annualization of FY 2008 air traffic controller hiring, a net increase of 306 air traffic controllers (153 FTE) in FY 2009, and a decrease of 54 FTEs resulting from base transfers to other lines of business.		
Transfer from Operations		
FY 2008 Enacted Level, Operations Appropriation: The FY 2008 Enacted level includes $6,966.2 million in the Operations appropriation for ATO. This "base" amount is being transferred into the new ATO appropriation to align with FAA's proposed account structure and reauthorization proposal.	6,966,193	30,907
FY 2008 One Time Items		
Additional FTI support: The FY 2008 budget contained a one time increase to cover additional costs associated with the FTI program. Funds were requested to maintain legacy systems including 59 LINCS EUL-A nodes and approximately 4,700 telecommunications services supporting NAS operations.	-69,000	
Unavoidable Adjustments		
Annualized FTEs: This represents the net annualized costs of FY 2008 net increase of 256 in the controller workforce and attrition.	11,050	128
Annualized FY 2008 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.5 percent average government-wide pay raise in January 2008. The actual factor used is 4.4 (3.5 percent plus 0.9 percent average of Within-Grade increases). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	3,748	

	Dollars ($000)	FTE
Annualized FY 2008 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2008. The OSI is 88 percent of the 3.5 percent average government-wide pay raise plus 1.0 percent (3.96 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	55,602	
FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 3.8 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 0.9 percent average of Within-Grade increases.	10,956	
FY 2009 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2009 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.	140,505	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	22,697	
One Less Compensable Day: This decrease is due to the loss of one compensable day in FY 2009 (261 in FY 2009 versus 262 FY 2008).	-20,772	

	Dollars ($000)	FTE
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	30,492	
Uncontrollable Adjustments		
NAS Handoff Requirements: This $43.2 million request consists of the following five components, with their corresponding amounts:	43,183	
Logistics Support: All activities associated with depot level support to NAS prime mission equipment and associated support equipment. Major systems include Advanced Technologies and Oceanic Procedures and National Airspace System Recovery Communications.	4,963	
Second-Level Field Maintenance Support: All activities required for the in-service management phase, including directly operating, providing maintenance functions (both scheduled and unscheduled), and furnishing technical and logistics support for maintenance of FAA systems, sub-systems, services or equipment. All engineering activities in support of the delivery of service, to include development of modifications, documentation, testing and implementation of technology refresh initiatives. Also includes associated travel time required to support systems. Major systems include ERAM for En Route Information Display System (ERIDS), and ATOP.	30,381	
Leased Telecommunications: All activities associated with maintaining, upgrading, or modifying operational and administrative communications services required to sustain the operation and maintenance of the NAS facilities. It also includes leases and other recurring telecommunication costs. Major system is FAA Telecommunications Infrastructure (FTI).	5,465	
Training: All activities associated with on-the-job training, attrition training, and refresher training of personnel who directly operate, maintain, or provide support functions. This includes contractor provided costs associated with specific training. Training costs include course conduct (including instructor and facilities costs), travel, and per diem costs for students. Major systems include Airport Surface Detection Equipment – Model X (ASDE-X) and Wide Area Augmentation System (WAAS)	1,679	
Flight Inspections and Procedures: All activities associated with in-service flight inspections, and the development and revalidation of Standard Instrument flight procedures, flight inspection; and the compilation, replication and dissemination of charts and related paper and digital products. Major systems include Very High Frequency Omnidirectional Range Co-located Tactical Aircraft Control (VORTAC) and Wide Area Augmentation System (WAAS).	695	
Contract Tower Program: A $3.7 million increase is needed to fund the cost of new sites added in	3,710	

	Dollars ($000)	FTE
FY 2008 as well as annual Department of Labor (DOL) wage determination increases, which average between 4.5 and 5.0 percent per year. The yearly wage rate increases set by DOL are non-negotiable, and must be incorporated into contract-tower contracts in order to comply with labor regulations. The FAA forecasts commercial aircraft operations at contract-towered airports to grow an average of 2.9 percent annually during the 18-year forecast period, from 1.9 million to 3.1 million operations annually, an overall increase of 60 percent. Non-commercial activity is expected to grow slower, increasing an average of 1.1 percent annually, from 14.9 million operations in FY 2007 to 18.3 million operations in FY 2025.		
Contract Weather Observation (CWO) Program: A $2.1 million increase is needed to address annual DOL wage determination increases, which average between 4.5 and 5.0 percent per year, affecting both the CWO vendor contracts as well as the Program Office support contracts. These contracts account for the majority of funding requirements for the CWO program. The yearly wage rate increases set by DOL are non-negotiable, and must be incorporated into each CWO contract in order to comply with labor regulations.	2,109	
Discretionary Increases		
Air Traffic Controller Hiring: The FAA requests $11.3 million to hire and train a net increase of 306 new controllers (153 FTE) in FY 2009. Following the 1981 strike and subsequent firing of nearly 10,500 controllers, the agency began the massive task of rebuilding the controller work force. From 1982 through 1991, the agency hired an average of 2,655 new controllers per year. This hiring surge created a situation where 63 percent of the current workforce will reach retirement age by 2017. To ensure that adequate staffing is available and fully trained to perform this critical safety function, FAA must hire some 17,000 air traffic controllers in the next decade. In December 2004, FAA issued its ten year strategy for future controller staffing in the report to Congress, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce.* The second update was released in March 2007 with the next update set for March 2008. The plan describes how FAA will hire, staff, and train controllers. The plans also highlight the steps FAA is taking to place the right number of controllers in the right place at the right time to maximize the safety and efficiency of the NAS. The staffing targets contained in the updated Plan have been revised to reflect retirement projections. Bringing aboard new controllers is a complex, time-consuming process. Since it takes several years to train a controller, the Agency needs to constantly add to its pool of qualified recruits and trainees. Filling the job of a controller who retires today is the culmination of a process that must by necessity have begun several years in advance. In the past, the process required three to five years. By improving our training techniques and using high-fidelity simulators, we expect to reduce the training period to two to three years. Even with that compression, the agency must prepare for a continuous increase in the number of retiring	11,263	153

	Dollars ($000)	FTE
controllers. The FAA's goal is to limit the controller-to-trainee ratio to less than 35 percent of the workforce. This will ensure there are adequate numbers of fully trained controllers in all facilities. Fully certified controllers not only control air traffic; they also train developmental controllers. The $11.263 million request supports hiring for a net increase of 306 air traffic controllers in FY 2009, a level consistent with the updated staffing plan. Controller staffing levels will need to increase each year through 2016 in order to ensure the number of certified professional controllers (CPC) in the system stays ahead of expected retirements.		
Cost Savings and Adjustments		
AFSS A-76 Cost Savings: One of the biggest success stories in cost management is the largest non-defense outsourcing initiative in the federal government-the contracting out of FAA's flight services function. That action will save the agency $14.8 million in FY 2009, with a cumulative 10 year projected savings and cost avoidance totaling almost $2.2 billion. This is the third year of such savings, with $51.7 million and $66 million in savings included respectively in the FY 2008 and FY 2007 budget requests.	-14,800	
ATC Salary & Productivity Savings: Further savings resulting from implementation of the June 5, 2006 NATCA contract will be realized in FY 2009, in addition to an estimated $40.6 million in FY 2008. Savings are expected from the establishment of new pay bands aligned with FAA's core compensation program, the phasing-out or elimination of two ineffective premium pay elements, and management flexibility in staffing and scheduling at air traffic control facilities.	-68,000	
Administrative Overhead Efficiencies: The ATO is confident that we can continue recent efforts to streamline operations and achieve a $18.9 million reduction. Business process reengineering efforts at the Service Centers, consolidation of overhead functions in headquarters, and savings in the procurement of supplies and equipment should generate these additional savings.	-18,863	
Base Transfers		
Regional Operations Center: The ATO will transfer $99,000 and one FTE to the Assistant Administrator for Region and Center Operations (ARC). This accommodates the movement of a regional operator in FAA's Eastern Region to the Regional Operations Center.	-99	-1
Aeronautical Center Facility Management The Mike Monroney Aeronautical Center (MMAC) in Oklahoma City	-27,814	-46

	Dollars ($000)	FTE
employs approximately 5,000 government and contract personnel, the largest concentration of Department of Transportation staff outside of Washington, DC. Its 1,100 acres encompass 55 occupied buildings and 71 unoccupied facilities. While facility management functions for FAA Headquarters were consolidated under the Assistant Administrator for Region and Center Operations (ARC) in FY 2007, management of MMAC remained in the ATO. This transfer of $27.8 million and 46 FTE further consolidates the agency's facility management responsibilities within ARC by incorporating the Aeronautical Center. This agreement covers the resources for the efficient operation and maintenance of the MMAC facilities, including the following functions: • physical plant operations and maintenance; • architecture, engineering, and space planning; • furniture and moving services; • environmental, safety, and health program management; and • Employee services management.		
Aeronautical Center Leased Telecommunications The FAA owns and manages its own Private Branch Exchange at the Mike Monroney Aeronautical Center (MMAC). Telecommunications funding for the MMAC has previously been requested through the Air Traffic Organization. In conjunction with the transfer of MMAC facility management functions this agreement would align telecommunications funding with management responsibility under the Assistant Administrator for Region and Center Operations (ARC).	-652	
Worker's Compensation Program Management ATO will transfer $108,000 and one FTE to the Assistant Administrator for Human Resource Management (AHR). This transfer furthers the consolidation under AHR of FAA's worker's compensation program management.	-108	-1
Procurement & Class Action Litigation This transfer of $2 million from the ATO to the Chief Counsel (AGC) covers ATO-related legal services generated primarily by increases in procurement activity and class action litigations. This transfer consists of $1 million required to cover PC&B costs for six personnel hired by AGC for ATO-related legal support and $1 million needed to cover contract support for anticipated class actions. The one position and FTE included in this transfer is for the law librarian.	-2,000	-1
MMAC Office of Acquisition (AMQ) Positions ATO will transfer $224,611 and two FTE to the Assistant Administrator for Region and Center Operations (ARC). These positions were given to the Aviation System Standards (AVN) organization when the National Aeronautical Charting Office (NACO) was transferred from DOC/NOAA to DOT/FAA in October 2000. These positions represent the increased level	-225	-2

	Dollars ($000)	FTE
of support the AVN organization would require from the MMAC's Office of Acquisition (AMQ).		
Delphi Asset Tracking Team (DATT) To improve internal controls and data reliability of the capitalization process, the initiation of set-up of project codes by the Delphi Assist Tracking Team (DATT) will be centralized in the Office of Financial Management (AFM). Centralization of this function involves the transfer of $383,000 and three FTE. Once transferred, AFM will be the organizational focal point for management oversight of the DATT process.	-383	-3

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Air Traffic Organization
Capital Programs

For FY 2009, the ATO request for capital programs is $2,591,085,000. The ATO capital request represents about 95 percent of the former Facilities and Equipment (F&E) account. The remainder of the former F&E account can be found in the Safety and Operations request. This request is consistent with the Capital Investment Plan, FAA's comprehensive plan for modernizing and improving aviation infrastructure. The requested funding supports programs that maximize operational efficiency, modernize automation and communication technology, and address aging facilities. Particular emphasis is placed on en route and terminal air traffic control, satellite navigation and landing systems, and communications.

The FY 2009 request also supports the Next Generation Air Transportation System (NextGen), either by providing new transformational capabilities or by contributing to the broader NextGen effort by creating a modern platform on which to establish future capabilities.

Among the transformational new capabilities are: Automatic Dependent Surveillance-Broadcast, the next generation surveillance technology, and System-Wide Information Management, which will provide a broad range of real-time information to users of the NAS. The request will fund a range of NextGen demonstration projects and system development efforts.

In addition to our transformation efforts, the request also supports essential modernization of and enhancements to our current air traffic control system. Approximately 30 capital programs create modern platforms for, enable, or otherwise contribute to future NextGen capabilities. Examples of these programs include: En Route Automation Modernization; the Wide Area Augmentation System, which augments the Global Positioning System (GPS) signal for aviation uses; Airport Surface Detection Equipment-Model X, which reduces runway incursions; and the Next Generation Air/Ground Communications System, which modernizes air-to-ground communications infrastructure. These investments are necessary to modernize the foundation of the NAS, allowing the eventual integration of a full complement of advanced air traffic management tools. While the majority of these modernization programs existed prior to the NextGen concept, the Joint Planning and Development Office and FAA believe it is important to begin approaching the FAA's capital investments in a holistic manner.

This budget request is organized according to the following FAA activity areas: engineering, development, test and evaluation; procurement and modernization of air traffic control facilities and equipment; procurement and modernization of non-air traffic control facilities and equipment; and facilities and equipment mission support.

FY 2009 Submit

2B12	DOD/FAA Facilities Transfer	$1,400,000	110
2B13	Precision Runway Monitors	$1,000,000	112
2B14	Runway Status Lights (RWSL)	$26,960,000	114
2B15	National Airspace System Voice Switch (NVS)	$10,000,000	116
2B16	Weather System Processor	$700,000	118
2B17	Voice Recorder Replacement Program	$10,800,000	120
2B18	Houston Area Air Traffic System (HAATS)	$3,600,000	122
2B19	Integrated Display System	$7,000,000	124
2B20	ASR-8 Service Life Extension Program	$3,000,000	125
2B21	Integrated Terminal Weather System (ITWS)	$4,500,000	127

c. Flight Service Programs

2C01	Automated Surface Observing System (ASOS)	$8,500,000	129
2C02	Flight Service Station (FSS) Modernization	$14,600,000	131
2C03	Weather Camera Program	$2,000,000	133

d. Landing and Navigational Aids Program

2D01	VHF Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)	$7,500,000	135
2D02	Instrument Landing System (ILS) – Establish	$7,500,000	137
2D03	Wide Area Augmentation System (WAAS) for GPS	$99,000,000	139
2D04	Runway Visual Range (RVR)	$5,000,000	142
2D05	Approach Lighting System Improvement Program (ALSIP)	$10,000,000	144
2D06	Distance Measuring Equipment (DME)	$6,000,000	146
2D07	Visual Navaids – Establish/Expand	$1,700,000	148
2D08	Instrument Approach Procedures Automation (IAPA)	$10,900,000	150
2D09	Navigation and Landing Aids – Service Life Extension Program (SLEP)	$1,000,000	152
2D10	VASI Replacement – Replace with Precision Approach Indicator	$4,000,000	154
2D11	GPS Signal Monitoring	$20,700,000	156

e. Other ATC Facilities Programs

2E01	Fuel Storage Tank Replacement and Monitoring	$6,100,000	158
2E02	Unstaffed Infrastructure Sustainment	$15,300,000	160
2E03	Air Navigational Aids and ATC Facilities (Local Projects)	$1,500,000	162
2E04	Aircraft Related Equipment Program	$7,400,000	163
2E05	Airport Cable Loop Systems – Sustained Support	$7,000,000	165
2E06	Alaskan NAS Interfacility Communications System (ANICS)	$5,000,000	167
2E07	Facilities Disposition	$5,000,000	169
2E08	Electrical Power System – Sustain/Support	$51,000,000	171
2E10	Aircraft Fleet Modernization – International Aircraft	$24,900,000	174

Total, Activity 2 .... $1,555,205,476

Activity 3, Procurement and Modernization of Non-Air Traffic Control Facilities and Equipment

a. Support Programs

3A01	Hazardous Materials Management	$18,000,000	175
3A05	Facility Security Risk Management	$15,000,000	177

b. Training, Equipment and Facilities

3B04	NAS Training Facilities – Simulator	$12,000,000	179

Total, Activity 3 .... $45,000,000

Activity 4, Facilities and Equipment Mission Support

a. System Support and Support Services

4A01	System Engineering and Development Support	$32,000,000	180
4A02	Program Support Leases	$43,504,524	182
4A05	Transition Engineering Support	$10,700,000	184

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A01	**Advanced Technology Development and Prototyping**	**$41,400,000**	**Various**	**A-28, M-08, M-46, M-47, S-09, W-10**

FAA Strategic Goals: Increased Safety – Reduce the commercial airline fatal accident rate; Reduce the number of fatal accidents in general aviation; and Reduce the risk of runway incursions.

Reduced Congestion – Increase airport capacity to meet projected demand; Increase reliability and on-time performance of scheduled air carriers

Organizational Excellence – Improve program delivery capability at reduced cost.

Description of Problem: The FAA's mission is to provide the safest and most efficient aerospace system in the world. As the leading authority in the international aerospace community, FAA is responsive to the dynamic nature of customer needs and economic conditions. A key element of this mission is the safe and efficient use of airspace. To accomplish this mission, FAA's Advanced Technology Development and Prototyping program develops and validates technology and systems that support air traffic services. These initiatives support the goals, strategies, and initiatives of the agency's Flight Plan, including the requirements associated with the evolving air traffic system architecture and improvements in airport safety and capacity.

For FY 2009, $41,400,000 is requested for the following activities:

1. Runway Incursion Reduction Program (RIRP) ($10,000,000):
   Description of Solution: Runway incursions remain on the National Transportation Safety Board's (NTSB) "Most Wanted" list of critical safety issues. During 2007, FAA convened aviation industry stakeholders to a "Call to Action" session to establish near, mid and long-term action plans to mitigate the continuing risk of runway incursions. Several areas of increased technology development emphasis emerged from that session, with the RIRP remaining the principal vehicle for initial development, demonstration, evaluation and establishment of these program initiatives. The reduction of high-hazard runway incursions remains the key safety objective as specified in FAA's Flight Plan. The RIRP will initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation.

   The requested funds provide for continuing operational testing and demonstrations of Runway Status Lights enhancements at complex airports. Under prior year efforts, RWSL operational test beds will be established at three additional complex and high-risk airports identified within an FY2007 GAO report on runway safety. Operational evaluation and maintenance of those test beds will be provided until the national RWSL deployment is scheduled at those facilities. Consistent with objectives identified during the 2007 "Call to Action", Low Cost Ground Surveillance (LCGS) product test beds deployed as part of a pilot program will be sustained in support of added runway safety application development. LCGS test beds will be augmented with selected Advanced-Surface Movement Guidance and Control System (A-SMGCS) applications to evaluate the operational utility of these applications in a small-medium airport setting. Taxiway guidance algorithms and data link delivery of runway safety alerts are emerging concepts that will be developed and evaluated.

   Benefits: The demonstration, evaluation and transition of mature runway safety technologies will reduce the incidence of high-hazard (Category A/B) incursion and ultimately reduce the risk of a runway collision. Early development, testing and maturation of viable technologies result in reduced technical, cost and acquisition schedule risk, with early delivery of runway safety benefits.

2. System Capacity, Planning and Improvement ($6,500,000):
   Description of Solution: Rapidly changing economic, operational, environmental, and technical environments are exerting extreme pressure on the NAS. Aircraft delays cost the airlines and their

passengers millions of dollars each year. As the number of aircraft operations increases to meet demand, delays will also increase, unless improvements are made to aviation system capacity. The FAA has made a firm commitment to its stakeholders in the FY 2008-2012 Flight Plan, the NextGen Integrated Plan, and the Operational Evolution Partnership (OEP) to increase capacity, provide system agility, and improve airport infrastructure. This program focuses on providing new and effective performance measures and analyses directed at resolving problems in the three core OEP domains: Airport Development, Air Traffic Operations, and Aircraft and Operator Requirements.

The program will provide data which will be used to develop and analyze airport solution sets contained in the Future Airport Capacity Task (FACT) report; implement the performance-based navigation roadmap by developing Area Navigation (RNAV) and Required Navigation Performance (RNP) routes and procedures; and support the 35 OEP airports' master plans for airfield improvement. Additional studies will analyze the effect of new equipment and technology, as well as high altitude airspace redesign to alleviate delays and congestion. These efforts will be sustained by the use of the Performance Data Analysis and Reporting System (PDARS), Design Team Studies, and Capacity and International Benchmark reports. U.S. aviation policy objectives will be furthered by means of participation in international organizations such as the Civil Air Navigation Services Organization (CANSO) and ICAO. PDARS Staffing Analysis will be used by FAA decision-makers to effectively and efficiently operate with a better prepared, better trained, safer, diverse workforce. These programs collectively drive the achievement of the office mission and support of the Agency.

Benefits: Capacity studies identify the operational benefits and delay-reduction cost savings of capacity enhancement alternatives. Program output includes: flight operational data for use in performance analysis; system safety, delay, flexibility, predictability, and user access performance measures on a daily basis; and travel times within geometric areas and for route segments (arrival fix to runway, runway to departure fix, etc.). Output also includes methodologies and prototypes for measuring the benefits and costs of airport, airspace, and procedural enhancements. This strategy combines program and project performance data with financial data to improve investment decision-making, thereby achieving optimal strategic and operational outcomes. PDARS is the Air Traffic Control System Command Center's primary tool for accessing radar data and provides an objective tool for operational planning, assessment and support of flow management initiatives. Integration of PDARS with Airport Surface Detection Equipment (ASDE-X); Out, Off, On, and In time (OOOI) data; Micro-EARTS; restrictions data; and playbook scenarios will minimize ground delays. These enhancements, which encompass the final phase of PDARS development and are an ATO community requirement, are critical for analyzing surface operations and baselining OEP performance. PDARS is a well-accepted and often-used tool at all major ATC facilities. The impact will be realized on assessments of such issues as wake turbulence mitigation, New Large Aircraft (NLA), Very Light Jets (VLJs), reduced separation criteria, and alternative flow management methods.

3. Operational Concept Validation and Infrastructure Evolution ($7,400,000):
Description of Solution: Rapidly changing economic, operational, environmental, and technical drivers continue to exert extreme demands on near term and future capabilities of the NAS. Aircraft delays cost the airlines and their passengers millions of dollars each year. As the number of aircraft operations increase to meet demand, delays will also increase unless improvements are made to aviation system capacity. According to the NextGen Integrated Plan, the air transportation system is under extreme pressure to accommodate a growing demand in a system that is riddled with traffic congestion, flight delays, and aging technology. The FAA has made a firm commitment to its stakeholders via the FY 2008-2012 Flight Plan, the NextGen Integrated Plan, and the Operational Evolution Partnership (OEP) to increase capacity, provide system agility, and improve airport infrastructure. This program focuses on providing new and effective performance measures and analysis directed at resolving the following four problem areas: Air Traffic Flow Efficiency, En Route Congestion, Terminal Area Congestion, and Alignment of Initiatives across ATO Service Units.

This work evaluates and incorporates lessons learned from the recent delivery of decision support tools to provide guidance on "if", "when", and "where" advanced decision support and operational enhancements will be integrated into the NAS. The program develops and exercises advanced analysis capabilities to consider the benefit and operational feasibility of the supported procedural changes. In particular, the program is analyzing the methods for "genericizing" controller areas of specialty recognizing differences between high and low altitude work, opportunities to use multi-sector planners, and the expanded role of Traffic Flow Managers in managing airspace capacity versus limiting demand. Associated with the changes in roles and responsibilities are opportunities for restructuring the services provided by air traffic control facilities to best support the re-aligned roles of humans in the NAS as enabled by new automation and communication capabilities. Simulation and human-in-the-loop experimentation are used to integrate this new guidance revealing the type, update rate, and display requirements that need to be established to ensure optimum controller performance. Funding includes validation of concepts for ground–ground and air-ground communications to support transfer of information and activities with the aviation community to validate assumptions about flight deck evolution.

Benefits: The program uses analyses and associated white papers to validate whether future system requirements meet NextGen goals, including the flight data processing evolution in En Route Automation Modernization (ERAM), future communications and voice switch, changes in surveillance requirements and associated procedures, establishment of new roles and responsibilities to support increased productivity, etc. Advanced facility planning identifies the system requirements to meet the operational needs and identifies opportunities for modernization, modification and/or expansion of air traffic control infrastructure including facilities. This programs allows FAA to analyze the facility configuration alternatives (separate new, refurbish old; collocate with other facility, consolidation) using considerations such as risk to service and workload distribution. Identifying the correct investment alternative reduces cost and improves efficiency.

4. NAS Weather Requirements ($1,000,000):
Description of Solution: One of FAA's top priorities is predicting and responding to weather. Weather has a significant impact on safety and efficiency and affects activities across all domains. The NAS Weather Group minimizes the negative impacts of weather on the NAS operations by increasing operational predictability during weather events (particularly during winter weather and convective weather situations). The NAS Weather Group develops aviation weather policy and standards; represents FAA in the Joint Planning and Development Office (JPDO) Weather Integrated Planning Team; and manages the research and development (RE&D) and ATO Capital Activity-1 weather portfolio. The NAS Weather Group manages the NAS Requirements Development program to align requirements, priorities, programs, and resources and develops metrics to understand the impacts of weather on the NAS. The program creates strategic plans and defines weather requirements, and policy and standards. FAA is the Meteorology Authority for the U.S. under the International Civil Aviation Organization (ICAO). On behalf of FAA, the NAS Weather Group provides national and international leadership to optimize aviation weather systems and services by establishing consensus and cooperation within FAA and between Government agencies, private weather services, research organizations and user groups on aviation weather requirements and priorities.

The requested funds will continue the contract support that provides a flexible means to direct attention and resources to concerns affecting safety, system efficiency and international leadership, changing focus as needs develop. The expertise paid for by this budget activity includes specialized, technical engineering and meteorological skills not available in FAA, giving this office a unique capability to analyze mission needs and establish requirements. The program operates to provide timely evaluation of selected services or technologies and serves as the Agency's only mechanism to look at weather from a NAS-wide perspective. Contract support provides analysis; conducts studies, prepares various concepts of use and implementation plans, develops plans and new procedures to transition from existing technologies and practices to advanced capabilities that satisfy user needs and impact overall NAS system capacity; works to transition weather products from research and development onto operational NWS and FAA platforms; and supports reconciliation of U.S. NAS aviation weather requirements with international aviation weather requirements. Support will also be used to establish requirements in support of the Joint Planning and Development Office, Weather Integrated Product Team (JDPO, WxIPT) and to support reconciliation of U.S. NAS aviation weather requirements with international aviation weather requirements.

Benefits: A large amount of work accomplished by the program is geared toward the movement of aviation weather products, including safety risk management functions from R&D into operational use. FY 2009 products include an enhancement that predicts location and intensity of turbulence and icing products for operational use in Alaska plus various other products in the experimental and testing stages of implementation. Funds will allow development of Operational Improvements (OIs) and Preliminary

Implementation Plans (PIPs) for weather; alignment of JPDO Weather Enterprise Architecture with FAA Enterprise Architecture Roadmap; development of plans to align FAA with NextGen policies to optimize government and commercial vendor's roles in observations, forecasting, and dissemination; and update of a NAS wide weather mission and needs statement for NextGen. The NAS Weather Group will also be able to develop the NextGen Network Enabled Weather Requirements, continue to manage the Weather Portfolio Investment Management Plan and develop various Concept and Requirements Definition (CRD) for weather.

5. Airspace Management Laboratory ($4,000,000):
Description of Solution: The goal of the Airspace and Aeronautical Information Management (AIM) Laboratory is to field advanced information systems and decision support tools that allow FAA to cost-effectively manage the NAS without sacrificing service delivery or safety. The Laboratory uses operational research, statistical analysis and modeling to evaluate potential NAS improvements. Subsequently, the Airspace and AIM Laboratory uses information management and process automation to provide new systems that improve safety, quality and efficiency. Tangible results of Laboratory research can be seen in new technologies that improve the quality and efficiency of proposed and actual obstacle assessments. The laboratory is a contributor to future air traffic management concepts like System Wide Information Management (SWIM) and NextGen. Trends towards global harmonization of aviation require the FAA to develop new information systems and tools to maintain leadership in global aviation. The Laboratory leads international aeronautical data standardization efforts and is working to incorporate these standards and recommended practices into FAA Aeronautical Information Management (AIM) systems.

The FY 2009 investment in the Airspace and AIM Laboratory will ensure that the FAA can continue to benefit from demonstrated modeling, metrics, system engineering, and information management capabilities developed in the Laboratory. This year's funding supports two strategies: ensuring FAA continues investments needed to manage FAA airspace and aeronautical assets efficiently and safely; and putting FAA on a path towards international leadership. Key initiatives in FY 2009 include:

Demonstrating and developing new capabilities to improve collection, processing and distribution of NAS resources that air traffic control and pilots depend upon to operate safely and efficiently. Efforts in this area include: determining if proposed towers and obstructions pose a hazard to air traffic, and evaluating terrain and obstacles to determine the lowest permissible flight level.

Developing information systems, decision support tools and advanced geo-spatial capabilities to collect, manage and analyze air traffic control operational data such as flight information, flight plans, airspace utilization, and navigation structures. These Laboratory products allow FAA lines of business to evaluate performance metrics, determine fee for service charges (both international over-flights and domestic), and estimate airspace and Air Traffic Control (ATC) benefits from new technologies (e.g. NextGen).

Streamlining input, storage and output for FAA AIM systems to ensure FAA has a single source of high quality data on navigation aids, airspace, communication systems, routes and procedures. The information is used to create customer products such as charts and publications as well as internal FAA products such as NAS modernization and improvement plans, environmental analyses, and infrastructure data needed to run the FAA ATC systems (e.g., Host Computer System (HCS), En Route Automation Modernization (ERAM), Standard Terminal Automation Replacement System (STARS), and Automated Radar Terminal System (ARTS))

The Laboratory's leadership in Aeronautical Information Management (AIM) Systems is critical to FAA's ability to interoperate in a global aeronautical environment and, hence, to realize substantial cost savings. Our key objective in FY 2009 is to improve NAS safety by incorporating end-to-end data integrity best practices, modernizing aeronautical data products through information engineering and by allowing FAA to deliver a consistent aeronautical product set.

Benefits: Airspace and AIM Laboratory information management and workflow systems, decision support tools, airspace system data repositories, and international standards work provide direct and indirect cost savings to the FAA. Work completed by the Laboratory leads to:

- Cost savings through automation of manual data processing and evaluation activities;
- Cost savings by streamlining integration and coordination of multi-division work;
- Cost savings by providing decision makers with timely access to airspace system data; and
- Cost savings by leading the adoption of standards for electronic data sharing and distribution of FAA aeronautical data.

Illustrative cost savings from Laboratory projects include:

- Obstruction Evaluation System. The use of automation to improve the quality, accuracy and timeliness of FAA Obstruction Evaluations (OE) and Airport Airspace Analysis (AAA) has led to a significant cost savings within ATO and FAA Airports divisions. The development of new terminal procedure screening tools will provide further annual cost savings over the coming year.
- SDAT MVA/MIA Automation System. The MVA/MIA Automation System is designed to assist field offices in complying with safety analyses designed to protect aircraft from terrain and obstacles while under the direction of air traffic controllers. The use of decision support tools is estimated to reduce evaluation times from several weeks to a single week with cost savings near $2 million annually.
- International Over-flight Billing and User Fee calculations. Laboratory developed calculation and quality control systems are used to identify international over-flights and calculate over-flight charges for the FAA.

6. Airspace Redesign ($3,000,000):
Description of Solution: The redesign of the nation's airspace is critical NAS modernization. Efficiently designed airspace allows users to get the full benefits of new technology, procedures and infrastructure (e.g. runways). Sector complexity and contention for airspace resources (e.g. departure fixes) cause a significant number of delays, restrictions and ultimately congestion. The Airspace Management Program (AMP) seeks to optimize terminal, En Route and oceanic airspace by improving design and allowing users to use new technologies and procedures to increase efficient travel. This effort funds the development and implementation of sectors and routes.

AMP works on redesign airspace in New York/Philadelphia, Chicago, Western Corridor, Houston, and High Altitude Airspace, with F&E funding planned at least for New York/ Philadelphia, Chicago, and national integration efforts of the program office. AMP also supports the new flows associated with new runways in Chicago. AMP funds infrastructure changes resulting from airspace redesign, such as communications modifications, changes in frequencies, connectivity of radio site to the control facility, and controller-to-controller connectivity; surveillance infrastructure modifications to ensure proper radar coverage; automation modifications to the host data processing or flight data processing; interfacility transmission modifications; additional consoles and communications backup needs; and modifications to the facility power and cabling.

Benefits: The AMP projects supported by these FY 2009 funds are projected to deliver as much as $121 million of direct operating cost benefits by 2009. These benefits are realized through the reduction of restrictions, shorter flight distances, more fuel efficient routes, and reduced delays. The most significant benefits will be in the key metropolitan areas. Airspace redesign in New York and Philadelphia metropolitan areas is estimated to reduce delays by 30-45 percent in the next 10 years; based on today's flight statistics. In Chicago, airspace redesign will ensure return on the runway investments. Airspace redesign will also provide internal FAA benefits. Without airspace redesign, sector splitting and growth in the number of sectors will be the only methods to manage complexity and congestion, increasing operations costs by millions every year. Reducing the number of sectors in the high altitude airspace through standardization and reallocation of airspace boundaries could provide a minimum of $20 million of annual FAA cost savings.

7. Strategy and Evaluation ($3,000,000):

   Description of Solution: The FAA anticipates a steady increase in air traffic for the foreseeable future. Traffic is projected to grow by 22 percent between 2007 and 2017, from 23 million to 28 million aircraft operations. Simultaneously, the advent of flexible ownership programs and Very Light Jets (VLJs), along with the airlines' increased reliance on regional jets, is expected to increasingly tax an already overburdened ATC system. This increase in airspace demand, coupled with an aging infrastructure and a lean fiscal environment, will require the ATO to exercise cost control and seek productivity improvements. Since the potential for accidents generally increases nonlinearly with the amount of traffic, further improvements to safety will be necessary just to maintain the current safety standard. The FAA must identify and evaluate solutions that cut across service units to address these complex problems.

   ATO will use the requested funds to develop computer models with which to evaluate strategies to enhance the efficiency, productivity, and safety of the NAS. Currently, FAA relies on a suite of outdated models for analyzing the impact of proposed changes to procedures, equipment, and airport infrastructure, as well as anticipated changes in the quantity, composition, and distribution of air traffic. These models are critical for many decision-making processes, including requirements analysis, cost-benefit analysis, performance assessment (to include metrics development and target setting), portfolio optimization, and tax incidence analysis. The FAA maintains models of varying scope and detail, from highly detailed airport surface models to macroeconomic models of the entire air transportation system. Some of these models are obsolete, owing to their inability to represent current Air Traffic Management (ATM) concepts and their reliance on outdated and unsupported software; others are rapidly becoming obsolete. Several models therefore need to be replaced.

   Benefits: This program will provide computational tools to identify and evaluate potential strategies, and to improve decision-making throughout FAA and the aviation community. For example, the Chicago O'Hare Modernization Project is estimated to cost about $7 billion. A new airport capacity model will help to ensure that this money is spent wisely and will reduce the cost of the required analyses. Also, the FAA's existing system-wide simulation model cannot accommodate new ATM procedures planned for NextGen (such as Continuous Descent Approaches and 4D trajectories) or even existing Traffic Flow Management (TFM) procedures (e.g., time-based metering, Severe Weather Avoidance Programs, etc.). This model is thus inadequate for assessing future NAS performance and the success of the Operational Evolution Partnership (OEP). A new system-wide model will address these shortcomings.

8. Wind Profiling and Weather Research Juneau ($1,100,000):

   Description of Solution: A FAA report to Congress in February 1995 determined severe upper air turbulence and wind shear raised potential hazards for aircraft executing tight departure procedures in the Juneau area. The report directed FAA to study the problem of wind shear, turbulence and intense horizontal and vertical rotors. This program, referred to as the Juneau Area Wind System (JAWS), is an outgrowth of the safety study and subsequent Congressional funding. The requested funding will allow for the continued operation of JAWS.

   Benefits: The potential benefits of JAWS are categorized into safety benefits and efficiency benefits. Three significant incidents involving transport aircraft that occurred during turning departures between 1993 and 1995 led to the implementation of wind restrictions and the need for JAWS. These wind restrictions along with additional routes have mitigated the safety risk significantly. In addition, general aviation users rely on JAWS for wind information and receive this information via the Juneau AFSS or the internet.

   The benefit of JAWS was derived from the wind measurements providing the ability to conduct departures and arrivals that are wind restricted. The FAA tracks the number of Required Navigation Performance (RNP) operations that could not have been conducted via an alternative route. In addition, Alaska Airlines provided data as to the number of turning departures that were conducted. Over 850 annual flight disruptions were estimated to be avoided by JAWS. This is a conservative number in that it only applies to flights that could not have operated on an alternative route which does not require wind measurements. With additional research into a wind warning system, JAWS has the potential to address another 28 to 35 flights annually that are currently disrupted due to the wind conditions.

9. Dynamic Capital Planning ($2,000,000):
Description of Solution: The Dynamic Capital Planning tools will allow ATO to make optimal decisions based on best business practices and provide verification for our stakeholders of aggressive approval thresholds and management of the Capital programs. The requirements analysis for selecting Dynamic Capital planning tools is being evaluated through the ATO Office of Finance and includes tools to address the following focus areas: quantitative economic value and internal benefits validation; milestone tracking and schedule modeling; performance measurement; auditing and trend analysis; earned value through program life cycle; field implementation planning; and post implementation analysis for corporate lessons learned results.

The amount requested will allow the implementation of the tool and continue to support better evaluation of programs through all phases of the acquisition life cycle.

This program will allow the agency to better allocate scarce resources and add management performance and accountability to the Capital program. The program will support the number of recommended actions to improve the management and performance of the Capital program by the Office of Management and Budget (OMB).

10. Traffic Collision Avoidance System (TCAS) ($3,000,000):
Description of Solution: In 2004, RTCA reconstructed its TCAS Special Committee (SC-147), as the direct result of a TCAS-related crash in Europe and a near mid-air that occurred in Japan. The committee examined these events and others to determine the cause and contributing factors. The Committee determined that in certain encounters between two aircraft, TCAS does not issue a sense reversal (e.g. change a "Climb" command to a "Descend") in a timely manner, if at all.

Based on limited monitoring in the U.S. and Europe, approximately 11 such "reversal logic" episodes have been detected. The predicated rate of mid-air collisions rate associated with this problem has been estimated to be once every four years, unless a fix is implemented immediately. A basis for a fix to the reversal logic has been identified.

Monitoring of TCAS performance has also identified instances where flight crews initially respond in the opposite direction to that specified by TCAS when a negative resolution advisory (RA) is displayed and announced to the flight crews. Europeans have concluded that the primary causal factor of the opposite responses is the use of 'Adjust Vertical Speed, Adjust' aural annunciation. A basis for a fix to the aural annunciation has been identified, but requires additional US air traffic operational validation.

During FY 2009, TCAS will complete the implementation of a near term TCAS monitoring capability, implement the new US airspace model, and continue assisting AVS with necessary rulemaking for the potential upgrade of all existing TCAS II units. This will be followed by coordination with avionics manufacturers and airlines if upgrades are deemed necessary and mandated.

Benefits: The program FAA's performance goal to reduce the commercial airline fatal accident rate." All aspects of the program are focused on safety issues related to this collision avoidance system, its ability to resolve near-midair encounters, and pilot's ability to react correctly to issued TCAS instructions.

11. Advanced Technology Development and Prototyping – In-Service Engineering ($400,000):

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for on-going engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)

Appropriated (FY 1982-2007)	---	$520,252.0 [1]
FY 2008 Appropriated	---	42,760.0
FY 2009 Request	---	41,400.0
FY 2010-2013	---	141,700.0
Total	Various	$746,112.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Runway Incursion Reduction Program and IOT&E	---	$10,000.0
2. System Capacity, Planning and Improvements	---	6,500.0
3. Operations Concept Validation	---	7,400.0
4. NAS Weather Requirements	---	1,000.0
5. Airspace Management Laboratory	---	4,000.0
6. Airspace Redesign	---	3,000.0
7. Strategy and Evaluation	---	3,000.0
8. Wind Profiling and Weather Research Juneau	---	1,100.0
9. Dynamic Capital Planning	---	2,000.0
10. Traffic Collision Avoidance System (TCAS)	---	3,000.0
11. In-Service Engineering	---	400.0
Total	Various	$41,400.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction pursuant to P.L. 108-7, February 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A02	**Traffic Management Advisor (TMA)**	**$3,700,000**	**Various**	**A-24**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Over the past three years, demand for air traffic services has been increasing and so have delays. The costs of these delays still plague the airlines, freight operators, general aviation, and everyday airline passengers. Users have identified the following as major contributors to the growth in delays:

- Reduced access to the airspace when demand is high,
- Ineffective upstream planning of flow to congested terminals,
- Maximizing the en route capacity by strategic management of conflicts and restrictions, and
- Flow through busy terminals to fill the runways.

Description of Solution: Based on a recommendation by the Radio Technical Commission for Aeronautics (RTCA), FAA is using TMA to help meet excess demand requirements. TMA provides an aircraft arrival schedule in the en route and terminal Traffic Management Unit and produces meter lists for display on en route controllers' displays. TMA also provides advisories to en route controllers for metering traffic into terminal airspace. TMA enables FAA to increase the number of aircraft that can land at an airport in a given period of time. TMA has been physically deployed to 20 Air Route Traffic Control Centers (ARTCCs) and is currently operational at 15. TMA will be operational at the last 5 ARTCCs by September 30, 2007.

In FY 2007, $37,600,000 was appropriated to provide continued system spiral development, integration and testing of TMA software to include enhancements and improvements that are critical to the user; concurrent adaptation and software development, hardware and communications procurement required to deploy the TMA to the last seven sites; and training of personnel in system administration, adaptation and hardware maintenance.

In FY 2008, $15,400,000 was appropriated to provide prime contractor support and on site engineering support to each new site for the development and verification of the metering adaptation data required to enable ARTCC personnel to use the time based metering functionality provided by the TMA system.

For FY 2009, $3,700,000 is requested to complete development and fielding of the final functional elements of the software, complete a critical update to the TMA adaptation software maintenance course, finish development of the TMA adaptation analysis tools required to maintain the TMA system, and perform contract closeout work

Benefits: Based on the TMA benefits analysis report that was updated in January 2007, the TMA system is expected to generate $3 billion in benefits through FY 2015.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$116,352.0 [1]
FY 2008 Appropriated	---	15,400.0
FY 2009 Request	---	3,700.0
Baseline Requirement	---	0.0 [2]
Total	Various	$135,452.00

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
TMA-Single Center	---	$3,700.0

[1] Includes reduction pursuant to P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirement are under review

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A03	**NAS Improvement of System Support Laboratory**	**$1,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to the FAA's Capital Investment Plan (CIP) programs. As CIP projects and their supporting systems are delivered, installed, and eventually removed, it is necessary to modify, upgrade, and reorganize the Laboratory infrastructure which occupies more than 160,000 square feet.

Description of Solution: The Technical Center's System Support Laboratory provides the environment to implement, test, and integrate new systems into the National Airspace System (NAS). Once accepted, the systems become part of the test bed and are used to provide support to the operational field sites over the life-cycle of the operational systems. To maintain a viable test bed, it is periodically necessary to upgrade and enhance those portions of the facilities that support the systems and form an integral part of the test bed. Electronic switching systems are used to permit replication of the myriad-fielded system configurations and to permit multiple parallel testing configurations to run with a minimum of system components. The switching systems must be upgraded, enhanced, and expanded to meet the changing needs of the CIP system deliverables.

In FY 2007, $1,198,000 was appropriated for system support laboratory improvements, such as the Business Continuity Plan design and beginning of modifications, the mockup tower renovation, router and firewall, rack servers and tape silos, and power quality monitoring and usage system expansion. In FY 2008, $1,000,000 was appropriated for various improvements to the Laboratory systems in order to support CIP programs.

For FY 2009, $1,000,000 is requested for various improvements to the Laboratory systems in order to support CIP programs.

Benefits: The program improves FAA's centralized state-of-the-art laboratory environment that supports the implementation, testing, and integration of new NAS systems prior to their delivery to the various FAA field sites. The single, centralized support laboratory helps FAA the avoiding cost of establishing and maintaining multiple laboratories for each project, program, Service Unit, and Line of Business.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$43,855.8 [1]
FY 2008 Appropriated	---	1,000.0
FY 2009 Request	---	1,000.0
FY 2010-2013	---	4,000.0
Total	1 [2]	$49,855.8

[1] Excludes $2,000,000 appropriated in FY 2000 under Technical Center Facilities. Includes $250,000 reduction of the FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003.
[2] All work/services to be performed at FAA William J. Hughes Technical Center.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Integration/Implementation of NAS Laboratory	1 [3]	$1,000.0

[3] All work/services to be performed at FAA William J. Hughes Technical Center.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A04	**William J. Hughes Technical Center Facilities**	**$12,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to FAA's Capital Investment Plan (CIP) programs. These laboratories provide around the clock operations support for all En Route and terminal ATC facilities throughout the nation. Within this complex reside the air traffic control simulation facilities where dynamic simulations are conducted in support of CIP programs. In addition, the Human Factors Laboratory is used to conduct studies of the validity, operational effectiveness, and impact of advanced technologies on the air traffic controller and maintenance technician. These facilities must be sustained and supported to meet mandated objectives associated with the CIP.

Description of Solution: For FY 2009, $12,000,000 is requested to sustain FAA's laboratory test beds and will be used for hardware and software support, software licensing fees, and other costs associated with operating these multi-user facilities. These laboratories include the En Route and terminal test beds; navigational, scan radar, and automated tracking sites; communications switching equipment; the aircraft fleet (flying laboratories); aircraft simulation systems such as the target generator; the technical computer data center; and the Human Factors Laboratory.

Benefits: This support is necessary for the successful development and implementation of various programs of the CIP. In addition, ATC field facilities support mission will continue throughout the transition from today's system to the full implementation of FAA's modernization efforts. These facilities provide in-house testing required to ensure new systems and modifications are thoroughly evaluated in an integrated environment to minimize problems prior to field deployment. A stable funding source obviates the need for each program office to establish and sustain the infrastructure needed to support their programs and fielded systems. This has been a proven method to sustain the Test Beds and to minimize FAA's costs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$156,354.5 [1]
FY 2008 Appropriated	---	12,000.0
FY 2009 Request	---	12,000.0
FY 2010-2013	---	48,000.0
Total	1 [2]	$228,354.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Hardware Sustainment	---	$943.9
2. Software Licenses and Support	---	1,613.9
3. Sustainment, Engineering and Support Services	---	7,327.9
4. Parts, Supplies and Equipment	---	2,114.3
Total	1	$12,000.0

[1] Includes $2,477,500 appropriated in FY 2000 for Technical Center Infrastructure Sustainment and $2,000,000 in FY 2000 for NAS Improvement of System Support Laboratory. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] All work and services to be performed at FAA William J. Hughes Technical Center.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A05	**William J. Hughes Technical Center Infrastructure Sustainment**	**$5,400,000**	**1**	**F-16**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The William J. Hughes Technical Center (WJHTC) owns and operates test and evaluation facilities, research and development facilities, administrative and storage facilities, and numerous project test sites. The Technical Center must keep the Central Utilities Plant (CUP), utility distribution systems, and the building infrastructure in operating order. The WJHTC must also comply with International Building Codes, the National Fire Codes (NFC), the Americans with Disabilities Act (ADA) and current energy policies.

Electrical testing during a 2005 scheduled power outage revealed that the Building 300's substations are in marginal condition. A private engineering firm's mechanical and electrical evaluation of twenty buildings identified significant deficiencies. A portion of Building 301's exterior glazing is single pane, energy inefficient and needs to be replaced. The oversized HVAC systems at Building 316 create high office humidity, poor indoor air quality and mold growth. The Center's Water Plant was constructed in the 1940's and is well beyond its estimated service life.

Description of Solution: $5,400,000 is requested for FY 2009 for the following activity tasks:

- Electrical substation replacement: The American National Standards Institute/Institute of Electrical and Electronic Engineers considers average life of a transformer to be 20 to 25 years. The existing transformers and equipment are 29 years old. This funding will allow replacement of two electrical substations in Building 300. Preventative maintenance testing has indicated these substations are in marginal condition. The substation replacement would improve the reliability of electrical power to Building 300. The FAA estimates the cost savings from one avoided power failure would pay for the entire program. This program is essential to the success of the Business Continuity Plan (BCP).

- Mechanical and electrical system improvements: The ten-year master plan, prepared in FY 2005, recommended replacement of mechanical and electrical systems at 16 Center facilities. This program replaces systems and equipment beyond their useful lives, and upgrades all deficient systems and equipment before serious operation and maintenance problems occur. The improvements will increase energy efficiency at these facilities by as much as 20 percent.

- Replacement of exterior windows and metal panels: This program replaces single pane glazing at Building 301 as well as and poorly insulated metal panels that are over forty years old. The program will provide a significant energy savings opportunity. The funding will eliminate asbestos material and improve facility security by better controlling building access from the airport operations area.

- Heating, Ventilating and Air Conditioning (HVAC) systems improvements: This program implements recommendations to improve working conditions in Building 316. The program will eliminate high office humidity, mold growth, and poor indoor air quality. The program will result in decreased maintenance costs, and improved employee productivity due to reduced sick leave usage.

- Water plant replacement: This program replaces a water plant that has significant structural problems and is over 60 years old, well beyond the estimated service life. The plant replacement will drastically improve water generation reliability, a critical feature since this plant provides potable water to all Center facilities. Finally, the replacement effort will reduces maintenance costs, as the repair of a small portion of the plant distribution piping in 2006 cost approximately $100,000.

Benefits: The modifications will ensure the continued reliable operation of the WJHTC by replacing aged mechanical, electrical, and life safety equipment and required utility and other support systems before serious problems occur. The work will also improve life cycle infrastructure planning; update certain facilities, facility support systems and utility distribution systems; reduce energy consumption on a per square foot basis; and enable the Center to support FAA programs to successfully complete their mission.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$37,634.4 [1]
FY 2008 Appropriated	---	4,200.0
FY 2009 Request	---	5,400.0
FY 2010-2013	---	22,700.0
Total	1	$69,934.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Replace two electrical substations in Building 300	---	$2,300.0
2. Mechanical/electrical system improvements to 16 facilities	---	1,400.0
3. Replace exterior windows and metal panels at Building 301	---	900.0
4. Improvements to 3 HVAC systems in Building 316	---	500.0
5. Water Plant (Bldg. 33) Replacement (design/permits)	---	300.0
Total	1	$5,400.0

[1] Excludes $2,477,500 appropriated in FY 2000 under Technical Center Facilities. Includes $750,000 reduction of the FY 2002 funds pursuant to supplemental P.L. 107-206. January 23, 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A06	NextGen Network Enabled Weather (NNEW)	$20,000,000	Various	W-11

FAA Strategic Goal: Greater Capacity - Increase capacity to meet projected demand and reduce congestion.

The FAA has identified this program as a "Transformational" program for NextGen. The most direct alignment to NextGen goal is Network Enabled Information Access.

Description of Problem: Weather causes 70 percent of the delays in the NAS, according to FAA data from OPSNET. The current weather dissemination system is inefficient to operate and maintain. Information gathered by one system is not easily shared with other systems. This leads to redundant and inconsistent information, and in many cases information not being universally available or used leading ultimately to sub-optimal decisions.

Description of Solution: The NextGen Integrated Plan is establishing a broad framework for the services, technologies, policies, procedures, and methods of operation that must be implemented by 2025 to achieve the plan's national goals. This vision establishes improved weather capabilities as a key element of the national strategy for supporting air transportation and enhanced operational decision making between now and 2025.

The achievement of improved weather capabilities will occur through the integration of enhanced weather information with other key components of NextGen. No longer will it be necessary to manually gather and integrate diverse weather data to realize a coherent picture of the weather situation. The overall NextGen weather program is tied directly to a set of operational improvements (OI) developed by Joint Planning and Development Office (JPDO). This will provide a common situational awareness of the weather, and rapid dissemination of any changes. The NextGen OIs are categorized in 4 functional areas: integration of weather information for decision support tools, improvements in weather sensing capability, improved weather forecast and processing, and the universal and common access of that information by all users.

The NextGen Network Enabled Weather (NNEW) effort is required to support JPDO OI item #4 identified above. It will enable the point-to-multipoint, networked access by all NextGen users, service providers, military planners, security personnel, and the flying public of observational and forecast weather information from the distributed 4-dimensional data cube. A distributed 4-dimensional data cube is a current description of the atmosphere in three dimensions. This includes the vertical plus the two horizontal dimensions, and projected into the future, the fourth dimension. This will be accessible by all NAS stakeholders. The data cube is a virtual database that is connected and accessible by communication networks supported by World Wide Web concepts and technology. The data cube provides weather information to NAS operators (pilots, dispatchers, and ATM) and identifies good airspace (free from hazardous weather) now and into the future. NNEW is responsible for establishing the information management capabilities necessary for the operations of the network enabled 4D data cube. The 4D data cube will be developed to be the authoritative weather data repository and will provide net-centric access by system users to consistent tactical and strategic-level weather information. Changes to weather information will be rapidly disseminated and all weather users will have improved access to timely and accurate flight information at their homes, businesses, airports, and in the air to support improved decision making for increased capacity and enhanced safety. There will be a demonstration effort to resolve key technical questions and reduce implementation risk of a network-enabled weather environment to the FAA and external system users. This will include assurance that NNEW is fully compatible and consistent with the evolved System-Wide Information Management (SWIM) infrastructure. This will also serve to define open standards and requirements necessary for overall NextGen weather dissemination compatibility.

Benefits: Disseminating weather information utilizing NNEW technologies will improve uniform access to key common weather parameters, in real time, thereby improving utilization of air space and reducing flight delays and fuel costs. Further, to the degree possible, weather information will be automated, reducing the chances for error, improving the quality of controller decisions and reducing controller workload during bad weather.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	7,000.0
FY 2009 Request	---	20,000.0
FY 2010-2013	---	100,000.0[1]
Total	Various	$127,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ConUse, requirements and standards for weather dissemination	---	$7,300.0
2. Prototype 4D data cube Weather Service development	---	3,950.0
3. Begin implementation of NEO standard formats in test configuration	---	8,750.0
Total	Various	$20,000.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A07	**Data Communications in support of Next Generation Air Transportation System (NextGen)**	**$28,800,000**	**Various**	**C-27**

FAA Strategic Goal: Greater Capacity - Increase capacity to meet projected demand and reduce congestion.

The FAA has identified this program as a "Transformational" program for NextGen. Most NextGen goals require digital data communications infrastructure.

Description of Problem: In the current air traffic system, all communication with airborne aircraft is by voice communications. Aircraft route of flight revisions must be communicated through multiple change-of-course instructions or lengthy verbal reroute instructions, which must be repeated, are prone to verbal communication errors and entry errors into an aircraft's flight management system. The use of voice communication is labor and time intensive and will limit the ability of the FAA to effectively meet future traffic demand. Voice-only communications will not support the NextGen vision, especially in the areas of net-enabled information access and aircraft trajectory-based operations.

Description of Solution: Adding an air-to-ground data communications capability will meet the needs of the NextGen vision, while significantly reducing controller-to-pilot communications and controller workload, and enhancing safety. This program will provide comprehensive data communications, including ground automation message generation and receipt, message routing and transmission, and aircraft avionics requirements. Initially, data communications will be an additional means for two-way exchange between controllers and flight crews for air traffic control clearances, instructions, advisories, flight crew requests and reports. Eventually, the majority of communications will be handled by data communications for appropriately equipped users. Automated data communications will support the NextGen vision by enabling air traffic control to issue an entire route of flight with a single data transmission directly to an aircraft's flight management system. This Data Communications program will progressively move the National Airspace System (NAS) toward NextGen by building incremental capabilities that reduce unit costs while enhancing capacity and safety.

To meet the NextGen timetable, the Initial Investment Decision for Data Communications in support of NextGen is scheduled for June 2008. For FY 2009, $28,800,000 is requested to complete FAA Investment Analysis, initiation of system development contracts, and continuation of long-lead operational and regulatory activities. FY 2009 efforts will include finalizing system-level requirements, achieving Final Investment Decision approval, preparatory work required for rulemaking, contract award for Data Communications enhancements to En Route and Tower automation applications and interfaces, and final preparations for acquisition of air/ground communications services. During FY 2009, operations and human factors research to mitigate design and operational risks associated with initial data communications services will be completed, and research supporting advanced NextGen-enabling data communications capabilities will continue.

Benefits: Data communications are at the heart of NextGen advanced airspace management concepts. The operations and services enabled by data communications will allow us to strategically manage the airspace, and meet traffic demand while constraining operational and life-cycle costs.

Analog voice communications can contribute to operational errors due to miscommunications, stolen clearances and delayed messages due to frequency congestion. In FY 2004 and FY 2005, approximately 20 percent of en route operational errors were voice communications related. Of those, 30 percent of the high severity operational errors were deemed to be communications-related. With total aircraft equipage, data communications can substantially reduce communications-related operational errors.

Data communications will enable air traffic controller productivity improvements, and will permit capacity growth without requisite growth in costs associated with infrastructure equipment, maintenance, labor, and training. As a result, unit costs (the resources necessary to provide air traffic management service per aircraft operation) will decrease. Data communications achieves these results by automating repetitive tasks, replacing voice communications with less workload-intensive data communications, and enabling ground systems to use real-time aircraft data to improve traffic management efficiency. Numerous studies suggest that with 70 percent of aircraft data-link equipped, exchanging routine controller-pilot messages and clearances via data can enable controllers to safely handle approximately 30 percent more traffic. This increase in traffic handling ability has a direct correlation to an increase in capacity. Data communications enabled NextGen services, including 4D trajectories and conformance management, will further improve capacity and efficiency by shifting air traffic operations from short-term, minute-by-minute tactical control, to more predictable, and planned strategic traffic management.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	7,400.0
FY 2009 Request	---	28,800.0
FY 2010-2013	---	128,400.0 [1]
Total	Various	$164,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Automation enhancement SIR development/evaluation	---	$4,100.0
2. Final Investment Decision activities	---	6,500.0
3. En Route automation (ERAM) enhancements contract initiation	---	13,100.0
4. Tower automation enhancements contract initiation	---	3,000.0
5. Data Communications Segment 2 services planning/development	---	2,100.0
Total	Various	$28,800.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A08	**NextGen Demonstrations and Infrastructure Development**	**$28,000,000**	**Various**	**M-49**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

The FAA has identified this program as a "Transformational" program for NextGen.

Description of Problem: The Joint Planning and Development Office (JPDO) is the steward of NextGen. Over the past year, the JPDO developed a NextGen Concept of Operations (ConOps) and an initial Enterprise Architecture. These documents establish a framework for the future, based on today's best information. These documents defined two major concepts NextGen will develop: Four Dimension Trajectory Based Operations (TBO) and Air Traffic Management.

Four Dimension Trajectory Based Operations — The four dimensions measure latitude, longitude, altitude and time. A set of systems would collect and disseminate 4D data to provide complete situational awareness to pilots, controllers and air traffic managers. The goal is to allow flights to find their best route, rather than restrict them to controlled paths.

Air Traffic Management — Currently FAA controls air traffic in the NAS using defined flight paths and airspace restrictions that do not take full advantage of the capabilities of an aircraft or its systems. NextGen would transition FAA to a more collaborative environment where pilots and FAA managers would work together to tailor an aircraft's route for optimum safety and efficiency.

Beyond defining these initial concepts, JPDO, with its many partners, must test and mature these concepts and the technologies that support them. This investment prepares partner agencies to make investment decisions and deploy new capabilities.

FY 2008 was the first year JPDO requested funding for demonstrations and infrastructure development activities to test central NextGen concepts. The results will be used to identify early implementation opportunities, refine longer-term objectives, and if results dictate, eliminate certain concepts from further consideration.

Description of Solution: For FY 2009, $28,000,000 is requested to fund the following activities:

1. International Air Traffic Interoperability ($6,400,000). This demonstration is designed to help the FAA promote safe, affordable and rapidly implemented innovations into Air Traffic Management (ATM). This effort, known as the Atlantic Interoperability Initiative to Reduce Emissions (AIIRE), will use commercial aircraft along oceanic routes to demonstrate and accelerate Airline and Air Navigation Service Providers (ANSP) efficiency improvements using existing systems and technologies. The flight trials development stage will include system architecture, design, hardware and software development (where applicable), procedures development, simulations, component and subsystem testing and certification, and system checkout. Flight trial execution could include scripted flight tests, limited operational testing and extended operational evaluations with revenue aircraft. The AIIRE program contributes directly to NextGen concepts and supports international collaboration, avoids overlap, and will "deconflict" activities with national and international organizations (FAA, DOD, EC, Eurocontrol, SESAR, ICAO, ANSP, Airlines, and industry partners). Further, this international interoperability air traffic demonstration and development initiative will assist the international communities and the FAA in validating 4D Trajectory Based Operations (TBO) and Performance-based Air Traffic Management (PATM) alternatives.

2. High Density Airport (HDA) Capacity and Efficiency Improvement Project ($5,000,000).
   This demonstration will serve as the first transition step to TBO. This concept attempts to take advantage of existing ground technologies and functionality while leveraging airborne navigational capabilities that

already exist on most commercial production and many in-service airplanes. Trajectory Based Management (TBM) will be accomplished using fully defined 3D paths to ensure aircraft sequencing and spacing (path stretching using dog-legs or offsets). The 3D paths permit a more orderly and predictable traffic patterns and use path clearances rather than the conventional speed, altitude, and heading clearances to manage aircraft spacing. This technique has the potential to reduce controller workload and allow the airplane to precisely follow a continuous path using the accuracy of Required Navigation Performance (RNP) operations. Execution of the demonstration will include data collection from real operations to show benefits in capacity, environmental (noise, computed emissions), and fuel efficiency. Site selection will require deployment of ATM ground automation prototypes to functionally support 3D path operations. The automation tools include the Center TRACON Automation System Traffic Management Advisor (CTAS TMA) and the En Route Descent Advisor (EDA).

3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration ($5,700,000). This demonstration has two objectives. The first objective will utilize the advanced capabilities of the UAS community to serve as a testbed for exploring future 4D trajectory based concepts. The second objective examines potential concepts for the wide-spread integration of UAS into the future NextGen environment. Today's generation of UAS offer a perfect testbed for "trajectory based" concept validation, in that they basically fly 4DT profiles today and are equipped with toolsets (data-link, GPS) needed for 4D. Use of the UAS community will allow the FAA to evaluate planned 4D automation toolsets, which will be evolving in the next few years. More importantly to the DoD community, these demonstrations will provide a platform for validation of RTCA SC-203 UAS performance requirements now under development. This validation will provide the FAA confidence in the safety case for UAS, and allow the FAA to transition the Minimum Aviation System Performance Standards (MASPS) documents into guidance material such as Advisory Circulars and Technical Standard Orders (TSO).

4. Virtual Tower (Staffed and Autonomous) ($5,900,000). The Virtual Tower (VT) program will demonstrate and validate the potential of emerging alternative approaches to performing local and ground air traffic control tower operations for other than the current Airport Traffic Control Tower (ATCT). Projected growth in air traffic and the high cost of building, sustaining and replacing air traffic control towers necessitate the development and evaluation of new concepts that do not require the construction of a new tower or its co-location within or immediately adjacent to the airport property. Such a concept is envisioned and outlined in the JPDO's NextGen ConOps. The ConOps outlines a future air traffic system in which tower ANSP services are provided from remote locations, thus not requiring the ANSP to be physically present in a tower in or near the airport property. The Virtual tower demonstrations will be at field sites (medium to low density airports) that have yet to be determined. The field site selection for virtual towers (both staffed and autonomous) is expected to occur in FY 2008.

5. JPDO Program Management ($5,000,000). The JPDO's oversight of NextGen requires approximately $19.5 million ($14.5 million from Research, Engineering, and Development (R,E&D) appropriation and $5 million from the ATO demonstration projects) in FY 2009 in support from the FAA. Prior to FY 2008, the entire amount was requested through the Research, Engineering, and Development appropriation. Beginning in FY 2008, as a few programs move toward implementation, there is a rationale for requesting part of the funding through the ATO Capital appropriation. A detailed description of the program management request can be found in the RE&D budget request.

Benefits: These demonstration and early implementation initiatives will provide JPDO and its partner agencies critical information to refine operating concepts and tools, including the following:

1. International Air Traffic Interoperability. The expected benefits are proof-of-concept and working prototypes for an operational environment with flight profile predictability and efficiency on long-duration international flights, where fuel burn optimization is a prime concern. This activity will demonstrate the benefits of flexibility in a four-dimensionally managed environment through en route flexibility; demonstrate exchange of operational data between aircraft operators and air traffic service providers for informed decision making in near real-time to increase productivity; and demonstrate efficient transition from the oceanic/en route phase of flight to the domestic/en route and offshore descent phases of flight to increase transition area efficiency and productivity.

2. High Density Airport (HDA) Capacity and Efficiency Improvement Project. This demonstration will show enhanced airspace use to accommodate the expected demand. It links two important activities: time based metering and procedures that reduce separation minima (RNAV/RNP) to more fully and efficiently utilize every landing opportunity at the airport runway. The demonstration will also test whether or not the FAA can increase capacity without additional staffing.

3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration. Initially, UAS will be used as surrogate transportation aircraft in this demonstration. The results of these tasks will allow for early implementation of trajectory management flight planning capabilities for all aircraft operating in the NAS. Significant benefits can be realized in airspace designated for high performance aircraft through problem identification and resolution earlier in the process, workload spread more evenly, and more effective management of airspace.

4. Virtual Tower (Staffed and Autonomous). The near-term goal and expected benefits are a proof-of-concept and working prototype for a Staffed Virtual Tower (SVT). The longer-term goal will be the Autonomous Virtual Tower (AVT). Both systems will support the projected growth in air traffic by providing additional options for providing ATCT services at airports not currently served, and potentially lower man-power costs. Further, these systems offer a potential reduction in the higher cost of building, maintaining and replacing ATCTs throughout the NAS.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	50,000.0
FY 2009 Request	---	28,000.0
FY 2010-2013	---	120,000.0 [1]
Total	Various	$198,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. International Air Traffic Interoperability	---	$6,400.0
2. High Density Airport (HDA) Capacity and Efficiency Improvement Project	---	5,000.0
3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration	---	5,700.0
4. Virtual Tower	---	5,900.0
5. JPDO Program Management	---	5,000.0
Total	Various	$28,000.0

[1] Future requirements are currently under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A09	**Next Generation Air Transportation System (NextGen) – System Development**	**$41,400,000**	**Various**	**M-48**

FAA Strategic Goal: Increased Safety - Reduce the commercial airline fatal accident rate. Reduce the number of fatal accidents in general aviation. Reduce the risk of runway incursions. Enhance the safety of FAA's air traffic systems.

FAA Strategic Goal: Greater Capacity - Increase capacity to meet projected demand and reduce congestion. Increase reliability and on-time performance of scheduled carriers. Address environmental issues associated with capacity enhancements

FAA Strategic Goal: Organizational Excellence - Improve financial management while delivering quality customer service

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand by 2025. The JPDO's 2004 Integrated Plan identified three key performance targets to achieve the desired capability by 2025. These are (1) satisfy future growth in demand up to three times current levels; (2) reduce domestic curb-to-curb transit time by 30 percent; and (3) minimize the impact of weather and other disruptions to achieve 95 percent on time performance. Achieving these targets by 2025 is a challenge. In addition, an increase in demand to three times current levels could cause a similar increase in the number of accidents, aircraft noise and emissions, and air traffic controller workload. This line item provides the research and development required to resolve these potential problems.

Description of Solution: The solution involves four areas of research and development – safety, capacity, human factors, and environment. The safety research includes expanding information sharing and data analysis to identify and mitigate risks before they lead to accidents. The capacity research develops new air traffic management systems to support NextGen; measures NextGen concepts to determine if they achieve the targets for 2025; and develops flexible airspace categories to increase throughput. The human factors research provides higher efficiency levels in air traffic control and identifies the new role for controllers as more responsibility shifts to the flight crew. The environmental research explores new procedures, and adapts new technologies and fuels into the National Airspace System (NAS) to reduce emissions, fuel burn, and noise; and includes demonstrations, methods to adapt the current infrastructure, and estimates of costs and benefits.

For FY 2009, a total of $41,400,000 is requested for the following activities:

1. Air Traffic Control/Technical Operations Human Factors – Controller Efficiency ($3,800,000). A key performance target of NextGen for the year 2025 is to satisfy growth in demand up to three times the current levels. Achieving this target could require three times the current number of air traffic controllers unless we increase efficiency levels through the use of automation and technology. Automation and technology must work in concert with the humans in the system to meet the targeted efficiency levels. Human factors aspects of existing air traffic control systems are a limiting factor for traffic loads. Projected traffic loads will exceed the capability of our current mode of air traffic control when traffic levels exceed 130 percent of 2004 levels (baseline). In FY 2009, research will define preliminary roles and responsibilities for actors in the NAS to achieve required performance and define requirements for integrated en route situation displays.

2. Air Traffic Control/Technical Operations Human Factors – Air/Ground Integration ($2,900,000). Achieving the capacity targets of NextGen and achieving self-separation between aircraft by the flight

crew requires significant changes in the roles and responsibilities between pilots and controllers and between humans and automation. Integration of air and ground capabilities poses challenges for the air traffic service provider and the flight crew. A core human factors issue is to ensure that safety is maintained. Information on intent as well as positive information on delegation of authority must be clear and unambiguous; and new types of human error modes, which may be introduced by new technology and procedures, will require the management of safety risk in the changing environment. The FY 2009 research will complete preliminary human error and safety analysis concerning changes in air traffic service provider and flight crew roles and responsibilities to manage safety of the NAS; and develop initial information requirements for air traffic service providers and aircraft operators to perform trajectory negotiations.

3. <u>Environment and Energy –Advanced Noise and Emission Reduction ($2,500,000).</u> Achieving the NextGen target of three times current levels of capacity could cause a three times increase in aircraft noise, fuel burn and emissions. The potential for environmental impacts could constrain capacity growth and prevent full realization of NextGen. Reducing the significant environmental impact of aviation in absolute terms will require new operational procedures, aircraft technologies, and alternative fuels to allow the desired increase in capacity. The solutions must demonstrate an acceptable benefit-to-cost ratio and infrastructure adaptation plan. There must be sufficient knowledge of human health and welfare and climate change impacts of aviation to enable appropriate means to mitigate these effects. The FY 2009 research will evaluate the potential NAS environmental benefits of new aircraft technologies and alternative fuels; initiate a comprehensive analysis of the impacts on the NAS of new aircraft types [e.g., aircraft featuring Continuous Low Emissions, Energy, and Noise (CLEEN) technologies, Very Light Jet (VLJ), Unmanned Aerial Vehicle (UAV), Supersonic Business Jet (SSBJ)] and assess approaches to optimize environmental performance; and initiate efforts to identify any NAS adaptation required to adopt new CLEEN technologies and alternative fuels.

4. <u>Environment and Energy – Validation Modeling ($4,500,000).</u> Achieving the NextGen target of three times the current levels of capacity could cause a threefold increase in aircraft noise, fuel burn, and emissions. Reducing significant noise and emissions impacts due to increasing capacity will require a thorough understanding of the economic and operational impacts of the system alternatives. As the system solutions to increase capacity develop, alternative operational procedures must be explored and validated to ensure that proposed solutions are sufficient to prevent environmental constraints that might limit the required capacity increases. Models and metrics must be developed and demonstrated to implement Environmental Management Systems (EMSs) to manage and mitigate NextGen environmental impacts. The FY 2009 research will explore advanced algorithms, automated systems and approaches for en route, surface, and terminal operations automated systems optimize reducing significant climate, air quality and aircraft noise impacts; define existing and planned environmental mitigation methods to counter NAS constraints of today and for NextGen; initiate development of the Aviation Environmental Design Tool (AEDT) regional version to enable evaluation of airspace environmental impacts and support EMSs; and apply metrics for health and human welfare and climate impacts to develop a sample NAS EMS and define benefits of mitigation actions.

5. <u>New ATM Requirement ($5,400,000).</u> Achieving NextGen will require a full-scale transformation of the air traffic control system, because FAA's current system simply is not scalable to handle the required changes. The new system must demonstrate higher capacity levels at faster speeds than today. Specifically, it must achieve three times current levels of capacity, a 30 percent reduction in curb-to-curb transit times; and 95 percent on time performance. A system transformation of this magnitude requires air traffic control to change from tracking aircraft to managing trajectories. Identifying the new operational requirements to achieve this change in air traffic control is the key to developing a transition strategy from our current system to NextGen. The FY 2009 research will consider the impacts of NextGen operations (e.g. closely spaced RNP routes) on Traffic Alert and Collision Avoidance System (TCAS) and develop requirements for TCAS 8, develop standards for L-Band and C-band data communications to provide international standards for air-ground communications and wireless air traffic control surface communications, and develop software assurance standards for the integrated air-ground decision support systems foreseen as necessary for NextGen.

6. Operations Concept Validation – Validation Modeling ($4,000,000). As proposed system alternatives for NextGen develop, there must be an understanding of the economic and operational impact of the proposed solutions. This requires a thorough understanding of aerospace system operations, the impact of change on system performance and risk, and how the system impacts the nation. This program will develop the methods, metrics, and models that evaluate how much proposed solution increases capacity, reduces transit time, or increases on time arrivals. The demonstration must address the combined solution as a system in terms of its progress toward and ultimate achievement of the NextGen targets. The FY 2009 research will provide an end-to-end NAS Operational Concept that integrates the capabilities envisioned across the solution sets, and it will provide a set of scenarios that describe operational changes for NextGen solution sets including: flexible terminal operations, surface management, and data communications for traffic flow management and conflict resolution.

7. System Safety Management Transformation ($16,300,000). Achieving NextGen will require a full-scale transformation of the air traffic control system, because the current system simply is not scalable to handle the required changes. At the same time, safety will remain the top priority of FAA. Transforming the system will require a thorough understanding of the operational safety impact of system alternatives. While pursuing 3 times current levels of capacity, FAA will continue to pursue reduced fatality rates. This will require data analysis capabilities to predict, identify, and mitigate safety risks before they become accidents; safety guidelines to help stakeholders develop their own safety management systems; and modeling to help measure progress toward achieving FAA goals. The FY 2009 research will begin the development of Aviation Safety Information Analysis Sharing (ASIAS) capabilities, to include NextGen member agency aviation safety information needs; baseline risk assessment for system-wide risks for current operations; and conduct initial safety assessments of proposed concepts, algorithms, and technologies.

8. Wake Turbulence – Re-categorization ($2,000,000). Achieving the NextGen target of three times current levels of capacity requires improved airspace access by a changing fleet mix and updated separation standards that increase capacity to allow efficient use of congested airspace while at the same time maintaining safe operations. Current separation standards are designed to protect the smallest aircraft in one category from the largest aircraft in the next category. There is a wide range of wing span and weight within each category. While different airports serve different categories of aircraft; however, the same six categories are used by all air traffic controllers at all airports. Allowing the six categories to adapt to conditions could increase flexibility and throughput**.** The FY 2009 research will develop enhanced analysis tools to link observed wake behavior to standards for required separation; determine safety risk associated with new standards relative to existing standards; simulate and validate new separation standards; coordinate with EUROCONTROL on new separation standards; and conduct analysis to link wake transport and demise characteristics to aircraft flight and surrounding weather parameters.

Benefits: Research and development identifies constraints and barriers, and separates solutions that are effective from those that are not. Each research element in this line item has a target that involves a demonstration. The demonstrations will prove concepts and show that it is possible to meet the target operationally by the year 2025. The benefits are: (1) capacity increased to three times current levels; (2) curb-to-curb transit time reduced by 30 percent; (3) on time performance increased to 95 percent; (4) noise and emissions reduced in a cost effective way to allow three times capacity; (5) air traffic controller efficiency increased to three times current levels; (6) aerospace-related fatality rate reduced commensurate with capacity increase; and (7) understanding of economic and operational impact of system alternatives. Benefits for the items in this FY 2009 request are as follows:

1. Air Traffic Control/Technical Operations Human Factors – Controller Efficiency. This program element targets a demonstration of three times improvement in air traffic controller efficiency (e.g. greater number of aircraft) and effectiveness (e.g., fewer operational errors) through automation and standardization of operations, procedures, and information. Interim progress will be measured by demonstrating 130 percent controller efficiency; 166 percent controller efficiency; 230 percent controller efficiency; and finally 300 percent controller efficiency. Research supports operational implementation by 2025.

2. Air Traffic Control/Technical Operations Human Factors – Air/Ground Integration. This program element contributes the controller perspective to defining the changes in roles and responsibilities between pilots and controllers and between humans and automation required to implement NextGen. The R&D outcome is to conduct a full mission demonstration of integrated NextGen air and ground capabilities for pilot separation responsibility and controller efficiency. There will be interim measures of progress through a series of demonstrations involve multiple research products and programs. Research supports operational implementation by 2025.

3. Environment and Energy – Advanced Noise and Emission Reduction. This program element targets a reduction of significant aviation noise and emissions in absolute terms (to enable three times capacity) in a cost-beneficial way and a reduction of uncertainties in particulate matter and climate impacts to levels that enable appropriate action. Progress will be measured by demonstrating (under the following program element) no environmental constraints at 130 percent capacity; no environmental constraints at 166 percent capacity; no environmental constraints at 230 percent capacity; and finally no environmental constraints at 300 percent capacity. Research supports operational implementation by 2025.

4. Environment and Energy – Validation Modeling. This program element targets system knowledge to understand economic (including implementation) and operational impact (environmental relative to capacity) of NextGen system alternatives. This program element explores new procedures and measures progress on environmental improvements relative to new procedures, technologies, and fuels performed under the above program element. Progress will be measured by demonstrating no environmental constraints at 130 percent capacity; at 166 percent capacity; at 230 percent capacity; and finally at 300 percent capacity. Research supports operational implementation by 2025.

5. New ATM Requirement. This program element conducts research to develop systems that support the capacity enhancements for the seven solution sets of NextGen. The research will demonstrate that the planned system can handle growth in demand up to three times current levels; demonstrate that gate-to-gate transit time can be reduced by 30 percent; and demonstrate that the system will allow achievement of a 95 percent on-time arrival rate. Progress on this research will be measured under the following program element. Research supports operational implementation by 2025.

6. Operations Concept Validation – Validation Modeling. This program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to capacity improvements) of NextGen system alternatives. It will measure the proposed NextGen system alternatives to determine whether or not the system meets the capacity targets of NextGen. It will develop methods, metrics, and models to measure capacity improvements. Progress will be measured by demonstrating capacity increases to 130 percent current levels; 166 percent; 230 percent; and 300 percent.

7. System Safety Management Transformation. This program element contributes to reducing the fatality rate commensurate with increases in capacity under NextGen. By 2015, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to safety) of NextGen system alternatives. The research outcomes include an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner; and demonstration of a National Level System Safety Assessment working prototype that will proactively identify emerging risk across the NextGen. Research supports operational implementation by 2025.

8. Wake Turbulence – Re-categorization. This program element will contribute to the target to demonstrate that NextGen can handle growth in demand up to three times current levels. It will focus on re-categorization of airspace in three steps. It will provide static changes using the six current aircraft weight categories to safely adjust wake separation distances to account for fleet mix changes; develop an alternate set of flexible airspace classifications for use under specific conditions to increase the capability to place more aircraft in the same volume of airspace; and support dynamic, pair-wise separation. Research supports operational implementation by 2025.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	41,400.0
FY 2010-2013	---	420,500.0 [1]
Total	Various	$451,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ATC/Tech Ops Human Factors (Controller Efficiency)	---	$3,800.0
2. ATC/Tech Ops Human Factors (Air/Ground Integration)	---	2,900.0
3. Environment and Energy (Noise and Emission Reduction)	---	2,500.0
4. Environment and Energy (Validation Modeling)	---	4,500.0
5. New ATM Requirement	---	5,400.0
6. Operations Concept Validation (Validation Modeling)	---	4,000.0
7. System Safety Management Transformation	---	16,300.0
8. Wake Turbulence (Re-categorization)	---	2,000.0
Total	Various	$41,400.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A10	**Next Generation Air Transportation System (NextGen) - Trajectory-Based Operations (TBO)**	**$39,500,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The FAA has identified this program as a "Transformational Program" for NextGen.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case, those that will achieve the management of air traffic by trajectory.

Description of Problem: Flights are managed in today's system primarily by voice communication. Separation is handled by controllers using radar screens to visualize trajectories and make operational judgments. These judgments are turned into clearances often expressed as vector coordinates - all handled by two-way radio. Decision support tools aid the controller by predicting potential future conflicts and aid in evaluation but there effectiveness is limited by the use of voice – workload and voice limitations on complexity. Separation management remains much as it was when the radar was first introduced into the system. Human limitations constrain efficiency and expansion of service as sectors have shrunk to the point of diminishing returns in many places. Human limitations drive costs as well. A separation management that can handle more, diverse traffic, with fewer impacts to user desired performance profiles, while lowering unit costs is needed.

As demand has grown, especially in the airspace surrounding and between major metropolitan areas, the current fixed airspace routings and large separations limit airspace capacity and tactical management of major flows. En route congestion has become a major constraint on the system as the inflexibility of the system to airspace adjustments makes tactical flow in the face of demand congestion or major weather disturbances difficult. Due to the limitations in automated prediction capability and voice communication, separation standards remain, for the most part fixed and conservative, which restricts capacity to the overall system.

The current flight data management system and the current navigation systems do not support the flexibility that is needed from both a planning and execution perspective. Trajectory management means that true 4-D trajectories can be exchanged and monitored and that the system can support the exchange of multiple alternative trajectories in both separation management and tactical flow. This requires a capability beyond that of the current flight plan which was developed in an era of human only interpretation and planning. Trajectory management and full use of the airspace also requires that aircraft can navigate off fixed routes and that new routes can be developed and published with minimum distances between. Keeping aircraft on historic routings with historic between route separations limits the use of airspace capacity in general and specifically to address weather and congestion limitations.

Description of Solution: Trajectory-based operations (TBO) are a critical NextGen capability that addresses the current situation and performance gaps particularly in the areas of capacity, productivity, efficiency, and safety. It is especially focused on the high altitudes where it is expected that all aircraft will have the capability, i.e. the performance to participate in full trajectory based operations. TBO integrates trajectory planning, separation management, and flow execution across the spectrum of time horizons, from strategic planning to tactical decision making. Tactical components of trajectory management include the evaluation and adjustment of individual trajectories to synchronize access to airspace system assets (or to restrict access, as required) and separation assurance to ensure safe separation among all aircraft. The flexible management of aggregate trajectories enabled by TBO allows maximum access for all traffic, while adhering to the principle of giving advantage to those aircraft with advanced capabilities that support the Air Traffic Management (ATM) system.

- Separation Management. TBO represents a shift from clearance-based control to trajectory-based control. In the near-term changes to separation management include integration of variable separation into conflict alert, the radar and planning controller displays and into the flight data management and support software. The inclusion of variable separation characteristics into the system will allow controllers to conduct separation assurance without limiting capacity due to the increased monitoring workload or a potential increase in errors. Changes will also include moving to multi-sensor surveillance processing allowing use of procedures with lower separation distance requirements. Also as part of these changes to trajectory modeling, RNP characteristics will be added to the automation so that these reduced separation advantages can be realized in both general operations as well as when aircraft are assigned to new lower-RNP routes. Where available, this will reduce the number of separation conflicts, decrease workload and provide for more efficient resolutions when conflicts do occur.

  Improvements to conflict alert using multiple trajectories to track both the aircraft's actual and modeled movement will increase the alert time for potential loss-of-separation. By increasing the performance of monitor alert controllers will reduce the additional buffers and conservative nature of clearances increasing both capacity utilization and flight efficiency will reduce the probability of errors.

  Finally in current separation management, especially at the higher altitudes flexibility of the use of controller across wider areas of the airspace is limited by the current automation, procedures and techniques which require "local knowledge". By providing local knowledge through information accessible through the controller display, etc. there will be increased flexibility in the assignment of airspace to controllers increasing overall productivity and flexibility to deal with weather and congestion events.

- En route Tactical Trajectory Management. In order to better manage the flow of aircraft in the en route there are a series of near and mid-term changes. The first change is to provide for efficient and regular flow into and through congested airspace. Point-in-space metering manages the entry from multiple directions of flights into congested and therefore demand managed airspace. Point-in-space metering will insure that new congestion does not occur near the constrained airspace due to early/late arrival of assigned aircraft into the vicinity and by assuring this regularity of flow, the target level for capacity of the congested airspace not restricted to mitigate flow concerns. (The FY09 En route Tactical Flow is focused on this aspect). Point-in-space metering will be built on NASA research with Traffic Management Advisor as the target capability for implementing the new algorithms.

  Moving the controller's activities towards trajectory management also requires improvements to the ability to execute tactical flow. This is accomplished by adding resolution advisories to the conflict probe. As next steps (FY 2010 and beyond) provision of conflict resolutions which include both arrival and point-in-space metering targets will developed. This will be a phased approach with simple but less efficient resolutions that can be delivered via voice to the ultimate goal of all resolutions being provided by data communications.

- Oceanic Tactical Trajectory Management. The operation of the ocean has been enhanced by the moving oceanic separation management from a human procedural environment to automation supported. This improvement in oceanic separation management has increased the efficiency of individual flight operations. While these separation management improvements support efficiencies for aircraft already within the track system, Oceanic Tactical Flow Management improvements are focused on improving entry into the track system so that the best available option at or near time of entry can be taken. Because the system has variability not all aircraft meet their strategically assigned entry and altitude assignments. Oceanic Tactical Flow supports adjustments to individual track assignments pre-departure and in-flight to maximize the use the more efficient altitudes and trajectories at entry. Once on the track systems Oceanic Tactical Flow management will identify opportunities for pair-wise reductions in separation to provide more efficient routes and use the aircraft position reporting and the separation management tool to validate the aircraft position and allow a pair-wise separation reduction.

- Trajectory Management Enablers. To provide for trajectory management that fully utilizes the available airspace improvements to the underlying enablers are needed. To support the more detailed trajectory objectives and to assure those objective are shared across domains and decisions support tools, NAS needs to move from the human based flight strip to information managed by flight object. The flight object can be shared across all NAS systems, including user systems, to provide access to information related to a flight and to provide a standard method for proposing, evaluating and acknowledging changes to trajectory, runway, gate assignments, etc. While a flight may "exist" across NAS and can be found in NAS systems neither the user nor the various functions of NAS have a complete picture of each application's intent for the flight. The flight object provides for that visibility and coordination. Once in place the flight object will support more integrated and coordinated flow planning by supporting multiple trajectories for each flight allowing flight contingency planning and collaboration throughout the flight. (Multiple trajectories, priority management, and integration are FY 2010 and beyond.)

Area navigation (RNAV) and required navigation performance (RNP) provide for efficient and flexible use and design of the airspace. Aircraft can fly more direct trajectories and, where and when required, routes can be established that provide for the greatest throughput. There are many areas of the NAS which can not support full RNAV capability. The DME network that supports the standard routing is not sufficient to support full RNAV/RNP in the en route and at many of the major metropolitan areas. To move to RNAV and full trajectory management, that DME backbone will be expanded to provide the NextGen required functionality.

Benefits: TBO provides benefits to the users in terms of increased flexibility in obtaining their preferred routing with reduced coordination. TBO also provides productivity benefits to FAA due to increased training and staffing efficiencies.

- Increased Customer Efficiency: Aircraft will fly more efficient, user-preferred routes. Increased system precision and enhanced automation support the more efficient use of flight levels so that aircraft can more closely fly routes that maximize the airlines' goals for fuel efficiency, aircraft operations, and schedule. Reduced separation standards for aircraft that provide state and intent data will lead to fewer predicted problems, and as a result, fewer diversions from the preferred routing. Reduced separation standards will also result in increased capacity within flow constrained airspace, allowing more aircraft to fly through those areas, rather than being rerouted or delayed to avoid them.

- Increased Safety: The problem prediction capability will continuously check for problems independent of traffic volume or complexity. In addition, it will continue to provide information about the predicted problem until it is resolved, providing a constant reminder of the situation that needs to be addressed. The problem prediction capability can provide a controller with sufficient warning time to allow the controller time to take action and prevent the loss of separation. The manual and assisted trial planning capabilities, as well as the problem resolution capability, will inform a controller if an action may create a loss of separation, allowing the controller to choose or develop an alternative, problem-free resolution. Automation support for TFM flow constraint implementation can improve safety by enhancing the controller's ability to avoid time-constrained tactical clearance changes that can result in operational errors.

- Reduced FAA Cost/Increased Controller Productivity: Controller productivity will increase as automation performs routine tasks in both mixed and high-equipage airspace, supports problem prediction in the mixed-equipage airspace, and becomes responsible for predicting problems in the high-equipage airspace. Electronic ground-to-ground communication and air-to-ground communication will lower controller task load by automating routine tasks, such as the transfer of communications. Automated problem prediction and resolution will allow the controller to handle more aircraft because predicted problems will be resolved strategically, reducing the number of situations that demand multiple time-critical actions. With enhanced airspace management capabilities (design to take advantage of capabilities, more flexible sectorization of airspace), pressure from growing demand to increase the number of controllers needed to handle NAS-wide traffic will be reduced.

APPROPRIATION SUMMARY

	Locations	Total Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	39,500.0
FY 2010-2013	---	335,700.0 [1]
Total	Various	$375,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Separation Management - Separation automation enhancements D-Side and R-Side)	---	$14,900.0
2. Separation Management - Identify cognitive support and, display change requirement for early transition to a high altitude specialty	---	3,000.0
3. En Route Tactical Trajectory Management Point in-space metering – TMA en route	---	6,000.0
4. Oceanic Tactical Trajectory Management	---	5,600.0
5. Trajectory Management Enablers – Flight Object Complete specification and full set of requirements	---	5,000.0
6. Trajectory Management Enablers NextGen DME	---	5,000.0
Total	Various	$39,500.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A11	**Next Generation Air Transportation System (NextGen) - Reduced Weather Impact**	**$14,400,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case, those that will reduce the impact of weather on system operations.

For FY 2009, future weather requirements are split between two white sheets – one that represents the existing NextGen Network Enabled Weather (NNEW) budget line item under 1A06, and this one, which represents the new solution set.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: In today's National Airspace System (NAS), weather data are not well integrated into either manual procedures or automated decision support systems, are not readily available to all decision makers, and are not sufficiently accurate. To address this problem, the weather component of NextGen must provide ready access to accurate weather information by all Air Traffic Management (ATM), Flight Operations Center (FOC), and flight deck operational decision makers. It must provide weather information that can be readily integrated into decision support tools for those decision makers, and must improve comprehensiveness and accuracy of weather observations and forecasts.

Currently, most decision tools, manual and automated, do not utilize weather information effectively or at all. This condition is partly due to gaps in today's weather dissemination system; partly due to incomplete, inaccurate, and inconsistent weather forecasts; and partly due to gaps and inaccuracies in weather observations used to depict current weather conditions and to support forecasts.

Description of Solution: This program addresses weather information required for integration into decision support tools, improvement in forecasts, and improvement in supporting observations.

The NextGen concept hinges on systematically developing, and disseminating, and integrating quality weather information into operational decision making, both manual and automated, in ATM, FOCs, and the flight deck. This solution will develop new capabilities to fuse tens of thousands of ground, airborne, and space-based weather observations and forecasts, into a single, national (eventually global) weather information system, to constantly update those data in the NextGen system, and to provide automated decision support tools (DST) with weather data that help users comprehend and manage the risks to their operation posed by weather. The realization of the benefits in the Flight Plan, including increased capacity and margin of safety in the face of large anticipated increases in demand, depends on providing these improved weather-related capabilities.

The overall NextGen weather program is tied to a set of operational improvements (OI) developed by the JPDO that define weather-related enhancements needed to realize the goals of the NextGen Integrated Plan.

The NextGen weather program is divided into the following three major functional areas: NextGen Weather Forecasting, Weather Observing Consolidation, and Weather Dissemination Management. This budget justification describes the weather forecasting and weather observing consolidation functional areas and their associated funding requirements. The management of weather information dissemination is described in a companion white sheet, entitled NextGen Network Enabled Weather (NNEW).

NextGen Weather Forecasting will build on the improved observations to provide enhanced analyses and forecasts of all aviation-relevant weather phenomena. Improved analysis/forecast information will allow users to safely plan and conduct 4-D, gate-to-gate, trajectory-based operations that avoid storm hazards and provide comfortable flight conditions. Consolidated forecasts will be developed for convective and winter storms, icing, turbulence, windshear, ceiling and visibility, and volcanic ash. These forecasts will also be used to develop the environmental information needed to reduce noise propagation, dispersion of aerosols, and exhaust impacts; develop information regarding the transport and decay of wake vortices needed to reduce aircraft separation; and develop the space weather forecast information needed to mitigate effects on the health of flight crews and passengers while minimizing impacts on communications, navigation, and other NextGen systems. Improvements will also include new and enhanced quality assessment techniques for forecast product accuracy; weather-specific and higher resolution numerical models to support diagnostic and probabilistic forecast processes. As part of this effort, a weather product operational suitability evaluation capability will be used to prepare products for use in the NAS. The FAA will continue to support existing NAS users while evolving to these capabilities. This will be accomplished in the near term through the implementation of improved analyses, forecast, dissemination, and display capabilities of weather phenomena, especially convection, in support of operational users. Additionally, it will evolve the regulatory structure to accommodate new capabilities, establish a governance model, and implement a training program for all aspects of the overall NextGen integrated weather system. It will also increase shared situational awareness, and make weather transparent to users by providing high-fidelity, weather forecasts that can be integrated with cockpit systems, highly automated Flow Contingency Management (FCM), Tactical Trajectory Management (TTM), Estimated Departure Clearance Time (EDCT), and other decision support tools (DST). The NextGen Weather Forecasting improvements can be used to replace capabilities provided by existing systems such as the Corridor Integrated Weather System (CIWS) and Weather and Radar Processor (WARP).

The Weather Observing Consolidation capability will obtain the improved weather observational information required for NextGen to accurately and quickly depict current weather and to support accurate forecasts of future weather impacting NAS operations. These improvements will eliminate redundancy among sensor types, configurations, and ground infrastructure. Optimized, externally controllable and configurable, ground-based (e.g., wake vortex detection capability), airborne, and satellite atmospheric-sensing networks that provide higher resolution weather observations will be developed to support more accurate weather forecasts and directly detect aviation safety hazards. It will develop observational capabilities to assess the impact of aviation on noise, air quality, and climate change. It will develop observational capability needed to mitigate the effects of space-based radiation on flight crews and passengers and minimize its impact on communications, navigation, and other NextGen systems.

For FY 2009, in the forecast improvement area, activities will include investment analysis for improved weather forecast implementation, detailed NextGen weather implementation planning, development and evaluation of maturing forecast technologies (e.g. thunderstorm, turbulence, and icing), and definition of metrics for improved forecasts. For FY 2009, in the weather observing consolidation area, activities will include the development of a concept of usage, and initial engineering of an evaluation capability for a replacement network for weather radars.

<u>Benefits</u>:

- Reduced cost through consolidation of weather processors and observation systems.

- Improved weather information, made accessible to FOCs, will reduce fuel costs and costs of aircraft cancellations and diversions due to unforeseen, adverse weather.

- Better weather information, provided for integration into controller decision support tools, will improve the quality of controller decisions and greatly reduce controller workload during bad weather, thus improving productivity.

- Improved weather information, observations and forecasts, provided for integration into operational decision making will improve safety by enabling pilots and FOCs to plan or re-plan around hazardous weather, and will enable ATM to plan or re-plan traffic flows around hazardous weather.

- En route and terminal controllers will be able to provide precise and timely information on hazardous weather to pilots and to anticipate and quickly respond to pilot requests for deviations around hazardous weather.

- A metric for determination of effectiveness of these changes on capacity will be improvements in flight Block time (gate-out to gate-in) will be determined for a pre-determined set of city pairs representing the 35 OEP airports. Block times for flights impacted by weather phenomena will be selected and will be compared for each target year to each previous target year. Block time normalization will consider identical sets of city pairs weighted using the average number of flights/month. Since weather impacts are quite variable depending on the frequency, duration, and intensity of the weather, a weather index will be developed which considers block time as a function of weather "severity."

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	14,400.0
FY 2010-2013	---	288,800.0 [1]
Total	Various	$303,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Weather Observation Consolidation	---	$1,500.0
2. NextGen Weather Forecast Improvements	---	12,900.0
Total	Various	$14,400.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A12	**Next Generation Air Transportation System (NextGen) - High Density Arrivals/Departures and Airports**	**$18,200,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership, this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case, those that will increase throughput at high density airports.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: With increasing demand the need grows to achieve peak throughput performance at the busiest airports and in the busiest arrival/departure airspace. Capability improvement via new procedures to improve airport surface movements, reduced route spacing and separation requirements, and improve overall tactical flow management into and out of busy metropolitan airspace is needed to maximize traffic flow and airport usage. Essentially the problem is getting the right aircraft to the right runway in the right order and time to minimize its individual impact on the system and maximize the use of these airports. Thus operations are conducted to achieve maximum throughput while facilitating efficient arrival and departure. Inefficiencies in any aspect of the operation reduces the totals use of the capacity and, because of the high demand, causes excessive compounding of delay.

Description of Solution: This program initiative is focused on the development of trajectory-based terminal operations and tactical flow management in support of NextGen. The primary goal of the high density initiative is to increase the throughput of the nation's busiest airport terminal areas. The term "high density" is used to describe airport operations in which there is high demand and significant interaction between traffic to individual runways and airports. It is arrival and departures because the interaction, the resulting congestion, and the solution extend beyond the normal terminal boundaries requiring a solution that manages the aircraft through its full arrival transition to the runway.

The activities in the High Density Arrival/Departure airports leverages the NextGen advances in flight data management and surveillance that are captured in the Flexible Terminal and Airports solution set (see budget line item 1A14). The High Density initiative expands on the capabilities of the Flexible Terminal and Airports program by developing time based metering and runway assignment technology to provide greater throughput. Major areas of focus include: high density corridors with reduced separation to provide trajectory-based transitions to match airport arrival capacity; enhanced surface technologies to support trajectory management; parallel runway operations with reduced lateral separation; digital taxi clearance and conformance monitoring for trajectory-based operations and safety; and, expansion of terminal separation procedures throughout the arrival and departure airspace. High Density operations encompass all operations from the gate to the en route structure and from the en route structure to the gate (surface, departures and approaches). High Density Operations will require higher performance navigation and communication capabilities than those required for Flexible Terminal Airspace.

- Surface Tactical Flow Management. The first step of surface traffic management is to provide increased awareness and support to the management of surface flows. The initial STMS will provide runway alternatives to better balance the airport and establish a preferred sequence at the departure queue to reduce the inter-departure spacing. This increases runway throughput and reduces overall departure delay. In addition the system will share airport surface and planning information with the user and the airport authority, providing information that can be used by all ground control positions including ramp and departure control to better integrate arrival and departures off the runways, and at the gate. This effort moves algorithms from prior NASA efforts and the test-bed systems at Memphis and Louisville into implementation architecture definition and decision.

In order to increase the efficiency of surface operations and to expand the ability to manage the sequencing of aircraft on the surface, taxi clearances with taxi conformance monitoring is required. With more complex taxi clearness the ability to differentiate between aircraft on a more complex clearance and those out of conformance is increased. This effort will initiate the evaluation of conformance algorithms and start to develop a full set of requirements for implementation.

- Arrival Tactical Flow Management. This effort will build on the Traffic Management Advisor to support the arrival flow into high density metropolitan airspace where the management of the flow may back several hundred miles and centers. TMA provides the backbone algorithms upon which this capability is developed. This first phase includes implementation of multi-center capabilities that were developed by NASA and tested in the Philadelphia/New York airspace. Future efforts will include the implementation of RNAV/RNP route assignment logic as being demonstrated in the NextGen Demonstrations and integration of flow objectives. Because it is not concentrated at a high density airport and extends beyond airport considerations, departure tactical flow management is addressed in 1A13 Collaborative ATM.

Benefits: The benefits to the system include increased capacity and efficiency at super-density terminal areas, improved Air Navigation Service Provider (ANSP) productivity for managing taxi operations, and environmental advantages, such as reduced emissions per flight and reduced airport noise. The benefit to the user is better taxi efficiency and access to airport facilities. This initiative will increase the throughput of the nation's busiest airports and metroplex areas and increase capacity with minimal to no increase in human resources. Benefits are as follows:

- The provision of surface information to traffic flow management will improve prediction of wheels-off times resulting in a more accurate load prediction for NAS resources.
- Users will be provided increased flexibility in obtaining preferred routing with reduced coordination.
- Optimized surface movement and runway utilization will result in increased departure throughput and average taxi-out times will decrease due to better sequencing and load balancing at departure points.
- An integrated arrival/departure airspace structure (including the use of dynamic airspace reconfiguration) will enable benefits such as:
    - reduced arrival delays due to earlier sequencing,
    - increased capacity of the airspace,
    - reduced airspace volume increases access to other classes of users in metro areas,
    - reduced complexity,
    - more efficient traffic flow management,
    - additional and integrated arrival/departure routes, and
    - expansion of terminal separation standards further from the airports.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	18,200.0
FY 2010-2013	---	585,600.0 [1]
Total	Various	$603,800.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Surface Tactical Flow – Surface Traffic Management System (Requirements, Design, Integration, Safety, HF, etc.)	---	$5,000.0
2. Surface Tactical Flow - CONOPS, requirements, standards and procedures for Taxi Conformance	---	3,200.0
3. Arrival Tactical Flow Management (TMA extension and integration)	---	10,000.0

Total	Various	$18,200.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A13	**Next Generation Air Transportation System (NextGen) - Collaborative Air Traffic Management (CATM)**	**$27,700,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case, those that will improve decision making throughout the system, in large part by increasing awareness within the cockpit.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: The current system uses relatively blunt tools to manage demand and capacity imbalances. The tools do not "share" objectives for flights nor do they have a common picture of the structure and status of NAS. While great strides have been made in the management of flow, this lack of common objectives, status and structure constrains improvement. The system needs to minimize the over constraint demand and assure efficient operations once constrained. Constraining flights needlessly costs carriers and the traveling public time and money. On the other hand, failing to accurately forecast constraints and manage demand when they are warranted also generates costs. Users have limited ability to specify their preferred alternatives when a constraint is required; creating a need to allow input from them on resolving imbalance issues.

The overall philosophy driving the delivery of CATM services in the NextGen is to accommodate flight operator preferences to the maximum extent possible and to impose restrictions only when a real operational need exists, to meet capacity, safety, security, or environmental constraints. CATM strives to adjust airspace and other assets to satisfy forecast demand, rather than constraining demand to match available assets.

Description of Solution: In NextGen, all airspace users are able to collaborate on Air Traffic Management (ATM) decisions. Collaborative ATM (CATM) involves the exchange of common information to create a mutual understanding among participants of overall objectives and influence decision-making among stakeholders.

Collaborative ATM covers strategic and tactical interactions with the customers to mitigate situations when the desired use of capacity cannot be accommodated. Collaborative ATM solution set includes the flow programs as well as collaboration on procedures that will establish balance by shifting demand to less desirable capacity alternatives. (e.g. routings, altitudes, times.)

Stakeholder decisions are supported through access to a rich information exchange environment and a transformed collaborative decision-making process that allows wide access to information by all parties (whether airborne or on the ground), while recognizing privacy and security constraints. Information is timely, relevant, accurate, and quality assured. Decision makers have the ability to request information when they need it, publish information as appropriate, and use subscription services to automatically receive desired information. This information environment will enable more timely access to information and increased situational awareness while providing consistency of information among decision-makers.

To the maximum extent, decisions are made at the local level with an awareness of system-wide implications in NextGen. This includes, to a greater extent than ever before, an increased level of decision-making by the flight crew and flight operations centers.

The CATM process recognizes that the expertise, data, and processing capabilities necessary to balance National Airspace System constraints and multiple operator objectives are distributed across many organizations and applications within the Air Navigation Service Provider (ANSP), flight operators, and other stakeholders. This distribution applies to situation assessment, plan generation, execution, contingency management, and adaptation.

Within this environment, flight operators have a range of flight planning capabilities that optimize flights based on individual mission objectives, available aircraft, security and airspace constraints, and forecasted weather. Operators also have access to an authoritative source of weather information that provides forecasts and current conditions. Flight planning automation uses weather data and system constraint data provided from the ANSP in planning individual flights or groups of flights. The execution of these individually tailored results is integrated into the systems separation and tactical flow management decision support tools. This removes the limitations of the current voice based dissemination which caused inefficient aggregate flight solutions.

Flight planning is iterative and interactive. For some operators, flight plans — represented as 4D trajectories — are planned months in advance. Trajectory and other information associated with the flight are stored in the flight object. As more information becomes available about the conditions affecting a flight, operators are automatically informed and in turn, make adjustments to provide "best known" information via a 4D Trajectory. The level of uncertainty will decrease as the time to actual flight departure decreases. The uncertainty is integrated into the evaluations removing the need for human interpretation and integration. Operators also have multiple options for indicating contingency plans associated with a given flight. For example, a filed flight may include alternative 4D Trajectories that represent the operator's preferences. The operator also may provide some contingency criteria to the ANSP to provide guidance for ANSP-generated changes to the 4D Trajectory. Operators maintain the ability to negotiate changes to a 4D Trajectory and may initiate a 4D Trajectory proposal in anticipation of an expected constraint.

Flight planners or an operator's flight planning automation interact with a common flow strategy and trajectory analysis service, available to all NAS stakeholders, that enables common situational awareness of current and projected NAS status and constraints. In addition to having common services to understand the potential effects on a trajectory or the effects of a flow strategy, operators and the ANSP can collaborate on the selection of both capacity management and flow contingency management strategies that balance NAS performance objectives with flight operators and the ANSP. They will then have a common understanding of overall national goals and desired performance objectives for the NAS. A transparent set of strategies is in place to achieve overall performance objectives, including airspace management to maximize capacity when demand is high and, as required, flow management initiatives to ensure safe levels of traffic are not exceeded when capacity limits are reached.

In addition to improving information sharing with users, CATM also involves integrating weather into the ATM decision support and improving departure flow management. The increased scope, volume, and widespread distribution of information that System-Wide Information Management (SWIM) provides will improve the dissemination of information which enables the customers to participate in CATM. Since departure flow management is not focused on a single airport or point-in-space it is addressed here due to its cross-cutting nature.

Benefits: Key benefits from CATM in the NextGen include the following:

- Airspace users benefit from improved collaborative decision-support tools, which better assess the potential impacts of decisions, reducing the likelihood of unintended consequences. Better decision support also increases the ability to maintain capacity in the presence of uncertainty. Less-conservative operational decisions are made because decision-support capabilities can better integrate large amounts of data over multiple time horizons.

- A larger percentage of users will participate in the collaboration process than do currently. Today's process is characterized by poor information distribution capabilities and is limited by verbal negotiations. Flight operators gain benefits in efficiency, access, and overall performance, and other national needs are accommodated effectively.

- Because decision-makers will have more information about relevant issues, and improved automation tools, decisions can be made more quickly, required lead times for implementation can be reduced, responses can be more specific, and solutions can be more flexible to change.

- Information exchange is more clearly targeted to the appropriate decision makers, reducing workload and unnecessary actions by those not affected. Machine-to-machine negotiation replaces labor-intensive, voice, or text-based processes.

- Participants are assured of data privacy and protection, so that sensitive or proprietary information can be shared in a way that helps to achieve their objectives.

- Dynamic information flows will improve strategic capability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	27,700.0
FY 2010-2013	---	387,400.0 [1]
Total	Various	$415,100.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Strategic Flow Management - Integrating Execution of Flow Strategies into Controller tools	---	$6,000.0
2. Strategic Flow Management –Enhancing the Strategic Flow Program (airborne flow, integrating weather)	---	6,400.0
3. Common Status and Structure Data - Separation, Tactical and Strategic Trajectory Management Common flight constraint data: SUAs, LOAs, runway configurations, NOTAMs, FCAs, TMI's *	---	8,300.0
4. Departure Tactical and Strategic Trajectory Flow Management	---	7,000.0
Total	Various	$27,700.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A14	**Next Generation Air Transportation System (NextGen) - Flexible Terminal Environment**	**$37,100,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case; those that will help a broad range of airports (including secondary and reliever airports) operate more effectively and increase overall system capacity.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: Terminal and tower operations run the gamut from very large airports to the small public use airports. They are a mix of Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) traffic with aircraft types ranging from airline transport to single engine propeller driven general aviation. Airports in these areas are towered and non-towered, depending on the traffic demand. In the future, many of the smaller airports could experience higher traffic demand due to a need to migrate air traffic to smaller satellite airports in high population areas in the effort to avoid traffic congestion. In addition, there is renewed interest in personal transportation including the increase in personal aircraft for pleasure and business and the emergence of on-demand air taxi services utilizing very light jets (VLJs).

Improved access and safe operations in terminals areas, in tower operations and on the surface is a requirement across the airports. Providing safe separation for aircraft from hazards allowing them to depart and land in lower visual conditions is required so that the capacity can be made available with the required predictability to support operational business cases. Improved access to runways in congested airspace while providing safe, fuel efficient and environmentally sensitive (noise and emissions) operations across the airport environ is also necessary to meet growth.

Description of Solution: The Flexible Terminal and Airports initiative capabilities includes dynamically configurable airspace (flexible airspace), development of "equivalent visual" approach procedures, low visibility taxi and departure operations, taxi conformance to enhance safety, net centric weather dissemination, appropriate wake vortex procedures, and efficient and environmentally sensitive continuous approaches. A major metric of this program will be increased capacity without a corresponding increase in human resources. The ultimate goal of flexible terminals is to provide separation capabilities that support the full use of each runway in nearly all weather conditions. This is necessary for the highest density airports to meet demand and at lower demand airports to provide viable business cases to users as alternatives to using high density airports and/or providing new service to a community.

- Separation Management. The initial focus on will be on three phases of separation management: departures on closely spaced runways, precision arrivals, and performance based approaches. Implementing automation support for changes to separation procedures on closely spaced parallel runways is the initial activity. Research and development have shown that in certain weather conditions sustained cross-wind wake from aircraft departing on the downwind runway will not interfere with operations in the opposite runways reducing the required spacing between aircraft on the parallel runways improving runway throughput and reducing delays. At least ten large airports can benefit from this operation.

  Another major initiative is to move forward with a ground based augmentation system to support multiple objectives. A ground based augmentation system can provide a lower cost alternative to ILS for CATII and CATIII like approaches extending operations into lower visibility conditions at many secondary airports. A ground based augmentation system will also support higher precision approaches at major airports by providing for precision missed approaches at lower RNP. Finally, such a system will support offset landing thresholds for high density airports helping to implement wake avoidance procedures on arrivals.

Providing precision approaches through transition to approach which are fuel efficient, with low noise and emissions support access through high density airspace to the runway. The effort is to develop criteria for RNP 3-D procedures with required time of arrival (RTA) objectives. These procedures provide for energy managed arrivals with a lower vertical containment than Continuous Descent Arrivals (CDA) and the RTA that supports effective management of flow.

- Separation and Trajectory Management Enablers. Longer term efforts to improve separation management include closely space parallel arrivals with flight deck to flight deck monitoring. Developing the requirements and standards for avionics to support these procedures is a necessary long-lead time effort.

  Finally, flight data management in the terminal and towers is still based on the exchange of flight strips. There is limited capability to amend flight clearance/trajectories and little or no insight into the status of aircraft until after they enter the airspace. In order to support the advancement in separation management as well as enhanced traffic management at the high density airports a new modern flight data management system is need in the terminal. Efforts include electronic flight strip/data solution that is supports all domains but can be tailored to terminal and the various levels towers. Engineering work will also be done on extensions to the Tower Data Distribution System (TDDS) and on the Tower Flight Data Management (TFDM) system.

Benefits: Increasing flexibility in the Terminal Environment provides foundational tools to enhance pilot and controller situational awareness and improve surface event management. The activities support providing initial aircraft-to-aircraft ADS-B applications, a low cost ground based augmentation system, environmental sensitive and efficient procedures, and more. The "other than" High Density Airports which will see benefits for the NextGen investments are very important to system-wide efficiency and performance of the air transportation system as a whole. Basic benefits achieved include:

- Increased efficiency of arrival and departure operations,
- Improved usage of runway capacity, and
- Improved airport access.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	37,100.0
FY 2010-2013	---	285,500.0 [1]
Total	Various	$322,600.0

[1] Future requirements are under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Separation Management Departures Precision Departures and Wake	---	$6,000.0
2. Separation Management Approach Precision Approaches: Continued development, define the concept, simulations	---	10,000.0
3. Separation Management Arrivals – Access and Environment RNAV/RNP with 3D and required time of arrival:	---	3,000.0
4. Separation and Trajectory Management Enablers Surface/Tower/Terminal System Engineering Support for Flight Data, Clearance Delivery and monitoring	---	14,300.0
5. Separation and Trajectory Management Enablers – Avionics Develop standards & certify flight deck moving maps w/taxi instructions supporting surface Separation Mgmt	---	1,300.0
6. Separation and Trajectory Management Enablers – Avionics General tasks: parallel runway operations, cockpit-to-cockpit monitoring	---	2,500.0
Total	Various	$37,100.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A15	**Next Generation Air Transportation System (NextGen) – Safety, Security and Environment**	**$8,000,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities—in this case; those that will address the safety, security, and environmental improvements to support the transformation of air traffic control.

The FY 2009 request for this solution set focuses on security activities. As requirements are identified for Safety and Environmental activities, those will be included in future budget requests.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: Current methods of performing airspace security operations are inadequate today. Although there exists a variety of communication and coordination tools, aircraft situation displays, and security related databases, there is limited connectivity among these systems. Analyses and data correlation are performed manually, and information sharing is limited to voice communication. In many cases, such operations could be costly, time-consuming, and inefficient.

Description of Solution: The Security Integrated Tool Set (SITS) will support automated threat detection and tracking, data correlation, National Airspace System (NAS) impact analysis of security or emergency actions, risk-based assessment, and other capabilities. NAS response to security risk assessments by partner agencies is intended to be accomplished in the same manner as for weather, Special Use Airspace (SUAs) and Traffic Flow Restrictions (TFRs). SITS will also support integrated security restricted airspace development and sharing capabilities. These capabilities will be seamlessly integrated with ATM and support defense, homeland security, disaster recovery and law enforcement operations, and will be scalable to meet required response and projected air traffic demand.

Benefits: Shared situational awareness among all partners will improve data gathering and correlation, coordination, report generation, collaborative decision-making, and NAS impact assessment in security operations. Also, automation of manual processes will result in cost savings and enable more effective security operation.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	8,000.0
FY 2010-2013	---	60,000.0 [1]
Total	Various	$68,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

[1] Future requirements are under review.

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Security Integrated Tool Set Applications (ADAPT, SKY WATCH)	---	$8,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A16	**Next Generation Air Transportation System (NextGen) - Networked Facilities**	**$17,000,000**	**Various**	**M-48**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

The Next Generation Air Transportation System (NextGen) is taking shape in the FY 2009 budget request. Based on the Concept of Operations and Enterprise Architecture developed by the Joint Planning and Development Office (JPDO) and its partner agencies, this budget supports the transformation to next generation capabilities. As embodied in the Operational Evolution Partnership (OEP), this request represents one of seven solution sets that will define, develop, and eventually deploy capabilities — in this case; those that will make FAA facilities more effective, flexible, and less costly to operate.

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: Providing an operational environment which support NextGen changes, handles increased traffic in the future while managing costs and improving and expanding services is a primary need. The current system has built-in limitations in terms of flexibility, cost of service delivery, and continuity of operations. Some smaller airports have limited service due to cost of service; creating a need to provide a lower cost solution to allow increased service in these locations.

The transformations in the delivery of ground, air-ground and Air Navigation Service Providers (ANSP) facility services are fundamental enablers of the flexibility necessary to respond to demand in an affordable and timely manner. Flexible infrastructure service delivery is how changing user needs are met and cost-effective services are scaled up and down as needs change. It is the way to ensure that the service providers and the information (e.g., flight data, surveillance, weather) are readily available when and where needed.

Description of Solution: The transformation of facilities includes all initiatives that are focused primarily on improvements in ANSP resource management. This includes providing an environment which supports the NextGen operational changes, the allocation of staffing and development of facilities to provide that operational change, the use of more cost-effective and flexible systems for information sharing and back-up, and general management and training for human assets. It also involves all activities related to the establishment or removal of facilities. While these need to be tied to operations, they are identified and managed here. This includes any changes to the number and size of control facilities as well as thinning and eliminating other facilities such as Navigational Aids (NAVAIDS).

The flexible ground and air-to-ground communications networks do not require proximity of ANSP facilities to the air traffic being managed. Facilities are sited and occupied to provide for infrastructure security, service continuity, and best deployment and management of the workforce. This includes co-locating several facilities (e.g., Air Route Traffic Control Centers (ARTCCs), Terminal Radar Approach Control (TRACONs), Air Traffic Control Towers (ATCTs), staffed virtual towers) within a single facility.

Information systems facilitate the monitoring of infrastructure health and remote maintenance to maintain service availability and automatically alert the community about the status of NextGen assets. One of the key transformations resulting from NextGen is the ability to operate NextGen with the loss of a limited number of key operational facilities. Network-enabled operations and infrastructure management services provide continuity of operations in the event of a major outage such as a major hurricane or terrorist event.

New facilities are about supporting this change management. In order to facilitate the significant transformations and changes in roles and responsibilities of ANSP personnel, new facilities were incorporated into the overall plan to achieve NextGen. Traffic is assigned to facilities on both a long term and daily basis based on the changes to service delivery and with service continuity a foremost requirement. These facilities are sited and sized to provide for a stable workforce environment with opportunities for career progression.

The work plan for FY 2009 includes the activities needed to support an initial investment decision.

An analysis of the full range of NextGen facility alternatives will be conducted. The multifaceted analysis will include operational and service delivery implications as well as support for service transition and business continuity. The products of these activities will support business case preparation and program risk mitigation. An assessment of market capability will also be conducted and a preliminary program baseline established.

Benefits: Implementation of networked facilities provides an opportunity to reach NextGen safety and capacity objectives. A geo-independent service delivery model can provide for optimization of service, improve workforce security, and ensure continuity of service. There will be increased cost-effectiveness through better matching assets to demand – reduced need for local surge buffers in personnel and equipment. The program will result in:

- Environments which support NextGen operational changes;
- Provide seamless information exchange that increases flexibility and ANSP agility to respond to demand;
- Improved work environment and increased opportunity for career progression;
- Reduce the time and cost to train controllers and other ANSP personnel;
- Meet Homeland security guidelines for facilities; and
- Reduce overall ANSP costs without reducing level of service.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	17,000.0
FY 2010-2013	---	809,000.0 [1]
Total	Various	$826,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Integration, Development and Operations Analysis capability	---	$3,000.0
2. Future Facilities Investment Planning	---	14,000.0
Total	Various	$17,000.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A01	**En Route Automation Modernization (ERAM)**	**$203,050,000**	**Various**	**A-01**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: En Route automation systems provide the foundation for FAA's air traffic control environment and are paramount to FAA's ability to implement new services and air traffic control tools necessary to improve efficiency and increase capacity. The current En Route automation domain comprises a mix of technologies that are the result of a piecemeal system evolution. The En Route Host Computer System is the heart, brain, and backbone of the NAS. This mainframe computer provides the primary radar data processing and flight plan processing information necessary for air traffic controllers to separate aircraft and ensure the safe, expeditious movement of air traffic. The FAA can only maintain the Host Computer hardware through 2012, after which operational availability and maintainability will be at risk. En Route automation system outages during peak travel times can create a ripple effect that results in long delays and/or cancellations, and can paralyze the entire National Airspace System.

Automation enhancements provide one of the few opportunities available to achieve productivity and efficiency gains that are necessary to deal with significant forecasted growth in operations without significant increases in controller staffing. While the Host and Oceanic Computer System Replacement program replaced the mainframe processors, the Host Computer software is still based on a dated, 30-year old architecture. Additionally, the current Radar-Position display processors deployed in 1998 are also reaching the end of their service life. Their processing power is less than a standard desktop computer and their resident graphics software language is proprietary and outdated. These hardware and software limitations progressively impede the FAA's ability to accommodate the steady, increasing demand for air traffic services that increase efficiency and capacity.

The current backup system, the Direct Access Radar Channel (DARC), provides only limited capabilities for air traffic controllers and no safety alert functions. As such, FAA imposes airspace restrictions whenever the backup system is engaged.

Today's threats make it imperative to approach information security in the en route environment in a holistic and systematic manner. Today's system relies on a mix of technologies cobbled together through 40 years of piecemeal investment developed before the introduction of modern information security standards and technologies.

Additionally, today's En Route system presents significant challenges in configuration management and documentation because of its multiple, disparate sub-systems and site-unique configurations. These challenges require complex testing and transition planning, increasing the effort required, and the risk to operations when fielding upgrades and managing airspace data. For example, in 2004, transition complexities that surfaced during relatively minor upgrades to the legacy Host computer system at three sites caused 300 flight delays.

Description of Solution: ERAM replaces today's En Route Host Computer System, its backup, and portions of the display system infrastructure, including the technical refresh of the Radar Position processor, to enable improvements in airspace capacity, efficiency, and safety that cannot be realized with the current 30 year-old system. ERAM will be fully integrated into the future NAS, providing flight information processing to terminal and approach control facilities. It also provides flight information and route processing to the traffic management systems that control the efficient flow of air traffic. ERAM has a fully functional backup system that simplifies system maintenance and eliminates the need for restrictions in the case of primary system failure. The ERAM program redesigned the display interface to support an open, COTS-based architecture. Its architecture is based on the En Route Communications Gateway and the Data Position display processor technical refresh. Failure to update the current Radar Position processors would leave a major bottleneck in ERAM's open system infrastructure. Attempting to deploy new ERAM infrastructure without new Radar

Position processors presents unmanageable technical and operational risk during transition. For these reasons, the Radar Position technical refresh is included in the ERAM acquisition program baseline.

ERAM provides capabilities that the current Host cannot because of its technological and structural limitations, including restrictions on the number of flight plans that can be stored, the number of air traffic control radars that can be used, and flexibility in airspace configuration. ERAM provides a state of the art foundation and will introduce new capabilities that will enable improvements in air traffic control services. New capabilities such as flexible routing around weather, congestion, and traffic restrictions and automated controller-to-controller coordination will reduce controller workload and increase productivity. Airspace users will be able to file their intent earlier in the flight planning process, allowing air traffic control resources to be more efficiently allocated to handle anticipated workload, and end-to-end flight plan analysis will improve the predictability of proposed routing. National adaptation will reduce life-cycle costs of system maintenance and ensure a consistent level of service from facility to facility, and the use of international flight plans will allow airspace users to fly across national borders almost seamlessly.

ERAM also improves configuration management and adaptation, and reduces the complexity of system upgrades and maintenance. ERAM provides the technology and mechanisms to introduce real and effective information security to the critical air traffic control system.

The ERAM architecture and deployment plans assume the successful implementation of the projects comprising the En Route Automation Program. The En Route Communications Gateway (ECG) completed the replacement of the Peripheral Adapter Module Replacement Item (PAMRI) system, providing a modular and expandable system to support ERAM. Additionally, ECG supports state-of-the-art system architectures such as Internet Protocol and extensible data formats such as ASTERIX. The En Route System Modifications program replaces components and provides upgrades for operational display systems within the En Route environment. URET is a set of decision support capabilities that assist the En Route sector team in the strategic detection and resolution of predicted problems with traffic and adapted airspace. URET provides four key capabilities to the Air Route Traffic Control Centers (ARTCC): (1) Aircraft-to-aircraft conflict detection; (2) Aircraft-to-airspace conflict detection; (3) Evaluation of user or controller request for flight plan amendments or route changes; and (4) Enhanced flight data management - URET deployed at all 20 ARTCCs in FY 2006. These efforts address component obsolescence, system maintainability, current system operational performance improvements, and technical solutions that provide continued improvements to the NAS. Additional efforts include: Console Reconfiguration and Main Display Monitor (MDM) Replacement (CRMR), Data Position display processors technical refresh (DPOS) and Console modifications (Console Mods) to accommodate equipment to support ERAM. The CRMR effort was completed on April 12, 2005. The Data Position display processors technical refresh effort was completed during FY 2006 and the Console Mods effort is ongoing with completion in FY 2008.

In coordination with other en route programs, ERAM will accomplish a complex transition from the current system to a modernized, en route system architecture while not impacting critical services. This transition will provide improved en route ATC capabilities and establish a modern and supportable environment, facilitating future capabilities and enhancements.

ERAM development and deployment is being conducted incrementally in order to reduce risk, provide early benefits, address equipment sustainment issues, and to ensure a stable system during the transition from the Host Computer system. The first step is the replacement of the Direct Access Radar Channel and the addition of safety alerts through the Enhanced Back-up Surveillance (EBUS) effort. EBUS introduces existing radar surveillance data processing software from the Microprocessor En Route Automated Radar Tracking System (MEARTS) into the En Route environment on the ECG processor and eliminates all of the existing DARC hardware/software. EBUS began deployment to Denver ARTCC (Key Site) and initial operations capability (IOC) was declared on April 24, 2005. Completion to all 20 ARTCCs occurred in FY 2006.

The next phase is the national deployment of the En Route Information Display System (ERIDS), an important tool for providing the early benefits of improved productivity and efficiency that distributes important information to air traffic controllers electronically. Reducing controller time spent accessing this information, and improving the quality control of the information will increase productivity and controller efficiency during periods of increased traffic loads. The investment analysis identified approximately $349 million in avoided staff time resulting from the implementation of ERIDS, reflecting the elimination of the manual labor required to process print, manage and distribute paper. ERIDS began deployment to the Salt Lake City (Key Site) ARTCC with initial operations capability (IOC) declared on June 7, 2006. National deployment will be completed early in FY 2008.

The third and by far most complex step (ERAM Release 1) is the replacement of the Host Computer System with new software and hardware and the integration of these elements within evolving En Route system architecture in coordination with the other elements of the En Route Automation Program. To mitigate risk, ERAM is leveraging existing FAA products and lessons learned to reduce cost, minimize deployment risk, and increase user acceptance. Specifically, Display System Replacement (DSR) forms the basis of ERAM radar controller display functionality; User Request Evaluation Tool (URET) forms the basis of the flight data processing, data controller display functionality, and conflict probe; Standard Terminal Automation Replacement System (STARS) radar data tracker provides a standard tracker; and Microprocessor En Route Automated Radar Tracking System (MEARTS) forms the basis for ERAM separation assurance and safety functions. This step will complete the delivery of a new automation system at each En Route Air Route Traffic Control Center in the continental United States. ERAM Release 1 national deployment begins in FY 2009 and concludes in FY 2011. Finally, ERAM Releases 2/3 will contain software maintenance updates and further functional enhancements.

For FY 2009, $203,050,000 is requested to complete operational testing and synchronization of legacy systems changes with ERAM Release 1. Deployment of Release 1 will occur during FY 2009. Additionally, requested funds will be used to complete system integration testing and begin deployment of Release 2.

Benefits: The ERAM deployment will ensure the safety and continuity of NAS operations by replacing technically obsolescent and logistically unsupportable systems. ERAM provides a fully redundant backup channel to ensure system reliability and availability. ERAM is being developed with an open architecture that will facilitate meeting demands on the NAS for increased safety, capacity, and security as well as the inclusion of future enhancements.

Prior to budget year 2006, ERAM was captured as one of the projects under the En Route Automation Program Budget Line Item. At the direction of the FY 2005 Conference Report, the following represents the funding request for ERAM only. The appropriation summary for prior years (FY 1982-2005) reflects the En Route Automation Program as a whole.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$1,272,662.7 [1]
FY 2008 Appropriated	---	368,750.0
FY 2009 Request	---	203,050.0
Baseline Requirement	---	302,400.0
Total	Various	$2,146,862.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ERAM Release 1	---	$169,900.0
2. ERAM Releases 2/3	---	32,300.0
3. Independent Operation Test and Evaluation	---	850.0
Total	Various	$203,050.0

[1] Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A02	**En Route Communications Gateway (ECG)**	**$7,400,000**	**Various**	**A-01**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The En Route Automation Programs provide automation infrastructure improvements at the 20 high-altitude centers in the continental US. Five interdependent projects comprise the program: En Route Communications Gateway (ECG), Host and Oceanic Computer System Replacement, En Route System Modifications, En Route Enhancements, and En Route Automation Modernization. These automation systems provide the foundation for FAA's air traffic control system.

While modern equipment is being procured and fielded to replace obsolete system elements, legacy operational automation systems must still be maintained and interim updates must be performed to continue air traffic services today. Minimizing disruption to high-altitude, or en route, automation services is critical because outages can create a ripple effect that results in long delays and cancellations throughout the NAS.

The ECG system, which replaced the aging Peripheral Adapter Module Replacement Item, is fully operational nationwide. ECG is the first step in FAA's plan to replace aging automation systems with modern technology. The ECG system was procured using commercial-off-the-shelf (COTS) products. The performance gap is the short life-cycle associated with COTS products, which require more frequent technology refreshes. Sometimes, technology upgrades improve capability. The ECG program allows the FAA to monitor, maintain, and evolve the ECG system to take advantage of technical advances.

The problem therefore is to maintain the viability of the ECG system while the air traffic technology evolves, maintaining the service capability that ECG provides.

Description of Solution: The solution is twofold. First, the ECG acquisition team will remain a viable entity to continue managing the investment the government has made in providing a modern portal capability. Second, the team developed the ECG Sustainment and Technology Evolution Plan (STEP) to document the multi-year approach to maintaining the viability of the ECG system. This approach to sustainment and technical evolution combines purposeful, ongoing monitoring for obsolescence or evolution opportunities with proactive planning to identify the best alternatives and the best solutions to maintaining and evolving the ECG technical baseline.

In FY 2008, $4,000,000 was appropriated for ECG for program objectives in support of the FAA Flight Plan. This funding will be used to ensure the ECG system remains sustainable and does not experience the type of obsolescence issues that plagued the predecessor system. ECG requested $2,100,000 for Sustainment and Technology Evolution Planning activities; $800,000 to carry out the analysis prescribed in the ECG Operational Analysis Plan; $363,000 to maintain the ECG security profile through execution of the ECG Security Profile Management Plan; $737,000 for remediation activities associated with the completed Security Certification and Authorization Package dated August 2005.

For FY 2009, FAA requests $7,400,000 for ECG program to support program objectives in support of the FAA Flight Plan. This funding will provide for the following:

- To ensure the sustainability of the ECG system and to avoid the type of obsolescence issues that plagued the predecessor system, the ECG team has identified potential issues that may require mitigation in FY 2009. ECG requests $2,700,000 for ECG Sustainment and Technology Evolution Plan activities. $200,000 is requested for testing purposes to check for the viability of STEP recommendations in an operational environment.

- To ensure Program Support for the ECG Program. $1,500,000 is requested for support activities including OMB 300 Exhibit, Earned Value Management, STEP, Operational Analysis, contract, and engineering. ECG Information System Security requests $1,500,000. This will include remediation activities associated with the completed Security Certification and Authorization Package dated

August 2007. Conducting of a yearly Contingency Disaster Recovery Plan at an Air Route Traffic Control Center and FISMA Reporting requirements. Also requested is $700,000 to be used for in-service engineering activities.

- The ECG program must continue to monitor the system to verify that it is providing the benefits, performance, and level of service required. The program requests $800,000 to carry out the analysis prescribed in the ECG Operational Analysis Plan. The OA results are also used to assist the monitoring for the ECG Sustainment and Technology Evolution Plan.

Benefits: The most significant benefits are improved efficiency, capacity, and safety by providing controllers with newer, faster, and more capable technology to manage the significant increase in air traffic. By replacing hardware prior to reaching the end-of-maintenance dates, FAA can avoid significant increases in operation and maintenance costs and delays due to system outages. The future en route automation system will provide a cost-effective and fully integrated platform to support new automation functionality. Supplemental benefits include aviation fuel savings, fewer system delays, and the ability to support the demands of a robust economy. The en route automation system will also accommodate the deployment of functions contained in the initiatives that are expected to provide significant savings to the user community through more fuel efficient routes, reduced flight times and delays, and increases in controller productivity.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$240,731.2 [1]
FY 2008 Appropriated	---	4,000.0
FY 2009 Request	---	7,400.0
Baseline Requirement	---	60,900.0
Total	Various	$313,031.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ECG Sustainment and Technology Evolution	---	$2,700.0
2. Program Support	---	1,500.0
3. ECG Information System Security	---	1,500.0
4. In-Service Engineering	---	700.0
5. STEP Testing	---	200.0
6. ECG Operational Analysis	---	800.0
Total	Various	$7,400.0

[1] Includes reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A03	**Next Generation Weather Radar (NEXRAD)**	**$3,000,000**	**Various**	**W-02**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: NEXRAD, a tri-agency program between the Department of Transportation, the Department of Defense, and the Department of Commerce's National Weather Service (NWS) share developmental costs in proportion to the number of systems fielded by each agency. The NWS is the lead agency responsible for the overall coordination of the development and implementation of the system upgrades. NEXRAD detects, processes, distributes, and displays hazardous and routine weather information on air traffic controller consoles. Technical upgrades are necessary to enhance NEXRAD and provide ATC with weather detection equipment to improve safety by detecting and characterizing hazardous weather phenomena.

The FAA weather system interdependencies of the NEXRAD, Weather and Radar Processor (WARP), the Integrated Terminal Weather System (ITWS), Corridor Integrated Weather System (CIWS), and DSR systems are based on modified and upgraded NEXRAD weather products. Other systems that depend on the NEXRAD product improvements include the Operational and Supportability Implementation System (OASIS), the Center/TRACON Automation System (CTAS), Traffic Management Advisor (TMA), URET, and are necessary to implement Free Flight (FF) capabilities.

The Medium Intensity Airport Weather System (MIAWS) is a weather processor system that utilizes NEXRAD input to provide weather awareness and real-time display of hazardous weather phenomena to medium intensity airports that currently have limited weather detection capabilities. Due to higher FAA priorities, a JRC decision was made to cancel the MIAWS program, but to maintain the three existing prototypes until such time as the ASR-11 and STARS systems become operational at these airports (Jackson, MS, Little Rock, AR, and Springfield, MO).

Description of Solution: On-going NEXRAD weather product improvements are critical for replacing the existing infrastructure, introducing required new capabilities to multiple FAA system interdependent weather systems, and decommissioning NAS architecture components. The NEXRAD Product Improvement (NPI) updates NEXRAD technology providing three upgrades which include Open Radar Data Acquisition (ORDA), an on-going hardware refresh; Super Resolution Products, an on-going infrastructure upgrade; and Dual Polarization (DUAL POL), a targeted technology upgrade boosting NEXRAD data quality for better precipitation data used by ITWS, CIWS, WARP, and MIAWS. DUAL POL provides for improved flash flood warnings, severe thunderstorm warnings, biological target identification, and various types of winter storm warnings. Aviation applications include new warnings of hail and icing conditions, turbulence warnings, and bird strike warnings.

During FY 1982 – 2005, $335,004,700 was appropriated for the installation of 159 NEXRAD systems, which provide near total countrywide coverage to include; Alaska, Hawaii, and San Juan, PR. Twelve of the 159 NEXRAD systems are owned and operated by the FAA. A portion of these funds, $4,860,800 was appropriated for NEXRAD to complete the development and begin installation of the ORDA system upgrade and continue the development of the Dual Polarization upgrade. In FY 2006, $5,049,000 was appropriated to fund FAA's share of the tri-agency agreement to complete the deployment of the RDA upgrade and to proceed from concept exploration to prototype development for the dual polarization upgrade.

In FY 2007, $2,000,000 was appropriated to fund FAA's share of the tri-agency agreement to complete the deployment of the RDA upgrade and to proceed to prototype development for the dual polarization upgrade.

In FY 2008, $3,000,000 was appropriated to fund software maintenance of tailored aviation algorithms and products. Primarily, funds will also be used to complete dual polarization testing and to begin deployment of this new capability.

For FY 2009, $3,000,000 is requested to continue funding software maintenance of tailored aviation algorithms and products. Funds will also be used to complete dual polarization deployment, and to begin development of NEXRAD algorithms that use dual polarization data to detect regions icing aloft. Program office support will continue through the end of FY 2009. This support will assist FAA with the oversight of NEXRAD activities.

Benefits: NEXRAD systems have increased aviation safety with the accurate and timely detection of hazardous aviation weather conditions. Weather related arrival and departure delays have been reduced, thus allowing aviation fuel consumption savings.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	130	$342,053.7 [1]
FY 2008 Appropriated	---	3,000.0
FY 2009 Request	---	3,000.0
FY 2010-2013	---	9,000.0
Total	130	$357,053.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
NEXRAD Product Improvements	---	$3,000.0

[1] Includes $8,700 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A04	**Air Traffic Control System Command Center (ATCSCC) Relocation**	**$28,600,000**	**1**	**F-28**

FAA Strategic Goal: Organization Excellence—Improve financial management while delivering quality customer service.

Description of Problem: The FAA Air Traffic Control System Command Center (ATCSCC) is responsible for the tactical command and control of the National Airspace System (NAS) on a daily basis. It plays a key role in the safe and efficient operation of the NAS. In addition, it plays a key national security role. For the past thirteen years the facility has been housed in commercially leased space with the current cost in excess of four million dollars annually. The long term lease expires on September 30, 2013. The FAA must have a location for this critical NAS function.

Description of Solution: This project will construct a new ATCSCC collocated with the FAA's Potomac TRACON near Warrenton, Virginia. There is no land acquisition required.

Benefits: The ATCSCC relocation will lower FAA's life cycle costs. The FAA will achieve cost avoidance benefits projected at $121.4 million from fiscal year 2010 through fiscal year 2031. Collocation will lower capital costs by eliminating the need for land acquisition, reducing site work costs, and significantly reducing backup power system and utility costs. Operations and Maintenance (O&M) costs will be reduced as well for the ATC system maintenance, facility security, telecommunication services, and grounds maintenance through collocation.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	2,500.0
FY 2009 Request	---	28,600.0
FY 2010-2013	---	14,500.0
Total	Various	$45,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Building Construction Contract	---	$25,500.0
2. Program Management	---	800.0
3. Power Infrastructure	---	300.0
4. Operational Telecommunications System	---	2,000.0
Total	1	$28,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A05	ARTCC Building Improvements/ Plant Improvements	$56,500,000	Various	F-06

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: En Route and Oceanic Services is responsible for sustaining and modernizing the FAA's 20 Air Route Traffic Control Centers (ARTCCs) as well as the Combined Center Radar Approach Control (CERAP) facilities at San Juan and Guam. This program is necessary to support Air Traffic Control (ATC) operational requirements and to reduce the risk of ATC delays caused by infrastructure failures. These facilities and much of the mechanical and electrical equipment inside are over 40 years old. Many of the systems are beyond their life expectancies and at risk of failure. For example, in June 2001 smoke from a kitchen fire at the Cleveland ARTCC required an evacuation of the control room resulting in the loss of ATC capability for 16 minutes over 65,000 square miles. Fifty flights were delayed and all en route traffic was routed around the Cleveland airspace. In FY 2005 alone there were eight catastrophic occurrences of pipe ruptures which could have similarly affected operations. At the Washington ARTCC, plastic sheeting had to be draped over air traffic control positions to maintain operations.

The presence of asbestos fireproofing continues to pose a risk to maintenance personnel and significantly increases costs associated with maintenance or repair activities. Fire protection systems must be added in some areas of the buildings to meet building codes and structural upgrades are necessary at ARTCCs in seismic areas.

In FY 2006, a condition assessment survey identified a $121,000,000 backlog of facility equipment that is past its life cycle. Obsolete equipment in this backlog increases facility operations risk in the event of failure. Additionally, when this equipment fails, the FAA often must expend additional funding to repair affected areas. For example when a roof or pipe leaks, repairs must be made to walls, ceilings and carpets. The facility industry estimates that building owners incur $4 of out year liability for each $1 of backlog.

Description of Solution: For FY 2009, $55,500,000 is requested to continue ARTCC modernization and sustainment projects. Major construction projects will replace obsolete support equipment in operations and training areas. These projects will include asbestos abatement, mechanical and electrical system replacements, fire detection and protection upgrades as well as interior architectural construction. All facilities will also receive smaller sustain projects targeted at eliminating infrastructure failure modes by replacing mission critical components. An additional $1,000,000 is requested for in-service engineering activities.

Benefits: To support the FAA's Greater Capacity goal, the FAA must cost effectively renovate and manage its En Route facilities. This program is linked to a Flight Plan performance target for sustaining the operational availability of facilities that support the 35 Operational Evolution Partnership (OEP) airports as well as the Air Traffic Operations organizational goals for optimizing service availability and reducing the unit costs of operations. These projects will reduce the risk of facility outages and will upgrade the facilities to meet current building code requirements. They will modernize En Route facilities to provide an efficient, reliable, and safe work environment. The effective service life of En Route facilities will be extended through these projects. The FAA will eliminate approximately $19 million of existing backlog and will avoid a projected $76 million of potential emergency repair costs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$882,700.0 [1]
FY 2008 Appropriated	---	52,900.0
FY 2009 Request	---	56,500.0
FY 2010-2013	---	237,900.0 [2]
Total	Various	$1,230,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ARTCC Facility Modernization	Various	$55,500.0
2. In-Service Engineering	---	1,000.0
Total	Various	$56,500.0

[1] Includes $19,600,000 in prior year funds for the San Juan CERAP – Sustain program. Includes $23,800 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes $1,179,900 reduction of FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A06	**Air Traffic Management (ATM)**	**$90,200,000**	**Various**	**A-05, A-21, M-08, M-39**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers

Description of Problem: Flight operations are approaching pre-9/11 levels, and aviation trends indicate that air traffic demand will continue to increase. Domestic, regional and commuter patterns and compositions are changing. Despite this growth, the economic viability of many commercial carrier airlines is uncertain. The Traffic Flow Management (TFM) portfolio of tools and capabilities is the only part of the national airspace system designed to help the aviation community reduce delays, improve operations, and succeed economically. However, the system cannot accommodate the anticipated growth in demand for services.

The existing TFM toolset will need to overcome the following challenges to meet the FAA's mission and customer expectations:

- Continued timely development and integration of sophisticated decision support tools to minimize NAS delays and improve efficiency.
- Obsolescence of existing TFM system software architecture.
- Near-term sustainment limitations of existing TFM Infrastructure (TFM-I).
- Fiscal pressures forcing a reduction in the cost of ownership.

Description of Solution: The FAA must maintain mission essential operations at its 81 TFM-equipped ATC facilities for its customers and continue to upgrade enhanced TFM services. Air Traffic Management (ATM) includes: modernization of the Traffic Flow Management Infrastructure (TFM-I), development of Collaborative Air Traffic Management Technologies (CATMT), technology refreshment of the Departure Spacing Program (DSP), and development of the Route Availability Planning Tool (RAPT) prototype, and provides direct mission support to the FAA by ensuring efficient flow of air traffic through the NAS.

TFM is the nation's primary source for disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFM system support the decision-making process used to adjust flight schedules and/or routes as necessary. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system has unique capabilities to predict chokepoints and facilitate the collaboration and execution of mitigation initiatives with stakeholders, using common information displays and tools, to minimize NAS delays.

- Traffic Flow Management Infrastructure Modernization (TFM-M): The TFM-M program has recently replaced the obsolete hardware at FAA's field ATC facilities and in the process of modernizing the hub site facility hardware and software of the current infrastructure. When completed, TFM-M will provide a hardware and software infrastructure that will enable continued development of products and services to more effectively manage the flow of air traffic, while reducing the cost of ownership and ensuring the technological capacity to meet future user and customer needs.

- Collaborative Air Traffic Management Technologies (CATMT): CATMT Work Package 1 focuses on four areas: Airspace Flow Management, Impact Assessment and Resolution, Domain Integration, and Performance Management. These capabilities will improve the usage of existing NAS capacity by improving automation tools and procedures to make air traffic more efficient during periods of adverse weather or excessive volume. Additionally, it will promote the use of automated systems that provide more accurate and timely information to all users and customers, and will implement tools and processes that promote collaborative decisions regarding best routing and scheduling alternatives. CATMT Work Package 2 is working on its business case development in order to recommend the set of key areas to pursue in the FY 2009 – 2013 time frame.

- Departure Spacing Program (DSP): The DSP system provides automation tools to controllers to sequence and minimize departure delays for aircraft at major ATC facilities in the New York metropolitan area. DSP improves ATC workforce productivity by making it easier to coordinate reroutes and aircraft status as well as assurance of common situational awareness. DSP operation is especially vital during periods of severe weather in the U.S. Northeast corridor. Due to obsolescence of the DSP hardware and software, the system will require technology refresh of its components to ensure continued operations.

- Route Availability Planning Tool (RAPT): RAPT is currently in operation as a prototype in the New York area and requires support for continued operation, evaluation, development and expansion of the demonstration system. RAPT combines state-of-the-art weather forecasts with operational flight data to help FAA traffic managers and airlines determine if future departures will encounter hazardous weather at some point along their intended path, and to determine if opportunities exist to route aircraft through safer skies.

In FY 2005, funding was appropriated for continuation of TFM-M design activities and for one functional upgrade at TFM-I field facilities, Hub operations, and lab facilities. Additionally, the evaluation of DSP multi-center system feasibility was discontinued, and the DSP Integration and Operations Lab was decommissioned at the William J Hughes Technical Center DSP field sites have initiated transition to operational sustainment. All DSP operational sites will continue to transition to operational sustainment. In FY 2005, TFM-M completed hardware replacement of existing obsolete TFM-I equipment ahead of schedule. This will reduce capital costs by 50 percent. TFM-M also completed system design of the modernized architecture.

In FY 2006, $72,576,000 was appropriated for TFM-M to begin full-scale development-of the new system architecture, and to initiate related CATMT software development activities. Funding was also used to develop functional software upgrades, including the Airspace Flow Program, for existing TFM-I facilities, including 81 FAA facilities and 41 non-FAA facilities. The FAA has also initiated a technology refresh for the Enhanced Status Information System that displays critical air traffic data to FAA controllers at En Route facilities.

In FY 2007, $78,850,000 was appropriated for TFM-M to continue software development of the modernized system architecture, and the CATMT program to provide incrementally developed and integrated decision support capabilities into the legacy TFM-I, while in consideration of TFM-M interdependencies. Included in the request was $1,000,000 for RAPT to support the existing operation, begin evaluation of the demonstration system, and extend RAPT to another major terminal. Funding is also necessary for in-service engineering, and for Independent Operational Test and Evaluation.

In FY 2008, $90,600,000 was appropriated to fund the continued development of TFM-M hardware and software, the continued enhancements of CATMT Work Package 1, the prototype efforts for RAPT, and continue in-house support efforts.

For FY 2009, $90,200,000 is requested to fund the continued development of TFM-M hardware and software, the continued enhancements of CATMT Work Package 1, the initial efforts for CATMT Work Package 2 (pending Joint Resources Council approval in FY 2008), the prototype efforts for RAPT, and continue in-house support efforts.

Benefits: TFM-M allows new tools and additional collaborative ATM functionality to be expanded and integrated into the existing infrastructure to improve system efficiency and decrease air traffic delays. Reduced delays produce substantial economic benefits to air carriers at a time when they are trying to recover financially. Independent economic analyses show that TFM programs currently deliver $350-$550 million in benefits per year to FAA customers. TFM-M and CATMT are estimated to deliver at least $155 million in annual benefits to FAA customers when the initial software functions are deployed, and will also reduce the FAA's cost of ownership for TFM-I by lowering sustainment costs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$828,235.8 [1]
FY 2008 Appropriated	---	90,600.0
FY 2009 Request	---	90,200.0
Baseline Requirement	---	89,400.0
Total	Various	$1,177,455.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. TFM-I Modernization	---	$40,800.0
2. Collaborative Air Traffic Management Technologies	---	47,100.0
3. Route Availability Planning Tool	---	1,600.0
4. In Service Engineering	---	700.0
Total	Various	$90,200.0

[1] Includes a $57,077 reduction of FY 2001 funds pursuant to rescission contained under P.L. 106-544. Includes a reduction for EAS in FY 2002. Includes a reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004. Includes $17,700,000 for Free Flight Phase 2/CDM program to continue functionality development under new program, Collaborative Air Traffic Management Technologies.

[2] Future requirement does not include Initial estimate of $100.0M for CATMT Work Package 2 effort which will go to the FAA JRC at the end of FY 2008.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A07	**Air/Ground Communications Infrastructure**	**$7,500,000**	**Various**	**C-04, C-06, M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The current air/ground communication system must be improved to support FAA's goal to provide increased capacity in the U.S. airspace system that reduces congestion and meets projected demand. The growth in air traffic operational requirements has increased the need for air/ground communications coverage. The current system is aging, increasingly unreliable, and susceptible to radio interference. Disruptions of air/ground communication services require rerouting aircraft around affected areas and may remove the ability of ground controllers to communicate with aircraft. Radio frequency interference at an A/G facility would severely disrupt air traffic services. Due to the deferment of the next generation air/ground communications (NEXCOM) system development program, FAA must continue to support the radio control equipment requirement to support expanded communications coverage.

Description of Solution: Air/Ground Communications Infrastructure[1] will replace aging and increasingly unreliable equipment. In addition, Air/Ground Communications Infrastructure will establish new communication facilities. The FY 2009 Air/Ground Communications Infrastructure request would fund the following programs:

- The Communications Facilities Expansion (CFE) program provides new communication facilities and equipment. The program also improves and/or relocates current communication facilities to meet new demands. For FY 2009, $4,000,000 is requested to provide funding for 9 expansion/relocation sites, procure replacement radios, equipment racks, antennas, towers, and site preparation/installation material.

- The Radio Control Equipment (RCE) program replaces radio signaling and tone control equipment. The equipment is located at all air route traffic control centers, remote center air/ground communications facilities, air traffic control facilities, remote transmitter receiver sites, flight service stations and remote control outlets. For FY 2009, $3,000,000 is requested to install 320 RCE units, conduct an investment analysis and award a new RCE contract.

Also requested is $500,000 for in-service engineering activities.

Benefits: The Air/Ground Communications Infrastructure program supports the FAA goal of Reduced Congestion. New and relocated communication facilities enable the establishment of new sectors to support capacity. In addition, new and relocated communication facilities will enable new and more efficient flight patterns. Efficient flight patterns reduce aircraft operations and maintenance costs for the airline industry. New communication equipment will lower periodic and correctional maintenance costs associated with the old and technically obsolete equipment in the field.

[1] The UHF Replacement Program has been transferred to BLI 2A14 Next Generation Air/Ground Communications System (NEXCOM)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$434,621.5 [2]
FY 2008 Appropriated	---	14.500.0
FY 2009 Request	---	7,500.0
FY 2010-2013	---	19,500.0 [3]
Total	Various	$476,121.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Communications Facilites Enhancement	---	$4,000.0
2. Radio Control Equipment	---	3,000.0
3. In-Service Engineering	---	500.0
Total	Various	$7,500.0

[2] UHF Radio Replacement Funding history transferred to BLI 2A17. Includes $584,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Also includes $3,200,000 reduction for FY 1998 Congressional reprogramming. Includes $5,453,300 reduction of the FY 2002 funds pursuant to supplemental P.L.107-206, January 23, 2002. Includes $3,000,000 reduction for FY2003 Congressional reprogramming. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[3] Future requirements depend on NEXCOM Segments 2 and 3 Investment Analysis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A08	**ATC Beacon Interrogator (ATCBI) – Replacement**	**$13,000,000**	**Various**	**S-02**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Air Traffic Control Beacon Interrogator Replacement (ATCBI-6) is a secondary radar used for En Route and Oceanic air traffic control. The ATCBI-6 provides aircraft position information and identification to Air Traffic Control facilities, for separation assurance, and traffic management. The ATCBI-6, in conjunction with co-located primary long-range radar, also provides back-up radar approach surveillance service to numerous Terminal Radar Approach Control (TRACON) facilities in the case of lost terminal radar services or scheduled maintenance downtime. The ATCBI-6 system is a low-cost, highly reliable, very accurate, and more capable replacement for the older, higher cost, and less reliable beacon interrogators (ATCBI-4/5).

The FAA's existing En Route surveillance ATCBI-4/5 systems have reached the end of their projected life-cycles and many of the parts are already obsolete. The inability to replenish spares is putting the availability of En Route secondary surveillance service at risk. Furthermore, the existing beacons are analog systems that are incompatible with new automation systems such as STARS and ERAM, the plan HOST Replacement. In addition, the antiquated technology of the ATCBI-4/5 systems does not provide the quality of performance that today's technology can provide. The processors supporting these beacons use a crude estimation technique for azimuth detection known as "sliding window" that calculates the aircraft azimuth by averaging the leading and trailing edge replies from the stream of responses from the aircraft. This is an imprecise estimation technique and if the stream of replies is interrupted (i.e., replies are missing), the system provides inaccurate or false reports. ATCBI-6 utilizes monopulse direction finding techniques for increased accuracy. The current ATCBI-4/5s also have a high susceptibility to interference and synchronous garble as well as a limited number of aircraft beacon codes.

The FAA utilizes surveillance coverage from 12 of the 15 current DoD AN/FPS-117 primary radars with attached OX-60 secondary (beacon) radars in Alaska, to support the FAA air traffic control mission. These facilities are referred to as Alaskan Minimally Attended Radar (MAR) radars. The OX-60 beacon radars were procured in the 1970's. DoD has been reporting an extended repair cycle due to parts obsolescence. The LSI-2000 will replace the aging OX-60 secondary beacon radars in Alaska. The FAA is assisting the USAF in expediting the replacement of the secondary surveillance systems at the Joint Use Radar Facilities in Alaska to improve the quality, reliability, and availability of radar data used for Air Traffic Control in the region.

Description of Solution: ATCBI-6 is part of the agency's continuing effort to upgrade equipment to provide greater system capability and reliability that will reduce operating costs. The ATCBI-6 replacement program will replace existing En Route ATCBI-4/5 equipment and establish new beacon-only sites. The ATCBI-6 program will upgrade the current beacons with compatible surveillance systems, to sustain NAS safety, efficiency, and to avoid incurring unmanageable maintenance and supportability costs. The original ATCBI-6 Replacement Program included 129 ATCBI-6 systems to replace existing operational beacons; establish support systems for training, testing, logistics, and operational support; and provide systems for three new sites. An additional 7 ATCBI-6 systems were added, due to Congressional establishments, agency cost share agreements, other FAA projects, and the need for additional support systems, for a total of 136 systems. This approach will meet the near-term needs while providing for a seamless transition for FAA use of GPS-based technology.

For FY 1998-2007, the Replacement Program awarded a contract to Raytheon in August 1998. The program office procured 1 prototype and 136 ATCBI-6 systems and spares and completed all deliveries from Raytheon to FAA. The program also conducted site surveys; completed interface development and test requirements for the General Purpose Interface Bus (GPIB), ARSR-3, and Mode 4/ARSR-4; procured all Monopulse Beacon Test Sets (MBTS); purchased and installed rotary joints and antennas; conducted technician training classes; delivered 126 systems to sites and support facilities; accepted 117 systems at sites and support facilities; commissioned 90 systems; developed and procured Occupational Safety and Health Administration (OSHA) ladders; completed MBTS interface development; completed ARSR-4/Mode 4 interface development and testing and commissioned the first ARSR-4 site with the Mode 4 variant; continued depot and software maintenance; completed the 3 year update of the Security Certification and Authorization Process (SCAP); conducted maintenance and operational training; completed NIM's ARSR-3 installation; began rotary joint modification; initiated infrastructure efforts at Grand Turk, TC and Pico Del Este, PR; and continued transitioning depot level support services from Raytheon to the FAA Logistics Center in Oklahoma City, OK.

The OX-60 Program will acquire LSI-2000 beacons, including non-recurring engineering and developmental work, for the 12 MAR sites in Alaska that interface with the Anchorage, AK Micro EARTS. The Beacon Only Facility Establishment has cost share agreement sites, which were commissioned in Eagle County, CO and Gallatin Field, MT. Also, congressional mandate sites saw completed construction activities at Redmond, OR and new construction activities at Jackson Hole, WY, and sites saw new construction at the Georgetown, BH site, and initiated site design activities at Freeport, BH and implementation efforts at Yakutat, AK.

In FY 2008, $20,200,000 was appropriated, of which $16,000,000 was for ATCBI-6 replacement activities and $4,200,000 was for Beacon Only Facility Establishment activities. The ATCBI-6 replacement program will support the delivery of 10 ATCBI-6 systems.

At the end of FY 2008, one ATCBI-6 system will require storage. The FAA plans to have the following 20 ATCBI-6 systems in IOC: 1) Slidell, LA; 2) Tamiami, FL; 3) King Mountain, TX; 4) Lufkin, TX; 5) Remsen, NY; 6) Mt. Kaala, HI; 7) Georgetown, BH; 8) Key West, FL; 9) Bucks Harbor, ME; 10) Empire, MI; 11) Cross City, FL; 12) Grand Turk, TC; 13) Paso Robles, CA; 14) Ft. Fisher, NC; 15) Riverhead, NY; 16) North Truro, MA; 17) Eagle Peak, TX; 18) Ajo, AZ; 19) Redmond, OR; and 20) Jackson Hole, WY. The program office will also use funds to continue installation of the ARSR-4/Mode 4 interface; continue optimization and 2nd level engineering support; procure and conduct additional maintenance training courses; complete life-cycle depot spares procurement; continue Rotary Joint Modification and installation; and complete infrastructure activities at Grand Turk, TC and Pico Del Este. PR. The Beacon Only Facility Establishment funding of $4,200,000 is requested to complete construction activities at Freeport, BH and Jackson Hole, WY; and continue construction efforts at Yakutat, AK.

For FY 2009, $13,000,000 is requested, of which $10,000,000 is for ATCBI-6 replacement activities and $3,000,000 is for Beacon Only Facility Establishment activities. The ATCBI-6 replacement program will support the delivery of the one remaining ATCBI-6 system to the site.

The FAA plans to have the following 17 ATCBI-6 systems in initial operating capability:

1. Watford City, ND;
2. Melbourne, FL;
3. Salem, OR;
4. Nashwauk, MN;
5. Fremont Valley, Edwards AFB, CA;
6. Mica Peak, WA;
7. San Antonio, TX;
8. Rainbow Ridge, CA;
9. Whitehouse, FL;
10. Malstrom AFB, MT;
11. Morales, TX;
12. Freeport, BH;
13. Mt. Laguna, CA;
14. Guantanamo Bay, CU;
15. Pico Del Este, PR;
16. San Clemente Island, CA; and
17. Yakutat, AK.

The program office will also use funds to continue installation of the ARSR-4/Mode 4 interface; continue optimization and 2nd level engineering support; procure and conduct additional maintenance training courses; continue Rotary Joint Modification and installation; start close out activities on prime contract; and complete the 3 year update of the Security Certification and Authorization Process (SCAP). The Beacon Only Facility Establishment funding of $3,000,000 is requested to complete construction activities at Yakutat, AK.

Benefits: As the ATCBI-6 systems are deployed, FAA will realize significant cost savings due to reduced maintenance. The ATCBI-6 will also provide the agency with the capability to sustain NAS safety and efficiency at both terminal and En Route radar locations by avoiding secondary surveillance service outages that occur as the availability of the ATCBI-4/5s decrease due to insufficient spare parts. Additionally, the enhanced performance of the modern ATCBI-6 technology should increase controller productivity.

APPROPRIATION SUMMARY

	ATCBI-6	OX-60	Amount ($000)
Appropriated (FY 1982-2007)	136	12	$262,413.9 [1]
FY 2008 Appropriated	---	---	20,200.0
FY 2009 Request	---	---	13,000.0
FY 2010-2013	---	---	11,200.0
Total	136	12	$306,813.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Prime Contract	---	$1,500.0
2. Contract Support	---	1,500.0
3. SCAP update	---	200.0
4. Site Prep/Flight Check/Schedule A&B Items	---	1,400.0
5. Optimization Support/2nd Level Engineering	---	2,000.0
6. Depot Level Support	---	400.0
7. Rotary Modification	---	3,000.0
8. Establish Beacon Only Facility	---	3,000.0
Total	Various	$13,000.0

[1] Includes reductions pursuant to P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A09	**Air Traffic Control En Route Radar Facilities Improvements**	**$5,300,000**	**Various**	**S-04, M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet project demand and reduce congestion.

Description of Problem: The NAS currently has 142 En Route surveillance facilities. All of these facilities contain critical long-range secondary beacon radars. Many of these En Route (long range radar) sites were established in the early 1950's. Today, FAA air traffic control (ATC) requires seamless surveillance information provided within each air traffic controller's area of responsibility. In order to reliably provide seamless surveillance information in the En Route environment and due to the extreme age of these facilities, the need for facility infrastructure improvements are required at all of the 142 operational En Route surveillance facilities. Failures and deficiencies in the existing infrastructure resulted in operational outages each year that have severe and immediate impacts on air traffic control En Route services.

The current air surveillance infrastructure has shortfalls that must be addressed to ensure that the air surveillance system can continue to meet the user needs into the future. The immediate need is to ensure that current air surveillance capabilities do not further degrade while planning and implementing longer-term solutions.

Most En Route surveillance facilities require improvements and/or modifications to correct existing deficiencies. Approximately 40 percent of the En Route surveillance service outages currently experienced can be directly linked to infrastructure failures and deficiencies.

Long Range Radar (LRR) Infrastructure Upgrades consist of two phases. Phase I consists of short term upgrades to facility infrastructure (i.e. refurbishment of lightning, grounding, bonding, and shielding systems) necessary to support the ATCBI-6 deployment; and, Phase II consists of long term upgrades, replacement, and refurbishment of facility infrastructure subsystems. These upgrades will replace critical infrastructure systems if required for En Route secondary beacon operations.

Description of Solution: Prior to FY 2006, funds supported Phase I ATCBI-6 infrastructure upgrades; the removal of surplus radar equipment and towers; En Route radar facility improvements including random replacements; ATC radar beacon system relocations; Alaskan upgrades; and engineering solutions for urgent, site specific, operational, En Route radar facility issues. Congress provided limited funding in FY 2003 to address some of the ARSR-4 technical deficiencies. In FY 2004 and FY 2005 Congress provided a pilot program for ARSR-4 electronic technical manual. In FY 2006, FAA will complete the Phase I infrastructure upgrades at 106 scheduled ATCBI-6 sites. Infrastructure upgrades include refurbishing power panels; improving lightning protection and grounding systems; replacing equipment shelters, and building improvements where necessary at beacon only sites.

In FY 2007, $5,000,000 was appropriated. In coordination with support activities for the primary En Route radars funded by DoD and Department of Homeland Security (DHS) reimbursable agreement, funding will support the facility grounding upgrades at approximately 10 sites, the completion of 66 facilities assessments, continuation of system rotary joint/azimuth pulse generator and critical infrastructure upgrades and refurbishments required in order to sustain En Route secondary beacon radar operations for an additional 20 years.

In FY 2008, $5,000,000 was appropriated for the continuation of facility grounding upgrades, improving lightning protection and grounding systems, system rotary joint/azimuth pulse generator and critical infrastructure upgrades and refurbishments required in order to sustain En Route secondary beacon radar operations for an additional 20 years. $300,000 was appropriated for in-service engineering activities.

DoD/DHS assumed shared financial responsibility for En Route primary surveillance radars. DoD/DHS is responsible for cost of maintaining and upgrading the primary surveillance radars.

For FY 2009, $5,000,000 is requested for the continuation of facility infrastructure upgrades at both ARSR-4 and LRR Service Life Extension Programs at 19 sites. In coordination with support activities for the primary En Route radars funded by DoD and DHS reimbursable agreement, funding will support the repair and maintenance of the aging en route radar towers and facility grounding upgrades, and critical infrastructure upgrades and refurbishments required to sustain En Route secondary beacon radar operations for an additional 20 years. An additional $300,000 is requested for in service engineering activities.

Benefits: The planned infrastructure modifications will provide greater efficiency and reduce operating costs in En Route air traffic control and facility maintenance operations by refurbishing En Route equipment and facilities. Prior year accomplishments reduced the potential for reduced coverage. The lightning protection, grounding, bonding, and shielding has reduced failure occurrences in the beacon surveillance sites.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	99	$186,357.3 [1]
FY 2008 Appropriated	10	5,300.0
FY 2009 Request	19	5,300.0
FY 2010-2013	22	22,600.0 [2]
Total	150	$219,557.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Infrastructure Upgrades	Various	$5,000.0
2. In Service Engineering	---	300.0
Total	Various	$5,300.0

[1] Includes $314,500 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999.
[2] An investment analysis is currently underway aimed at defining a program to extend the life of the infrastructure at all LLR sites. The goal would be a consolidated plan to match the life of the site infrastructure with that of the surveillance systems at those sites. The FAA and DoD funding responsibilities will be addressed as part of the recommended solution.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A10	**Voice Switching and Control System (VSCS) Tech Refresh Phase 2**	**$23,300,000**	**Various**	**C-01, M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The VSCS system allows air traffic controllers to talk to pilots, providing air-to-ground and ground-to-ground voice switching and control systems at the 21 high-altitude centers, the Mike Monroney Aeronautical Center, and the William J. Hughes Technical Center. Without this system, controllers would be unable to speak with pilots and ground personnel to separate air traffic. VSCS is a critical piece of today's air traffic infrastructure. This system was fielded between 1994 and 1997. VSCS Training and Backup System (VTABS), which provides training circuits, separate from the operational communications, functions as the backup communications system.

This existing high-altitude voice switching and control system architecture is based on a 1970's design. Critical hardware and software are reaching the end of their useful service lives. Obsolete parts and programming languages have made maintenance cumbersome and costly. The FAA must replace the obsolete hardware and software now to avoid diminishing service reliability and increasing maintenance costs.

Description of Solution: This tech refresh replaces obsolete hardware and software for all the high-altitude voice switching and control systems, the Mike Monroney Aeronautical Center, and the William J. Hughes Technical Center. Phase 1 of the equipment upgrade began in 2000 and ended in 2006. Continued technical refreshment will allow the system to remain in use beyond 2014, which gives FAA plenty of time to develop the next generation voice switch.

Prior year funding provided for the initial deployment of the VSCS/VTABS systems, the development and procurement of an upgrade to the VSCS Control System, and engineering support. In FY 2005, $23,907,200 completed the removal of the Tandem equipment replaced by the upgrade to VSCS Control System, completed testing activities, started the deployment of the Work Station Upgrade (WSU), and continued engineering efforts to replace the Video Display Monitor. In FY 2006, $7,425,000 funded equipment for the WSU project, initiated installations of the WSU, refurbished power supplies, studied the feasibility of System Node replacement, and continued engineering efforts on the Video Display Monitor. In FY 2007, $15,000,000 was appropriated to fund completion of WSU installations, begin deployment of video display monitors, continue power supply refurbishment, start engineering for VTABS power supply replacement, an internal local area network (LAN) upgrade, and test equipment replacement; begin some code conversion activities and conduct an engineering study for system node replacement. An additional $1,900,000 was provided for Business Continuity Plan (BCP). In FY 2008, $15,000,000 was appropriated to fund the retrofit of VSCS Power Supplies, the remainder of display monitors installation activities, continuing code conversion, test equipment development, engineering efforts for ground-to-ground switch replacement, and conducting studies about future phases of technology refresh for VSCS. Also, $200,000 was appropriated for Independent Operational Test and Evaluation (IOT&E) and $500,000 for in service engineering activities.

For FY 2009, $22,800,000 is requested to continue to fund the retrofit of VSCS power supplies, the development of depot test equipment of repeater/LAN efforts, PLM to C++ code conversion activities, and engineering analysis. An additional $500,000 is requested for in service engineering activities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	24	$1,524,550.7 [1]
FY 2008 Appropriated	---	15,700.0
FY 2009 Request	---	23,300.0
Baseline Requirement	---	32,900.0 [2]
Total	24	$1,596,450.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. VSCS Sustainment Activities	---	$14,080.0
2. Program Management	---	1,063.0
3. Contractor Support	---	3,507.0
4. Tech Operations Engineering Support	---	4,150.0
5. In Service Engineering	---	500.0
Total	Various	$23,300.0

[1] Includes $5,940 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106-544. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] The JRC approved the VSCS baseline and has funded the program through FY 2011. The JRC requested the program return with results of the Ground to Ground Switch replacement study and a plan for Phase 3 with views on how to approach replacing G/G Switch VSCS.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A11	**Oceanic Automation System (OAS)**	**$20,700,000**	**Various**	**A-10, M-25, M-39**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The FAA is allocated 80 percent of the world's controlled oceanic airspace. This airspace stretches beyond domestic coverage with its land-based ATC infrastructure, including radar. FAA provides air traffic control services for oceanic flights, within an area of approximately three million square miles in the Atlantic; and 21 million square miles in the Pacific. This airspace is not sovereign – it is delegated to Civil Aviation Authorities, of which FAA is one, by ICAO - and can be reassigned at any time. This airspace is presently managed by three ATC facilities: Oakland, New York and Anchorage Air Route Traffic Control Centers (ARTCCs). Oceanic air traffic is projected to continue to grow at a higher rate than domestic air traffic, primarily in the highest density areas. In addition, the market demands expanded capacity through improved operational and fuel efficiency. The FAA's current oceanic system is approaching maximum operating capacity.

Oceanic ATC differs from domestic ATC largely because there is no radar tracking of aircraft and no direct radio communication. Oceanic air traffic controllers must rely on other sources of aircraft position information. This data includes voice position reports from pilots derived from on-board navigation systems that include GPS and communications satellite information. This lack of reliable and timely position information, in turn, requires large aircraft separation standards that severely limit the useable system capacity. As a result, oceanic users are rarely able to obtain maximum fuel efficiency, minimize travel times, and access to preferred takeoff times and flight paths. An integrated, modernized oceanic air traffic control system is required to increase oceanic air traffic capacity and efficiency, without degrading safety, enabling the introduction of free flight in oceanic air space.

Description of Solution: Prior to FY 2000, $188,900,000 was appropriated under the Oceanic Automation program line item to deliver incremental improvements in oceanic air traffic control systems at the Oakland, New York and Anchorage ARTCCs. These included Telecommunications Processor, Interim Situation Display, Oceanic Display and Planning System, Air Traffic Services Inter-facility Data Communications Systems and Oceanic Data Link. This money also funded the Dynamic Ocean Track System (DOTS) Plus, which suggests optimum tracks for airlines and air traffic controllers, and Micro-En Route Automated Radar Tracking System (Micro-EARTS), the ATC platform for the FAA's offshore sites. These projects established the oceanic automation and communications infrastructure that currently exists in the three oceanic ARTCCs. The incremental system improvements enabled reduced wing tip to wing tip aircraft separation to 50 nautical miles in the Pacific and West Atlantic Route System (WATR) regions in 2000.

The new oceanic automation system sets the stage for reducing aircraft separation from 100 nautical miles to 30. The Advanced Technologies and Oceanic Procedures (ATOP) program enables the flexibility and predictability required for additional fuel savings and increased airline revenue.

ATOP replaces existing oceanic ATC systems and procedures with a single integrated system and modernizes facilities responsible for managing over 24 million square miles of airspace over the Atlantic and Pacific Oceans. ATOP integrates flight data processing, detects conflicts between aircraft, and provides satellite data link and surveillance capabilities. The new oceanic system collects, manages, and displays oceanic air traffic data, including electronic flight-strip data, on the computer displays used by air traffic controllers and integrate capabilities such as flight data processing, radar data processing, automatic dependent surveillance, controller pilot data link and conflict probe. ATOP provides a modernized oceanic air traffic control automation system including, installation, training, procedural development support and life-cycle system maintenance. The contract also allows for pre-planned product improvements over the system life-cycle.

In FY 2000 – FY 2006, $399,938,381 was appropriated for acquisition ATOP hardware, software development, information security, logistics support, training, facility modifications, IOT&E, system testing and maintenance, in-service management and software improvements for Micro-EARTS and DOTS Plus, technical refresh for Micro-EARTS, decommissioning of Oceanic Display and Planning System (ODAPS), and program support activities.[1] [2] Major accomplishments included awarding of the ATOP contract, delivery and installation of the ATOP system hardware at the three oceanic operational facilities (Oakland, New York and Anchorage) and William J. Hughes Technical Center, achieved government acceptance of the radar system at Anchorage ARTCC, and completion of facility modifications at New York ARTCC. ATOP achieved initial operational capability (IOC) for the procedural system at Oakland ARTCC (6/04), New York ARTCC (3/05) and Anchorage ARTCC (3/06). ATOP attained procedural system operational readiness demonstration (ORD) at Oakland (4/06) and New York (4/06) ARTCCs and is controlling aircraft full-time (24/7). Anchorage ARTCC transitioned to 24/7 operations in March 2007 and is anticipated to achieve ORD status by September 2007.

In FY 2007, $31,350,000 was appropriated to attain operational readiness at Anchorage, maintain operational readiness at New York and Oakland ARTCCs, continue implementation of Micro-EARTS technical refresh, provide for AT/AF training, information security, logistics support, system testing and maintenance, continue facility modifications at Oakland ARTCC, carry on the required level of program activities, enhance the Micro-EARTS and DOTS Plus software baselines, and IOT&E.

In FY 2008, $53,100,000 was appropriated to initiate ATOP technical refresh at the William J. Hughes Technical Center (WJHTC) and Oakland ARTCC which replaces operating systems and all major system components (e.g., servers, workstations, communications switches, and interface gateways) with state-of-the-art components, initiate ATOP Preplanned Product Improvements which includes enhancements to ATOP software to increase operational efficiency and controller productivity, complete facility modifications at Oakland ARTCC, maintain operational readiness at the Anchorage ARTCC, provide for second-level engineering support, information security, logistics support, and system testing, continue maintenance activities for the fielded systems, provide for the required level of program and engineering support, and make improvements to the Micro-EARTS and DOTS Plus software baselines, and for IOT&E.

For FY 2009, $20,700,000 is requested to complete the ATOP technical refresh at the William J. Hughes Technical Center (WJHTC) and the 3 oceanic sites, continue ATOP Preplanned Product Improvements for enhancements to ATOP software for procedural and radar operations, provide for information security and logistics support, provide for the required level of program and engineering support, and provide tech refresh for DOTS Plus.

Benefits: Although oceanic flights comprise only four percent of total U. S. air carrier operations, they provide 49 percent of the international cargo revenue and 20 percent of the passenger revenue. The new automation system has reduced aircraft separation from 50 nautical miles lateral/10 minutes longitudinal to 30 nautical miles lateral/30 nautical miles longitudinal (equates to four minutes). Ninety percent more altitude change requests were granted at Oakland Center and New York Center in September 2005 versus September 2004. ATOP automation has allowed for the use of new routes from South America to New York, saving between 2000-4000 pounds of fuel per flight. ATOP increases oceanic capacity and efficiency, has mitigated potential cost of delays, and is expected to save airlines and aircraft operators more than $5 billion in fuel costs. ATOP has enhanced communication and surveillance, and increased sector capacity. Annual U.S. transoceanic revenues are projected to increase significantly by the year 2010.

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[1] In addition, as Micro-EARTS is a component of the ATOP architecture, and both Micro-EARTS and DOTS+ are part of the ATOP baseline, funding is contained within this line item to improve those platforms.
[2] Requested funding includes Oceanic NAS Plan Handoff, IOT&E and In-Service Management activities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$620,222.5 [3]
FY 2008 Appropriated	---	53,100.0
FY 2009 Request	---	20,700.0
Baseline Requirement	---	39,600.0
Total	Various	$744,622.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Technical Refresh	---	$5,400.0
2. Preplanned Produce Improvements	---	7,900.0
3. Prime Contract, Program Management, Depot Support	---	700.0
4. Facility Modification and Site Support	---	300.0
5. Oceanic Integration and Interoperability Facility Lab	---	500.0
6. OAS Program Management	---	5,300.0
7. DOTS+ Tech Refresh	---	600.0
Total	Various	$20,700.0

[3] Includes $8,747,000 reduction for the FY 1998 Host/Oceanic Computer System Replacement (HOCSR)/Security Equipment formal reprogramming. Includes $81,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A12	**Corridor Integrated Weather System (CIWS)**	**$5,900,000**	**Various**	**W-07**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Weather is the major contributor to air traffic delays, accounting for 65 percent of all delays. Significant convective weather causes wide spread impacts on the capacity of En Route airspace. The lack of accurate forecasts of storm position, and intensity and the lack of current and forecast storm (echo) tops information constrains the ability of traffic managers to maximize sector and route capacity in times of significant convective activity. Traffic managers in TRACONs, and En Route Centers as well as the ATCSCC lack the common situational awareness of current and future storm information to act effectively in collaboration to reduce congestion and delays.

Description of Solution: The Corridor Integrated Weather System (CIWS) provides advanced weather product generation to help reduce convective weather delays. CIWS provides national, En Route, and terminal air traffic flow managers (TFM) and airline system operation centers (AOC) personnel with accurate, automated, rapidly updated weather information as well as weather products for integrated weather-Air Traffic Management (ATM) system (Wx-ATM) to support the weather-assimilated decision making envisioned for NextGen. CIWS automatically produces weather products including storm locations, radar measured storm tops, and two-hour storm forecasts including storm growth and decay. In addition CIWS uniquely provides a score of the recent performance of its predictions. The CIWS program supports the increased capacity goals of the agency's *Flight Plan.* CIWS requirements identify gaps for thunderstorm detection, forecasting and impact assessment for congested air corridors. CIWS requirements are allocated from the "Initial Program Requirements for Thunderstorm Impact Mitigation."

The CIWS project operates a demonstration system providing advanced weather products to the Command Center, eight ARTCCs and six TRACONs in the northeast. CIWS Coverage of the most heavily traveled areas of southern Canada provides an indication of route availability for the Canadian Playbook routes. The CIWS demonstration has shown that fully automated high resolution 3D weather information coupled with zero to two hour forecasts of storm locations can significantly improve the ability of ATC users to safely utilize the available capacity during severe convective activity. Air routes can be kept open longer before being impacted by weather, and can be reopened earlier. Similarly, better knowledge of future storm position allows more efficient rerouting around storms. Better information on current and predicted storm heights allows users to identify opportunities to safely fly over storm areas. This translates into substantial delay savings, user fuel savings, enhanced user safety, and well organized reroutes for weather avoidance. The CIWS has been shown to improve ATC productivity in terms of the time required to develop and execute effective convective weather mitigation plans. A key finding of the demonstration has been the importance of the CIWS advanced weather products integrated with traffic flow management tools and procedures. The CIWS demonstration system is undergoing a re-engineering effort to provide an increase in performance and maintainability as well as "harden" the CIWS source code. Plans are to transition the operation of the re-engineered CIWS system to the FAA William J. Hughes Technical Center (WJHTC) where it will be baselined into the NAS.

In FY 2008, $2,100,000 was appropriated, where $1,800,000 was for CIWS algorithm development and development of a Technical Transfer Package, and $300,000 was for program support functions.

For FY 2009, $5,900,000 is requested. $500,000 is to secure CIWS facilities and associated resources at the WJHTC; $2,000,000 is to procure hardware; $1,800,000 is to engineer and implement input data sources at the WJHTC; $800,000 is to continue development of the Technical Transfer Package, $500,000 is for training program development and program support and $300,000 is for Independent Operation Test and Evaluation.

Benefits: CIWS products allow better common situational awareness of expected weather events and help improve collaborative decision-making (CDM) among NAS users and traffic managers in all domains. An internal assessment of these benefits yielded an estimate of $122,000,000 in savings related Aircraft Direct Operating Costs (ADOC) and approximately $257,000,000 in savings to the flying public in the form of Passenger Value of Time (PVT).

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$13,100.0
FY 2008 Appropriated	---	2,100.0
FY 2009 Request	---	5,900.0
FY 2010-2013	---	52,500.0
Total	Various	$73,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Secure CIWS facilities	---	$500.0
2. Procure CIWS hardware	---	2,000.0
3. CIWS data source engineering	---	1,800.0
4. CIWS Technical Transfer Package	---	800.0
5. Other CIWS support	---	500.0
6. Independent Operation Test and Evaluation	---	300.0
Total	Various	$5,900.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A13	**San Juan Approach Control (CERAP)**	**$6,000,000**	**Various**	**F-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The San Juan CERAP was constructed in 1964 and was designed to resist hurricane forces. A structural evaluation completed in July 2005 identified significant seismic deficiencies with several of the on-site buildings. The CERAP is located in a zone of high seismic activity where earthquakes exceeding a magnitude of 7.0 are likely. The soil beneath the facility has a medium to high likelihood to "liquefy" during a seismic event. This could cause the foundation to crumble. The concrete beams, girders and columns are nominally reinforced and do not meet modern seismic resistance standards.

Description of Solution: The FAA is assessing the alternatives to mitigate this seismic risk while supporting future modernization plans. A seismic mitigation solution must be developed for the San Juan CERAP. This solution could include facility repairs, relocation of some of the CERAP functionality or a combination of both. While initial mitigation strategies are being developed now, an in-depth solution must be developed and implemented.

Benefits: A successful seismic mitigation solution will bring the CERAP operations into a configuration that meets code compliance, provide improved protection for building occupants and reduce ATC operations risk associated with an earthquake.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	8,000.0
FY 2009 Request	---	6,000.0
FY 2009-2013	---	0.0
Total	Various	$14,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Initiate implementation of seismic mitigation solution	---	$6,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A14	**Next Generation VHF Air/Ground Communications System (NEXCOM)**	**$46,400,000**	**Various**	**C-06, C-21**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The existing Very High Frequency (VHF) analog controller-to-pilot communications system lacks the capacity and flexibility to accommodate future growth in air traffic. The FAA goal of Reduced Congestion is at risk due to the lack of available air traffic control radio spectrum in high-density areas. The continuous growth in air traffic and the introduction of new services has driven a proportional demand (approximately four percent per year) for air/ground communication frequency assignments. The system is beyond its estimated life-cycle and is increasingly expensive to maintain. Furthermore, the existing system has no security against unauthorized users and channel blockage. The FAA also must support the ultra high frequency (UHF) air/ground communication service for the Department of Defense (DoD). Most of the UHF transmitters and receivers are over 25 years old and increasingly unreliable. UHF radio outages pose a risk to national security and are not acceptable. Air/Ground communication is the most fundamental and safety critical element of the ATC system and links supports all phases of flight for en route, terminal, and flight service operational environments. There are approximately 50,000 analog radio units installed at over 4,000 sites.

Description of Solution: NEXCOM will implement a new air/ground voice communication system using the limited available radio frequency spectrum more efficiently. NEXCOM will provide the operational flexibility required for NextGen. NEXCOM will be implemented in two segments (previously three)[1]. Segment 1 addresses the En Route environment, and is divided into two phases, Segments 1a and 1b. Installation of Segment 1a multimode digital radios (MDRs) began in 2004. The radios can function in analog or digital modes, though only one at a time. The MDRs, which will initially operate in the analog channel mode, will be a major improvement to our aging air-to-ground communications infrastructure. NEXCOM Segment 1b, system hardware and software has been cancelled because the agency believes that the spectrum problem can be addressed by the combination of the MDR and the Data Communications Program. NEXCOM Segment 2 (2010+) will implement MDRs that will service the high-density terminal areas and the flight service operations.

By the end of FY 2007, over 4,200 multimode digital radios will be operational at approximately 300 sites across the United States. In FY 2008, $30,400,000 was appropriated for program management, technical support, and to deploy multimode digital radios at 150 sites across the United States.

For FY 2009, $33,400,000 is requested for NEXCOM Segment 1a and $10,000,000 is requested for the UHF radio replacement program. The UHF Replacement program[2] replaces UHF radios at remote communications facilities. UHF radios are deployed concurrently with the MDRs to minimize implementation costs. NEXCOM Segment 1a MDRs and UHF radios will be installed at 160 sites across the United States, including Alabama, Alaska, Arizona, Arkansas, California, Colorado, Florida, Idaho, Indiana, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, Nevada, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. In addition, for FY 2009, $3,000,000 is requested for NEXCOM Segment 2. The funding will enable the agency to conduct an Investment Analysis and begin the radio procurement for terminal and flight service radio replacement in time to support NextGen.

Benefits: NEXCOM will meet the new and growing demands for air transportation services; accommodate the growing number of sectors and services; increase security by reducing circuit blockage and the risk associated

[1] The current NEXCOM Segment 2 was originally Segment 3. The Data Communications Program will address the requirements of the original Segment 2.
[2] The UHF Replacement Program has been transferred from BLI# 2A07 Air/Ground Communications Infrastructure.

from unauthorized access; and improve reliability by replacing aging air/ground communications equipment with new digital equipment.

The UHF radio replacement program will provide significant benefits to the FAA. The UHF radios will be deployed concurrently with the MDRs and will achieve minimum cost avoidance. Another benefit is the cost reduction of using existing radios removed from the en route facilities to meet near term non-en route growth requirements from 2004 – 2007. The difference between the cost of purchasing new radios and the cost of refurbishing and repackaging radios to meet these requirements will result in savings of $5,600,000 over four years. Deploying the radios concurrently also leaves the En Route air/ground remote sites with new, more reliable major components, which reduce maintenance expenses. The UHF radios also provide a vital part of the critical infrastructure supporting the nation's homeland defense efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$338,539.3 [3]
FY 2008 Appropriated	---	30,400.0 [4]
FY 2009 Request	---	46,400.0
Baseline Requirement	---	102,800.0 [5]
Total	Various	$518,139.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$2,170.0
2. In-Service Management	---	900.0
3. Multimode Digital Radio Equipment	---	13,980.0
4. Information Security	---	220.0
5. Logistics	---	860.0
6. Implementation	---	15,270.0
7. Segment 2 Investment Analysis	---	300.0
8. Segment 2 Multimode Digital Radio Procurement	---	2,700.0
9. UHF Radio Replacement Equipment	---	10,000.0
Total	Various	$46,400.0

[3] UHF Radio Replacement funding history transferred from BLI# 2A07. Includes $3,200,000 reduction for FY 1998 Congressional reprogramming and FY 2001 rescission reduction. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[4] Includes UHF radio replacement program.
[5] NEXCOM segment 1a and UHF radio replacement programs only. NEXCOM segment 1b has been cancelled and Segment 2 requires an executive investment decision.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A15	**System Wide Information Management (SWIM)**	**$41,000,000**	**Various**	**A-31, M-25**

FAA Strategic Goal: Organization Excellence - Improve financial management while delivering quality customer service.

The FAA has identified SWIM as a "Transformational" program for Next Generation Air Transportation System (NextGen).

Description of Problem: Today's hard-wired infrastructure and systems cannot readily support the addition of new data, systems, data users, and decision makers as NextGen requires. In general, they are connected directly to support yesterday's decision making needs. Each of these interfaces is custom designed, developed, managed, and maintained individually at a significant cost to FAA. NextGen relies upon a new decision construct that brings more data, systems, customers, and service providers into the process. Today's point-to-point architecture does not support these goals. This situation represents a performance gap that must be bridged for NextGen to be successful.

Description of Solution: The SWIM Program is an integral part of the National Airspace System (NAS) Enterprise Architecture roadmap and will close the performance gap by promoting the development of a secure NAS-wide information web to connect FAA systems. SWIM will provide policies and standards to support data management, along with the mechanisms (i.e., commercial software) for the core services needed to publish data to the network, retrieve it, secure its integrity, and control its access and use. SWIM will leverage existing systems and networks to the extent practicable, and be based on technologies that have been proven in both operational and demonstration environments to reduce cost and risk. SWIM will be developed incrementally based upon the needs of various data communities, maturity of concepts of use, and segments that are sized to fit reasonable cost, schedule, and risk thresholds.

Specifically, the current FAA system architecture is overly expensive, needed modifications are extremely costly and time consuming, and does not provide network-enabled operational capabilities needed to meet future capacity demands are not feasible. SWIM represents the steps that FAA is taking to reduce costs while providing better service to:

- Change system interfaces to support network messaging, reducing the cost of testing and maintaining each individual interface (currently a major cost driver and resource load for NAS systems).
- Provide the flexibility to provide the information to new systems and locations without adding custom interfaces. This will significantly reduce the marginal cost of adding new system interfaces.
- Provide common interfaces that facilitate spontaneously adding new users and applications, for purposes of continuity of operations.

In July 2006, the Initial Investment Decision was approved. In June 2007, the Final Investment Decision for Segment 1 was approved, and a baseline for the first two years of Segment 1 (FY 2009 and FY 2010) was established.

For FY 2009, $41,000,000 is requested for the development of Segment 1. Efforts in FY 2009 include design and development of initial Segment 1 capabilities, preparing for a Joint Resources Council (JRC) to baseline FY 2011-2013 funding, and conducting systems engineering analysis and investment analysis for Segment 2. For FY 2009, SWIM will:

- Provide standards/guidance to SWIM implementing programs on SWIM Segment 1 core capabilities,
- Procure service container software and provide to implementing programs,
- Code and test of initial Segment 1 capabilities,
- Prepare for JRC to baseline FY 2011-2013 funding, and

- Conduct analyses and prepare documentation for Final Investment Decision (JRC 2b) for Segment 2.

Benefits: SWIM is vital to the achievement of National, DOT, and FAA strategic plans and the future evolution of air transportation management in the nation. The current FAA systems and operations cannot support this vision as they are not network-enabled, and are characterized by rigidly configured systems (communications lines, computers, and software applications). SWIM contributes to meeting the following NextGen objectives:

a. Increase Predictability - SWIM will improve coordination to allow transition from tactical conflict management to strategic trajectory-based operations. SWIM will also provide the potential to increase machine to machine interchange supporting and disseminating decisions rather than the current man to man interactions. SWIM increases the likelihood that similar decisions will be consistent by enabling them to be based on the same data.

b. Reduce Costs for Aviation - SWIM will help to reduce infrastructure costs by reducing the number and types of interfaces, systems, and potentially, facilities. Initially, SWIM will provide a common network capability, reducing operation and maintenance costs of the hundreds of current interfaces. New systems will interface with SWIM, saving future development costs. Ultimately, redundant sources of data will no longer be needed and can be decommissioned.

c. Shared Situational Awareness - SWIM will help to provide shared situational awareness so that all appropriate parties are privy to the same complete set of information.

d. Collaborative Decision Making - SWIM will help to enable collaborative decision-making which means that once all parties have access to the same information, they can efficiently make real-time decisions and quickly reach agreements.

SWIM will also provide benefit to the FAA resulting from new SWIM AIM functionality resulting in a reduction of staff time through automated processes.

NAS users will realize the benefits from the Weather Community of Interest's new capabilities, in which weather data are published to Airline Operating Centers (AOCs) as well as to the National Weather Service. Data will also be provided to airlines to improve efficiency in planning airport departures and arrivals, based on changes in runway visibility.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$24,000.0
FY 2008 Appropriated	---	23,358.0
FY 2009 Request	---	41,000.0
FY 2010-2013	---	123,000.0 [1]
Total	Various	$211,358.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Investment Analysis	---	$5,600.0
2. Program Management	---	2,900.0
3. System Engineering	---	9,100.0
4. Hardware/Software Design and Development	---	22,204.0
5. Implementation and (F&E) In-Service Management	---	806.0
6. Independent Operational Test and Evaluation	---	390.0
Total	---	$41,000.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A16	**Automatic Dependent Surveillance Broadcast (ADS-B) National Airspace (NAS) Wide Implementation**	**$300,000,000**	**Various**	**S-10**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

The FAA has identified this program as a "Transformational" program for NextGen. The most direct alignment to NextGen goal is Network Enabled Information Access.

Description of Problem: While current surveillance is generally adequate for today's environment, it will not support the anticipated growth in aviation without loss of efficiency within the National Airspace System (NAS). As the request for additional services – including traffic demand – increases, system inefficiencies will increase in the form of delays and restrictions across the NAS. Surveillance methods used in today's environment will not support continued aviation growth. Additionally, the current surveillance systems do not take advantage of new technologies in navigation, communication, and flight management. Expansion of surveillance coverage is essential to support air traffic control modernization efforts. Any improvements FAA makes to surveillance capabilities must sustain or enhance the current levels of safety, capacity, and efficiency.

According to the Joint Government and Industry Roadmap for Surveillance Modernization, the Air Traffic environment of the future will be increasingly dependent on more accurate and timely information being available to Air Traffic Service providers and aircraft operators. Information pertaining to a variety of airspace conditions and accurate position data, including aircraft intent, will be necessary.

Description of Solution: ADS-B is an advanced surveillance technology that provides highly accurate and more comprehensive surveillance information via a broadcast communication link. ADS-B is a surveillance technique in which aircraft provide, via a data link, flight data derived form on-board position-fixing and navigational systems. Aircraft determine their position (longitude, latitude, altitude, and time) using GPS, internal navigational reference system, or otherwise. The aircraft's ADS-B equipment function processes this position information, along with other aircraft-derived flight parameters, into a periodic broadcast transmission, typically once a second, of the aircraft's position. Any airborne or ground-based ADS-B capable receiver, within range of broadcast, may receive and process the surveillance information for a variety of functions or uses.

The greater positional accuracy and ability to provide aircraft-derived, additional flight parameters (flight objects or flight data message elements), in addition to position data, defines ADS-B as "enhanced surveillance." The aircraft provides unique flight parameter information with the broadcast of its surveillance position. These other parameters, such as identification, directional vector, velocity, next waypoint, and other data are limited only by the equipment's capability, the communication link capacity, and the receiving system's capability. Additionally, ADS-B equipment may be placed on ground vehicles or obstacles to allow locating and identifying these items. The FAA's ADS-B system is based primarily on providing three fundamental broadcast services to support the ADS-B enabled applications:

ADS-B: This service provides highly accurate, aircraft-derived ADS-B reports that contain identification, state vector, and status/intent information about the aircraft. The information will be used for surveillance applications. ADS-B information is broadcast by the ADS-B equipped aircraft, received and processed by the ADS-B on-board avionics, and displayed on the aircraft's multi-function display.

TIS-B: Traffic Information Services provide ADS-B equipped aircraft with a more complete "picture" in situations where not all aircraft are equipped with ADS-B. TIS-B is a service that provides ADS-B equipped aircraft with surveillance data about non-ADS-B equipped aircraft. TIS-B comprises surveillance information provided by one or more surveillance sources, such as secondary or primary surveillance radar. The surveillance information is processed and converted for use by ADS-B equipped aircraft. TIS-B can also be used in ADS-B implementations involving multiple ADS-B data links to provide a cross-link or gateway between ADS-B equipped aircraft using the different data links. This TIS-B sub-function is identified as Automatic Dependent Surveillance – Rebroadcast (ADS-R). Two communication link protocols have been approved for ADS-R use; Universal Access Transceiver (UAT), used mostly by general aviation aircraft, and the 1090 extended squitter, which broadcasts but does not receive signals, normally used in commercial transport aircraft.

FIS-B: Flight Information Services provide ground-to-air broadcast of non-control, advisory information which provides users valuable, near real-time information to operate safety and efficiently. FIS-B products include graphical and textual weather reports and forecasts, Special Use Airspace Information, Notices to Airmen, and other aeronautical information.

In FY 2007, the primary focus of activities focused on competing and awarding the service contract for the National program, to include turning on options for implementation of limited areas of ADS-B in the Gulf of Mexico (GOMEX), Juneau, Louisville/Philadelphia/Ontario, and an expansion of the TIS-B and FIS-B services in the East Coast, Great Lakes, and Southern California areas. Other activities include:

- Development of the interfaces between ADS-B and four of the agency's automation platforms (STARS, Common-ARTS, HOST/ERAM, and Micro-EARTS);
- Completing activities associated with a Useful Segment 1 and 2 Final Investment Decision planned for February 2007 and August 2007;
- Screening Information Request (SIR) issued;
- Request For Offer (RFO) Released;
- National Contract Award;
- Notice of Proposed Rule-Making Issued; and
- Systems engineering activities such as development of a separation standards work plan, standards development, safety assessments, risk management, completion of the backup analysis, simulation and modeling of some of the future air-to-air applications, such as Merging and Spacing, currently being developed with UPS, and the continued operations and maintenance of the current legacy infrastructure along the East Coast, North Dakota, and Arizona areas.

In FY 2008, activities will focus on design reviews, testing and validation of the vendor designed architecture. Other activities include:

- Continue Development of the interfaces between ADS-B and four of the agency's automation platforms (STARS, COMMON-ARTS, HOST/ERAM, and Micro-EARTS;
- Installation of ADS-B in selected locations;
- Preliminary Design Review (PDR) for NAS-Wide Contract;
- Critical Design Review (CDR) for NAS-Wide Contract;
- SBS Service Delivery Planning and Implementation;
- Broadcast Services Expansion; and
- Contract Management activities associated with selecting Segment 2 options, if approved, on the prime contract so that work efforts may begin in FY 2009.

For FY 2009 activities include continuation of efforts started in FY 2007 and FY 2008 for ADS-B NAS-Wide implementation. FY 2009 deliverables include:

- In-Service Decision (ISD) of Broadcast Services;
- Louisville separation standards approval;
- GOMEX separation standards approval;
- GOMEX communication and weather IOC;
- Juneau separation standards approval;
- Philadelphia separation standards approval; and
- Continuing NAS-Wide deployment of ground infrastructure.

Benefits: The ADS-B, TIS-B, and FIS-B services provide new and improved operational capabilities. Service providers will use the new surveillance capability to provide ATC services. Users will use the surveillance and broadcast services capability to support flight operations.

Capacity and Efficiency: Airspace can be better utilized by providing the capability for reduced separation and allowing for greater predictability in departure and arrival times. ADS-B improves capacity and efficiency by:

- Providing radar-like separation procedures in remote or non-radar areas, possibly decreasing travel time;
- Supporting common separation standards (horizontal and vertical) in all classes of airspace;
- Improving the ability to manage traffic and aircraft fleets;
- Improving air traffic controllers ability to plan the arrivals and departures or aircraft in advance; and
- Providing the infrastructure necessary to operate the NAS at reduced cost.

Safety: ADS-B, TIS-B, and FIS-B helps to prevent accidents by providing increased situational awareness to air traffic controllers and pilots. ADS-B improves safety by:

- Provides air-to-air surveillance capability;
- Provides surveillance to areas that do not currently have surveillance coverage; and
- Provides real-time, in-the-cockpit, traffic, and aeronautical information. (weather, temporary flight restrictions, and special use airspace.)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$80,000.0
FY 2008 Appropriated	---	85,650.0
FY 2009 Request	---	300,000.0
FY 2010-2013	---	930,500.0 [2]
Total	Various	$1,396,150.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Solution Development	---	$112,200.0
2. Implementation	---	26,900.0
3. In-Service Management	---	160,000.0
4. Independent Operation Test and Evaluation	---	900.0
Total	Various	$300,000.0

[2] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B01	**Airport Surface Detection Equipment – Model X (ASDE-X)**	**$32,700,000**	**Various**	**S-09, M-25**

FAA Strategic Goal: Increased Safety – Reduce the risk of runway incursions.

Description of Problem: During FYs 2001 - 2004, there were approximately 257 million aircraft operations and 1,395 runway incursions.[1] This represents an average of one runway incursion per day during the four-year period. The FAA has calculated, based on historical data, if the FAA and the aviation industry took no intervening action, 15 fatal runway collisions at towered airports would occur between 2003 and 2022.[2] These collisions could result in 200 serious injuries and 700-800 deaths. Airport Surface Detection Equipment, Model X (ASDE-X) meets a recommendation for the implementation of new surveillance equipment aimed at preventing collisions and runway incursions at a large number of airports.

Description of Solution: Airport Surface Detection Equipment, Model X (ASDE-X) is a surface surveillance system that provides seamless multi-sensor airport surveillance with identification and conflict alerting to air traffic controllers. The ASDE-X system integrates five technologies: transponder multilateration, surface movement radar, Automatic Dependent Surveillance – Broadcast (ADS-B) data, multi-sensor data fusion, and control tower display equipment. The integration of these sensors provides data with accuracy, update rate, and reliability suitable for improving airport safety and efficiency in all weather conditions. The ASDE-X is particularly useful as a traffic control aid during hours of darkness and other conditions of poor visibility.

ASDE-X was developed to aid in preventing surface collisions and in reducing critical Category A and B runway incursions by enabling air traffic controllers to track the surface movement of aircraft and vehicles. ASDE-X provides air traffic controllers with a visual representation of the traffic situation on the airport movement area and arrival corridors which improves their ability to maintain awareness of the operational environment and to anticipate contingencies.

ASDE-X Safety Logic (AXSL) enhances the situational awareness provided by ASDE-X. AXSL uses surveillance information from ASDE-X to determine if the current and projected positions and movement characteristics of tracked aircraft and vehicles present a potential collision situation. Visual and audible alerts are provided to air traffic controllers when safety logic predicts a collision.

The FAA plans to install 35 operational systems and three support systems. The systems will be installed at airports with no surface surveillance systems and airports with existing ASDE-3/AMASS systems. The FAA plans to deploy ASDE-X to ten new establishment airports (no current surface surveillance capability), four replacement airports (existing ASDE-3/AMASS systems will be replaced with ASDE-X), twenty one ASDE-X Upgrade airports (ASDE-3/AMASS systems will be upgraded with ASDE-X capabilities such as multilateration, new color displays, fusion tracking, and AXSL).

ASDE-X program status as of January 2008:

- Eleven commissioned airports
    1. General Mitchell International Airport in Milwaukee, WI
    2. Orlando International Airport in Orlando, FL
    3. Theodore Francis Green State Airport in Providence, RI
    4. William P. Hobby Airport in Houston, TX
    5. Seattle -Tacoma International Airport in Seattle, WA
    6. Lambert - St Louis International Airport in St. Louis, MO
    7. Hartsfield - Jackson Atlanta International Airport in Atlanta, GA
    8. Bradley International Airport in Hartford, CT
    9. Louisville International Airport in Louisville, KY

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[1] Source: "FAA Runway Safety Report: Runway Incursion Trends and Initiatives at Towered Airports in the United States, FY 2001 – FY 2004", August 2005

[2] Source: "Fatal US Runway Collisions over the Next Two Decades", Air Traffic Control Quarterly, December 2000

10. Chicago O'Hare International Airport in Chicago, IL
11. Charlotte - Douglas International Airport in Charlotte, NC

- Remaining 24 airports are in various stages of the ASDE-X implementation process.

In FY 2008, $40,600,000 was appropriated to continue implementation activities including site design, construction, and site preparation and equipment installation at 24 airports. Four ASDE-X systems will be delivered and three airports plan to achieve IOC. The program office also plans to complete the safety logic retrofit activity. For all future installations, ASDE-X Safety Logic will be implemented during the ASDE-X system installation. Remaining funds will be used for systems engineering, software maintenance, ICDLS, spare parts, second level engineering support, initial leased telecommunication services, information systems security requirements, and contractor support for the program office and all of the above activities. An additional $4,900,000 was appropriated to relocate and upgrade the ASDE-X antenna at Seattle (SEA).

For FY 2009, $32,400,000 is requested to continue implementation activities including construction and site preparation, equipment installation and system optimization at 21 airports. The FAA will continue to implement the first dual ASDE-X Upgrade site at the Los Angeles International Airport (LAX). Eleven ASDE-X systems will be delivered and five airports plan to achieve IOC. Remaining funds will be used for systems engineering, ICDLS, second level engineering support, initial leased telecommunication services, and contractor support for the program office and all of the above activities. $300,000 is designated for the office of Independent Operational Test and Evaluation (IOT&E).

Benefits: ASDE-X provides both safety and efficiency benefits. The primary benefit, increased safety, is achieved by providing air traffic controllers with improved situational awareness. ASDE-X functionality provides data tags for all transponder equipped vehicles. The system also provides enhanced safety performance by supporting target projections and intersecting runway alerts. Moreover, through data fusion of multiple sensors (surface movement radar and multilateration inputs), more accurate positions with flight call signs and aircraft intentions are displayed on the controller's screen. This significantly improves controller common situational awareness, particularly during heavy periods of degraded weather or poor visibility. ASDE-X provides improved surface surveillance during heavy precipitation because rain has no impact on multilateration performance as it does on radar performance. Improved situational awareness will result in a reduction of surface deviations attributed to operational errors, reduce the number of runway incursions, and reduce the number and rate of general aviation and commercial accidents.

In addition to safety benefits, ASDE-X enables efficiency improvements by providing flight call signs for all transponder-equipped targets. As a result, controllers are able to view the ASDE-X display to determine the correct order of aircraft within queue, monitor whether aircraft are following their prescribed taxi routes, and validate that the proper beacon code is associated with the radar target for each aircraft. Through the implementation of data tags, ASDE-X provides the ability to accurately identify each aircraft within a queue preventing unnecessary coordination and communications to determine the order of aircraft. This improved capability will reduce the time spent between clearance deliveries and in turn lead to less taxi time and delays.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	38	$394,875.0 [3]
FY 2008 Appropriation	0	40,600.0 [4]
FY 2009 Request	0	32,700.0
Baseline Requirement	0	11,100.0
Total	38	$479,275.0

[3] Excludes $7.6M appropriated for ASDE-X under Airport Surface Detection Equipment (ASDE) in FY 2000. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[4] Includes $4.9M appropriated to relocate and upgrade ASDE-X system at Seattle-Tacoma.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$1,003.0
2. Logistic Support	---	748.0
3. Program Management	---	4,025.0
4. Site Design and Construction	---	9,097.0
5. Installation and Checkout	---	12,368.0
6. Second Level Engineering	---	1,246.0
7. Infrastructure Support	---	3,913.0
8. IOT&E	---	300.0
Total	Various	$32,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B02	**Terminal Doppler Weather Radar (TDWR)**	**$6,100,000**	**Various**	**W-03**

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate.

Description of Problem: The TDWR program includes 45 commissioned operational systems and two support systems. The TDWR system is comprised of a substantial number of proprietary software and hardware components, some of which have become obsolete and present significant supportability problems that have worsened with time. The TDWR requires a Service Life Extension Program (SLEP) in order to maintain the current level of service until 2020 and to improve deteriorating system reliability.

Description of Solution: Solutions to current and future supportability issues have been identified in the following six projects included in the SLEP: enhancing the antenna's elevation drive system, replacing the Direct Digital Controller (DDC) and rehosting its software; retrofitting the Radar Data Acquisition (RDA) hardware and software; replacing the current antenna drive motors with more reliable brushless motors; replacing the obsolete Radar Products Generator (RPG) computer; and replacing obsolete transmitter control cards.

From FY 2002 to FY 2007 $42,340,070 was appropriated under both the TDWR Product Improvement and TDWR SLEP budget line-items to complete installation of the backup communications upgrade; to procure spares and obsolete parts replacements, and complete the acquisition and installation of modification kits for the DDC hardware and software rehost. Funding was also provided for the acquisition, testing, and installation of the new elevation bearings, engineering development and field testing of the RDA retrofit modification, and the procurement of 30 modification kits. Funding was also provided to procure and test three prototype antenna drive systems; and to continue procurement of spares and replacements for obsolete parts and assemblies. Additionally, $397,400 was appropriated for NAS Plan hand-off and in-service management activities.

In FY 2008, $8,000,000 was appropriated to develop improved software for the RDA Retrofit modification; complete field evaluation of the RDA Retrofit modification, procure the last 25 production kits (includes four spares) and install 10 modification kits; procure 22 production antenna drive motor systems and install nine of them in field sites; develop and test a replacement for the obsolete RPG computer, acquire and install production kits to replace three obsolete circuit cards with a new transmitter control circuit card, and procure additional spares and related materials to support the TDWR system.

For FY 2009, $6,100,000 is requested to complete the acquisition of a retrofit modification to the RDA subsystem, to buy production antenna drive motor systems and begin their installation, to acquire and install a replacement computer and its uninterruptible power system, and to replace the air conditioners at about half of the TDWR sites.

Benefits: The TDWRs deployed at commercial airports have increased aviation safety through the accurate and timely detection of hazardous aviation weather conditions. Weather-related delays have been reduced, allowing savings in aviation fuel consumption.

Operational benefits of the system include the real-time detection of microbursts, gust fronts, wind shifts, and precipitation as well as prediction of wind changes that allow improved airfield efficiency when making runway changes. The program will continue to deploy improvements that will lower TDWR operations costs and improve its reliability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	47	$441,017.5 [1]
FY 2008 Appropriated	---	8,000.0
FY 2009 Request	---	6,100.0
Baseline Requirement	---	1,000.0 [2]
Total	47	$456,117.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Engineering Development/Implementation of SLEP Projects	Various	$6,100.0

[1] Includes $130,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] The future requirements for TDWR SLEP are under review and final estimated costs have not yet been determined.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B03	**Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1)**	**$28,200,000**	**Various**	**A-04**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: STARS automation systems have been operational at terminal facilities, both terminal radar approach control facilities (TRACONs) and air traffic control towers (ATCT) across the National Airspace System (NAS) since FY 2002. The STARS system consists almost entirely of Commercial-Off-the-Shelf (COTS) hardware and Commercially Available Software (CAS). Because COTS/CAS system are based on what is available in the commercial marketplace, there is a need to continually replace systems software and components when they have been identified as either End of Life (EOL) and/or End of Maintenance (EOM) items. Therefore it is necessary that the STARS system is maintained using Technical Refreshment of the COTS/CAS components which have been identified as EOL or EOM.

Description of Solution: The FAA is implementing Terminal Automation Modernization in a phased approach, starting with the TRACONs that have the oldest terminal automation systems. This approach reflects FAA's current philosophy in maintaining business continuity and effective program management. Phases mitigate government, vendor, and deployment costs and risks by breaking down large, complex Terminal modernization acquisitions. Phases allow FAA to select a "best value" system, meet budgetary constraints and fulfill critical NAS requirements. Each phase will be justified, priced and presented separately to the Joint Resource Council (JRC). The STARS Program and the associated baseline cover the initial replacement of 47 of the current 162 operational Terminal Automation Systems.

The STARS Program replaces the 47 oldest and most operationally critical ARTS IIIAs (43), and Common ARTS IIEs (4) sites. In April 2004, the FAA JRC approved STARS as the replacement solution for these critical sites and approved the new baseline for the program.

In subsequent phases, the FAA will evaluate viable alternatives for completing terminal modernization at remaining sites, based on cost benefit and performance.

In FY 2006 funding was utilized for end-of-life hardware technical refresh and software enhancements funding in support of STARS Program COTS/CAS life-cycle maintenance support activities. In FY 2007, $49,200,000 was appropriated to perform the following activities: Complete STARS installation and deployment at the Houston, Phoenix, and Norfolk sites. Additionally, funding will cover program and system engineering technical support; NAILS field support; software development in support of site specific deployment functionality; STARS laboratory management support; second level software maintenance support; operational field support; end-of-life hardware technical refresh; and STARS software enhancements required for all 47 STARS systems.

In FY 2008, $31,200,000 was appropriated, of which $14,700,000 was to complete operating system qualification and installation; complete the initial phase of the system processor and peripheral equipment qualification and purchase; complete path finding and qualification for a terminal controller workstation display monitor replacement, tower controller monitor replacement, and to eliminate costly inter-dependency of the system processors and operating system; "pop-up" end-of-life hardware items; and support program and system engineering technical support of activities. Also, $16,500,000 was appropriated for Terminal Enhancements. These activities include STARS software enhancements as well as other various system enhancement activities. As STARS enters the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and incorporate safety and security modifications. These software baseline enhancements are required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2005-2009. Additionally, funding will cover program and system engineering technical support, and operational/suitability testing of software and system enhancements.

For FY 2009, $28,200,000 is requested, of which $18,200,000 is for Technical Refresh activities which will be used to continue installation of a new operating system; continue the second phase of the system processor and peripheral equipment purchase and replacement; initiate procurement activities associated with tower controller monitor replacement: continue to eliminate costly inter-dependency of the system processors and operating system; "pop-up" end-of-life hardware items; and fund program and system engineering technical support of activities. Also, $10,000,000 is requested for Terminal Enhancements. These activities include STARS software enhancements as well as other various system enhancement activities. As STARS enters the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and to incorporate safety and security modifications. These software baseline enhancements are required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2005-2009. Additionally, funding will cover program and system engineering technical support, and operational/suitability testing of software and system enhancements.

Benefits: The STARS system is fully digital and capable of tracking all aircraft within the defined terminal airspace using available FAA and DoD surveillance or with system upgrades to global positioning satellite reports. It provides functions equivalent to or better than those accomplished by the existing terminal automation systems along with enhanced security. It is designed to incorporate new functionality more quickly and easily. STARS' infrastructure can be expanded and extended to meet increased traffic demands and accommodate the introduction of new automation functions necessary for improved safety, efficiency, and capacity.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$1,723,820.6 [1]
FY 2008 Appropriated	---	31,200.0
FY 2009 Request	---	28,200.0
Baseline Requirement	---	1,203,830.0 [2]
Total	Various	$2,987,050.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. STARS Technology Refresh	---	$18,200.0
2. STARS Software Enhancements	---	10,000.0
Total	Various	$28,200.0

[1] Includes $651,300 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future production/deployment requirements for remaining 106 systems are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B04	**Terminal Automation Modernization/Replacement Program (TAMR Phase 3)**	**$3,000,000**	**Various**	**A-04**

FAA Strategic Goal #2: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: This program would address the Modernization and Replacement of the ARTS IIEs not replaced with STARS and ARTS IIIEs and not upgraded during the TAMR Phases 1 and 2. A total of 125 sites are covered by Phase 3. The automation systems that currently provide National Airspace System (NAS) critical separation and capacity services must be sustained and upgraded to maintain functionality. These older systems are limited in capacity, unable to support future growth projections and new functionality, and present an operational risk to service. Because of this risk, systems at the Terminal Radar Approach Control (TRACON) facilities need to be upgraded or replaced in the near future.

Description of Solution: These systems integrate data from radar and weather sensors and flight plan information for each aircraft into a graphical and textual presentation used by several thousand air traffic controllers.

For FY 2009, $3,000,000 is requested to plan for the program scope, business case analysis and initial development of Terminal Automation solutions for the remaining 110 ARTS IIEs, seven IIIEs, and eight IEs sites. This funding supports analysis and preliminary development efforts.

Benefits: The Terminal Automation Modernization and Replacement System will replace or upgrade the existing automation to a state-of-the-art digital, radar and flight data processing and display system, providing new air traffic control "workstations" and backroom automation equipment to enable safe control of airplanes and enable continued service at current and future projected levels.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	3,000.0
FY 2010-2013	---	0.0 [1]
Total	Various	$3,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
TAMR Phase 3	---	$3,000.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B05	**Terminal Automation Program**	**$4,300,000**	**Various**	**A-01, A-03**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The automation systems that currently provide National Airspace System (NAS) critical separation and capacity services must be sustained and upgraded to maintain functionality. These older systems are limited in capacity and are difficult to maintain. New functionalities and upgrades necessary to sustain services in alignment with operational needs are required.

Description of Solution: The FAA procured ARTS IIIE and ARTS Color Displays (ACDs) for several large TRACONs. These sites, along with all legacy ARTS platforms are planned to remain in service for the next 10 years or more. A total of 110 ARTS IIEs, seven ARTS IIIEs, and eight ARTS IEs sites require on-going software and hardware efforts.

In FY 2007, $13,800,000 was appropriated for the Terminal Automation Program. $8,500,000 was provided to sustain the current terminal air traffic control systems, that must be maintained and improved to meet the current and projected air traffic growth; $2,300,000 was provided to procure Flight Data Input/Output (FDIO) equipment that provides standardized flight plan data, safety-related data, and other information to air traffic controllers at Terminal Radar Approach Control (TRACONs) and Air Traffic Control Towers (ATCT) facilities; and $3,000,000 was provided for Electronic Flight Strip Transfer Systems (EFSTS) to procure hardware and software and to develop an interface to the en route host and Terminal equipment. As directed, the funding will be used for an EFS demonstration.

In FY 2008, $2,300,000 was appropriated for FDIO equipment that provides standardized flight plan data, safety-related data, and other information to air traffic controllers at TRACONs and ATCT facilities.

For FY 2009, $4,300,000 is requested for the following activities: $2,300,000 to procure equipment for FDIO that provides standardized flight plan data, safety-related data, and other information to air traffic controllers at TRACONs and ATCT facilities; $2,000,000 for the continued sustainment of the ARTS automated system to handle air traffic growth and accommodate software changes to meet future air traffic safety and capacity demands.

Benefits: These activities ensure the availability and reliability of system hardware and software to support NAS modifications. The modifications help improve airport arrival efficiency, and enhance safety and system utility.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$69,557.0
FY 2008 Appropriated	---	2,300.0
FY 2009 Request	---	4,300.0
FY 2010-2013	---	9,800.0
Total	Various	$85,957.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Flight Data Input/Output	---	$2,300.0
2. Terminal Sustainment	---	2,000.0
Total	Various	$4,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B06	Terminal Air Traffic Control Facilities – Replace	$134,295,476	Various	F-01

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The FAA provides air traffic control services from over 500 airport traffic control towers (ATCT) and terminal radar approach control (TRACON) facilities. The FAA must continually replace portions of this infrastructure to ensure an acceptable level of air traffic control service and to meet current and future operational requirements. The average age of an ATCT is 28 years and a TRACON is 25 years, with some as much as 50 years old. As the volume and complexity of terminal air traffic control increases, so does the need to have additional positions in the ATCT/TRACON (i.e., helicopter positions, VFR traffic advisory, runway monitors, etc.). In many cases, control towers and TRACONs built 20 years ago do not meet today's operational requirements. The terminal facilities must conform to current building codes and design standards.

Description of Solution: The ATCT/TRACONs that cannot meet current operational requirements are being identified for replacement. Additionally, the FAA will determine the cost and operational benefit of collocating TRACONs that have common boundaries. When building a new facility, future growth and current building codes and design standards will be accommodated.

Terminal facility replacement projects are funded in five phases to provide sound financial management of projects. Phase I includes site selection and advance engineering. Phase II provides facility design, and electronic equipment design and procurement. Phase III is facility construction. Phase IV is equipment and utilities installation. Phase V is disposition, which includes decommissioning, demolition, or refurbishing of the old facility.

The FAA is in the process of developing a long-term Facilities Master Plan for ATCT and TRACON infrastructure replacement and improvements. This plan will address facility condition, ability to meet current needs, future growth and improvements at the airport served, and potential cost savings initiatives. The proposed list of projects for FY 2009 was developed in concurrence with the plan.

In FY 2007, $124,000,000 was appropriated to fund four phases of construction to continue replacing aging facilities. Phase I funding was provided for two sites, Cleveland, OH, Wilkes-Barre, PA; Phase III construction funding was provided for nine sites, including West Palm Beach, FL; Reno, NV; Jeffco, CO; Houston, TX; Gulfport, MS; Memphis, TN; Las Vegas, NV, Islip, NY and Boise, ID; and, Phase IV continuation funding for thirteen sites, including Dayton, OH, Pensacola, FL, Conroe, TX, Huntsville, AL, Oshkosh, WI, Indianapolis, IN, LaGuardia, NY, Joplin, MO, Opa Locka, FL, Phoenix, AZ, St. Petersburg, FL, North Bend, OR, and Las Cruces, NM. Funding for FAA organizational support and contracting support was provided to manage the programs.

In FY 2008, $145,530,000 was appropriated to fund five phases of facility deployment to continue replacing aging facilities. This includes: Phase I/II funding for eleven sites, including Abilene, TX, Palm Springs, CA, Traverse City, MI, Ft. Lauderdale, FL, Oakland, CA, Orlando, FL, Greenwood, MS, San Francisco, CA, Barnstable, MA, Nantucket, MA and Toledo, OH; Phase III construction funding for seven sites, Kalamazoo, MI, Jeffco, CO, West Palm Beach, FL, Reno, NV, Houston, TX, Gulfport MS and Boise ID; and, Phase IV/V continuation funding for six sites, including La Guardia, NY, Memphis, TN, Pensacola, FL, Medford, OR, Missoula, MT and Dayton, OH. Additional funding in the amount of $17,100,000 was appropriated for other direct program costs. Products and services delivered include: the Dulles, VA ATCT (IAD) lease payment, formal facility requirements documentation, siting evaluations for all ATCT locations under consideration, preliminary engineering, and program management.

For FY 2009, $134,295,476 is requested to fund five phases of facility deployment to continue replacing aging facilities. This includes: $5,100,000 for Phase I/II funding for three sites: Baltimore, MD, Champaign, IL, and Columbia, SC; $93,131,434 for Phase III construction for five sites: Abilene, TX, Ft. Lauderdale, FL, Traverse

City, MI, Las Vegas, NV, and Cleveland, OH; and $22,134,042 for Phase IV/V continuation for seven sites, Pensacola, FL, Kalamazoo, MI, LaGuardia, NY, Islip, NY, Medford, OR, Dayton, OH and Memphis, TN. Also included in the request is $13,930,000 for other direct program costs. Products and services delivered include: the Chicago, IL ATCT (ORD) lease payment, formal facility requirements documentation, siting evaluations for all ATCT planning locations under consideration, preliminary engineering, and program management.

Benefits: The terminal air traffic control facilities replace program contributes to FAA's system efficiency goal. New and replacement facilities support the NAS modernization strategy achieve efficient aerospace systems and operations. Strategic location, adequate height, and cab size of an airport traffic control tower will provide an efficient working environment, enable controllers to achieve an aerial view of the airport and fulfill the requirement to be able to see aircraft at the outer aircraft movement areas. This will result in enhanced safety and increased capacity, which will benefit the users.

Replace Terminal Air Traffic Control Facilities:

Phase I/II – Funding of $5,100,000 for three design starts.
Baltimore, MD - $2,000,000
Columbia, SC - $2,000,000
Champaign, IL – 1,100,000

Phase III - Funding of $93,131,434 for construction of five facilities started in previous years.
Abilene, TX - $17,000,000
Cleveland, OH - $50,000,000
Traverse City, MI - $11,174,900
Ft. Lauderdale, FL- $5,049,000
Las Vegas, NV - $9,907,534

Phase IV/V - Continuation funding of $22,134,042 for seven facilities started in previous years.
Pensacola, FL - $1,405,696
Kalamazoo, MI - $894,000
Memphis, TN - $4,580,072
Islip, NY - $5,093,612
LaGuardia, NY - $9,476,557
Medford, OR - $60,000
Dayton, OH – $624,105

Other - Funding of $13,930,000 is required for other direct program costs.

- Construction Leaseback: Chicago ATCT, Chicago, IL $3,400,000
- Advance Requirements Definition $1,280,000
- Engineering, Siting and Program Management Support $9,250,000

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	463	$1,710,688.5 [1]
FY 2008 Appropriated	24	162,630.0
FY 2009 Request	15	134,295.5
FY 2010-2013	28	640,000.0
Total	530	$2,647,614.0

[1] Includes $9,300,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes $9,854,675 reduction of the FY 2001 funds pursuant to rescission contained in P.L. 107-87, December 18, 2001. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Phase I–V Funding	15	$120,365.5
2. ORD Construction Lease Back	---	3,400.0
3. Advance Requirements Definition	---	1,280.0
4. Engineering, Siting and Program Management	---	9,250.0
Total	15	$134,295.5

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B07	**Airport Traffic Control Tower (ATCT)/Terminal Approach Control (TRACON) Facilities – Improve**	**$37,900,000**	**Various**	**F-01, M-08**

FAA Strategic Goal: Reduced Congestion – Increase airport capacity to meet projected demand.

Description of Problem: The FAA must continually upgrade and improve aging terminal facilities and equipment to provide an acceptable level of service and to meet current and future operational requirements. Upgrades and improvements include replacing obsolete equipment, such as tower cab consoles, and rehabilitating administrative and equipment space due to facility expansion. Facility expansion includes adding operational positions, training space, base building construction, and environmental equipment, accessibility, structural and electrical upgrades.

Facility improvements must incorporate new requirements and ensure an orderly transition to the new arrangement, for relocated or replaced equipment, with minimal impact to existing operations. The power and heating, ventilation and air conditioning (HVAC) systems at many terminal facilities must be upgraded to handle both the new and old equipment during the in-service change-out. A successful transition of improvement projects is critical. In many towers, there is no room for additional equipment; therefore, base buildings must be expanded.

An initial screening indicated a number of FAA ATCT/TRACON buildings do not meet Federal Emergency Management Agency (FEMA) criteria for seismic activity. This program improves the capability of facilities to withstand a seismic event in accordance with FEMA and Department of Transportation directives.
Facility condition assessments are necessary to determine the overall needs for facility improvements and to prioritize locations for investing improvements. These assessments are an in-depth evaluation of all the components of a facility.

Description of Solution: For FY 2009, $37,900,000 is requested as follows:

- $24,259,000 to improve, repairs, and sustain ATCT/TRACON facilities that are not candidates for replacement. This funding includes the relocation of approach control functions to other existing locations, reducing the number of approach control facilities, while providing the same service.

- $5,000,000 to initiate seismic modifications to ATCT/TRACON facilities that are not candidates for replacement.

- $5,341,000 to support system engineering, configuration management, risk management, facility planning, and other program support services.

- $1,700,000 for facility condition assessments.

- $1,600,000 for In-Service Engineering.

Benefits: The ATCT/TRACON Terminal Facilities Improvement Program (TFIP) contributes to FAA's goals. Upgrading and improving facilities supports the NAS modernization strategy to achieve efficient aerospace systems and operations. Improvement projects will enable facilities to maintain current operational, environmental, and safety needs in lieu of replacing or relocating the entire facility. This effort will result in a smooth and orderly transition of new equipment into the FAA's terminal facilities. This will also improve the operational efficiency and environment of equipment operating within ATCT/TRACON facilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$582,378.3
FY 2008 Appropriated	---	47,000.0
FY 2009 Request	---	37,900.0
FY 2010-2013	---	196,800.0 [1]
Total	Various	$864,078.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Costs ($000)
1. Improve Terminal Facilities - Modernize	---	$10,383.0
2. Seismic Modifications	---	5,000.0
3. Improve Terminal Facilities - Sustain	---	13,876.0
4. System Engineering/Program Management	---	4,741.0
5. Advance Facility Planning	---	600.0
6. Facility Condition Assessments	---	1,700.0
7. In-Service Engineering	---	1,600.0
Total	Various	$37,900.0

[1] Future requirements are based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B08	**Terminal Voice Switch Replacement (TVSR)**	**$8,400,000**	**Various**	**C-05, M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: As of FY 1994, over 70 percent of the voice switches in operation in the terminal environment were either the obsolete electromechanical or the aging analog switch installed from the 1960s through the 1980s. These older systems are unsupportable and replacement switches are required to ensure the continuation of effective air traffic control services. This program will replace these older switches with modern digital equipment and will significantly improve the operational and maintenance aspects of terminal operations. The acquisitions under this program also serve as the contract vehicles to provide equipment to new or modernized terminal facilities.

Description of Solution: This modernization program will replace the obsolete electromechanical and non-supportable electronic voice switch systems in terminal facilities. The terminal voice switch program consists of six major procurements: Small Tower Voice Switch (STVS) for small switches, Enhanced Terminal Voice Switch (ETVS), Rapid Deployment Voice Switch (RDVS) for large switches, Interim Voice Switch Replacement (IVSR), Conference Control System (CCS) and the Voice Switch By-Pass (VSBP). The STVS procurement was completed in FY 2002 with its last delivery in March 2002. The replacement of the conference control system consists of a single procurement for a new system at the Air Traffic Control System Command Center (ATCSCC), which went operational in October 2004. The VSBP is installed at terminal facilities to provide back-up access to selected radios. This contract will expire in June 2007; a follow on contract is being established. The ETVS and RDVS-IIA contracts are indefinite delivery/indefinite quantity (IDIQ) commercial off-the-shelf procurements. The ETVS contract was extended through June of 2007. The RDVS-IIA acquisition contract expired in December 2003, but systems for new facilities are in storage and installations continue. The IVSR contract was awarded in November 2004 and received an in-service decision in March 2007.

Prior year funding provided for the delivery of 447 voice switches, replacement of the air traffic control headsets in the terminal environment, and replacement of the conference control system at the ATCSCC. In FY 2006, $7,920,000 was appropriated to procure, deliver, install and sustain terminal voice switches. The FAA will continue the in-service decision (ISD) activities on the IVSR contract, as well as deliver and install voice switches at 15 airports, including Atlanta, Chicago and Phoenix (all OEP airports). Sustainment activities will continue on STVS, ETVS and RDVS voice switches that have been installed in the National Airspace System. In FY 2007, $11,300,000 was appropriated to complete the in-service decision (ISD) activities on the IVSR contract. The program office will procure, test, deliver, and install 10 systems. In FY 2008, $11,800,000 was appropriated to procure, deliver, test, and install 10 terminal voice switches. The FAA plans to perform system upgrades to existing RDVS sites and system expansions for three other sites. Sustainment activities will continue on previously deployed voice switches (STVS, ETVS and RDVS). Also, $200,000 was provided for IOT&E and $300,000 for in-service engineering activities.

For FY 2009, $7,900,000 is requested to procure, test, deliver, and install 10 terminal voice switches. An additional $500,000 is requested for in-service engineering.

Benefits: This program provides reliable voice communications in support of air traffic terminal operations. The reliability of communications from controller to controller and controllers and pilots is vital to a safe air traffic control system. By providing an essential element of FAA's communications network, this program will support the safety of our transportation system. Approximately $7,300,000 per year will be saved in operational costs by reducing the current annual maintenance cost for electromechanical switches, reducing annual depot support costs, and reducing man-year costs associated with greater reliability and inherent.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	447	$232,517.3 [1]
FY 2008 Appropriated	10	12,300.0
FY 2009 Request	10	8,400.0
FY 2010-2013	30	10,300.0
Total	497	$263,517.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Voice Switch Procurement	---	$3,449.7
2. Technical Support	---	1,800.0
3. Program Management Support	---	1,700.0
4. Logistics and Testing Support	---	725.3
5. Information Security	---	225.0
6. In Service Engineering	---	500.0
Total	Various	$8,400.0

[1] Includes $620,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999; and $30,730 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106-544. Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Location:	CIP Item(s):
2B09	**NAS Facilities OSHA and Environmental Standards Compliance**	**$26,000,000**	**Various**	**F-13, M-39**

FAA Strategic Goal: Environmental Stewardship – Reduce pollution and other adverse effects of transportation and transportation facilities.

Description of Problem: Environmental and occupational safety and health violations at FAA facilities have resulted in regulatory actions against FAA and have caused disruptions to National Airspace System (NAS) operations. In 2003, the Occupational Safety and Health Administration (OSHA) conducted 17 inspections of FAA facilities and issued 50 citations, including 30 citations listed as "serious." For example, ARTCC employees registered numerous complaints regarding indoor air quality at the Jacksonville Air Route Traffic Control Center (ARTCC) were registered with the Center for Disease Control in January 2005. The majority of the complaints were asbestos and mold related requiring an aggressive cleanup programs. In addition, there are approximately twenty EOSH events each month that disrupt NAS operations.

Description of Solution: This program implements Executive Orders 12088, 12196, 12223, 13148 and 13385, 32 public laws and negotiated labor agreements in occupational safety and health, environmental, fire life safety, and energy conservation. The result will be a safe, healthful, and environmentally sound work place.

For FY 2009, FAA requests $26,000,000 for the following activities:

- Asbestos control program – The FAA will conduct surveys, take corrective action and monitor air quality. Asbestos control is a major issue in ARTCC modernization and could result in a facility shutdown.
- Fall protection program – The FAA will continue to develop procedures for climbing towers and navigational aids (some as tall as 420 feet), perform structural analyses, design corrective systems, purchase climbing and install climbing equipment, work with program offices to retrofit communications towers and navigational aids that are structurally unsound and do not comply with OSHA regulations.
- Hazard communication program – The FAA will continue to identify and label hazardous chemicals. This program includes the polychlorinated biphenyls (PCB) abatement program, which includes tracking, testing, and safely disposing of equipment such as transformers containing PCBs.
- Lockout/tagout (LOTO) and electrical safety program – Hazardous energy is present in all NAS facilities and FAA employees have been injured by electrical shock incidents in the past. This program protects FAA employees from injury or death due to electrical hazards. FAA will conduct system analysis for hazardous energy, develop equipment and facility specific LOTO procedures, and purchase initial LOTO safety equipment.
- Employee training programs – This program emphasizes safe practices in high risk areas such as fall protection, electrical/high voltage, control of hazardous energy, and working in confined spaces. The FAA will continue to audit FAA Academy courses for necessary safety, health, and environmental issues, provide input and work with FAA Academy to develop/identify new course materials to address new hazards.
- Design review – Significant cost savings result when safety fixes are designed and implemented before system deployment. The FAA will evaluate new FAA systems for safety, health, and environmental concerns to design workplaces free of hazards.
- Radiation protection – This program administers routine surveys and radiation safety awareness training.
- Pollution abatement – The FAA will work to minimize pollution by engine generators and hazardous materials used in maintenance tasks.
- Equipment and facilities decommissioning – This program ensures that hazardous material evaluations are made before disposal or transfer, which will reduce the FAA's future liability.
- Indoor air quality (IAQ)/mold program – The FAA will continue to conduct investigations and air sampling to resolve increasing IAQ/Mold issues at FAA facilities.

- EOSH impacts on NAS facilities – This program works to minimize EOSH impacts from construction projects on NAS facilities through increased project coordination and oversight.
- Fire Life Safety Upgrades – The FAA will continue fire life safety upgrades at ATC towers to comply with OSHA regulations; develop fire prevention plans and model specifications; train tower occupants, resident engineers, maintenance technicians, and employees. The FAA plans to retrofit nearly 400 towers to provide earlier fire detection and notification and to protect the single egress path. FY 2009 funding will initiate and certify 15 fire life safety designs to support ATCT compliance with OSHA requirements and initiate 25 fire life safety construction projects to support compliance with OSHA requirements.

Benefits: The NAS Facilities OSHA and Environmental Standards Compliance program maps to the FAA goals of organizational excellence and environmental stewardship by developing better safety management techniques. The benefit of this program will result in a safe, healthy, and environmentally sound work place; a decrease in costs associated with workers -compensation claims and environmental cleanups; and a decrease in adverse impacts to the NAS. The Environmental and Occupational Safety and Health Services, ATC-Facilities conducted a Cost-Benefit Analysis for this budget line that showed a Benefit to Cost Ratio of 2.2 to 1 and an internal rate of return (IRR) of 8.12 percent.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$396,289.4 [1]
FY 2008 Appropriated	---	26,000.0
FY 2009 Request	---	26,000.0
FY 2010-2013	---	104,000.0
Total	Various	$552,289.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Environmental and Occupational Safety and Health (EOSH) Compliance	---	$16,000.0
2. Fire Life Safety for ATCTs	---	10,000.0
Total	Various	$26,000.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B10	**Airport Surveillance Radar (ASR-9)**	**$8,800,000**	**Various**	**S-03, M-25, M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Airport Surveillance Radar Model 9 (ASR-9) provides aircraft target and weather information to air traffic controllers, which help reduce delays and improve safety at high activity airports. The ASR-9 system was designed and deployed in the 1980s and 1990s, and has experienced an increase in failures. As a result of these failures, reliability and performance levels have degraded, thus adversely impacting efficiency. Therefore a service life extension of the ASR-9 hardware is necessary to continue system operation, improve reliability and performance levels, and maintain the current level of safety.

Description of Solution: The FAA developed a two-phased strategy to provide the 135 highest traffic airports aircraft surveillance services. Phase 1 immediately addresses the highest risk physical equipment repair and replacement in order to sustain operations. Phase 2 is a long-term strategy that will reduce overall service risk through 2025. This two-phased approach is more affordable and lowers risk.

Phase 1 was broken down into two elements, Phase 1A and Phase 1B. Phase 1A included: external antenna modifications to mitigate risk of structural collapse; replacement of the obsolete ASR-9 Remote Monitoring System (RMS) and Mode-S Maintenance Data Terminals (MDT) which mitigated technical obsolescence risk (unavailability of spare parts); and modifications to the waveguide and pedestal that addressed additional OSHA issues. The Joint Resources Council approved the investment required for performing the work under Phase 1A in September 2004. The last year of funding received for Phase 1A was in FY 2008.

Phase 1B consists of modifications to the ASR-9 transmitter to improve reliability and maintainability. A final investment decision for Phase 1B was obtained in June 2005.

Phase 2 consists of implementing additional modifications to the aging primary ASR-9 radar systems to sustain primary surveillance in terminal airspace through 2025. The sustainment of the ASR-9 aligns with the Next Generation Surveillance Roadmap Decision, and the ADS-B backup strategy.

In FY 2007, $15,900,000 was appropriated for Phase 1A and 1B activities. Under Phase 1A, $1,100,000 was used to perform installations for the external modification project consisting of up to five different modifications per site; such as antenna reinforcements, waveguide refurbishments and replacements, ASR-9 control and monitoring, and pedestal oil splash shield and leveling hardware. Under Phase 1B, $14,800,000 was used to complete development, test, and installation of first article transmitter modification; commence production of transmitter modification kits for 135 sites; and, begin implementation planning for the installation, testing, and acceptance of the production kits. Funding was also used to provide IOT&E oversight support.

In FY 2008, $11,200,000 was appropriated for Phase 1A and 1B activities. Under Phase 1A, $900,000 will be used to finish the installations of external antenna modification kits at operational sites. Under Phase 1B, $4,600,000 will be used to continue transmitter modification installations. Also, $400,000 was appropriated for IOT&E and $400,000 was appropriated for in-service engineering. An additional $4,900,000 was appropriated to site and install an ASR-9 at Chicago O'Hare International Airport.

For FY 2009, $8,800,000 is requested, of which $3,300,000 will continue Phase 1B transmitter modification installations, $4,300,000 will complete the business case development for Phase 2 SLEP, award a contract for design and development, and procure and implement non-development items. Also, $900,000 is requested to provide in-service engineering support, and $300,000 is requested for IOT&E.

Benefits: Terminal radar reduces delays and improves safety at congested airports. During instrument meteorological conditions the radar provides air traffic controller's information that allows closer aircraft operations and increases air traffic arrival and departure operations. Modifying these radar systems reduces the risk of outages and ensures the continuation of maximum service capabilities during poor visibility, night time, and adverse local weather conditions. In addition, it reduces the overall lifecycle operation and maintenance cost of the systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$997,631.8 [1]
FY 2008 Appropriated	---	11,200.0
FY 2009 Request	---	8,800.0
FY 2010 - FY 2013	---	2,200.0
Total	Various	$1,019,831.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Transmitter Modification Installations (Phase 1B)	---	$3,300.0
2. Contract Award and Procurement of non-development items (Phase 2)		4,300.0
3. In Service Engineering	---	900.0
4. Independent Operation Test and Evaluation	---	300.0
Total	Various	$8,800.0

[1] This funding includes the St. Louis Relocation Project and the Palm Springs Installation Project.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B11	**Terminal Digital Radar (ASR-11)**	**$17,100,000**	**Various**	**S-03**

FAA Strategic Goal: Reduced Congestion – Increase capacity to meet projected demand.

Description of Problem: Radar is a critical part of the National Airspace System (NAS), which allows air traffic controllers to determine an aircraft's precise location. When radar information is supplemented with weather information, FAA is able to provide an additional level of safety, especially during storms, to continue the safe, efficient and orderly operation of the NAS.

Many terminal areas are still using 20-30 year-old analog radars and Air Traffic Control Beacon Interrogator (ATCBI) systems that have reached the end of their projected life-cycles. The FAA must replace these older surveillance systems to continue primary and secondary radar service. Furthermore, these older systems do not provide the digital surveillance data required for the operation of new automation systems such as the Automated Radar Terminal System (ARTS) IIIE and Standard Terminal Automation Replacement System (STARS).

Description of Solution: The FAA and the Department of Defense (DoD) awarded a contract in 1996 for a single integrated digital primary and secondary radar system, the Airport Surveillance Radar, Model 11 (ASR-11). The program was originally scheduled to provide 112 ASR-11 radar systems. In FY 2005, FAA established an interim program baseline to deploy the ASR-11 radar system to 66 sites. The FAA completed an alternative analysis in FY 2006 and determined that additional systems would not be procured. There will be 38 ASR-8 radars that will remain in the NAS.

The ASR-11 radar system provides digital surveillance data for digital automation systems such as STARS and ARTS IIIE. The ASR-11 radar system replaces the aging infrastructure with new radar facilities, including advanced grounding and lightning protection systems, digital or fiber optic telecommunications, emergency backup power supplies, and enhanced physical security. The ASR-11 radar system also provides a six-level National Weather Service calibrated weather capability that is not available with existing radar systems.

Since July 2000, FAA has conducted 110 site surveys, developed 84 site designs, contracted 62 facilities constructions, ordered 66 ASR-11 radar systems, and commissioned 31 systems through end of FY 2007.

In FY 2008, a total of $19,600,000 was appropriated to procure three facilities constructions and 13 demolition and restorations. An additional $700,000 was provided for test proof kits for in support of technology refresh initiatives. The program plans to commission six systems.

For FY 2009, a total of $17,100,000 is requested at the target level to procure 11 demolition and restorations and purchase the final set of depot spares. The program is conducting a business case analysis to support the $5,700,000 requested to begin Technology Refresh for purchase of the initial 14 kits to commence deployment. The funding would be used to replace the obsolete COTS hardware cards within the signal data processing card rack with the Advanced Signal Data Processor (ASDP). The ASDP reduces the number of processing cards from fourteen to three. The program plans to commission two systems.

Benefits: The ASR-11 radar system is more reliable and costs less to maintain than the existing analog radar systems. The ASR-11 system includes technology that will reduce the time it takes to repair these systems, in addition to reducing outages. The resulting improvement in operational availability will reduce aircraft delays that result from these outages. This will reduce the cost to the airlines and flying public in the form of passenger value time and aircraft direct operation costs.

The ASR-11 reduces operations and maintenance costs because it requires less maintenance than existing radars through the use of extensive computer-aided fault-isolation capabilities and remote system monitoring and certification. For example, earlier versions of the airport surveillance radars (ASR-7 and ASR-8) needed weekly certification by the maintenance technician at the radar site, while the ASR-11 system can be remotely certified without visiting the site.

The ASR-11 radar system also provides National Weather Service-calibrated six-level weather information to air traffic controllers – a feature that was not available in the older radars. During poor weather conditions, the additional weather data allows controllers to handle more operations. Replacing and improving the existing radars with the ASR-11 allows FAA to provide a higher level of air traffic services during poor visibility, nighttime, and adverse local weather conditions.

The ASR-11 radar system also supports the Homeland Defense security mission by providing digital radar coverage to fill gaps between established FAA high-altitude radars.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	66	$657,844.0 [1]
FY 2008 Appropriated	---	20,300.0
FY 2009 Request	---	17,100.0 [2]
FY 2010-2013	---	25,300.0 [3]
Total	66	$720,544.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$2,800.0
2. Program Management	---	1,300.0
3. Logistics Support	---	1,300.0
4. Second Level Engineering	---	1,400.0
5. ASR – 7/8 Disposition	---	4,600.0
6. Tech Refresh	---	5,700.0
Total	Various	$17,100.0

[1] The FY 2001 appropriation total has been adjusted to reflect rescission amounts pursuant to: P.L. 106-554, FY 2001, P.L. 108-7, February 20, 2003, and P.L. 108-199, January 23, 2004.
[2] Requirements for technical refresh are under review. FY 2009 Tech Refresh funding is included.
[3] Business case for ASR-11 ASDP requirements is being prepared. FY 2010-2013 Tech Refresh funding is not included.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B12	**DOD/FAA ATC Facilities Transfer**	**$1,400,000**	**5**	**F-04**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Department of Defense (DoD) will relinquish jurisdiction of approach control airspace and navigational equipment to FAA, in accordance with the DoD/FAA memorandum of agreement of 1993 and the Base Realignment and Closure Act of 2005. National airspace systems and equipment will be modernized to meet FAA standards at five locations.

Description of Solution: This program integrates segments of DoD airspace into the National Airspace System (NAS). Modernization of DoD legacy systems lowers costs for replacement parts; reduces long-term maintenance costs, repair time, and travel costs; increases FAA productivity by reducing the number of employee hours required to repair failures and outages; benefits our airline customers by reducing flight delays due to equipment failure; benefits airline passengers by increasing timely arrivals and departures; and increases NAS and ATC system reliability in all project locations.

In FY 2007, $1,300,000 was appropriated for modernizations at Adak, AK, El Toro, CA, Oakdale, PA, Willow Grove, PA, Brunswick, ME, and a flight inspection in Bermuda. Also, $1,000,000 was appropriated for DoD Base Closures. In FY 2008, $1,300,000 was provided for modernizations at El Toro, CA, Oakdale, PA, Willow Grove, PA, Brunswick, ME, Galena, AK, and a flight inspection in Bermuda.

For FY 2009, $1,400,000 is requested to continue engineering, acquisition, and installation of a modernized power distribution system at El Toro, CA; to design and install security and utility modernizations at base closure sites in Willow Grove, PA, and Brunswick, ME; to design and install repairs to the permafrost platform at Point Lay, AK; and to conduct a flight inspection in Bermuda.

Benefits: The program supports FAA's goal of increased capacity by enlarging and modernizing the NAS. DoD equipment and property added to FAA's existing systems would be upgraded and maintained to meet FAA standards. This increase capacity results from streamlining air traffic procedures, increasing system capabilities, and enhancing radar accuracy.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	43	$30,151.4
FY 2008 Appropriated	5	1,300.0
FY 2009 Request	5	1,400.0
FY 2010-2013	---	5,800.0 [1]
Total	53	$38,651.4

[1] Future requirements are under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
DoD/FAA ATC Facility Transfer 1) El Toro, CA 2) Willow Grove, PA 3) Brunswick, ME 4) Point Lay, AK 5) Bermuda	5	$1,400.00

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B13	**Precision Runway Monitors (PRM)**	**$1,000,000**	**Various**	**S-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Precision Runway Monitor (PRM) system allows simultaneous independent approaches on closely spaced parallel runways less than 4,300 feet apart, returning a portion of lost capacity during adverse weather conditions and thereby reducing delays.

The PRM system is a highly accurate, electronic scan (e-scan) radar that tracks and processes aircraft targets in a one second update rate (as opposed to 4.8 seconds with conventional radars). The PRM system provides the controller with automatic alerts and high resolution displays that, in conjunction with specific procedures, enable pilots to fly simultaneous independent approaches to parallel runways spaced less than 4,300 feet. Parallel runways can be used for independent/simultaneous approaches during visual meteorological conditions (VMC); however, in instrument meteorological conditions (IMC), closely spaced runways cannot be used for independent/simultaneous approaches without PRM technology. The inability to conduct simultaneous approaches during adverse weather reduces throughput and increases delays. PRM supports FAA initiatives of increasing operational efficiency while reducing delays and maintaining operational safety standards.

Description of Solution: In 1992, Congress mandated installation of production PRM systems at five candidate airports with closely spaced (i.e., 750-4,300 feet) parallel runways. Systems were installed at Minneapolis (MSP), St. Louis (STL), Philadelphia (PHL), New York (JFK) and Atlanta (ATL) airports. From FY 1998 through FY 2001, three systems were commissioned (MSP, STL and PHL). The FAA entered into a National Agreement with the City of San Francisco to provide a PRM system to the San Francisco International Airport. Under a Memorandum of Agreement (MOA), the City of San Francisco received the system originally designated for Atlanta, procured another PRM system, and agreed to reimburse the FAA for oversight and management of the installation activities. The ATL PRM installation contract award was delayed in FY 2002 due to additional runway construction. In FY 2003, the FAA Administrator directed that the system procured under the San Francisco MOA be installed in Cleveland (CLE). There was a Congressional mandate to initiate the procurement of three additional PRM systems for ATL, Detroit (DTW) and a site to be determined. Due to agency priorities and funding limitations, only one PRM system would be procured, which would be for the ATL site. In FY 2004, due to operational issues, the JFK system would be removed and assets sent to the Aeronautical Center to resolve supportability issues with the other systems. In FY 2005, the SFO and CLE systems were commissioned (for a total of five). Evaluation of Multilateration (MLAT) technology as a possible replacement for the E-scan PRM at Detroit (DTW) was initiated, as required by Congressional language. The MLAT subsystem, known as PRM-A, will provide accurate position and identification information on transponder equipped aircraft and surface vehicles by "multilaterating" on signals transmitted by the transponder. In FY 2007, the ATL system was commissioned bringing the total number of commissioned systems to six.

In FY 2008, a total of $9,000,000 was appropriated to support parallel runway operations at Detroit (DTW) using a multilateration sensor with precision runway monitoring capability. This funding will be utilized: to complete the design, testing and commissioning of the DTW system; to complete the construction, infrastructure support and installation for the Multilateration system at DTW; to procure, install and commission ILS equipment; for procedures development, planning, administrative and engineering support services covering the development, installation, testing and commissioning of the DTW system and its support infrastructure; to perform Air Traffic and Airways Facility training. This will result in the qualification of the PRM-A as an effective, low-cost alternative to the legacy PRM E-Scan system.

For FY 2009, $1,000,000 is requested to conduct an investment and economic analysis of replacing legacy PRM E-Scan systems with the Multilateration PRM-A system, and determining other candidate sites with closely-spaced parallel runways that may benefit from this technology.

Benefits: The commissioning of PRM and implementation of simultaneous approach procedures at selected airports can restore diminished capacity during adverse weather for approach and landing during instrument meteorological conditions. PRM allows simultaneous approaches to be closer together while retaining equivalent or improved levels of safety.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	7	$186,711.5 [1]
FY 2008 Appropriated	1	9,000.0
FY 2009 Request	---	1,000.0
FY 2010-2013	---	0.0 [2]
Total	8	$196,711.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program/Business Management	---	$330.0
2. Cost/Benefits Estimation	---	300.0
3. System Engineering	---	200.0
4. Second Level Engineering for DTW	---	170.0
Total	Various	$1,000.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B14	**Runway Status Lights (RWSL)**	**$26,960,000**	**Various**	**S-11, M-25**

FAA Strategic Goal: Increased Safety – Reduce the risk of runway incursions.

Description of Problem: The FAA's Flight Plan performance goal is to reduce category A and B runway incursions to a rate of no more than 0.509 per million operations by FY 2008, 0.450 by 2010 and maintain or improve that rate through FY 2012. The FY 2004 reported number of A and B incursions, 28, represents a rate of .444 per million operations. The FY 2005 runway incursion status report shows 29 category A and B incursions, or .460 per million operations. The FY 2006 runway incursion status report shows 31 category A and B incursions, or .507 per million operations. This trend shows an increase rather than decrease in both numbers and rate. While the numbers are not statistically conclusive, their volatility suggests that additional efforts will be required to ensure that the *Flight Plan* performance target is achieved. The establishment of additional installations to accrue incremental RWSL functionality will contribute toward the accomplishment of the Flight Plan performance target.

Description of Solution: Runway Status Lights (RWSLs) act as stoplights on runways and taxiways, signaling when it is unsafe to enter, cross or begin takeoff on a runway. Located along the centerline of a runway or taxiway, Runway Entrance Lights (REL) and Takeoff Hold Lights (THL) will illuminate red when a runway is in use, notifying the pilot of a taxiing aircraft to either stop prior to crossing the runway, or yield to the aircraft landing or taking off. Since most runway incursions are caused by pilot deviations, RWSLs are a vital layer of redundancy in runway safety and provide a back up and reinforcement of controller guidance.

In FY 2007, $5,713,854 was appropriated to continue Investment Analysis of the RWSL Program. An Initial Investment was approved at the Joint Resource Council in July 2007.

In FY 2008, $9,000,000 was appropriated, of which $8,700,000 will be used to complete Investment Analysis and begin procurement activities for contract award. Funding will also be used to conduct pre-site surveys at designated airports. Provide funding to sites where on-going construction ties to RWSL site configuration to avoid duplicate construction efforts and costs. The remaining $300,000 will be used for Independent Operational Testing and Evaluation (IOT&E).

For FY 2009, $26,960,000 is requested to provide additional funding for the software design, development, testing, and implementation activities at the key site. This contract would also have options for procurement of additional systems. This funding will also cover construction activities at key site and other RWSL sites. Included in the request is $460,000 for Independent Operational Testing and Evaluation (IOT&E).

Benefits: Implementation of RWSL will reduce the likelihood of runway incidents. Most accidents take place at takeoff or landing; therefore, a reduction in runway incursions directly translates into avoided accidents. Current runway accident risk models indicate that even with ASDE-X and AMASS, a residual risk remains. RWSL is expected to address a significant portion of the remaining risk. Preliminary cost-benefit data suggests a positive business case for deployment of RWSL to high-risk airports. Specifically, current runway accident risk models indicate a risk-based return on investment in RWSL deployment to 19 airports.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$5,713.8
FY 2008 Appropriated	---	9,000.0
FY 2009 Request	---	26,960.0
FY 2010-2013	---	66,000.0
Total	Various	$107,673.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$10,848.8
2. Program Management	---	2,631.1
3. Hardware and Software	---	9,980.7
4. Construction	---	3,039.4
5. Independent Operation, Test and Evaluation	---	460.0
Total	Various	$26,960.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B15	**National Airspace System Voice Switch (NVS)**	**$10,000,000**	**Various**	**C-05**

FAA Strategic Goal: Greater Capacity - Increase capacity to meet projected demand and reduce congestion.

The FAA has identified this program as a "Transformational" program for NextGen. The most direct alignment to a NextGen goal is Aircraft Trajectory Based Operations.

Description of Problem: There are currently 17 different types of voice switches in the NAS. There are several different support contracts in place to provide logistics support to these configurations. Training and spares are required to be in place to support each switch configuration. Some of the switches have been in the inventory more than 20 years and are starting to experience an increase in parts usage. This infrastructure and the aging of the system are starting to impact the operational budget. The current switch technology will not support the expected future NAS operations, as envisioned by NextGen, of either reduced facilities or such concepts as dynamic re-sectorization, major facility backup, resource reallocation, and off-loading during non-peak operations.

Description of Solution: The NAS Voice Switch will support current and future Air Traffic Control (ATC) operations as envisioned by government and industry forecasters. Much of this focus has been on reducing the duplication of functions and costs currently existing among the many systems providing ATC communications. This is driven by the demand to reduce operating, maintenance, and technology refresh costs. In conjunction with current technologies, a common architecture platform is currently being analyzed to resolve these issues. In FY 2007, $500,000 was appropriated for initiating an investment analysis to start the program. In FY 2008, $3,000,000 was provided for completion of the investment analysis and to support engineering studies for:

- A traffic study on the current usage of operational communications lines connecting ATC facilities;
- An engineering study to look at digital voice protocols (Voice Over Internet Protocol (VOIP), Time Division Multiplexing (TDM), etc.) as transported over a network in relation to Air Traffic control communications. The study would look at latency, message formatting, implementation, migration and other areas; and
- A switching study looking at signaling and network layers.

For FY 2009, $10,000,000 is requested to complete a network analysis study to determine candidate network topologies, conduct vendor demonstrations, and complete investment analysis activities leading to a Final Investment Decision for the JRC.

Benefits: The NAS Voice Switch program maps to the FAA goal of increased airport capacity to meet reductions in the projected operating costs by: reducing the number of equipment components needing to be inventoried, by reducing the number of switch types; reducing acquisition, training, and maintenance costs by reducing the number of voice-switch designs; improving equipment availability and related inventory issues by reducing obsolete equipment; and reducing potential costs to users from air traffic delays due to projected outages of the existing systems and increased user demand.

The NAS Voice Switch program will allow FAA to achieve voice switching modernization objectives such as a network-based infrastructure as well as evolve toward a flexible communications routing architecture that supports dynamic re-sectorization, resource reallocation, airspace redesign and the NextGen vision (e.g., improving flow capacity).

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$500.0
FY 2008 Appropriated	---	3,000.0
FY 2009 Request	---	10,000.0
FY 2010-2013	---	190,000.0 [1]
Total	Various	$203,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Cost Analysis	---	$1,500.0
2. Engineering Analysis	---	2,500.0
3. Program Management Support	---	2,000.0
4. Technical Center Demonstration	---	2,000.0
5. Documentation	---	2,000.0
Total	Various	$10,000.0

[1] Future requirement under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B16	**Weather System Processor (WSP) Technology Refresh**	**$700,000**	**Various**	**W-09**

FAA Strategic Goal: Increased Safety - Reduce the commercial airline fatal accident rate.

Description of Problem: Fifteen years since a National Transportation Safety Board (NTSB) recommendation (A90-84) required Airport Surveillance Radars (ASR-9) be modified to detect wind shear, 34 Weather Systems Processors (WSP) are in service today. The WSP protects four OEP airports and is the primary source of wind shear and microburst warnings at nine busy (ATC Level-9 thru 12) Control Towers and 25 medium intensity facilities in 20 States. The WSP uses substantial numbers of Commercial Off The Shelf (COTS) proprietary software and hardware components. As of April 2005 nearly 70 percent of the WSP parts were technically obsolete, past their End of Service and Repair (EOSR) or were otherwise discontinued by the manufacturer. Interim Contract Depot Logistic Support (ICDLS) has had to resort to bidding in on-line auctions in order to obtain critical, out-of-manufacture WSP parts to accomplish repairs.

By 2007, the WSP Contract Depot will fully deplete stock of many WSP parts and can no longer replenish certain high-failure-rate/non-repairable items including CPUs, driver/driver interface cards, interlink modules and mother/daughterboard assemblies. Significant supportability problems and NAS operational risks will worsen when the contract depot, support sites such as the FAA Academy, and then operational sites begin to operate without spares on-site. Assuming current failure rates do not accelerate with age, FAA estimates the first WSP airport would lose WSP service altogether and could not return to service due to a lack of specific Line Replaceable Units (LRUs), within 3.6 years. WSP must receive a Technical Refresh to realize full benefits from the legacy $80 million plus Federal investment and thereby assure NAS service availability and continued air safety for the duration of WSP service life (Year 2021). Risks to the safe operation of the NAS will mount should WSP airports begin shuffling ever-increasing holes in on-site spares to cover normal usage.

Description of Solution: From 1990 to 2007 $81,400,000 was appropriated to develop procure and complete installation of the 34 WSP systems plus five support units. Additionally, in FY 2006, the FAA Air Traffic Organization Executive Council approved the WSP Technical Refresh Phase I Final Investment Decision to implement the first segment of the solution. FY07 funding was used to develop and procure prototypes, install and initiate testing software changes, and initiate documentation for the System Support Modification (SSM).

The technology refresh will modernize and reduce the number of Line Replaceable Units, re-host the operating system on a sustainable platform, inject modern solid-state technology in lieu of moving parts and address diminishing manufacturing sources through establishment of second sources and new repair vendors for WSP commercial components.

In FY 2008, $4,100,000 was appropriated to procure hardware and ready modification kits, beta test SSM at Key site, deliver and install 17 production modification kits, including five support systems.

For FY 2009, $700,000 is requested to procure additional modification kits and install 12 kits at WSP sites.

Benefits: Weather Systems Processors increase aviation safety through accurate and timely detection of hazardous microbursts, wind shear conditions, thunderstorms and gust fronts. The systems warn pilots, airports and air traffic flow control services of severe weather conditions and allow proactive adjustments. Since the WSP was deployed, no Commercial, Part 121 Air Carrier accidents caused by wind shear have occurred at any WSP-equipped airport. Weather related arrival and departure delays are also reduced, allowing savings in aviation fuel consumption. Operational benefits of the system include the real time detection and warning of wind shear and microbursts as well as prediction of gust fronts, storm cells, wind shifts, and precipitation coordinated identically among ground control, local control, approach control and ultimately pilots throughout the terrain airspace.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	39	$81,400.0 [1]
FY 2008 Appropriated	---	4,100.0
FY 2009 Request	---	700.0
FY 2010-2013	---	300.0
Total	Various	$86,500.0 [2]

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Continue procurement and installation of System Support Modification	Various	$700.0

[1] Prior year funding in the amount of $80,400.0 is associated with the original WSP program.
[2] Final investment decisions for WSP Technology Refresh Phase II (FY 2012-2014) and Phase III (FY 2016-2021) planned.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B17	**Next Generation Voice Recorder Replacement Program (VRRP)**	**$10,800,0000**	**Various**	**C-23, M-08**

FAA Strategic Goal: Increased Safety - Reduce the commercial airline fatal accident rate.

Description of Problem: FAA Order 7210.3 Facility Operation and Administration requires that ATC facilities "record operational communications to the maximum extent practicable." FAA Order 8020.11 and FAA Order 7210.56 require retention of data extraction records for accident and incident investigations. Recordings may be used to monitor any air traffic position for evaluation, training or quality control purposes and are to be available under requests made under the Freedom of Information Act. Voice recorders also are needed to support search and rescue activities. As the voice recorder technology has continued to evolve, early digital voice recorders have experienced obsolescence and supportability issues. These digital voice recorders are reaching the end of their service life utilizing obsolete operating systems and parts that have reached their end of life and are no longer manufactured. The remaining air traffic control analog voice recorders are beyond their expected service life and increasingly unreliable and expensive to maintain. Reduced availability critically impacts the detailed investigation of air traffic incidents and accidents. This reduced system availability impacts controller evaluation and training.

Description of Solution: The Next Generation Voice Recorder Replacement Program provides new voice recorders for en route and terminal ATC facilities. The program will replace obsolete and unsupportable digital voice recorders that have reached their 10-year end of life. The program will also provide the capability for new FAA facilities to procure voice recorder equipment and replace obsolete Dictaphone 9800 recorders in mobile air traffic control towers (MATCT). System deliveries of the next generation voice recorder replacement are planned through FY 2013.

In FY 2008, $10,500,000 was appropriated for procurement, delivery and installation of 85 systems.

For FY 2009, $10,300,000 is requested for procurement, delivery and installation of 120 systems. An additional $500,000 is requested for in service engineering.

Benefits: The Next Generation Voice Recorder Replacement Program will support the safety goal, providing legal recording capability between air traffic controllers, pilots and ground-based air traffic facilities in all ATC domains. It will also be utilized in the investigation of accidents and incidents and routine evaluation of ATC operations to include operational errors and operational deviations. Additionally, the program will reduce O&M costs to sustain recorder systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	10	$4,700.0 [1]
FY 2008 Appropriated	85	10,500.0
FY 2009 Request	120	10,800.0
FY 2010-2013	263	21,500.0
Total	478	$47,500.0

[1] First year Next Generation Voice Recorder Replacement Program (NGVRRP) (C23.01-00) funds in FY 2006 and beyond are shown. FY 2006 funds of $4.7M were transferred to C23.01-00 from the original Voice Recorder Replacement Program (VRRP) (CIP C23.00-00) to separate the two baselines. This decision was finalized by Executive Council decision on 30 April 2007.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Voice Recorder Procurement	120	$7,369.6
2. Program, Configuration, and Quality Management	---	1,312.6
3. Technical and Logistics Support	---	562.9
4. Second Level Engineering Support	---	619.2
5. Site Preparation and Implementation	---	435.7
6. In Service Engineering	---	500.0
Total	120	$10,800.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B18	Houston Area Air Traffic System (HAATS)	$3,600,000	Various	F-02

FAA Strategic Goal: Greater Capacity – Increase airport capacity to meet projected demand and reduce congestion.

Description of Problem: The city of Houston, Texas, initiated a $3.1 billion expansion effort for the three city owned airports: George Bush Intercontinental Airport (IAH), William P. Hobby Airport (HOU), and Ellington Field (EFD). The IAH expansion included an upgrade of one runway to air carrier standards and the construction of a new air carrier runway plus numerous terminal, air cargo, and supporting infrastructure expansions. The HOU expansion reconstructed the terminal for 26 additional gates for Southwest Airlines, and upgraded the instrument approach to Category III minimums. The EFD efforts include an upgrade of a runway. The upgrade of the existing runway (15R/33L) in May 2002 to air carrier standards at IAH resulted in a significant increase in departure capacity for the airport. The new air carrier runway (8L/26R) at IAH was commissioned October 2003. This runway provided a 50 percent increase in arrival capacity with the implementation of triple simultaneous instrument landing system (ILS) approach procedures. The increased airport capacity created by the new and expanded runways at IAH cannot be supported by the current air traffic control facilities, airspace and procedures that originate in the 1960s.

The city of Houston has recently completed a new master plan update for HOU and the IAH update is well underway. Both plans include: additional runways and expansion of existing runways, expansion of passenger terminals, and numerous other airport infrastructure projects. The increases in airport capacity created by the initial airport expansions of IAH and HOU cannot be supported by the existing airspace design or FAA facilities. Any future expansion of these airports will significantly increase congestion in the airspace surrounding the airports. Therefore, several existing FAA facilities must be upgraded, expanded, new systems need to be installed to support the expansion of the airspace.

Description of Solution: The Houston Area Air Traffic System (HAATS) program is designed to oversee all FAA activities associated with the expansion of the airspace, including those identified in the Operational Evolution Partnership (OEP) for the Houston area. The OEP identifies the redesign of the Houston terminal airspace as part of the National Airspace Redesign Program. The HAATS program will provide the infrastructure, system improvements, and implementation of the new procedures associated with the redesigned airspace. The HAATS program will integrate the improvements identified under the National Airspace Redesign Program and benefits from the new runways at IAH. The HAATS program, along with the associated new TRACON, will support the new airport capacities and support the growth and development of the aviation community in the Houston terminal area well into the 21st century.

In FY 2005, $11,904,000 was appropriated for construction of the communications, surveillance and navigational aids facilities; acquisition of communications equipment; and program support. These facilities were at nine locations.

In FY 2006, $10,098,000 was appropriated for equipment installation and integration of supporting networks for the communications, surveillance and navigational aids facilities; procurement of communications equipment; improved connectivity to existing support facilities; and program support.

In FY 2008, $4,000,000 was appropriated for Environmental Assessment for HAATS airspace; flight check for new navaids at Hardin County; flight check for airspace expansion changes; charting for airspace expansion; commissioning communication facilities; expanding existing TRACON to meet current growth; reconfiguration and refurbishment of three Houston ARTCC sectors; completing airport fiber loop and Tower/TRACON equipment segregation; and refurbishment of the Fort Worth ARTCC Paxto sector with program support.

For FY 2009, $3,600,000 is requested for completion of flight check activities for airspace expansion changes; continued charting for airspace expansion; establishment of a STARS remote at College Station (CLL); establishment of a remote transmitter/receiver (RTR) communications outlet at Sealy, TX; establishment of additional radio frequencies at Houston (I90) TRACON; completion of the refurbishment of three Houston (ZHU) ARTCC sectors; completion of all airport and Runway 9/27 fiber loops; completion of the Fort Worth (ZFW) ARTCC Paxto sector refurbishment; and program support.

Benefits: The HAATS Program has conducted two benefits studies: the Houston Gulf Coast Airspace Project Benefits Report conducted by MITRE in May 2003 and the Houston ARTCC and IAH/I90 Airspace and Airfield Analysis Project conducted by ATAC in February 2004. Both studies analyzed the benefits from the additional capacity generated from new and upgraded runways combined with new arrival and departure routes resulting from the airspace redesign. These analyses have been updated for the FY 2009 submission.

Both studies measured system savings in minutes saved per operation. This value was converted to dollars. The savings in time were very similar and consistent in both studies. The following dollar values are from the MITRE study estimated savings expressed in millions of dollars, present value, from 2002 – 2017. The study lists the following savings: Passenger Revenue of $1,108,900; Aircraft Direct Operating Cost (ADOC) $463,800; Fleet Savings $225,000; Passenger Value of Time (PVT) $799,000; for a Total Passenger Revenue Benefit of $2,597,700. With the current investment the agency is expected to start realizing payback by 2010.

The airport capacities created by the new and expanded runways at IAH cannot be supported by the current air traffic control facilities, airspace and procedures that originate in the 1960s. Implementation of the airspace and procedures modifications created by the new facilities, along with the associated new TRACON, will support the new airport capacities and support the growth and development of the aviation community in the Houston terminal area well into the 21st century.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$70,789.1
FY 2008 Appropriated	---	4,000.0
FY 2009 Request	---	3,600.0
FY 2010-2013	---	2,000.0
Total	Various	$80,389.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Installation/Integration of Facilities	---	$811.0
2. Environmental Assessment/Charting	---	700.0
3. Program Support/Flight Check	---	2,089.0
Total	Various	$3,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B19	**Integrated Display Systems (IDS) Technology Refresh and Sustainment**	**$7,000,000**	**Various**	**A-03**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Information Display System Version 4 (IDS-4) integrates several National Airspace System (NAS) data weather sensors and operational data onto a single display platform. The information is used by several thousand air traffic controllers. The IDS-4 vendor provided the FAA with a recent notification of obsolescence issues, making it unfeasible to continue long term sustainment of the IDS-4. The current IDS-4 system is one of the largest automation systems used by the air traffic control system and must be sustained in order to continue providing the same level of service to the flying community. These older systems are obsolete, unable to support, repair, or maintain future growth projections, and are not able to add new functionality. This is an operational risk to service. Because of this high risk, systems need to be replaced and sustained in the very near future (FY 2008 – FY 2009).

Description of Solution: Replace approximately 350 IDS-4 workstations at the three largest OEP airports and their respective TRACON networks. This will mitigate the risk of a catastrophic failure at these sites, and provide test, training, and 2nd level engineering support. The replaced IDS-4 workstations with the new equipment will be provided to the Logistics Center to boost their assets to assist sustainment of the remaining IDS-4 systems. This system will be a stop gap action necessary to provide the FAA time to develop and deploy the Terminal Flight Data Manager (TFDM) system as defined in the FAA Enterprise Architecture Automation Roadmap. TFDM implementation is currently planned in the Roadmap from 2015-2020.

For FY 2009, $7,000,000 is requested to replace approximately 350 of the 2,230 workstations at the three largest and oldest FAA networks, and to develop failure rate matrixes to measure future IDS-4 failure rates. This data will be used to annually validate future replacement requirements to the Capital Investment Team and to replace additional IDS-4 networks at a rate consistent with validated failures.

Benefits: The Integrated Display System will replace three of the largest and oldest IDS-4 systems with current technology at Southern California (SCT), New York (N90), and Chicago (C90). Replacement of these three systems will mitigate service provision risks at these sites. Replacement encompasses the minimum quantity of 300 workstations required to receive substantial quantity savings. Ensuring the system remains in service will help to sustain controller situational awareness by maintaining departure and arrival rates and providing more timely emergency response actions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	7,000.0
FY 2010-2013	---	0.0 [1]
Total	Various	$7,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
IDS-4	Various	$7,000.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B20	**Airport Surveillance Radar (ASR-8)**	**$3,000,000**	**Various**	**S-03**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The ASR-8 was procured and fielded in the late 1960's to early 1970's. The system provides target detection and clutter breakthrough (inadequate weather detection) to air traffic controllers to help reduce delays and improve safety at low and medium activity airports. The ASR-8 system was expected to remain operational until 2005 when it was to be replaced by the ASR-11. In 2006, the FAA Joint Resources Council revised the ASR-11 baseline which resulted in retention of 40 ASR-8's until 2020. The ASR-8 has experienced increased failures due to aging and obsolete parts resulting in degraded reliability and performance. As a result, a Service Life Extension Program (SLEP) for the ASR-8 is necessary to sustain radar service, improve reliability and performance levels, and maintain safety.

Description of Solution: The FAA is performing an investment analysis to determine the best alternative to sustain the ASR-8 service at low– medium activity airports until 2020.

In FY 2007, the FAA performed an investment analysis of three alternatives to determine the most feasible solution for addressing obsolescence issues and sustaining ASR-8 radar service to 2020. The FAA completed Investment Analysis decision 2A, which includes updating operational performance requirements, and performing an economic analysis of the three alternatives.

In FY 2008, the FAA continued its analysis of three alternatives for sustaining ASR-8 radar service to 2020. The FAA completed Investment Analysis decision 2B which includes obtaining detailed cost estimates and refining and updating the economic analysis to select the best alternative.

For FY 2009, $3,000,000 is requested to begin acquisition and implementation of the approved SLEP alternative to sustain ASR-8 radars and service to the year 2020. Implementation includes contract award for the design, test and installation of the SLEP alternative at a key site.

Benefits: Terminal radar reduces delays and improves safety at congested airports. During instrument meteorological conditions the radar provides air traffic controllers information that allows closer aircraft operations and increases air traffic arrival and departure operations. Modifying these radar systems reduces the risk of outages and ensures the continuation of maximum service capabilities during poor visibility, night time, and adverse local weather conditions. In addition, it reduces the overall operation and maintenance cost of the systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	3,000.0
FY 2010-2013	---	0.0 [1]
Total	Various	$3,000.0

[1] Future requirements are under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$300.0
2. System Engineering	---	500.0
3. Hardware/Software Design and Development	---	2,000.0
4. Independent Operation Test and Evaluation	---	200.0
Total	Various	$3,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B21	**Integrated Terminal Weather System (ITWS)**	**$4,500,000**	**Various**	**W-07, M-25, M-31, M-39**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Weather is the major contributor to air traffic delays, accounting for 65 percent of all delays, and 40 percent of accidents. Air traffic personnel in tower cabs and Terminal Radar Approach Control (TRACON) facilities rely on a number of terminal area sensors that collectively provide large amounts of weather data. Controllers manually interpret this data. Data from the various sensors may also be confusing. The main shortcoming of the present system is that it cannot anticipate short-term weather changes that affect capacity, safety, and efficiency in the terminal area, such as ceiling, visibility, windshear, microbursts, and thunderstorms, nor the impact of these changes on terminal operations. There is a need to consolidate and provide value-added, timely, and accurate weather forecasts and special products to the aviation system users and operations community.

Description of Solution: The Integrated Terminal Weather System (ITWS) will provide products to terminal aviation system users that characterize the current terminal weather situation and forecast anticipated weather conditions for the next 60 minutes. ITWS will integrate data and products from various FAA and National Weather Service (NWS) sensors (e.g., Terminal Doppler Weather Radar (TDWR), Airport Surveillance Radar, Next Generation Weather Radar (NEXRAD), Low Level Windshear Alert System, Airport Surface Observing System), aircraft (via the meteorological data collection and reporting system), and other NWS weather information systems. Products generated by ITWS include windshear and microburst predictions, storm cell and lightning information, and terminal area winds aloft. The ITWS situation displays at tower cabs, TRACONs, and their associated Air Route Traffic Control Centers (traffic management units and center weather service units) will facilitate a common situational awareness of severe weather phenomena among air traffic control personnel. Data will also be available to airlines and other airline industry users for their use in planning activities.

In FY 2006, the program completed development and integration of TCWF and procured two TCWF-capable systems (installed and tested the first in New York and began activities to install the second in Memphis). To improve program cost efficiency and mitigate increasing technical obsolescence due to pending changes in manufacturers' commercial product lines, the program also procured the hardware for the remaining 9 of 26 TCWF-capable production systems and 11 TCWF retrofits. The program is accelerating system deployments as much as possible in FY 2007 and FY 2008. The program began TCWF retrofit preparations, continued to fund the operation of the prototypes, and started activities to install production systems in FY 2007.

In FY 2007, $20,900,000 was appropriated to install and test seven TCWF-capable production systems and operationally commission four systems, completing replacement of the prototypes. ITWS completed installation of TCWF retrofits at all 11 previously installed non-TCWF production sites. The project also incorporated the TCWF enhancement into the Volpe Transportation Center ITWS External User 2 interface website. This website allows additional FAA and non-FAA users access to ITWS products on a real time basis. Additionally, technical support and transition to organic maintenance at delivered sites will continue to be supported.

In FY 2008, three systems will be installed and seven commissioned, completing ITWS Segment 1 (22 operational systems and 4 support systems serving 35 airports). In November 2007 the JRC approved the procurement of 11 of the 12 deferred sites and hardware for displays at 16 secondary and reliever airports. Related site preparations and installations will begin in FY 2008.

For FY 2009, $4,500,000 is requested to install seven ITWS Product Generators (PGs) and commission five ITWS Product Generators (PGs). Additionally, the communication lines and displays will be installed for the secondary and reliever airports. The requested funding will also provide for operational support of recently commissioned systems, and the addition of the new systems to the external user interface at Volpe which provides ITWS products to other authorized users such as the airlines. Funding will also provide for studies and concept demonstrations of potential NextGen weather capabilities and weather system integration initiatives for ITWS transition as part of future NextGen and SWIM capabilities.

Initial software development for an ITWS SWIM gateway at Volpe is included in the SWIM program FY 2009 request.

Benefits: National Transportation Safety Board (NTSB) statistics indicate weather-related delays cost the aviation industry and the traveling public approximately $4.1 billion per year, of which $1.7 billion per year is considered avoidable. Weather is a direct contributor to 40 percent of all aviation accidents, 50 percent of all aviation fatalities, and accounts for 65 percent of system delays. Through improved integration of weather data into timely, accurate aviation weather information, FAA can reduce delays and improve NAS capacity utilization while enhancing aviation safety. The ITWS will integrate terminal weather data to automatically provide current weather information and predictions in easily understood graphic and textual form.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	33	$339,970.6 [1]
FY 2008 Appropriated	---	13,200.0
FY 2009 Request	---	4,500.0
Baseline Requirement	---	6,700.0
Total	33	$364,370.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$1,174.8
2. Production Contract	---	1,200.0
3. Engineering	---	111.8
4. Telecommunications	---	64.9
5. NAS Implementation	---	199.7
6. Test and Evaluation	---	677.1
7. Program Support	---	271.7
8. In-Service Engineering	---	800.0
Total	Various	$4,500.0

[1] Of this amount, $49,300,000 was appropriated for the aviation weather products generator (AWPG) program, which was canceled in FY 1995. Additionally, $6,000,000 was appropriated for the aviation weather research program in FY 1996. Also, $3,000,000 was appropriated for phased array radar in FY 2001. Total non-ITWS funds $58,300,000. The appropriation amount also reflects a $359,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Also includes $58,560 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106 554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C01	**Automated Surface Observing System (ASOS)**	**$8,500,000**	**Various**	**W-01**

FAA Strategic Goal: Greater Capacity – Increase airport capacity to meet projected demand and reduce congestion.

Description of Problem: Accurate, reliable weather information is an integral element in the safe and efficient use of the Nation's airspace. Surface weather observations are required by pilots for flight planning, takeoffs, and landings, by the National Weather Service for aviation weather forecasts, and by airline dispatchers and air traffic control personnel for air traffic control and flow management. Automated weather observing equipment improves the quality, frequency, and timeliness of weather observations, reduces costs, and reduces the period of time expended by air traffic controllers on weather observation duties. There is a continuing need for automated weather observing capabilities at many airports.

Description of Solution: The FAA has developed a long-range equipment strategy for improving automated surface weather observations. The Automated Surface Weather Observation Network (ASWON) is comprised of eight separate weather systems. ASWON includes the Automated Weather Observing System (AWOS), Automated Surface Observing System (ASOS), ASOS Pre-Planned Product Improvement project, Automated Weather Sensors Systems (AWSS), Stand Alone Weather Sensors (SAWS), AWOS Data Acquisition System (ADAS), F-420 Wind System, and Digital Altimeter Setting Indicator (DASI). The ASOS Controller Equipment Information Display System (ACE-IDS) program has been removed from ASWON and realigned into FAA ATO Terminal Automation. The primary purpose of ASWON is to provide automated surface weather observations to meet the needs of pilots, operators, and air traffic personnel without incurring the high costs of labor-intensive manual surface weather observations. The ASWON program consists of 170 AWOS systems procured from 1988 through 1991; 571 FAA-sponsored ASOS systems procured from 1991 through 1997 in a joint program with the National Weather Service; 15 AWSS systems procured in FY 1998, plus four systems mandated by Congress in 2004 and 2005 (for a total of 19 AWSS systems); 122 SAWS systems, 25 ADASs, and numerous F-420 wind systems and DASIs. The FAA has determined that it is not cost effective to deploy the remaining 148 SAWS systems.

Through FY 2007, the AWOS, ADAS, F-420, and DASI programs have been completed; the ASOS base program has commissioned all 571 sites; the ASOS Pre-Planned Product Improvement project has completed installation of the processor upgrade, the hydrothermometer replacement sensor, and the ice-free wind sensor at all 571 sites. The sensor development and performance testing of the Enhanced Precipitation Identification sensor have been completed and the first 332 sensors have been procured. The development of the ceilometer has begun. The AWSS program has completed installation and commissioning at all 19 airports, and the SAWS program has completed all 120 installations and commissionings.

In FY 2008, $5,000,000 was appropriated to complete the operational acceptance testing and procure the remaining 239 Enhanced Precipitation Identification sensors for ASOS, to complete the ceilometer development and operational acceptance test, and to procure the first 37 ceilometers as part of the ASOS Pre-Planned Product Improvement project.

For FY 2009, $8,500,000 is requested to procure 223 ceilometers and spares as part of the ASOS Pre-Planned Product Improvement project

Benefits: The principal benefits from implementing ASWON are the continued and expanded capability for Instrument Flight Rule (IFR) flight operations; improved continuous observation capability at a significantly reduced cost from manual observations; high quality, real-time weather data communication networks and one minute updates to weather parameters to provide for rapid observation of changing conditions and awareness of conditions impacting the efficient flow of air traffic.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	881	$370,837.1 [1]
FY 2008 Appropriated	---	5,000.0
FY 2009 Request	---	8,500.0
FY 2010-2013	---	14,700.0
Total	881	$399,037.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
ASOS – Pre-Planned Product Improvements	All systems	$8,500.0

[1] Includes $4,808,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes FY 2001 rescission. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C02	**Flight Service Station Modernization - Alaska Flight Service Modernization (AFSM)**	**$14,600,000**	**Various**	**F-05**

FAA Flight Plan Goal: Increased Safety — Reduce the number of fatal accidents in general aviation.

Description of Problem: Alaska has the highest per capita number of general aviation airplanes and pilots in the United States. One person out of every 58 people is a pilot and there are six airplanes for every 10 pilots. Air travel is a major mode of transportation between locations within the state. The combination of many pilots and extreme flying conditions has contributed to numerous accidents in Alaska. Alaska Flight Service Stations provide essential flight planning assistance and weather and aeronautical flight information to pilots operating under extreme weather conditions exacerbated by Alaska's challenging terrain. Alaskan pilots are critically dependent on weather and flight planning information provided by Flight Service Stations.

Alaskan Flight Service operational systems (Model 1 Full Capacity (M1FC) and non-NAS baselined legacy systems) have exceeded their projected useful lifecycle, are difficult to support and do not meet FAA requirements. Recent security issues and reports of lost data have been temporarily resolved by replacement of M1FC and the non-NAS baselined legacy systems with the Operational and Supportability Implementation System (OASIS) in Alaska. However, the OASIS contract period of performance ends in February 2008. FAA must develop options for this system until the Alaska Flight Service Modernization (AFSM) achieves Initial Operating Capability (IOC) in FY 2012 is unreasonable.

Alaska's flight service facilities have infrastructure deficiencies and require updating to meet ADA and OSHA requirements. Existing heating, ventilation, and air conditioning (HVAC) systems fail to provide the proper environmental controls in operations, equipment, and administrative areas. Some HVAC systems re-circulate exhaust fumes from outside. Leaking roofs create water soaked areas – radically increasing the building mold spore count. These conditions endanger personnel health and safety. Power failures affect flight service's ability to handle search and rescue efforts, provide pilot weather briefings, conduct in-flight communications, and receive and distribute weather and NAS information.

Description of Solution: AFSM is an integrated approach that provides not only an automation system but a voice switch replacement at the Automated Flight Service Stations (AFSSs) and addresses flight service facility conditions resulting in increased business continuity. Implementing new technology will allow flight service to expand and make service more readily available to the aviation users in Alaska, provide increases in productivity and reduce operational costs. Voice switch replacement provides the flexibility to reduce single points of failure as well as support part-time AFSSs operations. Currently system servers are routed through Alaska Air Route Traffic Control Center (ARTCC); thus a catastrophic disruption at the ARTCC could leave Alaska without flight services. AFSM will provide flexibility to correct the problem of all system servers being routed through the ARTCC.

The AFSM system will provide up to the minute, pilot briefing data by integrating weather graphics with text based weather and aeronautical information. Automated weather, aeronautical and flight planning updates will be integrated with NOTAM and flight planning databases. A web portal will make data available to both FAA personnel and pilots, and will increase access to flight service information in even the most remote locations. A new voice switch will increase operational flexibility by allowing frequencies to be offloaded to other flight service facilities to meet productivity demands. Additionally, flight service buildings will be updated to meet OSHA and ADA requirements. Building power, electrical and safety systems will be updated to meet current standards.

In FY 2008, $5,100,000 was appropriated. This included $3,000,000 to be used to conduct investment analysis. By the end of FY 2008, a preferred solution will be identified and AFSM will proceed with solution development and the acquisition process. Two million dollars will be used for infrastructure sustainment at four sites in Alaska for correcting Environment, Energy and Occupational Safety and Health (EEOSH) discrepancies, correcting power system reliability issues, relocating to a new building, and disposing of facility components no longer required. An additional $100,000 will be used for in-service engineering activities.

For FY 2009, with Alaska Flight Service Modernization being a new start, the primary work to be done is to begin the acquisition. Actual products to be procured will be acquired in the following year. For FY 2009, $14,500,000 is requested for development of the following products: 1) Final Investment Analysis Plan; 2) Final Requirements Document; 3) Exhibit 300 with Attachments 1 and 2; 4) Briefing for the investment decision; 5) Integrated program plan; 6) Lifecycle program baseline; 7) Investment analysis report; 8) Acquisition strategy paper; 9) Solicitation / tasking packages; 10) Evaluation of responses; 11) Risk mitigation strategies; 12) Risk management planning; 13) Preliminary Hazard Analysis; 14) Program Safety Plan; and 15) Security Plan. In addition, on-going Alaska Flight Service sustainment activities will be executed to keep facilities operating until the final investment decision can be implemented. These projects include EEOSH planning for Fairbanks and Nome, closing of the old Cold Bay building, and continuing the projects begun in 2008 at Ketchikan and Barrow. Also, $100,000 is requested for in-service engineering activities in support of the modernization program.

Benefits: The Flight Service Station Modernization program maps to the FAA Flight Plan Goal of Increased Safety – Reduce accidents in Alaska. With greater service availability, the result will be increased safety to the general aviation community in Alaska and a reduction in accidents. Other benefits include:

- Life-Cycle support efficiencies of NAS-baselined programs,
- Reduced operating costs through replacing and supplementing existing infrastructure,
- Integrated and enhanced capabilities and functions, and
- Reduced support and maintenance costs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982 – 2007)	---	$419,789.8
FY 2008 Appropriated	---	5,100.0
FY 2009 Request	---	14,600.0
FY 2010-2013	---	67,600.0
Total	1	$507,089.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$3,050.0
2. Systems Engineering Management	---	6,000.0
3. HW/SW Design/Development/Procurement/ Production	---	3,000.0
4. Physical Infrastructure	---	150.0
5. Infrastructure Support	---	2,100.0
6. Disposition	---	200.0
7. In-Service Engineering	---	100.0
Total	1	$14,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C03	Weather Camera Program (formerly Safe Flight 21)	$2,000,000	1	M-08

FAA Strategic Goal: Increased Safety – Reduce the number of fatal accidents in general aviation.

Description of Problem: In the state of Alaska, flying is equivalent to driving in the continental US (CONUS). Alaska's skyways are equivalent to the road infrastructure found throughout the CONUS making the use of small aircraft essential to everyday life. Many times flying is the only means to get children to and from school activities; to transport service providers such as clergy, doctors, dentists, and nurses; to deliver patients to medical facilities; and to supply the communities with groceries, fuel, and mail.

The combination of many pilots and extreme flying conditions has resulted in a much higher accident rate in Alaska. According to the National Institute for Occupational Safety and Health, a disproportionate number of all U.S. aircraft crashes occur in Alaska. Between 1990 and 2006, there were 1497 commuter and air taxi crashes in the United States of which 520 occurred in Alaska – 35 percent of all commuter and air taxi crashes.

Deficient weather information in Alaska contributes to a higher risk of accidents and flight inefficiencies. Without weather information about their destination airport and route of flight, pilots cannot make informed decisions on whether it is safe to fly or continue their flight. This leads to accidents and unnecessary fuel costs. The effective use of automated weather systems is limited and costly. In November 1995, the NTSB's Safety Study on Aviation Safety in Alaska recommended that FAA assist the National Weather Service (NWS) with an evaluation of the technical feasibility and aviation safety benefits of remote color video weather observing systems in Alaska. A need for pictorial views of current weather conditions accessible to the aviation community was established.

Description of Solution: The mission of the Weather Camera Program is to improve safety and efficiency by providing weather visibility information in the form of near real-time camera images to aviation users. Near real-time weather images of airports and strategic en route locations are provided to the pilot and flight service station specialist for enhanced situational awareness, preflight planning and en route weather briefings. Images are updated every ten minutes and stored for six hours. These images are made available through a user-friendly, web-enabled application.

For FY 2009 $2,000,000 is requested continues administration of the Weather Camera program and funds installation of approximately 10 additional camera sites.

Benefits: Weather cameras have been identified as a specific initiative in the FAA's Flight Plan Increased Safety Goal: "Decreasing the number of general aviation aircraft accidents in Alaska from 130 accidents per year observed in FY 2000-2002 to a goal of no more than 99 per year in FY 2009."

This goal of no more than 99 accidents per year by FY 2009 has a continuously improving annual performance target.

- FY 2005 - no more than 120 accidents   Actual results: 128
- FY 2006 - no more than 115 accidents   Actual results: 102
- FY 2007 - no more than 110 accidents
- FY 2008 - no more than 105 accidents
- FY 2009 - no more than 99 accidents

Weather cameras are extremely beneficial in areas with rapidly changing terrain, weather phenomena, and as information about the safety Alaska airports and mountain passes. Weather cameras allow pilots to have weather information about their destination airport and route of flight. Pilots are able to make more informed decisions on whether it is safe to fly before they are airborne and whether to continue flight. This prevents accidents and avoids unnecessary fuel costs. Preliminary benefit data indicates weather cameras reduce 25% of weather related accidents within 25 miles of a weather camera sites. The continued expansion of weather cameras across the state of Alaska will help ensure FAA's safety goals are successful.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	74	$21,300.0 [1]
FY 2008 Appropriated	10	2,000.0
FY 2009 Request	10	2,000.0
FY 2010-2013	---	16,200.0 [2]
Total	94	$41,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Alaska Weather Cameras	10	$2,000.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004. Only prior year funds that were appropriated under Safe Flight 21, item 1A02 for Weather Cameras are reflected here. Prior year funds under 1A01 for the expansion of ADS-B are shown under item 1A10.
[2] Future requirement are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D01	**Very High Frequency Omnidirectional Range (VOR) with Distance Measuring Equipment (DME)**	**$7,500,000**	**Various**	**N-06**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The VOR/DME is a ground-based electronic system that provides azimuth information to aircraft. When VOR/DME signal transmission deterioration occurs due to site encroachment such as tree growth, construction of bridges, buildings, etc., it is necessary to restore these facilities to their full service volume. TACAN (Tactical Air Navigation) Antennas provide azimuth and distance information for military aircraft and distance information for commercial aircraft. The TACAN system sustainment is needed to allow continued access to En Route and terminal approaches. The equipment at most of these sites is over 35 years old, which is beyond the originally estimated service life.

Description of Solution: This program replaces, relocates, converts and modifies VOR facilities (including VOR/DME and VORTAC) to improve VOR performance. This program also provides for the continued field installation of approximately 100 remaining low-power TACAN antenna retrofit kits that were procured with prior year funds.

Benefits: The VOR/DME program maps to the FAA goal of Reduced Congestion by making air traffic flow more efficiently over land and sea. The replacement, relocation, conversion, or modification of VOR facilities will enable FAA to maintain a highly reliable, safe, and efficient ground based VOR, VOR/DME, and VORTAC navigation system until the use of Global Positioning System is widespread. The improved availability of this program provides enhanced aircraft routing and increased airport capacity.

In FY 2007, $5,000,000 was appropriated which will allow the FAA to relocate and convert VOR facilities and also install low-power TACAN retrofit kits necessary to sustain and replace those that are no longer operational or supportable due to life-cycle issues.

In FY 2008, $5,000,000 was appropriated to convert/relocate VOR/DME facilities and continue necessary sustainment implementation efforts for those systems that are no longer operational or supportable due to life-cycle issues.

For FY 2009, $7,500,000 is requested to fund engineering and technical services support; begin new acquisition activities, convert approximately five VOR/DME facilities; relocate two VOR/DME; and continue necessary sustainment implementation efforts for those systems that are no longer operational or supportable due to life-cycle issues. This funding will help to mitigate the risk of isolated capability gaps throughout the National Airspace System.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$239,914.4 [3]
FY 2008 Appropriated	---	5,000.0
FY 2009 Request	---	7,500.0
FY 2010-2013	---	17,500.0
Total	Various	$269,914.4

[3] Includes $970,100 reduction of the FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission pursuant to P.L. 106-554. Includes reduction pursuant to P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. New Acquisition Activities	---	$1,350.0
2. Relocate VOR Facilities	---	3,375.0
3. Convert VOR/DME Facilities	---	1,875.0
4. Logistics/Engineering Support	---	525.0
5. In Service Engineering	---	375.0
Total	Various	$7,500.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D02	**Instrument Landing System (ILS) – Establish/Sustain**	**$7,500,000**	**Various**	**N-03**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: An ILS provides electronic guidance to pilots for safe aircraft landing during inclement weather and reduced visibility. The system includes a localizer, which gives lateral guidance to the runway centerline, a glide slope or landing beam to give vertical guidance, and marker beacons to show the aircraft progress as it approaches the landing field. The ILS sends information to instruments in the cockpit so that the pilot can maintain a perfect flight path to the runway even in low visibility. Some planes are equipped with an autopilot, which can directly receive ILS signals to automatically guide the plane to a landing.

Approach lighting and other equipment such as distance measuring equipment (DME), approach lighting systems (ALS), runway visual range (RVR) indicators, and non directional beacons (NDB) are part of the ILS approach and also aid the pilot in landing.

There are three categories of ILS. The lowest altitude at which a pilot is able to decide whether to land or abort (decision height) and how far the pilot can see the runway (runway visual range) defines each category.

- Category I: Decision Height (DH) 200 feet and Runway Visual Range (RVR) 2,400 feet (with touchdown zone and centerline lighting, RVR 1,800 feet);
- Category II: DH 100 feet and RVR 1,200 feet;
- Category IIIa: No DH or DH below 100 feet and RVR not less than 700 feet;
- Category IIIb: No DH or DH below 50 feet and RVR less than 700 feet but not less than 150 feet; and
- Category IIIc: No DH and no RVR limitation, requires an autopilot.

Approximately 1,200 runway ends are equipped with an ILS in the U.S. Of these, approximately 125 are more than 25 years old and must be replaced because they have exceeded their expected service life and their original manufacturer no longer provides support. Furthermore, FAA receives funding to purchase additional systems but until recently, received little money for site preparation and installation. Site conditions can affect ILS component performance so FAA must select ILS sites carefully. Large buildings or hangars can affect localizer signals and uneven terrain distorts glide slope signals. Once a site is selected, FAA must rectify any environmental impacts. Installers must also dig trenches to install electrical cable and communication lines. All of this construction work adds considerably to the cost of providing ILS service.

The FAA is aggressively pursuing implementation of satellite navigation but until that transition is complete, ILS remains the world standard for providing approach and landing services. In the next decade, more than 700 currently deployed ILS will exceed their service life. Many of these will have to be replaced.

Description of Solution: This program procures, installs, and replaces ILS's with a grouping of electronic devices (i.e., localizers, glides slopes, Approach Lighting Systems (ALS), and other ancillary aids). It provides a precision approach capability for landing aircraft with precise electronic guidance and visual aid information. This precision approach capability allows aircraft to land in weather conditions that would otherwise be prohibited, and enable airports to meet increasing traffic demands.

In FY 2007, $6,005,000 was appropriated to fund engineering and technical services support as well as the procurement and installation of Category I/II/III ILS approaches.

In FY 2008, $15,094,000 was appropriated of which $9,000,000 will be used to fund engineering and technical services support; provide incremental implementation funding for on-going establish/sustain ILS projects; and continue acquisition and implementation activities to increase operational availability for approximately seven Category I/II/III ILS approaches. The remaining $6,094,000 will be used to implement eight Congressional mandated locations.

For FY 2009, $7,500,000 is requested to fund engineering and technical services support; provide incremental implementation funding for on-going ILS projects; and continue acquisition and implementation activities to increase operational availability for approximately six Category I/II/III ILS approaches.

Full implementation of satellite navigation and large-scale equipment decommissioning is decades away. In the meantime, the NAS continues to expand and users demand increased capacity, particularly in low visibility conditions. To do so, FAA must replace aging equipment and ensure that new equipment is installed correctly.

Benefits: The ILS program maps to the FAA goal of Greater Capacity by increasing airport capacity to meet projected demand and reduce congestion. The ILS provides both vertical and horizontal guidance information to the pilot to allow safe landings to touchdown and rollout.

The approach lighting provides the necessary visual cues for the pilot to safely land an aircraft when conducting an instrument approach. The ILS along with required approach lighting systems directly impact both system safety and capacity. This program provides the aircraft the ability to land in Instrument Meteorological Conditions, which increases the capacity to runways with ILS precision approach equipment. Weather-caused flight disruptions delays, diversions, over-flights, and cancellations impose economic penalties on both aircraft operators and users. A precision approach capability allows an airport to remain open to traffic when it would otherwise have closed thereby avoiding weather caused flight delays.

Establishment of new ILS's and replacement of aging ILS equipment will improve reliability and availability, therefore reducing the outage rate and the maintenance man-hours. Moreover, the ability to land aircraft in Instrument Meteorological Conditions (IMC) allows increased capacity to runways equipment with ILS precision approach and greatly improves Air Traffic Controller's workload.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$517,600.0 [1]
FY 2008 Appropriated	---	15,094.0
FY 2009 Request	---	7,500.0
FY 2010-2013	---	41,600.0 [2]
Total	Various	$581,794.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Procure/Install/Sustain CAT I/II/III ILS's	---	$6,500.0
2. Logistics/Engineering Support	---	1,000.0
Total	Various	$7,500.0

[1] Includes $24,000,000 appropriated in FY 1999 and $18,000,000 appropriated in FY 2000 under "Next Generation Landing Systems". Includes $340,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes $2,727,087 reduction of the FY 2001 funds pursuant to rescission P.L. 107-87, December 18, 2001. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

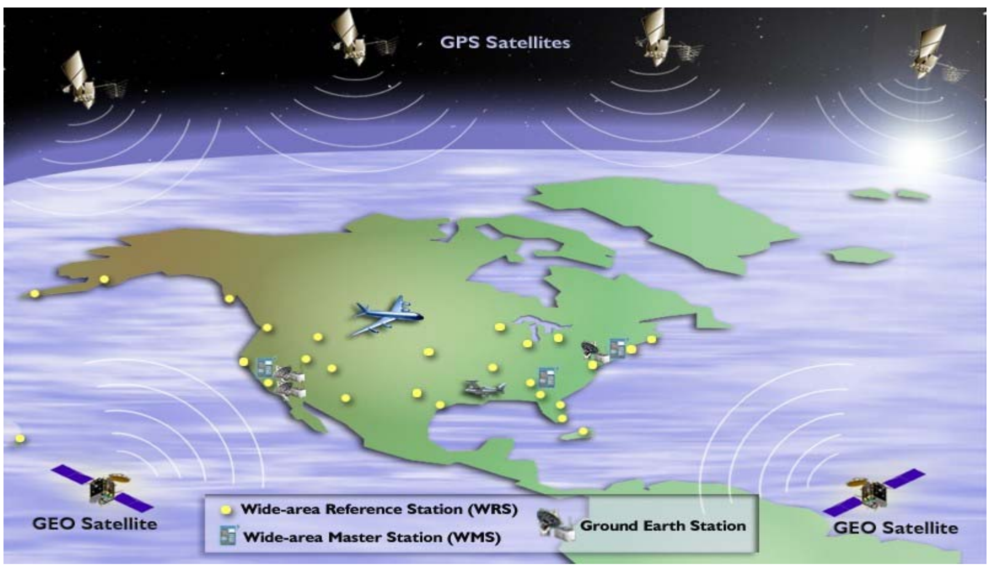
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D03	**Wide Area Augmentation System (WAAS) for GPS**	**$99,000,000**	**Various**	**N-12**

FAA Strategic Goal: Increased Safety – Reduce the number of fatal accidents in general aviation.

Description of Problem: Many of the aircraft flying in the NAS lack seamless navigation capability and many runway ends in the NAS lack navigation aids that deliver stable vertical guidance in all weather conditions. The FAA provides vertically guided navigation to less than 18 percent of all public use runway ends in the NAS. FAA cannot afford to provide horizontal and vertical navigation for precision approach operations for all runway ends using ground-based navigation equipment such as the Instrument Landing System (ILS).

Description of Solution: WAAS, a satellite based navigation technology allows any qualifying airport in the NAS to have vertical and horizontal guidance without of expensive legacy navigation hardware installed at each runway. WAAS increases safety and enhances capacity in the NAS at a reduced lower cost than all other alternatives. WAAS continuously broadcasts a GPS-like signal in space for horizontal and vertical navigation across the NAS. WAAS consists of a network of 38 (by the end of FY 2007) precisely surveyed ground reference stations that monitor the global positioning system (GPS) satellite signals. The ground reference stations are distributed across the continental United States and Alaska at FAA facilities. Three master stations collect the reference station data and calculate corrections and integrity messages for each GPS satellite. The WAAS messages are broadcast to user receivers via leased navigation transponders on two commercial geostationary (GEO) satellites. The user receiver on the aircraft applies the corrections and integrity information from the WAAS message to obtain the precise navigation service. Today, WAAS users can conduct En Route operations over 100 percent of the NAS and can conduct precision approach operations to qualifying airports throughout 95 percent of the 48 contiguous States—no conventional ground based navigation hardware required.



The FAA is continuing to develop WAAS to expand the precise horizontal and vertical guidance capability to 100 percent of the 48 contiguous states and to most of Alaska. For FY 2009, $99,000,000 is requested to address ground system sustainment, satellite costs, avionics development, and procedures.

This request includes activities essential to sustainment of the WAAS system. FY 2009 is the first year with funds specifically allocated to technology refresh which includes subsystem replacement. WAAS is a COTS-based system. The baseline architecture requires an on-going activity involving evaluation of component reliability and obsolescence, determination of replacement components as needed, associated hardware and software development appropriate to stringent safety requirements, integration and test into the overall system, and software refresh for software components which have undergone extensive rework over the last several years. In addition, purchase and deployment of expensive cesium frequency standards for WRS sites is necessary in FY 2009. There will be a delay in the replacement of equipment which is not considered to be essential to WAAS system sustainment in FY 2009. The total cost of technology refresh activities including required replacement purchases and software upgrades is $22,210,000 in FY 2009.

GEO development specific to the deployment of the 5th GEO satellite is requesting $9,330,000 in FY 2009. Avionics development essential to ensuring the widest range of equipage options for users is requesting $3,270,000 in FY 2009. In addition, $2,650,000 is requested to development of a dual-frequency L1-L5 avionics standard. Early development of this standard is essential to ensuring that dual-frequency avionics capability is in-place in advance of dual-frequency satellite deployment. Dual-frequency avionics promises higher continuity and availability, wider acceptance among carriers, and substantially lower infrastructure costs. The key to accruing these benefits is having the equipage base in-place well in advance of full satellite deployment. Program support, technology evolution, performance assessment, National Satellite Test Bed sustainment, and technical engineering is requesting $15,930,000 in FY 2009.

In addition, this request includes $24,180,000 for satellite lease costs, ground uplink lease services, and other recurring costs. The funding in FY 2009 will be used to pay for leasing two Lockheed Martin geostationary satellite leases that became operational in FY 2007. These geostationary satellites will be in view to all users over CONUS and Alaska.

This request also includes $15,000,000 for procedure development ($5,000,000 is for WAAS Procedures and $10,000,000 is for new surveys). The customer acceptance and benefit portion of the WAAS program includes all the activities that will make WAAS readily available and usable to FAA customers. FY 2009 funding will be used to increase the number of precision approach procedures developed and published at selected airports to facilitate increased user acceptance of WAAS. In addition, FAA will initiate partnerships with avionics manufacturers, aircraft manufacturers, airlines and selected airports to create an environment that will enable the FAA customers to build their own business cases to equip and use WAAS for navigation. Standards to accommodate new capabilities unique to WAAS, including curved approaches and helicopter instrument approaches will be developed, and on-going data collection and analysis of procedures will be conducted. This overall activity, including outreach, coordinating and promoting procedure development, working with avionics developers and airframe manufacturers to facilitate equipage, standards development, and procedure data collection is requesting an additional $6,430,000 in FY 2009.

<u>Benefits</u>: The WAAS program maps to the FAA goals of Increased Safety and Increased Capacity. WAAS is the first navigation aid capable of providing vertical guidance, or three dimensional guided instrument approaches, to pilots during all phases of flight, in all weather conditions at all locations throughout the NAS. WAAS increases the availability of vertical guidance to all aviation operations. WAAS reduces accidents and saves lives (Flight Safety Foundation Report shows that reliable, accurate vertical guidance can reduce landing accidents by seven-fold). WAAS increases airport capacity. A highly accurate and reliable navigation signal available throughout the NAS to all aircraft is a capacity multiplier. The WAAS investment increases the availability of highly accurate and reliable horizontal and vertical navigation to all users.

By increasing procedures and expanding WAAS coverage, customers will equip with WAAS receivers and increase the total benefit realized by WAAS. It is estimated that several million WAAS enabled receivers have been sold for non-aviation purposes with no encouragement from the FAA to non-aviation industries such as maritime, surveying, recreation and agriculture. WAAS will reach over $315 million in safety benefits and $3.2 billion in efficiency benefits over the program life-cycle. Benefits of $495 million are realized by WAAS enabling reduction or avoidance of the expensive and high maintenance cost ground based navigation aids. Reductions in the number of ground based navigation aids and the associated cost savings are expected to begin in 2010. A minimum operating network of ground based navigation aids will be retained.

WAAS enables feeder airports to have reliable landing capability in all weather conditions, permitting feeder airports to establish scheduled transport operations and unloading major hub airports during bad weather. Airports can also exploit WAAS's inherent flexibility of providing vertical guidance at both runway ends for any runway to maintain or increase arrivals depending on changing traffic and weather conditions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	Various	$1,242,268.8 [1]
FY 2008 Appropriated	---	105,900.0
FY 2009 Request	---	99,000.0
Baseline Requirement	---	1,699,000.0 [2]
Total	Various	$3,146,168.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Technology Refresh and Equipment Replacement	---	$22,210.0
2. WAAS Procedure Development	---	5,000.0
3. Expanded Procedure Development	---	10,000.0
4. Avionics Development	---	3,270.0
5. L1-L5 Avionics Standard Development	---	2,650.0
6. Airport, Avionics, and Standards Coordination and Promotion	---	6,430.0
7. Program Support and Technical Engineering	---	15,930.0
8. Third GEO satellite Development	---	9,330.0
9. Satellite Communications Recurring Costs	---	24,180.0
Total	Various	$99,000.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004. Also includes FY 2003/2004 approved reprogramming.
[2] LPV Segment Only

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D04	**Runway Visual Range (RVR)**	**$5,000,000**	**Various**	**N-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The RVR provides air traffic controllers and pilots with critical meteorological visibility data that is used to allow take offs or landings during limited visibility conditions. Approximately 20 percent of all RVR systems in the NAS exceed their 20 years of Economic Service Life (ESL). Consequently, there is an increasing likelihood of loss of service due to life-cycle issues associated with the older RVR systems currently in the NAS.

Furthermore, the older RVR equipment is mounted on rigid structures. If struck accidentally during departure or landing, severe damage to aircraft and possible loss of life could result.

Description of Solution: The older RVR systems are being replaced with new-generation RVR equipment that will eliminate the emerging life-cycle issues (i.e., Reliability, Availability, and Maintainability) associated with the older RVR systems currently in the NAS. Furthermore, the new-generation RVR equipment is mounted on frangible, low-impact-resistant structures that break away if struck by aircraft during takeoff or landing.

In FY 2007, an amount of $5,000,000 was appropriated for engineering and technical services/support; procurement of six RVR systems; provide final incremental funding for ongoing RVR installation projects and provide initial funding for four new RVR installation projects.

In FY 2008, an amount of $5,000,000 was appropriated for engineering and technical services/support; procurement of eight RVR systems; final incremental funding for on-going RVR installation projects; and initial funding for five new RVR installation projects.

For FY 2009, $5,000,000 is requested for engineering and technical services/support; procurement of 13 RVR systems; final incremental funding for on-going RVR installation projects; and initial funding for 10 new RVR installation projects.

Benefits: The two main areas from which cost savings can be expected are:

- Reduced Flight Disruption: Weather caused flight disruptions – delays, diversions, over-flights and cancellations – impose economic penalties on both aircraft operators and users. Favorable RVR information is required to land during category II, III and many category I precision approaches. This allows an airport to remain open to traffic when it would otherwise have closed, avoiding weather-caused flight disruptions. These benefits are calculated by estimating the number of flight disruptions avoided multiplied by the unit cost for a flight disruption. The unit cost for a flight disruption is based on assumed operating scenarios that describe the flow of events when a flight is disrupted.

- Improved Safety: The benefit realized is the reduction or elimination of facilities and costs associated with aircraft accidents involving low-impact resistant structures versus aircraft accidents involving rigid approach structures. Use of low-impact-resistant structures reduces fatalities and the severity of damage to aircraft that accidentally strike these structures during departure or landing.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$131,200.7 [1]
FY 2008 Appropriated	---	5,000.0
FY 2009 Request	---	5,000.0
FY 2010-2013	---	19,000.0 [2]
Total	Various	$160,200.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement	---	$2,522.0
2. Final incremental funding for on-going RVR installation projects and initial incremental funding for 10 new projects.	---	1,607.0
3. Logistics/Engineering Support	---	871.0
Total	Various	$5,000.0

[1] Includes $685,500 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D05	**Approach Lighting System Improvement Program (ALSIP)**	**$10,000,000**	**Various**	**N-04**

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate.

Description of Problem: Many of the older approach lighting systems in the National Airspace System (NAS) have rigid approach lighting structures. Aircraft that accidentally strike these structures during departure or landing can incur substantial damage. The National Transportation Safety Board (NTSB) has recommended replacing the rigid approach lighting structures with low-impact resistant structures that collapse or break apart upon impact.

Description of Solution: This program procures and installs frangible approach lighting equipment, including the High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) and Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). ALSF-2's are installed at runways requiring Category II/III precision approaches. MALSRs are installed at runways requiring Category I precision approaches. The entire ALSF-2 and MALSR system is replaced when non-frangible structures are replaced.

In FY 2007, $15,000,000 was appropriated for engineering and technical services/support; final incremental funding for ongoing ALSF-2 and MALSR replacement projects; procurement of ancillary components; and initial funding for three MALSR replacement projects.

In FY 2008, $15,000,000 was appropriated for engineering and technical services/support; funding for on-going ALSF-2 and MALSR replacement projects; procurement of ancillary components; and funding for Alaska-based projects. An additional $4,312,000 was appropriated for distribution as follows:

Project	Amount
Airfields in Alaska	$2,499,000
Gulfport-Biloxi runway and centerline lighting	$490,000
Rutland State Airport MALSR	$1,323,000

For FY 2009, $10,000,000 is requested for replacement of the Seattle-Tacoma International Airport runway end 16C ALSF-2 support structure; final incremental funding for ALSF-2 and MALSR replacement projects; procurement of ancillary equipments; and engineering and technical services/support.

Benefits: This program reduces fatality incidents and costs associated with aircraft accidents involving rigid approach lighting structures through the use of low-impact-resistant structures.

- Improved Safety: Safety benefits are estimated by comparing incidents and costs of life and equipment for collision accidents with rigid structures and non-rigid structures to estimate a differential cost per incident.

- Reduce Flight Disruption: Weather-caused flight disruptions – delays, diversions, over-flights, and cancellations – impose economic penalties on both aircraft operators and users. An operational MALSR or ALSF-2 allows an airport to remain open to traffic, when it would otherwise have closed, avoiding weather-caused flight disruptions. These benefits are calculated by estimating the number of flight disruptions avoided multiplied by the unit cost for a flight disruption. The unit cost for a flight disruption is based on assumed operating scenarios that describe the flow of events when a flight is disrupted.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$346,892.2 [1]
FY 2008 Appropriated	---	19,312.0
FY 2009 Request	---	10,000.0
FY 2010-2013	---	23,000.0
Total	Various	$399,204.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ALSF-2 Support Structure (Seattle-Tacoma – Runway End 16C)	---	$4,100.0
2. Final incremental funding for on-going replacement projects	---	4,000.0
3. Ancillary Equipment Procurement	---	$700.0
4. Logistics/Engineering Support	---	$1,200.0
Total	Various	$10,000.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D06	Distance Measuring Equipment	$6,000,000	Various	N-09

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Obsolete tube-type DME equipment collocated with the instrument landing systems (ILS) and terminal non-directional beacons is decreasing system efficiency. Replacement parts are largely unavailable. By providing the procurement and installation of upgraded, state-of-the-art DME systems, efficiency will improve by reducing the downtime required for the maintenance and repair of the antiquated DMEs.

Low-power distance measuring equipment (LPDME) is a critical part of the ILS during the aircraft's final approach to landing. LPDME replaces the Marker Beacons. An increase of the number of aircraft utilizing the equipment contributes to DME saturation and a shutdown of the systems. In addition, older equipment does not meet present availability and maintainability requirements. The FAA requires navigation systems of 99.95 percent availability or greater. Previous LPDME are unreliable, maintenance intensive and lack required Remote Maintenance Monitoring (RMM) capability. The capacity of older systems is less than 50 aircraft simultaneously and the mean time to repair can be greater than one hour.

Description of Solution: This program will replace older LPDME with new solid state LPDMEs. The LPDMEs will replace older marker beacons at existing ILS locations and be implemented at new ILS locations. The availability of the new LPDME is greater than 99.95 percent, mean time to repair is less than one-half hour, mean time between failures is 14,231 hours, and mean time between outages is 15,193 hours.
There are 451 identified Commercial Aviation Safety Team (CAST) requirements. However, FAA recommends implementation of only 177. This number would cover 80 percent of all operations. For safety reasons, the industry wants to discontinue step-down non-precision approach procedures whenever possible. The use of LPDMEs supports this operational goal for older, less-equipped aircraft, until these older aircrafts are outfitted with more advanced equipment

In FY 2007, $5,000,000 was appropriated which allows FAA to fund sustainment activities as well as continue acquisition and implementation activities that increase operational availability at existing and new locations.

In FY 2008, $5,000,000 was appropriated to fund initial support for engineering and technical services as well as continue acquisition and implementation activities that would increase operational availability at existing and newly established runway ends.

For FY 2009, $6,000,000 is requested to fund engineering and technical services support; provide incremental implementation funding for on-going LPDME projects; and continue acquisition and implementation activities to increase operational availability at approximately 30 existing and newly established runway ends.

Benefits: The LPDME program maps to the FAA goal of Reduced Congestion by increasing airport capacity to meet projected demand. The equipment can handle more than 100 aircraft simultaneously, thus increasing airport capacity by a factor of two. Cost savings can be expected at a location by discontinuing relevant step-down non-precision approach procedures.

Additional savings are will accrue when the marker beacons are replaced, through leasing the cost of the land, and discontinued maintenance of the older equipment. In addition, new equipment has the required RMM that can be maintained and certified remotely.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$21,051.8 [1]
FY 2008 Appropriated	---	5,000.0
FY 2009 Request	---	6,000.0
FY 2010-2013	---	24,000.0
Total	Various	$56,051.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement and Installation	---	$4,000.0
2. Logistics/Engineering Support	---	2,000.0
Total	Various	$6,000.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-555. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D07	**Visual Navaids - Establish/Expand**	**$1,700,000**	**Various**	**N-04**

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate.

Description of Problem: The Commercial Aviation Safety Team (CAST) has identified 781 runway ends that require implementation of a visual precision-like vertical approach capability. This capability will reduce the possibility of a controlled flight into terrain accident during approach and landing. The FAA has agreed to implement this capability at the 170 highest priority runways by installing Precision Approach Path Indicator (PAPI) systems.

Approximately 73 percent of all Runway End Identifier Lights (REIL) systems in the National Airspace System (NAS) exceed their 20 years of Economic Service Life (ESL). Because many of these systems significantly exceed their ESL, REIL service disruptions are possible.

Description of Solution: The FAA will procure and install PAPI systems to satisfy the CAST requirements. In addition, the older REIL systems are being replaced with new-generation REIL equipment that will eliminate the emerging life-cycle issues (i.e., Reliability, Availability, and Maintainability) associated with the older REIL systems currently in the NAS.

In FY 2007, $2,000,000 was appropriated for engineering and technical services/support, and final incremental funding for ongoing PAPI and REIL installation projects.

In FY 2008, $3,500,000 was appropriated for engineering and technical services/initial support; procurement of 15 REIL systems; final incremental funding for ongoing PAPI and REIL installation projects; and initial funding for four new PAPI installation projects and four new REIL installation projects.

For FY 2009, $1,700,000 is requested for engineering and technical services/initial support; procurement of seven REIL systems; final incremental funding for ongoing PAPI and REIL installation projects; and initial funding for ten new PAPI installation projects and seven new REIL installation projects.

Benefits: Improved Safety - Safety benefits stem from the reduction of accidents. Safety benefits are estimated by comparing incidents and costs of non-precision approach accidents with the same for precision-like approach accidents to estimate a differential cost per approach. Use of a precision-like landing capability of a PAPI will reduce accidents during landing. The use of REILs increase safety and capacity during landing by providing a pilot with the location of the approach end of the runway.

Reduced Controlled Flight Into Terrain - Controlled flights into terrain causes fatalities and imposes economic costs on aircraft operators. The visual precision-like vertical landing capability of the PAPI reduces the number of controlled flights into terrain.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$192,218.4 [1]
FY 2008 Appropriated	---	3,500.0
FY 2009 Request	---	1,700.0
FY 2010-2013	---	14,800.0
Total	Various	$211,218.4

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement (REIL Systems)	---	$119.0
2. Final incremental funding for on-going installation projects and initial incremental funding for 10 new installation projects (PAPI)	---	1,020.0
3. Final incremental funding for on-going installation projects and initial incremental funding for 7 new installation projects (REIL)	---	306.0
4. Logistics/Engineering Support	---	255.0
Total	Various	$1,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D08	Instrument Flight Procedures Automation (IFPA)	$10,900,000	Various	A-14

FAA Strategic Goal: Greater Capacity – Increase airport capacity to meet arrival demand and reduce congestion.

Description of Problem: Instrument Approach Procedures Automation (IAPA) creates new Instrument Flight Procedures (IFP's) and sustains the more than 14,000 existing IFP's. Developed in the early 1970's, the system is increasingly obsolete and unable to support the required safety and efficiency initiatives in the FAA Flight Plan. The cost to maintain this system has escalated drastically. Specifically, the maintenance workload on the existing IFP's has escalated at a rate of 45 percent each year since the mid-1990's. In addition, the demand for obstacle evaluation studies has doubled since the late 1990's to approximately 50,000 requests per year. These requests are expected to increase an additional 60 percent in the next ten years due to high definition television and cellular telephone industries. The majority of this workload accomplished through manual processes with very limited automation support. The increasing maintenance workload drastically diminishes the organization's ability to support the agency's initiatives such as: required navigation performance, area navigation, wide area augmentation system, distance measuring equipment, and standard terminal automation replacement systems. The performance based National Airspace System, requires the investment in systems integration and the automation of aviation data for safety and liability purposes, as well as an automated electronic means of information sharing.

Description of Solution: This request will provide funds to replace the current IAPA system with next generation automated tools that generate products using fully integrated solutions for all aspects of visual and instrument flight procedures. In addition, this new system must be able to calculate, retain, and share the intricate business rules needed to design IFP's while automatically assessing impact of obstacles. The automated process must have the ability to evaluate new obstructions as well as perform necessary activities associated with changes in magnetic variation. Collaboration with the U.S. Air Force will save resources by developing a common tool that can still support unique agency requirements. The following projects are part of a tool suite called Instrument Flight Procedure Automation (IFPA):

- Instrument Procedures Development System (IPDS): IPDS provides a complete U.S. Terminal Procedures (TERPS) and International (ICAO) PANS-OPS criteria evaluation tool for the development or amendment of instrument flight procedures. IPDS will replace the legacy IAPA system and provide full coverage of new requirements, including international criteria.
- Obstacle Evaluation System (OE-IFR): OE-IFR will provide automation of existing or proposed obstacles' impact on IFP's, saving many staff hours expended in the current manual process. This module will be developed as a component of IPDS.
- Instrument Flight Procedures (IFP): IFP provides a repository for all IFP's and the ability to generate all 8260 series forms, as well as Aeronatuical Radio Incorporated (ARINC) encoded IFP's for loading to aircraft flight management systems.
- Airports and Navigation Aids (AIRNAV): AIRNAV is a critical database and maintenance application for Airports, Runways, NavAids, and Obstacles used to support IFP development and maintenance.
- Automated Procedures Tracking System (APTS): APTS provides the ability to forecast and schedule IFP development, inspection and publication workloads.

For FY 2009, $10,900,000 is requested to enable continued development of the IPDS, OE, IFP, AIRNAV and APTS tools. This request is in line with the program funding baseline approved by the JRC in September 2006.

Benefits: IFPA will support greater capacity by increasing the airport arrival capacity for eight major metropolitan areas, and at the OEP airports when visibility is restricted. The new IFPA suite will replace, modernize, and update IAPA systems in support of both visual and instrument flight procedure development such as approaches, standard terminal automation replacement system, airways, and departures. IFPA will greatly increase automated capabilities for all types of precision and non-precision flight procedures, including conventional and area navigation (RNAV) for en-route, feeders, arrivals and departures. In addition, the new program will build an integrated obstacle evaluation application, replacing a manual process. Existing systems cannot generate and integrate the necessary physical, temporal and spatial information needed to develop, inspect and publish flight procedures as well as evaluate the impact of obstacles. New technology is now available to meet these requirements.

While supporting FAA flight plan goals, continued support of IFPA will specifically provide the following overall benefits:

- Capability for ongoing maintenance of over 14,000 instrument flight procedures in use at over 4,000 paved airports, accommodating requirements for precision approaches and departures using Global Positioning System/area navigation, wide area augmentation system and local area augmentation system.
- Efficient response to Air Traffic Obstacle Evaluation (OE) requests, addressing affects to instrument flight procedures, alleviating manual effort currently required for 50,000+ OE requests annually. In addition, application of TERPS rules as part of automated obstacle evaluation will be an important benefit.
- Replacement of IAPA's old 1970 obsolete computer hardware and software.
- Conversion of current IAPA software to OMB, DOT & FAA recommended architecture, providing opportunities for improved integration as well as a foundation for anticipated flight procedure demand well beyond FY 2009.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$45,192.6 [1]
FY 2008 Appropriated	---	17,800.0
FY 2009 Request	---	10,900.0
FY 2010-2013	---	8,400.0
Total	Various	$82,292.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Instrument Procedures Development System (IPDS)	---	$7,000.0
2. Obstacle Evaluation System (OE)	---	400.0
3. Instrument Flight Procedures (IFP)	---	1,500.0
4. Airports and Navigational Aids (AIRNAV)	---	1,500.0
5. Automated Procedures Tracking System (APTS)	---	500.0
Total	Various	$10,900.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D09	**Navigation and Landing Aids – Service Life Extension Program (SLEP)**	**$1,000,000**	**Various**	**N-04**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: On average, 60 percent of all visual and navigation aids in the NAS are greater than 23 years old and exceed their 20 years of Economic Service Life (ESL) by three or more years. Because many of these systems exceed their ESL, service disruptions are possible. Also, the existing medium intensity approach light system with runway alignment indicator lights (MALSR) and approach lighting system with sequence flasher 2 (ALSF-2) in-pavement steady burning approach lights are maintenance intensive. As a result, excessive runway down time exists that negatively impacts airport capacity.

There are approximately 800 MALSR systems in the NAS. The following provide a distribution of the MALSR systems in the NAS.

Manufacturer	Systems	Years in Service
GTE-Sylvania	30	34
SEPCO-Crouse Hines	42	33
Godfrey	127	33
Multi Electric	347	32
ADB-ALNACO	19	20
AVW Electronic (Remote Maintenance Monitoring Capability)	98	18
DME Corp. (RMM Capability)	137	10 or less

There are approximately 150 ALSF systems in the NAS. The following provides a distribution of the ALSF systems in the NAS.

Manufacturer	Systems	Years in Service
General Electric	3	47
Westinghouse	2	45
Hollingsworth	1	41
Heavy Duty	5	33
Godfrey	41	25
Airflow	46	20
New Bedford Panoramex	52	8 or less

Description of Solution: The older navigation aids are being replaced with new generation navigation aids that will eliminate the emerging life-cycle issues associated with the older navigation aids currently in the NAS. Additionally, the existing MALSR and ALSF-2 in-pavement steady burning approach lights will be replaced. Replacing aging, obsolete visual navigational aids and other ground-based navigation and landing aids maintains current en route, approach, and landing capabilities at various airports throughout the United States.

In FY 2008, $5,000,000 was appropriated to procure semi-flush fixtures and two ALSF-2 monitor that provide Remote Lamp Monitoring Systems, (RLMS); complete installations and engineering of ten REIL, two MALSR, and four Remote Radio Control Systems; replace a MALSR tower and generator; undertake new technology initiatives, and provide engineering and technical services support.

For FY 2009, $1,000,000 is requested to procure semi-flush fixtures and one ALSF-2 monitors that provide Remote Lamp Monitoring System, (RLMS); complete installations and engineering of three MALSR, and one ALSF-2, extend the service life of five ALSF-2 at OEP airports by replacing the constant current regulations and installing a monitor for category II/III approaches, replace guide wires for light station, replace cable between light stations, replace aluminum light towers, replace DME antenna pedestal, convert antenna arrays, recabling localizer antenna, four navigation equipment relocate, one replace glideslope wooden tower, two replace light station guide wires, four replace localizer antenna platform, and repair pier with navigation equipment and complete engineering and installation of four REILS; undertake new technology initiatives, and provide engineering and technical services support.

Benefits: The replaced and upgraded equipment will help to reduce runway downtime and technician time associated with maintenance and repair of the visual and navigation aids. Additionally, the new in-pavement steady burning approach lights will require less maintenance, thus reducing runway downtime. These benefits will increase safety and airport capacity. The installation of RLMS' will reduce the need for technicians to physically monitor the ALSF-2's during adverse weather conditions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$14,926.0 [1]
FY 2008 Appropriated	---	5,000.0
FY 2009 Request	---	1,000.0
FY 2010-2013	---	26,000.0
Total	Various	$46,926.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Equipment Sustain/Replace/Install	Various	$1,000.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D10	**VASI – Replacement – Replace with Precision Approach Path Indicator**	**$4,000,000**	**Various**	**N-04**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The Visual Approach Slope Indicator (VASI) system was initially deployed in 1960 within the NAS and requires replacement with more modern systems. The VASI systems are no longer the visual slope indicator standard for the International Civil Aviation Organization (ICAO). The ICAO recommended that all U.S. airports serving international operations replace the VASI lights with Precision Approach Path Indicator (PAPI) lights to standardize on the visual vertical guidance information.

Description of Solution: Phase 1 of the replacement program procures and installs PAPI systems to replace the older VASI systems. The first phase of this program addresses the approximately 207 runways serving international operations. To date, FAA has completed 89 replacements with approximately 118 still remaining. Once the ICAO requirement is met, Phase 2 of the program will replace the remaining 674 VASI systems serving non-international operations.

In FY 2007, $3,000,000 was appropriated for engineering and technical services/support; final incremental funding for ongoing replacement VASI with PAPI projects and initial funding for four new replacement projects.

In FY 2008, $3,000,000 was appropriated for engineering and technical services/support; final incremental funding for ongoing replacements of VASI with PAPI projects and initial funding for 12 new replacement projects.

For FY 2009, $4,000,000 is requested for engineering and technical services/support; procurement of 43 PAPI systems, final incremental funding for on-going VASI replace PAPI projects and initial funding for 30 new replacement projects.

Benefits: This program contributes to the FAA Strategic Goal of International Leadership. The PAPI system complies with the ICAO standard.

This replacement program will:

- Fulfills the ICAO standard to install PAPI systems at all international runways.
- Responds to Airline Pilot's Association and General Aviation requests for PAPI's at validated approaches within federally controlled airspace.
- Adds remote maintenance monitoring to visual glideslope indicators.
- Reduces maintenance person-hours.
- Eliminates the currently supply support deficiencies related to lack of uniformity between various VASI configurations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$48,370.0
FY 2008 Appropriated	---	3,000.0
FY 2009 Request	---	4,000.0
FY 2010-2013	---	25,000.0
Total	Various	$80,370.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. PAPI Equipment Procurement	---	$600.0
2. Final incremental funding for on-going replacement projects and initial incremental funding for 30 new replacement projects.	---	3,000.0
3. Logistics/Engineering Services Support	---	400.0
Total	Various	$4,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D11	Global Positioning System (GPS) Civil Requirements	$20,700,000	Various	N-12

FAA Strategic Goal: Increased Safety – Reduce the number of fatal accidents in general aviation.

Background: The global positioning system (GPS) is a satellite-based system that provides position, navigation, and timing (PNT) service to the U.S. government (USG) and the world with no direct user charges. GPS provides two PNT services; the precise positioning service (PPS), using the dual L1-C/A and L2 signals, and the Standard Positioning Service (SPS), using the single L1-C/A signal. Only the SPS is available for worldwide use by the civil community. Currently, GPS consists of second generation satellites (GPS-II) and the operational control segment (OCS). The GPS program is entering into a period of transition from GPS-II to the third generation (GPS-III) and the modernized operational control segment (OCX). The GPS III Modernization adds a new civil signal (L1C) and signal monitoring for all civil signals.

Description of the Problem: The National Space-based PNT policy (NSPD-39) requires civil agencies to fund new and unique civil GPS capabilities beyond the second and third civil signals already contained in the current GPS, specifically, the L1C signal and civil signal monitoring with DoT serving as the lead civil agency. FAA will include the funding to implement L1C and civil signal monitoring in its budget request for FY2009-2013 and serve as DOT's implementing agency for the civil funded capabilities.

Description of Solution: Implementation of the L1C signal will consist of system design and development activities performed by the GPS-III and OCX prime contractors, managed by the USAF GPS Wing. In FY2009, the work required to implement L1C is expected to consist of systems engineering, system design, and program management.

The GPS Signal Monitoring system will consist of a worldwide network of 18-21 GPS monitor stations connected to two processing facilities. The monitor stations must be installed at worldwide geographically dispersed locations such that every GPS satellite can be continuously monitored from at least two monitor stations. The monitor stations will collect real-time measurements of the GPS signals (L1C, L1-C/A, L2C, and L5) and forward this information to the processing facilities where a suite of software algorithms will monitor the accuracy, integrity, continuity, and availability of performance to verify that modernized GPS is suitably safe for use.

For FY 2009, $20,700,000 is requested to accomplish the following:

- Program Management - $2,180,000 to prepare specifications, establish a development contract, and the resources necessary to monitor cost, schedule, and technical performance.
- Systems Engineering - $7,133,000 to develop the satellite architecture and system design for the L1C signal and new GPS monitor station receivers to collect the L1C, L1-C/A, L2C, and L5 measurements, establish new user avionics receiver standards, and algorithm description documents for the signal monitoring algorithms located at the processing facilities. This effort will also include site surveys, design of the terrestrial communications system, and implementation planning required prior to fielding of the ground infrastructure.
- Hardware and Software Development - $10,750,000 to design, procure, integrate, test, and factory acceptance of GPS monitor station and the processing facility equipment. The design and prototyping of the signal monitoring software algorithms will also be started.
- Test and Evaluation and Logistics Support - $637,000 is requested for test and evaluation planning, data collection to support prototyping, and logistics support planning for the GPS monitor station and processing facility equipment. Documentation will be developed to establish the operation standards and training needs for the GPS Signal Monitoring system.

Benefits: The Civil Unique GPS Capabilities (L1C and civil signal monitoring), in conjunction with GPS III/OCX modernization and new user receiver avionics, is expected, with other enhancements, to enable global aviation use of GPS for vertically guided approach operations, with minimum or possibly without augmentation, by 2028. This benefit is dependent on a DoD commitment to provide a minimum of 30 dual frequency (L1 & L5) GPS satellites with OCX that delivers 1-2 meter user range accuracy with high reliability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$1,100.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	20,700.0
FY 2010-2013	---	0.0
Total	---	$21,800.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$2,180.0
2. System Engineering	---	7,133.0
3. Hardware/Software Development	---	10,750.0
4. Test and Evaluation/Data Collection and Documentation/Logistics Support	---	637.0
Total	---	$20,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E01	**Fuel Storage Tank Replacement & Monitoring**	**$6,100,000**	**Various**	**F-13, M-39**

FAA Strategic Goal: Environmental Stewardship – Reduce pollution and other adverse effects of transportation and transportation facilities.

Description of Problem: Fuel storage tanks support the critical operations of emergency power generators at FAA facilities across the NAS. A loss of integrity in the tank systems may result in critical facility failures during periods of emergency generator operations.

Storage tanks have historically contained materials that could cause environmental harm or result in personal injury if released. In response to the risk of accidental release, the Federal government, the various State legislatures, local county and city jurisdictions have all passed laws specifying the minimum requirements for construction, installation, removal, and operations of fuel tank systems. Additional requirements affecting storage system operations have been established under the jurisdiction of state and local building codes, fire protection codes, airport authority requirements, and occupational safety and health acts.

The fuel storage tank (FST) systems installed in the mid-1980s have reached the end of their planned life cycle. The 3,005 NAS tank systems managed under the FST Program life cycle sustainment guidelines must be replaced or upgraded with a cost of approximately $110,000 per tank site.

For example:

- Due to loss of fuel source, emergency power generators were inoperable.
- Approximately 6,000 gallons of fuel spilled from the FST system at the Atlanta ARTCC. Remediation efforts to date have cost approximately $500,000. EPA performed an inspection at this site and issued Notices of Violation.
- An intermittent leak may have spilled up to 500 gallons at Pico del Este, Puerto Rico. Remediation efforts to date have exceeded $475,000. Clean up in this environmentally sensitive area continues.
- Wisconsin Division of Environmental and Regulatory Services issued Administrative Orders requiring replacement of 6 tank systems not meeting minimum construction standards. Replacement costs are expected to exceed $400,000.

Description of Solution: The FAA will continue life cycle maintenance of 3,005 fuel storage tanks to support mission-critical activities and to comply with environmental requirements. The fuel storage tank systems have varying life cycles depending on the specific hardware. Leaking FST systems will be abated immediately to minimize any adverse impact to personal and environmental safety, restore availability of the systems for National Airspace System (NAS) operations, and preclude regulatory fines.

The implementation of the national ARTCC fuel storage system upgrades is a major program initiative. The ARTCC fuel systems have been redesigned to provide enhanced technician control and increase operational readiness capacity. Components of the fuel storage system are being upgrade to comply with changing Environmental Protection Agency (EPA) underground storage tank regulations.

In FY 2009, $6,100,000 is requested to fund:

- Three ARTCC fuel storage system upgrades,
- Emergency system repairs necessitated by unforeseen integrity losses,
- Modification efforts to comply with changing environmental regulatory requirements,
- Regulatory requirement for state tank registration and licensing,

- Lifecycle sustainment for FST systems, and
- Backlogged tank replacements.

Benefits: The FST and ARTCC lifecycle sustainment programs contribute to the FAA goal of organizational excellence by proactively pursuing operational readiness and safety issues within existing NAS safety standards/structures. Executing a life cycle sustainment program achieves the cost benefit of reducing the risk of leaking FST systems, minimizing adverse impacts to personal and environmental safety, restoring availability of the systems for NAS operations, and precluding regulatory fines of up to $32,500 per day.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$235,774.0 [1]
FY 2008 Appropriated	---	5,900.0
FY 2009 Request	---	6,100.0
FY 2010-2013	---	25,500.0
Total	Various	$273,274.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ARTCC Initiative	3	$4,200.0
2. FST systems sustainment	Various	1,900.0
Total	3	$6,100.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E02	**Unstaffed Infrastructure Sustainment (formerly FAA Buildings and Equipment)**	**$15,300,000**	**Various**	**F-12, M-08**

FAA Strategic Goal: Reduced Congestion – Increase capacity to meet projected demand.

Description of Problem: The FAA owns thousands of buildings and structures that house, support and protect the NAS Communication, Weather, Surveillance, and Navigational aids. A majority of these 20,000 plus structures were built during the 1940's and 1950's. They suffer from leaking roofs, deteriorated foundations and walls, inadequate air conditioning and electrical systems, and corroded steel towers. These structures need repair. There are currently over $130,000,000 in maintenance backlog projects that have been deferred. This maintenance backlog will continue to grow and threaten FAA's capability to add capacity unless funding for maintenance is provided.

Description of Solution: For FY 2009, a total of $15,300,000 is requested for the following:

- $14,100,000 is requested to make repairs to unstaffed facilities in the worst condition. These maintenance actions include replacing antiquated heating, ventilation and air conditioning; replacing old electrical wiring and lighting system; repairing damaged roofs, foundations, and walls; refurbishing steel towers; repairing culverts and embankments; cutting trees and vegetations; and grading rutted access roads.
- $1,200,000 is requested for In-Service Engineering.

Benefits: The Unstaffed Infrastructure Sustainment (UIS) Program will reduce the backlog of deferred maintenance by ten percent. The majority of the unstaffed facilities provide surveillance, communications, weather, and air traffic assistance to remote areas in a very efficient and cost saving manner. While no labor costs are necessary to operate these facilities, the facilities require periodic upgrades. The program extends the service-life of the buildings and equipment, avoids system outages and provides cost savings for FAA, the airline industry and the public.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$266,185.3 [1]
FY 2008 Appropriated	---	13,700.0
FY 2009 Request	---	15,300.0
FY 2010-2013	---	61,500.0
Total	Various	$356,685.3

[1] Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Structural improvements	---	$14,100.0
2. In Service Engineering	---	1,200.0
Total	Various	$15,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E03	**Air Navigational Aids and ATC Facilities (Local Projects)**	**$1,500,000**	**Various**	**M-08**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: During daily operations, critical equipment outages require local emergency actions to restore communications, surveillance, weather information, and air traffic control equipment. In addition, FAA must modify facilities and equipment to accommodate operational changes to over 30,000 commissioned air navigation and ATC facilities. The unplanned modifications include minor adjustments to air traffic control positions in air traffic control towers or air route traffic control centers, raising or relocating air/ground communications antennas to reduce frequency interference, correcting fire hazards, and improving minor security deficiencies. Also, local project funds are used to restore lost service caused by major storms that do not qualify as disasters.

Description of Solution: For FY 2009, $1,500,000 is requested to fund unplanned emergencies, which demand immediate action and minor site-specific adjustments. In the past Air Navigational Aids and ATC Facilities have helped:

- Restore various facilities damaged by hurricanes, tornadoes, and wildfires that do not qualify as national disasters. For example during recent wildfires in Southern California, a VORTAC navigation aid serving a major flyway between northern and southern California was destroyed. The impact was costing users of the ATC system almost $1,000,000 per month in increased fuel costs by flying more circuitous routes;
- Install a portable very high frequency omni-directional range (VOR) navigation aid for the burned down VOR facility at Presque Isle, Maine; and
- Mitigate expected traffic growth in a major sector at Los Angeles Center that required immediate action to prevent controller overload and massive delays to the users. The situation was such that traffic was being re-routed around that sector's airspace because of the overload. Users estimated a total of $2,000,000 per year in fuel savings alone, with no amount assigned to additional time of crew members or passengers.

Benefits: The local project program maps to FAA goal of greater capacity. This program contributes to achieving an 86.9 percent on-time arrival for all flights equal to or less than 15 minutes late due to NAS-related delays. Allowing emergency adjustments to NAS facilities will mitigates costly long-term maintenance and safety incidents.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$68,911.3 [1]
FY 2008 Appropriated	---	3,000.0
FY 2009 Request	---	1,500.0
FY 2010-2013	---	10,400.0 [2]
Total	Various	$83,811.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Regional site work	Various	$1,500.0

[1] Includes reduction pursuant to P.L. 108-7 February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E04	**Aircraft Related Equipment Program**	**$7,400,000**	**Various**	**M-12**

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate.

Description of Problem: The FI fleet is composed of 31 specially equipped aircraft operating around the world to ensure the integrity of air navigation by providing an in-flight certification that the underlying structure of the airspace is safe, useable, and accurate.

- Average life-cycle of an aircraft is calculated for 20 years,
- Beechcraft average life is 17.11 years, and
- The technology is aging.

The FAA operates a fleet of flight inspection (FI) aircraft for certifying flight procedures before publishing for public use. They also conduct airborne evaluation of electronic signals. Signals are used for aircraft departure, en route and arrival flight procedures. FI pilots verify the accuracy of data, human factors, and flyability of flight procedures. These procedures are based upon the use of satellite or space-based systems, and aircraft flight management systems. FI pilots verify the integrity of instrument approaches, flight procedures, and charts used for visual and instrument flight by air carrier and general aviation pilots. The FI fleet must be equipped to help the NAS evolve to a performance based system. A performance based NAS allows civil aircraft to navigate airspace more safely and with greater flexibility than the current ground based system. Performance based initiatives will be achieved through implementation of Required Navigation Performance (RNP) area navigation, in addition to local area augmentation system (LAAS) and wide area augmentation system (WAAS). To meet these safety and greater capacity objectives, new instrument flight procedures will provide both lateral navigation (LNAV), vertical navigation (VNAV), and localizer performance with vertical guidance (LPV).

Description of Solution: The program will provide service life extension projects and technical equipment refreshment/replacement/upgrades to existing aircraft to meet mission performance requirements and ensure NAS safety by extending the expected life-cycle of 20 years to more than 30 years. The Aircraft Related Equipment (ARE) program is the vehicle to modernize FAA Flight Inspection aircraft.

In FY 2009, $7,400,000 is requested to continue ongoing initiatives from prior years and to implement new starts for the critical safety and capacity initiatives of the FAA Flight Plan:

- Next Generation Automated Flight Inspection System (NAFIS) formerly MFIS (Transition from Automated Flight Inspection System (AFIS)): NAFIS is a system that provides FI capabilities in areas inaccessible by current FI aircraft. Technology refreshment is needed to meet FI system modernization and increase independent truth system accuracy requirements to support the Future Air Navigation System (FANS) activity of the International Civil Aviation Organization (ICAO) and the Agency's Free Flight 2000 Program. The AFIS is continually refreshed to comply with evolving NAS and the new space based Air Traffic System mission performance technology. Continued development of a (NAFIS) will employ an independent truth system and avionics suite to certify specialized instrument approaches and enable Standard Instrument Approach Procedures to locations that have been unable to have instrument approach capabilities. NAFIS uses advances in technology to reduce system weight resulting in increased aircraft range and fuel savings and will be adaptable to future Flight Inspection aircraft.

- BE-300 Navigational Flight Management System (FMS) and Avionics Systems; Service Life Extension Program (SLEP): This will replace the current navigational system, interior and avionics suite in the BE-300 model FI aircraft with new spaced based Air Traffic System capable flight management system. This upgrade will also assist in weight reduction resulting in increased endurance and fuel savings.

- Communication and Data: This is an airborne system that provides FI crews with data capability to transmit or access required data between the FI aircraft and ground stations.

Benefits: The improvements provided by this program will help the agency achieve FAA Flight Plan safety and increased capacity objectives develop performance based safety standards for the NAS starting with navigation, mitigate risk and improve safety management through development and deployment of technology and procedures, provide capability to protect communications, navigation and surveillance service, meet demand in adverse weather conditions, maintain runway use in reduced visibility, maintain optimum runway use, reconfigure airports efficiently, reduce NAS equipment outage delays at terminals, meet demand in terminal non-adverse weather conditions, fill gaps in arrival and departure procedures and support construction of new runways.

- NAFIS / Transition from AFIS: This will increase the safety composite index by providing a means to ensure the integrity of existing, new, and improved navigational aids introduced into the NAS. The FAA will keep pace with the increase in NAS facilities and will control costs while supporting FAA Flight Plan by providing the flying public greater safety and quality of service, and ensuring a safe air traffic system. NAFIS will verify infrastructure integrity and accuracy required in the evolving NAS.

- BE-300 Navigational Flight Management System (FMS) and Avionics Systems; Service Life Extension Program (SLEP): The FMS will replace two older existing systems and provide reduced weight and power usage and increase limited cockpit space. It will standardize the FI fleet and enable the agency to achieve FAA Flight Plan goals of safety and system efficiency by improving the FI capabilities for the new space based Air Traffic System and support Operational Evolution Plan (OEP) initiatives to expand system capacity (RNP, WAAS, LAAS, FI capability).

- Communication and Data: This will provide real-time information between FI aircraft and ground systems, with uncorrupted, accurate, current, and timely data thereby improving efficiency and reducing cost during ground technician communication.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$95,184.0 [1]
FY 2008 Appropriated	---	9,800.0
FY 2009 Request	---	7,400.0
FY 2010-2013	---	36,000.0
Total	Various	$148,384.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Automated Flight Inspection System (AFIS)/ Next Generation Flight Inspection System (NAFIS)	---	$900.0
2. BE-300 Navigation, Flight Management & Avionics	---	5,000.0
3. Communications and Data	---	1,500.0
Total	Various	$7,400.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E05	**Airport Cable Loop Systems - Sustained Support**	**$7,000,000**	**Various**	**F-10**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Surveillance, landing, and air communications systems at many large airports are endangered because of the condition of the underground cables supporting these systems. Much of the control and signal cables serving critical airport facilities are 25 to 40 years old and badly deteriorated. This makes the NAS vulnerable to catastrophic failure. Existing airport control cable configurations do not allow for redundant communication paths between these systems and towers. Most of the NAS control and signal cable infrastructure is copper and is highly susceptible to damage from lightning strikes, electromagnetic pulses, electromagnetic interference, corrosion, and rodents. The cable infrastructure supporting the new NAS systems being brought on line must be upgraded.

Description of Solution: The Airport Cable Loop program will field redundant communication paths. Instead of using copper cable, the program will field a fiber optic transmission system. Ongoing projects include fiber optic loops at Chicago O'Hare, Atlanta, LaGuardia, Detroit, Portland Phase I, and Los Angeles.

In FY 2008, $5,000,000 was appropriated to provide funding for Tampa, Austin, Dallas Ft. Worth, Portland, Washington Ronald Reagan National, Denver, Charlotte Douglas, and Cincinnati Northern Kentucky. The funding will also provide for upgrade and retrofit support, equipment procurement, engineering testing, and configuration management.

For FY 2009, $7,000,000 is requested to provide funding for Portland, LaGuardia, Denver, Newark, Charlotte Douglas, Washington Ronald Reagan National, Cincinnati Northern Kentucky, and Boston-Logan Phase 2. The funding will also provide for upgrade and retrofit support, engineering testing, and configuration management.

Benefits: The Cable Loop Program maps to FAA goal of increased capacity by reducing or eliminating communications cable related outages. The program also supports the goal of increased on-airport safety by reducing or eliminating A and B runway incursions. System reliability and safety are enhanced due to increased system performance from multiple pathways provided by the cable loop system. Standardizing requirements will simplify logistics, configuration management, training, procurement, and depot support. There will now be a standard building block approach for installation and service. The FAA will realize savings in costs, resources, and time. Using fiber optic cable instead of copper will reduce the possibilities of interference and impedance faced by copper wire currently in use. Fiber optic cable is impervious to extremes in weather, lightning strikes, electromagnetic pulses, and electromagnetic interference. By using fiber optics, the agency will be assured of bandwidth and capacity to serve future systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	24	$47,815.1 [1]
FY 2008 Appropriated	8	5,000.0
FY 2009 Request	8	7,000.0
FY 2010-2013	---	20,000.0
Total	40	$79,815.1

[1] Includes $1,300,000 reduction of the FY 2002 funds pursuant to supplemental P.L.107-206, January 23,2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Site Engineering and Fiber Optic Installation	---	$6,400.0
2. Program Management Support	---	400.0
3. Engineering Support/Design/Documentation	---	200.0
Total	Various	$7,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E06	**Alaskan NAS Interfacility Communications System (ANICS)**	**$5,000,000**	**Various**	**C-17**

FAA Strategic Goal: Increased Safety – Reduce the number of fatal accidents in general aviation.

Description of Problem: Alaska has the highest aircraft accident rate in the world. A contributing factor is the lack of critical flight information due to the lack of reliable communications. Commercial communications services are unreliable. They are out an average of eight days a year per provider. FAA requires essential telecommunications service 99.9% of the time – less than ½ day of outage per year.

- Commercial telecommunications carriers in remote Alaska are unreliable or non-existent. Existing carriers are small and cannot provide critical information to the flying public. Also, cost for limited services can be outrageous.
- Flying in Alaska is treacherous as rough terrain in remote areas and changing weather conditions create extreme hazards with little margin for error.
- Flying is the only way to reach the majority of Alaskan communities.
- Alaska has nine times the number of licensed pilots per capita than average.

As a result of system aging, equipment obsolescence, and extreme Alaskan weather, trend data indicates increased system degradation of Phase I sites. Equipment that is impacted includes cabling, antenna feed assemblies, power boxes, deicers, controllers, cards, radomes, and ancillaries. Some ANICS parts and software are no longer supported by the manufacturer and need to be replaced.

Description of Solution: The FAA has established a six-year schedule (FY 2007 – FY 2012) for the technical refresh of the PHASE I ANICS Network estimated to cost $28,000,000.

For FY 2009, $3,000,000 is requested for the continuation of the installation of system modems and modem switches, which began in FY 2007. Also requested is $2,000,000 to rebuild the Cape Newenham and Sparrevohn facilities that were destroyed in FY 2007 by Category 4 hurricane-force winds.

Benefits: The ANICS program maps to the FAA goal of Increased Safety and reducing the number of accidents in Alaska to 99 accidents per year or less.

In FY 2006, ANICS helped reduce accidents in Alaska over the previous year. In the current year of FY 2007 to date, there have only been 26 aviation accidents in Alaska. The technical refresh of aging facilities in Alaska will further reduce the number of accidents.

Additionally, the FAA saves an average of $350,000 per year in operating costs when facilities are switched to the ANICS Network. As a result of the savings and accident prevention, FAA's investment in the ANICS Program will have substantial savings within a number of years.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	87	$126,806.9 [1]
FY 2008 Appropriated	---	2,000.0
FY 2009 Request	27	5,000.0
FY 2010-2013	---	8,000.0 [2]
Total	114	$141,806.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Rebuild Sparrevohn	1	$1,000.0
2. Rebuild Cape Newenham	1	1,000.0
3. Complete Modem Switch Upgrade	25	3,000.0
Total	27	$5,000.0

[1] Includes $2,000,000 reduction for the FY 1999 Essential Air Services reprogramming. Also includes $786,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999.
[2] Future requirements are currently under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E07	**Facilities Decommissioning**	$5,000,000	Various	F-26

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The June 2005 GAO report "Air Traffic Operations, the Federal Aviation Administration Needs to Address Major Air Traffic Operating Cost Control Challenges" states that FAA needs to expand its efforts to cut operational costs to address an expected gap between budget forecasts and expenses. The report recommends accelerating ground-based navigational aids decommissioning.

In recent years FAA has decommissioned many redundant or underused facilities, but funding has not been identified to effect the divestiture (including environmental testing, property restoration, and equipment disposal) of those facilities. In addition, FAA has plans to decommission entire classes of facilities such as Non-Directional Beacons and Remote Communications facilities.

This program funds disposal activities including:

- termination environmental due diligence audits (EDDAs),
- testing for environmental clean-up and hazmat abatement and disposal,
- non-hazmat real property site restoration, demolition, and disposal,
- lease termination liabilities,
- equipment (personal property) removal, reuse, and disposal,
- removing telecommunications systems, services, and circuits,
- frequency spectrum reallocation,
- modification of the National Airspace System Resources (NASR) database, aeronautical charts, and terminal procedures publications, and
- addressing cultural and historic preservation and natural resource protection issues.

Description of Solution: This program will result in the final disposition of existing buildings, structures, or real and personal property. For FY 2009, $5,000,000 is requested to fund costs associated with the decommissioning of facilities. The FAA projects over 1,000 facilities will need to be evaluated. The funding request will include the following:

- Payment for environmental testing (but not remediation, which is funded elsewhere in this budget);
- Costs associated with the restoration of the land including demolition and final disposition of excess structures;
- Payments to property owners in lieu of restoration;
- Funds for screening, transporting, and final disposition of associated personal property;
- Costs for disposition of telecommunications and other utility systems, services, and circuits;
- Costs to assure that relocated frequencies do not interfere with other equipment;
- Incremental costs associated with changes to publications and databases;
- Costs associated with addressing cultural, historic, and natural resource preservation;
- Funds for developing business tools to enhance decommissioning activities; and
- Funds for studies and implementing resulting procedures and practices to enhance program effectiveness and efficiencies.

Benefits: Providing funds for the final disposal of structures, equipment, and real estate that is no longer required by FAA supports the infrastructure investments to maintain existing capacity in a cost effective manner.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$500.0
FY 2008 Appropriated	---	5,400.0
FY 2009 Request	---	5,000.0
FY 2010-2013	---	20,000.0 [1]
Total	Various	$30,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Facility Disposition	Various	$5,000.0

[1] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E08	**Electrical Power Systems - Sustain/Support**	**$51,000,000**	**Various**	**F-11, M-39**

FAA Strategic Goal: Greater Capacity – Increase airport capacity to meet projected demand and reduce congestion.

Description of Problem: The National Airspace System (NAS) power system infrastructure is critical to both maintaining existing capacity and increasing the capacity of the NAS in the future. Analysis of NAS outage data shows a significant link between delays and the reduced reliability and aging of the NAS power system infrastructure. Failure of the aging power infrastructure has led to significant delays and resulted in investigations by the National Transportation Safety Board and the Department of Transportation Inspector General. The Power Systems Group is proactively addressing this situation to mitigate future risk from NAS power outages.

Of the $4.6 billion NAS power system infrastructure, $2.2 billion represents the power cable at airports essential to the operation of all air traffic. Seventy-five percent of this cable is well beyond the condition and age that commercial power companies would continue to operate. This has led to major airport disruptions. A proactive program is planned to tackle this significant risk. The current infrastructure is failing to deliver the power reliably, resulting in outages and delays. The FAA must maintain the current Air Traffic Control (ATC) system capacity by replacing unreliable power system equipment to avoid increasing power outages and service interruptions in the future. The following components of the ATC power system require immediate attention:

- Power Cable: The top 300 airports require 18 million feet of power cable to sustain operations. Seventy percent of these power cables are at a high risk of failure, which could lead to extended delays and outages. Replacement of this cable costs $120 per foot and would normally be expected to last 30 years. The FAA aims to extend the life of this cable to 60 years with precise identification of candidate cables for replacement. Even with a 60 year life the annual cost of the cable replacement is estimated to be $35M. Several Operational Evolution Plan airports are operating with cable between 50 and 60 years old and are experiencing significant failures and delays. Replacing unreliable terminal power cables will be given the highest priority in this budget.
- Uninterruptible Power Supply (UPS): An uninterruptible power supply is a device that prevents power disruptions and surges from adversely affecting electronic system performance. A UPS is necessary within an Airport Traffic Control Tower to ensure the continued performance of the facility and eliminate power disruptions to critical infrastructure. The FAA currently maintains 1783 UPS with an expected service lifetime of 20 years. A significant portion of the UPS inventory requires replacement due to reliability and supportability issues attributable to age. UPS batteries require refurbishment on a four year cycle.
- En Route Power Systems: The FAA maintains 23 En Route Center power systems. Because of the critical role of the En Route Centers in the NAS, 100 percent of the power systems require sustained funding to maintain service life. The Los Angeles Air Route Traffic Control Center outage highlighted a system flaw or single point of failure that can lead to the loss of all critical and essential power and significant delays to air traffic. Each ARTCC requires $5,000,000 to correct this situation. The delivery of this correction will take several years to complete due to funding and disruption constraints.
- Radar Lightning Protection: ATCT radars face threats to operability from both man-made sources and lightning. Lightning Protection systems are incorporated to ensure ATCT radars do not sustain damage from lightning. Lightning protection and grounding is applicable to over 16,000 FAA facilities. Lightning protection and grounding systems require systematic refurbishment after a service life of 25 years.
- Direct Current (DC) Power Systems: DC power systems are used to provide a low cost, shorter term alternative to an engine generator. Critical safety electronic system availability is increased and commercial power disturbances of up to several hours no longer disrupt air traffic operations. The FAA maintains 541 DC Power systems with a service life of up to 15 years.

- Engine Generators: Engine generators serve as a backup power source for essential NAS electronic systems when commercial power becomes unreliable due to a weather system, natural disaster or other electrical outage beyond FAA control. Without an engine generator, a FAA site may expect 10 or more hours per year of commercial power failure and hence significant NAS disruption. The FAA maintains 3,565 NAS engine generators with a useful service life of 24 years. Maintenance of the aged inventory has increased five fold in six years with a significant reduction in reliability and availability.
- NAS Batteries: Batteries serve as a backup power source for key NAS facilities including navigation aids and communications. These batteries provide limited power during major power system disruptions and maintain the function of key systems while the NAS transitions to a safe level of reduced operation. The FAA maintains in excess of 4000 battery installations with periodic replacement of between 10 and 20 years depending on application.

Prioritization
Projects will be prioritized to provide the maximum reduction of risk of loss of NAS service. This will utilize the monetized impact priority model developed by the Air Traffic Organization (ATO) for the Power Services Group. This model prioritizes sustainment projects to the locations in the NAS that would result in the most disruption.

Description of Solution: Reliable distribution, conditioning and standby power systems must be in place to operate the NAS as well as to maintain the capacity of the NAS during commercial power outages. This funding will proactively sustain Key NAS infrastructure and the top 75 airports.

For FY 2009, $51,000,000 is requested to accomplish the following:

- $6,504,000 to replace batteries.
- $4,424,000 to replace UPS.
- $4,061,000 to replace DC systems.
- $9,000,000 to sustain the En Route Centers' critical power distribution systems.
- $3,251,000 to correct grounding and lightning protection systems.
- $6,036,000 to proactively replace airport power cables.
- $10,000,000 to replace aging engine generators.
- $2,224,000 to sustain critical power distribution systems.
- $5,500,000 to provide Power System Sustain Support (PS3) and project support system engineering.

Benefits: The Electrical Power Systems Sustain Program maps to FAA goal of greater capacity by avoiding delays due to NAS equipment outages. The FAA conducted a study using their System Outage Disruption Model which shows that the Power Systems Sustain/Support investment of $51,000,000 would provide significant user benefits in avoiding the costs of delay to aircraft and passengers. At a total annual $51,000,000 funding level, the cumulative discounted incremental benefits over 20 years amounts to $240 million, with a benefit to cost ratio of six, and a net present value of $210 million. The FAA also benefits by avoiding expensive electronic equipment repair due to electrical outages.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$388,615.0 [1]
FY 2008 Appropriated	---	38,000.0
FY 2009 Request	---	51,000.0
FY 2010-2013	---	280,000.0
Total	Various	$757,615.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Regional Site Work	Various	$47,000.0
2. Washington Headquarters Procured Equipment and Services	---	4,000.0
Total	Various	$51,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E10	**Aircraft Fleet Modernization (ATO) – International Flight Inspection Aircraft (ATO)**	**$24,900,000**	**Various**	**M-11**

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate

Description of Problem: The FAA is in the process of upgrading its capability to perform the FAA mission of flight inspecting DoD facilities, and to provide reimbursable flight inspection services to foreign governments located across all continents. These efforts are critical to the security of the U.S. and its allies. Before and during military deployments, FAA must certify the safety of runways, navigational aids, landing systems, and support. FAA's remaining fleet of three Hawker aircraft no longer support current and anticipated worldwide military contingencies, other international flight inspection missions, and domestic "new NAS" requirements including Required Navigation Performance (RNP) Flight Inspection. The Hawker aircraft do not have the necessary range, mission payload, or response time for current military and international requirements, and the avionics are inadequate for current and future requirements. The Hawker aircraft do not have "new NAS" flight inspection capability including WAAS/LPV & RNP.

Description of Solution: For FY 2009, $24,900,000 is requested to replace the three remaining Hawker flight inspection aircraft with a Challenger 600 series aircraft. The U.S. Air Force will also purchase a Challenger aircraft. The proceeds from the trade-in of the remaining three Hawker aircraft will be used to offset the purchase price of the FAA Challenger aircraft. The FY 2009 funding request will supplement the trade-in value of the remaining three Hawker aircraft and to complete the JRC approved acquisition. The contractor is not obligated to accept the Hawker aircraft for trade-in after FY 2009. However, if the contract option is not exercised, value of the Hawker aircraft will be significantly reduced and firm-fixed pricing no longer exists for the Challenger aircraft. This could increase the cost to the taxpayer of an additional $5 million. The Challenger aircraft will provide New NAS (i.e. WAAS/LPV and RNP) operational and Flight Inspection capability, increased payload, reduced response time and increased range that is necessary to fulfill FAA's mission.

Benefits: The fleet modernization effort will satisfy FAA's required mission of flight inspecting DoD facilities. Operations and maintenance costs will be decreased by the reduction of FAA's Flight Inspection fleet by two aircraft. The reduction in the number of aircraft fleets from 4 to 3, and reduction of flight inspection aircraft from 31 to 29, will also reduce the Operations and Maintenance costs. A 20 percent increase in productivity of work historically conducted by the Hawker aircraft will be achieved. This results in a reduction of 400 international flight-hours annually. This program also provides increased capability for RNP flight inspection and promotes fleet standardization critical to achieving the FAA mission of certifying navigational aids and instrument flight procedures including RNP, RNAV, and WAAS.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$0.0
FY 2008 Appropriated	---	0.0
FY 2009 Request	---	24,900.0
FY 2010-2013	---	0.0
Total	Various	$24,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
International Flight Inspection Aircraft Acquisition	---	$24,900

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A01	**Hazardous Materials Management**	**$18,000,000**	**Various**	**F-13**

FAA Strategic Goal: Environmental Stewardship – Reduce pollution and other adverse effects of transportation and transportation facilities.

Description of Problem: The FAA has identified over 700 contaminated sites at 204 locations nationwide that require investigation, remediation, and closure.

The US Environmental Protection Agency (EPA) lists federal facilities that require remediation actions on the Federal Hazardous Waste Compliance Docket (FHWCD). The FAA has been responsible for 70 sites listed on the Docket, the most of any DOT organization. The FAA is currently conducting required site assessment, remedial and closure actions for these sites, and has attained No Further Remedial Action Planned (NFRAP) closure documentation for 65 of the 70. The FAA is currently responsible for five FHWCD sites that have not achieved NFRAP. Site investigations revealed that toxic contamination resulted from a variety of hazardous substances, including cleaning solvents, degreasing agents, pesticides, asbestos, polychlorinated biphenyls (PCBs), and heavy metals. The FAA has mandatory cleanup schedules in place as part of enforcement agreements with regulatory agencies. These agreements require the FAA to remediate contaminated soil and groundwater. Extensive contamination at the William J. Hughes Technical Center prompted EPA to place the site on the EPA National Priorities List (NPL or Superfund) as one of the Nation's most environmentally dangerous sites. Other contaminated sites (many of which are located in Alaska) and the requirements of the Hazardous Materials Management program account for a large portion of unfunded liabilities documented in FAA's financial statement.

Description of Solution: To manage and remediate these contaminated sites, FAA developed the Hazardous Materials Management program. To achieve compliance with all federal, state, and local environmental cleanup statutes, including the Resource Conservation and Recovery Act of 1976, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the Superfund Amendments and Reauthorization Act of 1986, FAA must continue mandated program activities. The FAA's program activities include investigating sites; managing hazardous materials and hazardous waste accumulation, handling, and disposal; installing groundwater monitoring wells; remediating site contamination; and controlling air pollution.

For FY 2009, $18,000,000 is requested to:

- Conduct contaminant investigations, implement site remedial projects, and complete regulatory closures at the five remaining Docket sites: William J. Hughes Technical Center; Ronald Reagan Washington National Airport; Mike Monroney Aeronautical Center; Omaha EX Air Force Station ; and Kirksville ARSR Air Force Station;
- Attain 93 percent "No Further Remedial Action Planned" closure documentation for FAA listed on EPA's Federal Hazardous Waste Compliance Docket; and
- Continue to perform investigations and remediation projects at all other identified contaminated sites in accordance with state mandates and enforcement agreements to limit future liability to the Agency and foster environmental stewardship.

Benefits: The Hazardous Materials Management program maps to FAA goal of Environmental Stewardship by reducing pollution and other adverse effects of transportation and transportation facilities. The program significantly decreases financial and operational risks to FAA through assessing and remediating contaminated sites. The Hazardous Materials Management program also ensures that FAA complies with the Department of Transportation's performance goal of placing 93 percent of all sites listed on the EPA Federal Hazardous Waste Compliance Docket into the status of "No Further Remedial Actions Planned."

The FAA conducted a cost benefit analysis and determined a benefit ratio of 3.7 and an internal rate of return of 12.6 percent.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$314,219.7 [1]
FY 2008 Appropriated	---	18,200.0
FY 2009 Request	---	18,000.0
FY 2010-2013	---	80,000.0
Total	Various	$430,419.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Superfund Sites Remediation	Tech. Center, Atlantic City, NJ	$8,000.0
2. Investigation and Remediation	Alaskan Region	4,400.0
3. Investigation and Remediation of Other Sites in FAA Regions; and Program Management	---	5,600.0
Total	Various	$18,000.0

[1] Includes $3,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A05	**Facility Security Risk Management**	**$15,000,000**	**Various**	**F-24, M-08**

FAA Strategic Goal: Security — Balance homeland and national security transportation requirements with the mobility needs of the Nation for personal travel and commerce.

Description of Problem: The FAA staffed facilities are vulnerable to outside intruders, and existing security vulnerabilities jeopardize air traffic services critical to the National Airspace System. Employee and user security is critically dependent upon an operational and administrative environment that provides reasonable safeguards against these types of disruptions. HSPD-7, Critical Infrastructure Identification, Prioritization and Protection mandates that agencies identify, prioritize, and coordinate the protection of critical infrastructure and key resources against terrorist acts.

Description of Solution: All FAA staffed facilities must be secured. To this end, FAA has assessed physical security risks and prioritized corrective actions based on the threat to the facility. The Facility Security Risk Management (FRSM) program has ongoing activities to reduce these risks. These activities include reducing the risk of intrusion and unauthorized entry by installing surveillance, intrusion detection, and access control systems. Other improvements include controlling parking, fencing, lighting, occupant emergency plans, intelligence sharing, physical barriers, shipping and receiving upgrades, and employee and visitor identification.

For FY 2009, $15,000,000 is requested to enable the following upgrades:

- Complete construction at three Security Level (S/L) 3 ATCTs and five S/L 3 TRACONs;
- Complete installation of access control/intrusion detection at six S/L 3 TRACONs and five S/L ATCTs;
- Install fences at thirty S/L 1 and 2 ATCTs and
- Accredit 49 facilities.

Benefits: The FRSM program reduces the risk of criminals accessing FAA facilities. The FAA has completed upgrades and accredited 826 of 1125 facilities, which protect employees, facilities, and assets of FAA's critical infrastructure. The FAA personnel security awareness has increased through the FSRM program, and the program also supports the FAA's response to Homeland Security Presidential Directives (HSPD) 7, 12 and 16.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$195,500.0 [1]
FY 2008 Appropriated	---	22,000.0
FY 2009 Request	---	15,000.0
FY 2010-2013	---	118,400.0
Total	Various	$350,900.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/[2] Quantity	Estimated Cost ($000)
1. Site Preparation/Construction	---	$7,141.4
2. A&E Design	---	1,489.2
3. Implementation	---	1,421.2
4. Security Systems Equipment Acquisition	---	4,095.8
5. Program Management	---	852.4
Total	Various	$15,000.0

[2] Sites are subject to change. Facilities assessed and found to have "high" risk will receive security upgrades before facilities with lesser risk.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3B04	**National Airspace System (NAS) Training Equipment Modernization-NAS Training Simulators**	**$12,000,000**	**12**	**M-20**

FAA Strategic Goal: Organizational Excellence – Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.

Description of Problem: The Controller Workforce Plan submitted to Congress in March 2007 indicated that approximately 72 percent of the controller workforce will be eligible to retire within the next 10 years. This potential increase in required hiring of new controllers opens many opportunities for transfers to higher traffic volume towers as well as centers. This poses an on-site training gap for these sites in terms of not having simulation available.

Description of Solution: For FY 2009, $12,000,000 is requested for the NAS Training Simulator. The program will equip selected terminal facilities with specialized simulation training equipment to further reduce the time it takes to check out transfers, re-certifications, refreshers and new hires to certified professional controller status. En Route facilities will have completed deployment in FY 2008.

Benefits: Air traffic control students will be trained in a safer, simulated, interactive environment, rather than in a live traffic situation, reducing risk to the flying public. This approach ensures training objectives are more fully met before the student transitions to live traffic in the control tower or en route center.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 2005-2007)	19	$20,418.0
FY 2008 Appropriated	6	14,600.0
FY 2009 Request	12	8,700.0
FY 2010-2013	---	4,300.0
Total	37	$48,018.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

	Locations	Estimated Cost ($000)
NAS Training Simulators – NAS (Field Sites)	12	$8,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A01	**System Engineering and Development Support**	**$32,000,000**	**Various**	**M-03, M-08, M-45**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

System Engineering and Technical Assistance (SETA) provides the continuity workforce required to support the agency goals of improving aviation safety and security, improving the efficiency of the air traffic control system, increasing the capacity and improving the reliability of the National Airspace System (NAS), and increasing productivity while reducing operating costs.

Description of Problem: The Capital Investment Plan (CIP) specifies the need for a total system approach to modernizing the NAS. This effort will accommodate future demands and technology, improve vital safety services, and increase productivity, while reducing operating costs. The NAS architecture is the structure that reflects the changes in requirements and the evolution of technology in aviation. It is a road map for transition from one program to another, the replacement of existing infrastructure, the introduction of new capabilities, and the retirement of outdated systems. The key to the architecture's success and the future of NAS is maintenance of the interfaces between outgoing systems, current systems, and incoming systems. This is achieved through the discipline of system engineering and integration.

Description of Solution: For FY 2009, FAA requests a total of $32,000,000 and 180 contractor staff years to procure the necessary critical technical expertise to perform the function of system engineering and integration for the NAS architecture, the development and implementation of an automated NAS configuration management system, support for air navigation facility and air traffic control systems, and for the continued evaluation of acquisition alternatives.

Funding in the amount of $28,000,000 will provide for various contracts supporting SETA, system architecture and other 8a support, and program evaluation support. The request will support 165 contractor staff years of air traffic control specialists, subject matter experts, computer science, electrical, and communications engineers, program analysts, cost analysts, financial analysts, operations research analysts, planners, and computer hardware and software technicians. This expertise meets the requirements of system engineering and integration for automation, communications, navigation and landing, surveillance, weather, software integration, and facilities for the NAS.

Air navigation facility air traffic control systems support is requesting $3,000,000 and nine contractor staff years and provides for engineering and related services to adjust to unforeseen circumstances affecting the safety and operations of the air traffic control system, as well as responding to specific emergency project deficiencies that would delay the realization of aviation user benefits.

Configuration Management (Web-CM) is requesting $1,000,000 and six contractor staff years to nationally implement the NAS configuration management system with the desktop accessible configuration management data repository. Once fully implemented, the NAS configuration management system will provide the capability for the agency to move from an obsolete, cumbersome, and inefficient paper-based environment to one that is automated, standardized, efficient, and paperless.

Benefits: SETA provides the continuity, innovation, and cost-effective workforce required to support agency goals of improving aviation safety and security, improving the efficiency of the air traffic control system, increasing the capacity and improving the reliability of the NAS, and increasing productivity while reducing operating costs. The creativity and innovation of the SETA workforce has resulted in significant cost savings and reductions of risk to FAA programs. SETA has also developed and enhanced software tools and programs to help improve the efficiency of the agency.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$1,203,819.5 [1]
FY 2008 Appropriated	---	30,155.0
FY 2009 Request	---	32,000.0
FY 2010-2013	---	131,400.0
Total	Various	$1,397,374.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering Technical Assistance Prime Contractor and Support Contractor and Services	---	$25,300.0
2. System Architecture/Other 8A Support	---	2,200.0
3. Program Evaluation	---	500.0
4. ATC/ANF Systems Support	---	3,000.0
5. Web CM	---	1,000.0
Total	Various	$32,000.0

[1] Includes $248,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes $3,200 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A02	Program Support Leases	$43,504,524	Various	M-08

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: To operate the NAS, FAA requires real property rights for approximately 3,145 rentable real estate leases. Without these leases FAA could not operate the NAS since a majority of its facilities reside either on leased land or in leased building space. The FAA must also obtain clear zones to prevent interference with electronic signals at certain facilities, such as very high frequency omnidirectional ranges, airport surveillance radars, and air route surveillance radars.

The real property leases are legally binding contracts and require rents to be paid each year. The total rent for the leases portfolio increases each year due to the addition of leases for new facilities and the renegotiation of expired leases.

Description of Solution: This program secures the required real property rights by providing the payments for approximately 2,398 land leases, 672 space leases, and 75 leases covering both land and space for operational facilities. It also funds the purchase of land when economically advantageous to FAA.

For FY 2009, $43,504,524 is requested to fund 3,145 leases along with other real estate requirements and will include:

- Payment of rents on approximately 3,145 land and space leases that directly support navigation, communication, weather, and air traffic control facilities;
- Costs associated with the rental and management of land and space for service/maintenance centers, deployment/development centers, laboratories, test beds, and other types of facilities that support the deployment and operation of technical facilities;
- Payments for condemnation of real property interests;
- Funds for conversion of existing leases to fee ownership or perpetual easements;
- Costs for real estate appraisals, market surveys, title reports, and other costs associated with the acquisition and management of real property assets;
- Funds for costs to relocate offices, facilities, personnel, and equipment and combine or consolidate multiple offices when technically feasible and economically advantageous;
- Funds for the development, management and administration costs for establishing and maintaining a database of leases and owned facilities, for developing business tools to enhance logistics activities, and for implementing program efficiency practices;
- Funding for certain costs associated with real property and equipment disposals with sale proceeds to be used to offset other direct and related program costs and real property and equipment disposal costs not otherwise funded;
- Funding for costs associated with the termination of ATO leases and the re-use of vacated Automated Flight Service Station (AFSS) space for other ATO purposes; and
- Funding for real property costs associated with the transition to next generation facilities.

Benefits: This program improves management of the FAA's real property assets and supports the Agency Flight Plan Goal of Organizational Excellence through the improvement of financial management while delivering quality customer service. Real property costs are being effectively controlled through:

1. The oversight and approval of all requests for additional real property rights,
2. The oversight and approval of all major maintenance and enhancements to existing real estate, and
3. The co-location of sites that currently are leased separately; hence, eliminating rents, utility costs, and maintenance costs for the excess space.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$441,270.1
FY 2008 Appropriated	---	40,000.0
FY 2009 Request	---	43,504.5
FY 2010-2013	---	199,300.0 [1]
Total	Various	$724,074.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Operational Leases	Various	$43,504.5

[1] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A05	**Transition Engineering Support**	**$10,700,000**	**Various**	**M-22**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: Due to staffing shortfalls, FAA's technical workforce cannot handle the surge in demand for short-term projects that are critical to managing the volume of diverse systems and equipment associated with National Airspace System (NAS) modernization. As a result, FAA will experience significant NAS modernization scheduling delays if additional support services are not available to complete these projects.

Description of Solution: The Transition Engineering Services program provides FAA with the technical expertise necessary to ensure that NAS modernization stays on schedule.

For FY 2009, $10,000,000 is requested for Transition Engineering Services to support the modernization schedules for NAS programs by providing critical core resources to key projects at significant cost savings. Also requested is $700,000 to ensure facility configuration management support is provided for the expeditious and effective implementation of facility and power system upgrades along with the introduction of new systems and equipment into the facilities. Some of the Capital Investment Plan (CIP) projects that use these resources are as follows:

- Air traffic control tower and radar replacement,
- Computer-aided engineering and graphics modernization,
- Air route traffic control center plant modernization/expansion,
- Planning new air traffic control systems,
- Facility modernization, automation, and information technology, and
- Configuration management.

Benefits: The Transition Engineering Services program maps to organizational excellence by providing a highly skilled and experienced workforce at cost effective rates. This support integrates equipment and systems into the NAS and ensures that the equipment functions properly once delivered. The NAS Implementation Support Contract (NISC) improves facility reliability and availability to the NAS, which results in safe, efficient, and cost effective air traffic services.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$549,099.9 [1]
FY 2008 Appropriated	---	10,700.0
FY 2009 Request	---	10,700.0
FY 2010-2013	---	60,000.0
Total	Various	$630,499.9

[1] Includes $358,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes $5,000,000 reduction of FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Centrally Procured Services	---	$10,000.0
2. Configuration Management	---	700.0
Total	Various	$10,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A06	**Frequency and Spectrum Engineering – NAS Interference, Detection, Location, and Mitigation (IDLM)**	**$3,500,000**	**Various**	**M-08, M-43**

FAA Strategic Goal: Greater Capacity – Increase capacity to meet demand and reduce congestion.

Description of Problem: Radio Frequency Interference (RFI) detrimentally affects ground and satellite based NAS communications, navigation, and surveillance systems. RFI causes loss and/or corruption of fundamental voice and/or data information required for the safe air traffic control of aircraft. Since 1995, the FAA has experienced an average of 1,600 RFI events per year. The FAA existing legacy systems to resolve and restore RFI disrupted NAS services have reached their service life. Technology and equipment refresh is required to continue mitigating and resolving disruptions to safety radio services throughout the NAS.

Description of Solution: The FAA will procure new RFI detection and location equipment to replace the existing legacy systems and will procure and install new fixed monitoring systems around critical OEP airports. For FY 2009, $3,200,000 is requested for the Radio Frequency Interference, Detection, Location, and Mitigation (IDLM) program. The IDLM program will:

- Finalize the design of replacement RFI vehicles and associated RFI investigation equipment used to find the source of the reported interfering radio signal.
- Replace existing fixed direction finding sites around three OEP airports. These direction finding sites will monitor the GPS and all other critical aviation frequencies around the airport to automatically detect, identify, and locate any RFI signal source allowing for quick resolution.
- Replace 30 existing Portable Interface Monitoring and Detecting field Systems that are beyond the end of the service life and are now obsolete.

Also requested is $300,000 for in-service engineering activities.

Benefits: The Frequency and Spectrum Engineering Services Program maps to the FAA goals of Greater Capacity. By investing $3,500,000 in FY 2009, FAA will continue to capitalize on new NAS technology services free from corruption and interference to voice and data with the development and implementation of the IDLM program. IDLM will quickly detect, locate, and resolve RFI incidents affecting the NAS, expedite the resolution of RFI incidents around critical airports, minimizing the use of personnel resources, flight inspection aircraft, and will prevent operational aircraft delays caused by RFI. This effort is critical for the support of Satellite based navigation and Global Positioning System (GPS) approaches.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$5,000.0 [1]
FY 2008 Appropriated	---	$3,400.0
FY 2009 Request	---	$3,500.0
FY 2010-2013		$4,500.0
Total	Various	$16,400.0

[1] Prior year funding in the amount of $48,581.2 was appropriated under CIP #M15.01/02 (NAS Spectrum Engineering Sustained Support/Frequency Interference Support-Resolution.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Finalize the design for the replacement Radio Frequency Interference vehicles and location equipment	---	$500.0
2. Replace Fixed Interference Monitoring and Detection New York, Chicago, Los Angeles and Miami Airports	4	2,200.0
3. Replace 30 Portable Interference Monitoring and Detection Systems (PIHMDS)	Various	500.0
4. In-Service Engineering	---	300.0
Total	Various	$3,500.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A07	**Capital Implementation Service (formerly Technical Support Services Contract (TSSC))**	**$22,000,000**	**Various**	**M-02**

FAA Strategic Goal: Organizational Excellence – Improve program delivery capability at reduced cost

Description of Problem: The amount of skilled work necessary to modernize the National Airspace System (NAS) far exceeds available in-house resources.

Description of Solution: The Capital Implementation Service (CIS) formerly Technical Support Services Contract (TSSC) is the agency's primary vehicle to provide a supplemental work force to install equipment and to support infrastructure modernization in a timely, cost-effective manner. Significant work is required to install, modify, and relocate equipment by personnel with electronic, mechanical, and civil engineering skills. Often, the engineering and technician support is of short duration and requires skills that FAA government employee work force does not have or exist in insufficient numbers for a specific type of installation need. The Capital Implementation Service allows FAA to avoid hiring added employees for a limited duration to handle surge demand such as when new equipment is installed at multiple locations.

For FY 2009, $22,000,000 is requested to continue most of the CIS vehicle infrastructure costs. At this level there would be a need to transfer the cost burden to our customers for agency drafting services.

Benefits: The CIS program maps to Organizational Excellence by providing a highly skilled and experienced workforce at cost effective rates. In a typical year, the CIS vehicle is used to purchase more than $60.5 million in labor and accomplish more than $27.8 million in non-labor cost activities such as site preparation and other public works construction. CIS directly supports modernization to the NAS that ensures operational availability by replacing old equipment and sustaining the infrastructure.

APPROPRIATIONS SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$859,431.8 [1]
FY 2008 Appropriated	---	20,000.0
FY 2009 Request		22,000.0
FY 2010-2013	---	96,000.0 [2]
Total	Various	$997,431.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Contractor Labor and Travel (CL&T)	Various	$22,000.0

[1] Includes $407,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A08	**Resource Tracking Program (RTP)**	**$4,000,000**	**Various**	**M-08**

FAA Strategic Goal: Organizational Excellence – Make decisions based on reliable data to improve our overall performance and customer satisfaction.

Description of Problem: The hardware and software for the Resource Tracking Program (RTP), which is the key tool that makes up the Corporate Work Plan (CWP) Toolset, must be constantly maintained and upgraded, to support FAA and the processes that will be impacted as it continues to evolve into ATO. If this program is not funded at the requested level RTP will fall out of sync with other systems and processes and the agency will not be able to retrieve reliable data for ATO Capital projects. RTP is used to track all ATO Capital projects from cradle to grave. It is also used to develop the CWP and work releases for the Technical Support Services Contract (TSSC). It interfaces with DELPHI and the Budget Execution Module (BXM). RTP is a centralized system with load-balanced servers residing in Headquarters.

Description of Solution: In order to keep RTP current, the software and hardware will continue to be modified to support the changing processes and the other systems such as the CWP Toolset with which RTP interfaces. To do this, the NAS Implementation Support Contract (NISC) and the Technical Support Services Contract (TSSC) will be maintained for contractor support, software development efforts, and technical support. Also, hardware and software licenses will be maintained to keep the cost of upgrades to a minimum. This maintenance will cover both the Headquarters and Boston sites. Documentation that is used to provide training to users and administrators of the system will also be maintained.

For FY 2009, $4,000,000 is requested to keep hardware and software licenses current, support Earned Value Management (EVM) and cost accounting, purchase the enterprise license for the program management software, maintain TSSC contract and NISC support, upgrade training documentation, and continue to provide training to users and data administrators.

Benefits: The RTP meets the FAA performance goal of Improving Efficiency of Mission Support. Three of the primary achievements will be:

- Providing reliable data with an automated tracking and reporting system for capital projects that will enable decision-makers to enhance the use of agency resources;
- Keeping major acquisition programs on schedule and within costs by maximizing limited resources linked to budget information and processes. These achievements will be reached by providing enhanced program and project management capabilities with cost accounting of capital expenses to FAA. Managers and engineers will have up-to-date reliable data on capital projects through RTP; Productivity is improved by more than 20 percent when a standardized project management process is supported and emulates current operating procedures; and
- Providing EVM capability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$19,880.2 [1]
FY 2008 Appropriated	---	3,500.0
FY 2009 Request	---	4,000.0
FY 2010-2013	---	16,000.0
Total	Various	$43,380.2

[1] Prior to FY 1997, RTP was funded under the Technical Services Support Contract budget line item 4A10. Includes $3,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant ton P.L. 108-7, February 20, 2003.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Training and Documentation	---	$500.0
2. Contract Support	---	2,000.0
3. Configuration Management	---	1,500.0
Total	Various	$4,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A09	Center for Advanced Aviation System Development (CAASD)	$76,000,000	Various	M-03

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The technologies in the National Airspace System (NAS) are complex. Although FAA employees are highly knowledgeable about those technologies, it would be impossible to employ all of the research, science and engineering expertise needed to develop and improve them. The FAA also requires highly specialized simulation and computer modeling capabilities that it does not have in-house.

Description of Solution: The Center for Advanced Aviation System Development (CAASD) is a Federally Funded Research and Development Center (FFRDC), operating under a Memorandum of Agreement with the MITRE Corporation. CAASD has unique knowledge, skills, and capabilities in aviation research, systems engineering, and analysis. CAASD also conducts a continuing program of research, development, system architecture, and high-level system engineering to meet FAA's long-term NAS requirements. A long-term contractual relationship is in the best interest of the public and FAA, because it stabilizes funding and supports an established and experienced work force that provides continuity of services. In addition, CAASD's charter permits access to sensitive and confidential agency information and data that is not normally available to support contractors. CAASD's expertise is critical to FAA in transforming the nation's air transportation system in an effective and timely manner

The FY 2009 funding will support approximately 258 MITRE Technical Staff years (MTS) of research and systems engineering as well as technical and operational analyses. This staffing level is well below the Congressional ceiling of 425 MTS. The FFRDC Executive Board has approved the third edition of the FFRDC Long Range Plan (FY 2008 – FY 2012).

For FY 2009 FAA requests $76,000,000 to continue research and development, advanced analysis, and engineering in the following areas.

NAS and NextGen Systems Integration and Evolution. Develop and integrate the NextGen enterprise architecture, operational concepts, capability action plans, and roadmaps to achieve an integrated evolution and align agencies' enterprise architectures; analyze NAS-wide strategic issues involving multiple outcomes for efficient investment and operational decisions; provide definition, structure, and content for the NAS EA and ensure alignment with the evolving NextGen architecture; provide recommendations for U.S. and international flight data processing to improve NAS operations and global harmonization; assess and provide recommendations for NAS evolution paths to maximize the use of common capabilities and automation platforms that will support investment decision making; validate the productivity gains, operational feasibility and user benefits of selected NAS initiatives to effect the transition to NextGen; assess service and cost benefits and provide recommendations for implementing net-centric strategies that reduce NAS complexity and improve user access to information.

Communications Modernization. Conduct technical analyses on architecture alternatives at the program, service, and domain levels to ascertain which alternatives meet the required level of NAS communications service at least cost; conduct engineering analysis, network definition, and transition strategy studies for the FAA's Voice Communications and SWIM programs to provide robust network-enabled operations and to reduce the overall FAA communications costs; conduct cost analyses on spectrum and radio technology issues applied to the problem of extending the existing air-ground voice communications systems. As options for life extension develop, CAASD will work with the FAA's NextGen plan and other CAAs around the world to develop the next generation system. This will enable the FAA to take a global leadership role in aviation communications; provide technical and operational insight into the implementation of digital and data communications services in the NAS. Ensure that FAA and the user community understand the operational benefits to be gained.

Performance Based NAS. Provide new concepts for achieving a performance-based NAS, for example, the RNP Parallel Approach Transition (RPAT) concept, which utilized CAASD's operational knowledge, laboratories, and visual tools in its development; conduct technical analyses to identify airports and runways that will benefit from RNP and RNAV procedures; develop algorithms and prototype performance case analyses to validate Flight Standards procedure development tools; identify problems that emerge in the implementation of RNP and RNAV procedures and recommend resolutions and new criteria requirements using CAASD's air traffic, airline, and avionics expertise; analyze and model all aspects of navigation assets, including Wide Area Augmentation System (WAAS), Local Area Augmentation System, (LAAS), divestiture of navigation aides, modernization of GPS, and interoperability with other Global Navigation Satellite System (GNSS) systems (e.g., Galileo).

En Route Evolution. Perform system engineering analyses for new technologies, capabilities, and procedures for the en route system architecture and operational applications; develop concept of operations and prototypes to demonstrate and evaluate new capabilities and procedures; conduct risk management analyses to identify and mitigate the key risks for capability completion; conduct benefit and cost analyses for new capabilities; assess and prioritize candidate en route extensible capabilities; develop system-level requirements for capabilities that can be transferred to the development contractor; validate innovative approaches that can reduce the time and cost of training controllers; develop and conduct field evaluations of a simulation training prototype that will provide effective transition of automation and procedural advancements into operation use; validate the operational feasibility and expected productivity gains from changing roles and responsibilities in the en route domain.

Terminal Operations and Evolution. Provide FAA with technical analyses that inform decision making on which technical architecture alternatives provide the required level of service and minimize costs; provide technical and operational insight into systems that can be used to safely permit reduced separation standards and/or significantly increase overall system capacity and productivity, including factors such as system technical performance, weather measurement performance, human factors engineering, operational evaluation, safety assessment, and decision support system design; provide operational feasibility and implementation risk analyses that assist the FAA in identifying and prioritizing among the more promising operational changes, procedures and enabling technologies; provide technical and operational expertise to enhance the quality and efficiency TRACON controller training, to allow for reduced training time and cost, improve trainee success rates, and improved workforce capabilities (e.g., reduced operational errors, improved productivity).

Airspace Design and Analysis. Structure and execute technical analyses that will inform FAA and Industry decisions on airspace design and management; engineer the processes that govern airspace strategic planning and analysis efforts; investigate, innovate, and develop modeling, simulation, and analysis capabilities facilitating airspace design; explore issues that influence strategic airspace management and design policy, such as sectorization concepts; integrate all the above efforts to provide a national, system-wide optimization of airspace, leveraging CAASD experience, and perspective to coordinate multi-regional and multi-facility design efforts and other national airspace activities.

NAS System Operations. Improve the NAS system-level performance by assessing system performance during severe weather and snowbird seasons; design, develop, and evaluate solutions to significant issues with FAA operational personnel and customers responsible for implementing the solutions; develop improved analytic techniques and capabilities for system operations analysis; develop operational strategies to manage emerging and chronic congestion problems by modeling capacity, delay, predictability, ripple effects, and access issues; design and evaluate solutions with FAA operational personnel and customers responsible for implementing the solutions; develop improved measurement techniques for assessing operations; improve the FAA's responsiveness to customer issues and improve traffic management strategies by modeling and assessing major operational problems with integrated analysis to verify alternate solutions; develop new modeling and analysis capabilities for analytic weaknesses; design, model, and assess new system operations procedures for new capabilities and airspace changes that will be implemented in the near future; develop analysis techniques and data to improve information on en route and terminal operations used in FAA operational and investment decision making; develop and evaluate new metrics to measure overall NAS operational performance.

Traffic Flow Management (TFM) Operational Evolution. Provide analysis of the TFM requirements and system design in order to ensure that developed system enhancements will meet the current and future operational needs in a cost-effective manner; develop metrics that provide insight into the performance of the TFM domain; provide assessment of concept maturity, operational feasibility and implementation risks; advance the maturity of concepts to account for uncertainty (e.g. probabilistically) in predictions and decision making, by developing algorithms and prototype capabilities and conducting (HITL) evaluation that will improve the FAA's ability to predict imbalances between traffic demand and real NAS capacity; translate concepts into requirements and assess the impact of enhancement capabilities on the TFM modernization system so that implementation cost and difficulty can be factored into the prioritization planning process for new capabilities and procedures.

Future NAS Performance and Analysis. Assess the NAS-wide operational impacts of investment options and decisions; improve understanding of the future environment, including anticipated demand at airports and for airspace; anticipate the impact of planned improvements on future airport and airspace capacity; perform analyses to assess the affordability and long-term economic implications of different investments, operational changes, or proposed policies.

Aviation Safety. Perform technical analyses of NAS-wide accident and runway incursion risk to identify airports or specific types of operations with the highest risk, and prioritize implementation of appropriate operational and technological mitigations, leading to a reduction in accidents and runway incursions; develop metrics and processes that allow FAA to proactively identify potential safety issues with both operations and architecture; identify risks before they lead to incidents or accidents; identify and assess the feasibility of new or advanced capabilities and standards that mitigate safety issues in the NAS.

Mission Oriented Investigation and Experimentation (MOIE). Develop the tools and techniques for studying system capacity, throughput, performance, system dynamics and adaptation to technology- and policy-driven change; identify opportunities for innovative solutions to NAS problems and enhancements to NAS capabilities and procedures, and capitalize on them through applied research and technology transfer; research future concepts and technologies to understand their potential impact on the NAS and to develop and refine concepts for operational use and potential benefits; use prototyping and in-lab demonstration and experimentation to learn what works and what doesn't, and incorporate stakeholder feedback and building industry consensus on the way forward in key areas; strengthen FFRDC systems engineering skills and tools by exploring new regimens including complexity theory, agent-based modeling, and productivity modeling; leverage collaborations with industry, academia, and the broader aviation research community.

NAS-Wide Information System Security. Provide technical guidance on the most effective way to engineer security capabilities into the NAS, emphasizing a NAS-wide approach that reduces overall cost by leveraging shared services and building security into the underlying IT infrastructure; provide guidance on security threats, technology, standards, and practices being applied in other government and commercial enterprises in order to evolve Information Systems Security (ISS) to adapt to changing threats and technology advances; develop requirements and recommend solutions for effective cyber incident management program; advise the FAA on creating an IT infrastructure that will be resilient, flexible, and adaptable, and provide a defense-in-depth strategy; apply MITRE experience with the DOD's successful transition to Network Centric Operations and CAASD's NAS domain knowledge to provide technical guidance on deploying network centric technologies within the NAS while maintaining ISS defense-in-depth.

Broadcast and Surveillance Services. Research ADS-B ground and cockpit-based solutions that will permit the FAA to deploy ADS-B throughout the entire NAS in a cost effective and timely manner, while reducing the cost of ownership for FAA surveillance infrastructure and ATC, and improving safety for all NAS users; prototype basic and advanced ADS-B applications that will result in improved efficiency and capacity for FAA and the airlines. This includes transforming applications that will leverage the aircraft as an active part of the NAS, as in the NextGen vision, and result in more efficient NAS operations; assess the impact of ADS-B on safety, capacity, and efficiency benefits for the FAA and users. This includes performing user coordination and lab simulations prior to deployment, and data collection and analysis after deployment; develop domestic and international requirements and engineering standards for future ADS-B applications, in close coordination with the users and manufacturers, as part of RTCA, the ICAO, FAA, RFG, and Eurocontrol standards development activities.

Special Studies, Laboratory and Data Enhancements. Manage the breadth of the CAASD FAA work program in a manner that ensures the activities contributing to each individual outcome benefit from the broader perspective of the entire work program; provide the CAASD work program with a research environment where prototypes and capabilities can be brought together with the appropriate mixture of fidelity and development flexibility to facilitate integration investigations, compressed spiraling of operational concepts and procedure development; exploration of new technologies, visualization of concepts, exploration of human factor issues, and transition of prototypes between the lab and the field; provide the CAASD work program with a an efficient aviation data repository system and associated tools to support data analysis that results in more useful products across the work program at a lower cost; provide the CAASD work program with a flexible model of the NAS capable of quickly and reliably estimating the high-level impacts of new technologies, procedures, or infrastructure improvements on key system performance metrics; conduct special studies of key subjects, as directed by FAA senior management.

Benefits: High quality research, systems engineering, and analytical capabilities help FAA meet the technically complex challenges in the NAS. CAASD provides independent advanced research and development required by the FAA to obtain technical analyses, prototypes and operational concepts needed to fulfill the vision for NAS architecture, FAA's Flight Plan, the Operational Evolution Partnership (OEP) – FAA's plan to NextGen - and the NextGen Integrated Plan. CAASD efforts support all Flight Plan goals across the board and the FFRDC continues to play a key role in defining NextGen. Its expertise is critical to FAA's efforts to transform the nation's air transportation system in an effective and timely manner.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	---	$1,006,866.1 [1]
FY 2008 Appropriated	---	80,000.0
FY 2009 Request	---	76,000.0
FY 2010-2013	---	380,800.0
Total	Various	$1,543,666.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. CAASD (Air Traffic Organization)	---	$62,300.0
2. CAASD (Non-Air Traffic Organization)	---	13,700.0
Total	Various	$76,000.0

[1] Prior year funding for GCNSS was appropriated in FY 2004 under OEP BLI 5A30.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A10	**Aeronautical Information Management Program (formerly known as NOTAMS/NAIMES)**	**$11,600,000**	**Various**	**A-08**

FAA Strategic Goal: Increased Safety — Reduce the commercial airline fatal accident rate and the number of fatal accidents in general aviation.

Description of Problem: The distribution of safety critical Notice to Airmen (NOTAM) messages requires modernization. With limited automation and use of manual processes for initiating and disseminating NOTAMs, the current NOTAM distribution process is deficient. The current mix of automated and manual systems used operationally to enter, collect, distribute, and receive NOTAMs evolved over several decades. While some of the systems have undergone or are undergoing modernization using state-of-the-art technologies, many of the systems have not been modernized.

On June 1, 2001, the FAA Deputy Administrator recommended that the NOTAMs be distributed using a "state-of-the-art distributive capability" to "help ensure that critical safety information reaches the pilots and other users of the system." In addition, the events of 9/11 further confirmed the shortcomings of NOTAMs distribution process. Changes in security operations (military responses, temporary flight restrictions (TFRs), etc) increased the number, duration and size of NOTAMs. These added requirements lengthened NOTAM distribution process and decrease the ability of customers to adjust to information contained in NOTAMs.

Description of Solution: Aeronautical Information Management (AIM) program is committed to improving the NOTAM, NAIMES, and MILOPS information management systems. The AIM program will:

- Provide central NOTAM repository and distribution system containing all US NOTAM information,
- Provide a modern, security high availability US NOTAM system capable of delivering NOTAM information to operational air traffic systems and customers,
- Provide a NOTAM and military aeronautical information system consistent with System Wide Information Management (SWIM) precepts and future concepts outlined in the Next Generation Air Traffic System (NextGen),
- Provide operational and back up facilities for managing NOTAMs, flight planning and weather information,
- Ensure NOTAMS are consistent with International Civil Aviation Organization (ICAO) standards and recommended practices, and
- Ensure compatibility with emerging international standards for aeronautical data (e.g., Aeronautical Information Exchange Model (AIXM)) and data link concepts (e.g., RTCA Special Committee 206).

The AIM program has planned the following FY 2009 solution development activities:

- Continue to provide digital NOTAM capability to airspace system customers through Aeronautical Information System Replacement (AISR) modernization,
- Implement next phase of real-time airspace management to include special use airspace (SUA) and temporary flight restriction (TFR) management,
- Finalize site preparation and installation of failover and disaster recovery sites,
- Complete Federal Contract Tower (FCT) Technical Refresh for NOTAM distribution,
- Complete en route assured acknowledgement of NOTAMs, and
- Complete development of consolidated aeronautical information portal for external and internal customers.

Benefits: Benefits of the AIM Program activities are still being quantified, but qualitatively we can expect the following benefits from the FY 2009 work plan:

- Improved NOTAM accuracy for customers through improved automated quality control and the transition to ICAO and digital NOTAMs,

- Assured information delivery to en route and Terminal air traffic controllers. This will improve controller situational awareness resulting in safety increases for the National Airspace System (NAS)
- Increased US NOTAM system reliability and availability,
- Efficiency gains through better management of military airspace reservations and releases, and
- Goodwill and international leadership benefits by transitioning the US NOTAM system to ICAO best practices.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2007)	231	$69,902.0
FY 2008 Appropriated	80	9,000.0
FY 2009 Request	80	11,600.0
FY 2010-2013	337	36,000.0 [1]
Total	728	$126,502.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aeronautical Information Management	---	$11,600.0 [2]

[1] Future requirements are pending a JRC Decision.
[2] This budget request is divided between NOTAMs, NAIMES, and MILOPS. The narrative above clearly defines these three major parts of the program.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
5A01	Personnel and Related Expenses	$443,975,000	Various	M-08, X-01

(Dollars in Thousands)

	FY 2007 Enacted	FY 2008 Request	Change	FY 2009 Request
FTE, Direct	2,792	2,790	-53	2,737
EOY Employment	3,142	3,140	-53	3,087
Funding	$414,200	$444,169	-$194	$443,975

This activity funds the personnel, travel and related expenses of FAA's ATO Capital workforce. The ATO Capital workforce includes electronic, civil, and mechanical engineers; electronics technicians; quality control and contract specialists; and program planning and implementation personnel. The request for personnel related expenses is further justified as follows:

	FY 2007 Enacted	FY 2008 Request	Change	FY 2009 Request
Personnel Compensation and Benefits	$373,269	$400,277	-$1,084	$399,193
Travel	31,934	34,276	695	34,971
Other Objects	8,997	9,616	195	9,811
Total Funding	$414,200	$444,169	-$194	$443,975

Explanation of Changes: -$194

-$7,575	Staffing reduction from FY 2008
1,264	Annualization of FY 2008 pay raise and locality pay
4,861	FY 2009 pay raise and locality pay
1,877	Annualization of performance pay increases
-1,511	One Less Compensable Day
890	Inflation

PERSONNEL COMPENSATION and BENEFITS (PC&B)

The reduction of $1,084 reflects attrition of 53 FTE (-$7,575) among the workforce required to sustain ATO Capital Programs as offset by pay-related increases (+$8,002) and one less day of pay (-$1,511) required for the workforce in FY 2009. This workforce is critical to FAA's ability to modernize the National Airspace System (NAS). Their work ensures that new systems enhance the overall efficiency, safety, and reliability of the NAS. Civil, mechanical, and electrical engineers are required to provide technical support for design reviews, perform site preparation and installation, conduct technical evaluations, and provide systems integration and in-service management.

TRAVEL

An increase of $695 is requested for inflation in travel costs required to accomplish training, installation, and certification of new equipment funded in the ATO Capital program. Travel requirements are driven by engineering and technical work. Installation crews spend as much as 80 percent of their time working at sites distant from their assigned work place. The ability to use centrally located technicians and engineers ensures a consistent, highly proficient pool of personnel to accomplish these critical tasks. These engineers and technicians are involved in development and operational testing, factory acceptance testing, site evaluations, site preparation, critical design reviews, quality assurance activities, and support of field installation crews.

OTHER OBJECTS

An increase of $195 is requested to maintain funding for other objects. Spending in other objects includes contractual services in support of ATO Capital Programs as well as supplies, and common use equipment, and information technology services.

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RESEARCH, ENGINEERING, AND DEVELOPMENT APPROPRIATION

For necessary expenses, not otherwise provided for, for research, engineering, and development, as authorized under part A of subtitle VII of title 49, United States Code, including construction of experimental facilities and acquisition of necessary sites by lease or grant, $15,025,000, and in addition, $156,003,000, which shall be derived from the Airport and Airway Trust Fund: *Provided,* That the total amount provided herein shall remain available until September 30, 2011: Provided, That there may be credited to this appropriation as offsetting collections funds received from States, counties, municipalities, other public authorities, and private sources, which shall be available for expenses incurred for research, engineering, and development.

PROGRAM AND FINANCING
($ in Millions)

Identification code: 69-1334-0-7-402		FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
	Obligations by program activity			
	Direct program			
00.01	Improve aviation safety	.....	.....	91
00.02	Improve efficiency of the air traffic control system	.....	.....	43
00.03	Reduce environmental impact of aviation	.....	.....	32
00.04	Improve the efficiency of mission support	.....	.....	5
09.01	Reimbursable program	.....	.....	16
10.00	Total new obligations	.....	.....	187
	Budgetary resources available for obligation			
22.00	New budget authority (gross)	.....	.....	187
23.95	Total new obligations	.....	.....	-187
24.40	Unobligated balance carried forward, end of year	.....	.....	.....
	New budget authority (gross), detail			
	Discretionary:			
40.00	Appropriation	.....	.....	15
	Spending authority from offsetting collections			
58.00	Offsetting collections (cash)	.....	.....	172
70.00	Total new budget authority (gross)	.....	.....	187
	Change in unobligated balances			
73.10	Total new obligations	.....	.....	187
73.20	Total outlays (gross)	.....	.....	-119
74.40	Obligated balance, end of year	.....	.....	68
	Outlays (gross), detail			
86.90	Outlays from new discretionary authority	.....	.....	119
	Offsets			
	Against gross budget authority and outlays			
88.00	Offsetting collections (cash) from: Federal sources	.....	.....	172
	Net budget authority and outlays			
89.00	Budget authority	.....	.....	15
90.00	Outlays	.....	.....	-53

This account provides funding to conduct research, engineering, and development to improve the capacity and safety of the national airspace, as well as the ability to meet environmental needs. For 2009, the Administration proposes funding the Research, Engineering and Development (RE&D) program from a combination of resources from the Airport and Airway Trust Fund and the General Fund, requiring this account to accommodate both sources of funding. The proposed funding is allocated to the following performance goal areas of the FAA: increase safety and create greater capacity. The request includes funding for the Joint Planning and Development Office to coordinate the interagency effort to develop the Next Generation Air Transportation System.

Federal Aviation Administration
FY 2009 President's Budget Submission

OBJECT CLASSIFICATION
($ in Millions)

Identification code: 69-1334-0-7-402		FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
	Direct obligations			
	Personnel compensation			
11.11	Full-time permanent	.....	.....	34
11.13	Other than full-time permanent	.....	.....	1
11.19	Total personnel compensation	.....	.....	35
11.21	Civilian personnel benefits	.....	.....	7
12.10	Travel and transportation of persons	.....	.....	2
12.55	Research and development contracts	.....	.....	107
12.60	Supplies and materials	.....	.....	2
13.10	Equipment	.....	.....	1
14.10	Grants, subsidies, and contributions	.....	.....	17
19.90	Subtotal, obligations, Direct obligations	.....	.....	171
	Reimbursable obligations:			
22.55	Research and development contracts	.....	.....	16
29.90	Subtotal, obligations, Reimbursable obligations	.....	.....	16
99.99	Total obligations	.....	.....	187

PROGRAM AND FINANCING
($ in Millions)

Identification code: 69-8108-0-7-402		FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
	Obligations by program activity			
	Direct program			
00.11	Improve aviation safety	85	114	5
00.12	Improve efficiency of the air traffic control system	24	31	. . . . .
00.13	Reduce environmental impact of aviation	15	17	. . . . .
00.14	Improve the efficiency of mission support	4	6	. . . . .
09.01	Reimbursable program	1	16	. . . . .
10.00	Total new obligations	129	184	5
	Budgetary resources available for obligation			
21.40	Unobligated balance carried forward, start of year	24	26	5
22.00	New budget authority (gross)	131	163	. . . . .
23.90	Total budgetary resources available for obligation	155	189	5
23.95	Total new obligations	-129	-184	-5
24.40	Unobligated balance carried forward, end of year	26	5	. . . . .
	New budget authority (gross), detail			
	Discretionary:			
40.26	Appropriation (trust fund) [20-8103-0-402-N-0505-01]	130	147	. . . . .
43.00	Appropriation (total discretionary)	130	147	. . . . .
	Spending authority from offsetting collections			
	Discretionary			
58.00	Offsetting collections (cash)	1	16	. . . . .
70.00	Total new budget authority (gross)	131	163	. . . . .
	Change in unobligated balances			
72.40	Obligated balance, start of year	149	123	122
73.10	Total new obligations	129	184	7
73.20	Total outlays (gross)	-153	-185	-84
73.40	Adjustments in expired accounts (net)	-3	. . . . .	. . . . .
74.10	Change in uncollected customer payments from Federal sources (expired)	1	. . . . .	. . . . .
74.40	Obligated balance, end of year	123	122	43
	Outlays (gross), detail			
86.90	Outlays from new discretionary authority	57	104	. . . . .
86.93	Outlays from discretionary balances	96	81	84
87.00	Total outlays (gross)	153	185	84
	Offsets			
	Against gross budget authority and outlays			
88.00	Offsetting collections (cash) from: Federal sources	1	16	. . . . .
	Net budget authority and outlays			
89.00	Budget authority	130	147	. . . . .
90.00	Outlays	152	169	84
95.02	Unpaid obligation, end of year	126	. . . . .	. . . . .

OBJECT CLASSIFICATION
($ in Millions)

Identification code: 69-8108-0-7-402		FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
	Direct obligations			
	Personnel compensation			
11.11	Full-time permanent	25	34	.....
11.13	Other than full-time permanent	1	1	.....
11.19	Total personnel compensation	26	35	.....
11.21	Civilian personnel benefits	6	6	.....
12.10	Travel and transportation of persons	2	2	.....
12.55	Research and development contracts	73	102	.....
12.60	Supplies and materials	1	2	.....
13.10	Equipment	4	5	.....
14.10	Grants, subsidies, and contributions	16	16	5
19.90	Subtotal, obligations, Direct obligations	128	168	5
	Reimbursable obligations:			
22.55	Research and development contracts	1	16	.....
29.90	Subtotal, obligations, Reimbursable obligations	1	16	.....
99.99	Total obligations	129	184	5

EXHIBIT III-1
RESEARCH, ENGINEERING AND DEVELOPMENT APPROPRIATION
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST	CHANGE FY 2008-2009
Improve Aviation Safety	88,232	96,526	90,763	-5,763
Improve Efficiency	21,166	30,234	43,254	13,020
Reduce Environmental Impacts	16,018	15,469	31,658	16,189
Mission Support	4,818	4,599	5,353	754
TOTAL	130,234	146,828	171,028	24,200
FTEs				
Direct Funded	298	298	303	5
Reimbursable, allocated, other	0	0	0	0

Program and Performance Statement

This account provides the necessary resources to support Research, Engineering, and Development activities and maintain the agency's administrative infrastructure. Funding will support efforts to improve aviation safety, aviation efficiency, and to reduce the impacts of aviation on the environment. Resources are also provided to fund NextGen research and development initiatives.

EXHIBIT III-2

RESEARCH, ENGINEERING AND DEVELOPMENT APPROPRIATION
SUMMARY ANALYSIS OF CHANGE FROM FY 2008 TO FY 2009
Appropriations, Obligations, Limitations, and Exempt Obligations

Item	Change from FY 2008 to FY 2009	FY 2009 PC&B by Program	FY 2009 FTEs by Program	FY 2009 Contract Expenses	Total
FY 2008 Base (Enacted)		Note Columns are Non-Add			
Research, Engineering and Development Appropriations, Obligations, Limitations, and Exempt Obligations		41,248	298	105,580	$ 146,828
Adjustments to Base [include items from Exhibit II-6]					
Annualization of FY 2008 Pay Raise	206				
FY 2009 Pay Raise	560				
WIGs	451				
Non-pay Inflation	67				
Subtotal, Adjustments to Base	1,284				1,284
New or Expanded Programs					
Improve Aviation Safety	-6,796			-6,796	
Improve Efficiency	12,928	600	4	12,328	
Reduce Environmental Impacts	16,120	150	1	15,970	
Mission Support	664			664	
Subtotal, New or Expanded Program Increases/Decreases	22,916	750	5	22,166	22,916
Total FY 2009 Request	24,200		303		171,028

		Budget Line Item ($000)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
A11.		**Improve Aviation Safety**	**88,232**	**96,526**	**90,763**
		Commercial Aviation Safety	**88,232**	**96,526**	**90,763**
	a.	Fire Research and Safety	6,638	7,350	6,650
	b.	Propulsion and Fuel Systems	4,048	4,086	3,669
	c.	Advanced Materials/Structural Safety	2,843	7,083	2,920
	d.	Atmospheric Hazards/Digital System Safety	3,848	3,574	4,838
	e.	Aging Aircraft/Continued Airworthiness	18,621	15,946	14,589
	f.	Aircraft Catastrophic Failure Prevention Research	1,512	2,202	436
	g.	Flightdeck/Maintenance/System Integration Human Factors	7,999	9,200	7,465
	h.	Aviation Safety Risk Analysis/System Safety Management	5,292	9,517	12,488
	i.	Air Traffic Control/Technical Operations Human Factors	9,654	10,000	10,469
	j.	Aeromedical Research	7,032	7,760	8,395
	k.	Weather Program	19,545	16,888	16,968
	l.	Unmanned Aircraft System Research	1,200	2,920	1,876
A12.		**Improve Efficiency**	**21,166**	**30,234**	**43,254**
	a.	Joint Planning and Development Office	18,100	14,321	14,494
	b.	Wake Turbulence	3,066	12,813	10,132
		GPS Civil Requirements		3,100	
	c.	NextGen – Air Ground Integration			2,554
	d.	NextGen – Self Separation			8,025
	e.	NextGen – Weather Technology in the Cockpit			8,049
A13.		**Reduce Environmental Impacts**	**16,018**	**15,469**	**31,658**
	a.	Environment and Energy	16,018	15,469	15,608
	b.	NextGen Environmental Research – Aircraft Technologies, Fuels, and Metrics			16,050
A14.		**Mission Support**	**4,818**	**4,599**	**5,353**
	a.	System Planning and Resource Management	1,388	1,184	1,817
	b.	William J. Hughes Technical Center Laboratory Facility	3,430	3,415	3,536
		R,E&D Total	**130,234**	**146,828**	**171,028**

Research, Engineering, And Development Programs

For FY 2009 FAA requests $171,028,000 for Research, Engineering and Development (R,E&D). At this level, FAA launching new research initiatives that focus on improved efficiency and reduced environmental impacts in support of the NextGen effort and maintains much of its ongoing research efforts.

In FY 2009, most of FAA's research focuses on Safety, primarily in the areas of weather, aging aircraft and risk analysis. RE&D also supports the Joint Planning and Development Office (JPDO), which leads the Next Generation Air Transportation System (NextGen) effort.

The Research, Engineering, and Development Advisory Committee (REDAC) and FAA's National Aviation Research Plan (NARP) guides and directs FAA's research portfolio. REDAC, established by Congress in 1989, ensures that FAA meets the Office of Management and Budget's Research and Development (R&D) investment criteria. REDAC's 30 members represent corporations, universities, associations, consumers, and other agencies. REDAC considers aviation research needs in six key areas: air traffic services, airport technology, aircraft safety, aviation information security, human factors, and the environment. REDAC reports to the FAA Administrator on Research, Development and Test (RD&T) issues and provides a link between FAA's RD&T program and similar efforts in industry, academia, and government. REDAC works to ensure that FAA's program goals and priorities properly link to national needs. The Committee also periodically examines the quality and performance of R&D programs to provide FAA with advice on how best to allocate funds to ensure a good R&D program. REDAC meets with FAA senior managers two times a year and annually reviews the agency's RD&T budget submission.

The National Aviation Research Plan (NARP) documents how FAA's R&D programs will assist in meeting near-term goals and prepare for the longer-term needs of the aviation system. It defines the strategies that address major operational challenges facing aviation and helps FAA ensure that efforts are focused on high quality, relevant research that is cost-effective and well managed. Since FAA is not the sole aviation research agency, the NARP specifically addresses the needs and programs of related federal agencies that complement FAA's efforts.

Budget Item	Program Title	Budget Request
A11.a.	**Fire Research and Safety**	**$6,650,000**

GOALS:

Intended Outcomes: The Fire Research and Safety Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with aircraft fires and by mitigating the effects of a post-crash ground fire. The program supports FAA's aviation safety goal by developing technologies, procedures, test methods, and fire performance criteria that can prevent accidents caused by hidden in-flight fires and fuel tank explosions and improve survivability during a post-crash fire. Fire safety research focuses on near-term improvements in fire test methods and materials performance criteria, fire detection and suppression systems, aircraft fuel tank explosion protection, and long-range development of ultra-fire resistant cabin materials.

Agency Outputs: The FAA issues aircraft fire safety rules that govern material selection, design criteria, and operational procedures. The new test methods, reports, and journal publications produced by the Fire Research and Safety Program describe the technical basis for these regulations and offer guidance for regulatory compliance. Through this research, which is also producing new materials and government-owned patents, FAA provides industry with state-of-the-art safety products and information.

Research Goals: The FAA will work to reduce the number of accidents and incidents caused by in-flight fire, to prevent fuel tank explosions, and to improve survivability during a post-crash fire. Near term research will focus on improved fire test standards for interior and structural materials, improved fuel tank inerting systems and extended inerting applications, and new or improved fire detection and extinguishment systems. Additional long-range research will be conducted to develop the enabling technology for a fireproof aircraft cabin constructed of ultra-fire resistant materials. The following milestones directly support the ultimate strategic goals of in-flight fire prevention, fuel tank explosion prevention and improved post-crash fire survivability:

- By FY 2010, develop and validate a methodology for predicting the flammability of wing fuel tanks of aluminum or composite construction.
- By FY 2011, provide comprehensive guidance on the fire safety of high energy density lithium batteries in passenger carry-on items and aircraft power systems.
- By FY 2012, demonstrate the improvements in post-crash fire survivability, provided by ultra-fire resistant materials under full-scale test conditions.

Customer/Stakeholder Involvement: The Fire Research and Safety Program works with the following industry and government groups:

- Aircraft Safety Subcommittee of the FAA Research, Engineering and Development Advisory Committee – These representatives from industry, academia, and other government agencies annually review the program's research activities.
- Technical Community Representative Groups – The FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.
- Aircraft manufacturers (U.S. and foreign), airlines, foreign airworthiness authorities, chemical companies, material suppliers, and aircraft fire safety equipment manufacturers meet regularly to share information on interior material fire tests and improvement of fire detection and suppression systems.
- National Transportation Safety Board (NTSB) – The FAA works with and supports NTSB on in-flight fire incidents, on-site accident investigations, and related testing.
- Pipeline and Hazardous Materials Safety Administration (PHMSA) – PHMSA cooperatively develop with FAA requirements/guidelines for the safe transport of hazardous materials

R&D Partnerships: Fire Research and Safety Program R&D partners include:

- FAA-sponsored International Systems Fire Protection Working Group – R&D involves fuel tank protection, hidden fire safety, fire/smoke detectors, halon replacement, and lithium battery fire hazards.
- FAA-sponsored International Aircraft Materials Fire Test Working Group – R&D involves development and standardization of improved material fire tests.
- Interagency working group on fire and materials – promotes technology exchange among U.S. Government agencies and prevents unwarranted duplication of work.
- Interagency agreement with the National Institute of Standards and Technology – develops fire retardant mechanisms and rapid screening tools for flammability.
- Memorandum of cooperation with the British Civil Aviation Administration – R&D involves a variety of fire safety research efforts.
- Cabin safety research technical group – cooperates in and coordinates cabin safety research conducted and/or sponsored by the international regulatory authorities.
- Arrangements with Fortune 100 companies to share development costs for new fire resistant materials.

Accomplishments: The FAA operates the world's most extensive aircraft fire test facilities. The FAA certification engineers receive training in these facilities each year and, at the request of the NTSB, program personnel participate in major fire accident and incident investigations. The Fire Research and Safety Program annually publishes over two-dozen reports and papers (available to the public on-line at http://www.fire.tc.faa.gov/reports.asp) highlighting research results that have led to major improvements in aircraft safety.

Outstanding program accomplishments include:

FY 2007:

- Developed a cabin crew training video for fighting in-flight fires.
- Characterized the flammability of epoxy-graphite structural composites.
- Developed and standardized a next generation burner for insulation burn-through resistance.
- Evaluated the flammability of non-halogen, ultra-fire resistant plastics.

FY 2006:

- Evaluated the cabin hazards caused by outgassing from a composite fuselage material subjected to a simulated post-crash fuel fire.
- Determined the fire hazards of lithium ion batteries shipped as air cargo.
- Conducted engine nacelle fire extinguishment tests to determine the suitability of a promising new environmentally friendly agent, NOVEC 1230, as a replacement for the currently used halon.

FY 2005:

- Issued the first Department of Transportation licenses to manufacture the FAA-patented microscale combustion calorimeter for evaluating the heat release rate of extremely small research samples of advanced ultra-fire resistant material.
- Developed technology to support the use of low false alarm cargo fire/smoke detectors.
- Determined the vulnerability of AN-26 insulation to ignition by a small arc, resulting in the issuance of a proposed Airworthiness Directive requiring its removal from affected aircraft.
- Characterized the fire performance of ultra-fire resistant chlorobisphenol polymers for aircraft interior applications.

FY 2004:

- Conducted flight tests in National Aeronautics and Space Administration 747 shuttle carrying aircraft to measure performance of FAA fuel tank inerting system and measure fuel tank vapor concentration (first time ever done).
- Determined the limiting concentration of oxygen to prevent fuel tank explosions.
- Evaluated the effectiveness of halon hand-held extinguishers against hidden fires in standard and wide body aircraft.
- Developed technology and requirements for the protection of shipped oxygen cylinders during a cargo compartment fire, resulting in the issuance of a Notice of Proposed Rulemaking.

Previous Years:

- Developed and demonstrated a simple and cost effective fuel tank inerting system.
- Developed improved and new flammability tests for thermal acoustic insulation, measuring in-flight fire resistance and post-crash burn-through resistance, respectively.
- Developed minimum performance test standards for halon replacement agents.
- Developed and demonstrated an onboard cabin water spray system for significantly improving post-crash fire survivability.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements

- Develop and evaluate an onboard detection and extinguishment system to protect against hidden in-flight fires (under full-scale test conditions).
- Complete development of updated Advisory Circular on hand held extinguishers prescribing safe agent exposure levels.
- Examine lithium battery technology in passenger carry-on items and aircraft power systems for potential fire safety risks.
- Measure the flammability of wing fuel tank vapors under simulated operational conditions.
- Evaluate the effectiveness of intumscent paint for fuselage burn-through protection under full-scale fire test conditions.

Fire Resistant Materials

- Fabricate small-scale ultra-fire resistant cabin panels (sidewalls, ceiling) using fire smart polymer technology and measure fire and mechanical performance; down-select to optimal panel design.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Research on the prevention of hidden in-flight fires will continue to address the fire resistance of interior materials and the growing problem with lithium battery fire hazards. This research responds to FAA concerns with the high frequency of in-flight smoke/fume incidents, averaging more than two per day, and the diversions/returns that often occur.

Research related to the fire behavior of structural composites is driven by the new Boeing 787, the first large transport aircraft with a composite fuselage and wings. A number of fire safety concerns will be studied, associated with the replacement of aluminum with a combustible composite material that can burn and is a poor conductor of heat.

Research will also continue on the improvement of existing required flammability tests and the development of new tests for novel applications of materials that may impact future aircraft fire safety.

Fuel tank explosion protection research will focus on supporting the introduction of fuel tank inerting systems in the U.S. Fleet, and understanding and predicting the flammability of wing fuel tanks, which is an immediate concern for aluminum and composite (e.g., B-787) constructions.

Long term, applied research will continue to develop the enabling technology for ultra-fire resistant interior materials, and facilitate the transfer of that technology to the private sector through patents, reports, publications, and international standards.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements

- Develop improved fire test criteria for materials in hidden areas not previously addressed.
- Develop fire safety guidance for new high energy density lithium batteries in passenger carry-on items
- Develop fire test criteria to limit the emission of hazardous gases during post-crash fire exposure of a burn-through resistant fuselage, including composite construction.
- Develop small-scale fire test criteria to measure the effectiveness of intumescent paint used to impart burn-through resistance to an aluminum fuselage, if warranted.
- Demonstrate the application of non-intrusive oxygen measurement technology in aircraft fuel tanks.
- Develop an analytical model to predict the flammability in <u>wing</u> fuel tanks.

Fire Resistant Materials

Fabricate small-scale ultra-fire resistant thermoplastic components (e.g., seat tray, passenger service units) and measure fire and mechanical performance; down select optimal thermoplastic design.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$140,998
FY 2008 Appropriated	7,350
FY 2009 Request	6,650
Out-Year Planning Levels (FY 2010-2013)	27,996
Total	$182,994

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Fire Research and Safety	3,263	2,570	2,816	3,355	2,961
Personnel Costs	2,890	3,379	3,588	3,650	3,443
Other In-house Costs	372	233	234	345	246
Total	**6,525**	**6,182**	**6,638**	**7,350**	**6,650**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	6,525	6,182	6,638	7,350	6,650
Development (includes prototypes)	0	0	0	0	0
Total	**6,525**	**6,182**	**6,638**	**7,350**	**6,650**

A11a - Fire Research and Safety Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
061-110 Fire Research & Safety							
Fire Resistant Materials	**0**						
Fabricate/test small-scale cabin panels		◆					
Fabricate/test small-scale cabin plastics			◊				
Fabricate/test small-scale cabin fabrics and foams				◊			
Evaluate improvement in post-crash fire survivability provided by ultra-fire resistant materials during full-scale fire tests						◊	
Fire Safety Improvement	**2,961**						
Assess need/develop improved fire test criteria for hidden materials not previously addressed			◊				
Develop detection/extinguishing system to suppress hidden in-flight fires		◆					
Develop Advisory Circular on hand-held extinguishers for safe agent exposure levels		◆					
Examine lithium battery technology for fire safety risks		◆					
Develop safety guidelines for lithium battery passenger carry on items			◊				
Develop fire test criteria gas emissions during burn-through resistant fuselage post-crash fire exposure			◊				
Develop test criteria for intumescent paint			◊				
Evaluate intumescent paint for fuselage burn-through protection (full-scale tests)		◆					
Validate wing fuel tank prediction method (aluminum and composite)				◊			
Provide comprehensive guidance on lithium battery fire safety					◊		
Measure wing fuel tank flammability under simulated operational conditions		◆					
Demonstrate oxygen measurement technology for fuel tanks			◊				
Develop analytical model wing fuel tank flammability			◊				
Examine fuel cell technology for fire safety risks							◊
Personnel and Other In-House Costs	**3,689**						
Total Budget Authority	**6,650**	**7,350**	**6,650**	**6,819**	**6,935**	**7,057**	**7,185**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.b.	**Propulsion and Fuel Systems**	**$3,669,000**

GOALS:

Intended Outcomes: The Propulsion and Fuel Systems Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with the failure of aircraft engines, components, and fuel systems. The program supports FAA's aviation safety goal by developing technologies, procedures, test methods, and criteria to enhance the airworthiness, reliability, and performance of civil turbine and piston engines, propellers, fuels, and fuel management systems. In addition, the program is working with fuel, airframe, and engine manufacturers to test new unleaded fuels as they become available to seek a safe alternative to current leaded aviation gasoline (avgas). To improve safety, the program will conduct the research needed to develop tools, guidelines, and data to support improvements in turbine engine certification requirements.

Agency Outputs: The FAA issues certification and advisory standards, and it endorses the specifications and practices recommended by recognized technical societies to maintain the airworthiness of aircraft engines, fuels, and airframe fuel management systems. The agency also publishes information and sponsors technology workshops, demonstrations, and other means of training and technology transfer. The Propulsion and Fuel Systems Program provides the technical information, R&D resources, and technical oversight necessary for the agency to deliver the propulsion, fuel, and fuel transfer system technologies.

Research Goals: To enhance the safety and reduce the risk associated with the failure of engine systems, the propulsion program is developing criteria, guidelines, and data to support improvements of turbine engine certification standards. The current focus is to ensure the structural integrity and durability of critical rotating engine parts throughout their service life. This research is providing analytical tools to meet the requirements of Advisory Circular (AC) 33.14-1, "Damage Tolerance for High Energy Turbine Engine Rotors", allowing aircraft turbine engine manufacturers to assess the risk of fracture and manage the life of rotor disks. Research is also being conducted to establish an improved understanding of other material factors and manufacturing anomalies that can shorten the fatigue life of rotor disks. In the general aviation piston engine arena, the goal is to find a replacement for current leaded avgas (100LL). The replacement fuel should perform as well as 100LL in general aviation (GA) piston engines. This unleaded high octane replacement fuel must not cause any accidents and should be a seamless, transparent change to a GA pilot. Extensive laboratory and test cell dynamometer engine testing will evaluate and characterize all new fuel formulations provided by industry for consideration.

- By FY 2010, evaluate the feasibility of using ethanol and ethanol blends as a general aviation fuel.
- By FY 2012, evaluate the feasibility of modifying general aviation piston engine controls to accommodate alternative fuels for 100LL.
- By FY 2012, develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- By FY 2012 evaluate and characterize all candidate replacement formulations for 100LL.
- By FY 2012, develop advanced damage tolerance methods to reduce the risk of failure of turbine engine rotor disks.

Customer/Stakeholder Involvement: The Propulsion and Fuel Systems Program works with the following industry and government groups:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.

- The Coordinating Research Council (CRC) Unleaded Aviation Gasoline Development Group – representatives from Texaco, Exxon Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming facilitate two-way transfer of technology between government and industry to benefit all participants.
- The CRC Molecular Marker Ad Hoc Committee – representatives from turbine engine manufacturers, major oil companies and FAA provide oversight to ensure the safe implementation when adding molecular markers to jet fuel.
- The Aerospace Industries Association (AIA) – working subcommittees on rotor integrity and rotor manufacturing.
- The National Transportation Safety Board – Recommendations A-90-89 and A-90-90 recommend that a damage tolerance philosophy be implemented in the design and maintenance of failure critical engine parts and A-98-28 recommends that FAA in cooperation with industry address the uncontained engine failures caused by cold dwell fatigue.

R&D Partnerships: Propulsion and Fuel Systems Program R&D partners include:

- Turbine Rotor Material Design Program - Southwest Research Institute (SwRI) has teamed with Pratt and Whitney, General Electric, Honeywell, and Rolls Royce to provide DARWIN™, a probabilistic-based rotor life and risk management certification tool.
- The AIA working subcommittees on rotor integrity and rotor manufacturing.
- The Ohio State University, a member of the FAA Airworthiness Assurance Center of Excellence (COE), is conducting research on a failure mode of titanium rotor disks known as cold dwell fatigue.
- SwRI is conducting research to determine the acceptable level of fuel dye contamination allowable for the safe, continuous operation of turbine engines in partnership with the Defense Energy Support Center, Internal Revenue Service, Air Transport Association, American Petroleum Institute, General Electric Aircraft Engines, Pratt and Whitney, Rolls Royce, Honeywell and Boeing.
- CRC Unleaded Aviation Gasoline Development Group – includes Texaco, Exxon-Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming; this group facilitates two-way transfer of technology between government and industry to benefit all participants.
- The FAA General Aviation Center of Excellence in conjunction with direct grants with the University of North Dakota, South Dakota State University and Baylor University – these relationships produce feasibility studies for the use of ethanol fuel blends as a possible unleaded piston fuel replacement for 100LL avgas.

Accomplishments: Outstanding program accomplishments include:

FY 2007:

- Completed an enhanced version of the DARWIN™ code with the following new features: new analysis mode for titanium hard alpha anomalies, probabilistic treatment of multiple anomalies, and a crack formation module.
- Completed full scale engine tests of 45 fuel formulations provided by the CRC.

FY 2006:

- Continued the enhancement of the DARWIN™ probabilistic rotor design code.
- Completed research on an experimental GA fuel provided by Exxon-Mobil under a cooperative research and development agreement; results demonstrated that amine-based additives show some promise as a replacement for 100LL.

- Completed research investigating the feasibility of using ETBE, an ethanol fuel blend, as a GA fuel; results showed there are significant range penalties associated with this fuel that make it an undesirable replacement for 100LL.

FY 2005:

- Completed an enhanced version of the DARWIN™ code that addresses multiple subsurface defects in turbine engine rotor disks.

FY 2004:

- Populated a rotor manufacturing induced anomaly database for use by the engine industry in sharing lessons learned in the manufacture of critical rotating engine parts to prevent future accidents caused by manufacturing defects.
- Completed an industrial demonstration of the pool power controller for the vacuum arc remelting process that will aid in producing defect-free titanium material for the manufacturer of turbine engine rotor disks.
- Completed research on the performance in a GA piston engine of 30 unleaded fuel formulations specified by the CRC Unleaded Aviation Gasoline Development Group. The research showed that none of the candidate formulations match the detonation suppression capability of 100LL.

Previous Years:

- Demonstrated, verified, and industrialized the probabilistic rotor design and life management code known as DARWIN™ for titanium alloys that provides turbine engine manufacturers a tool to augment their safe life approach.
- Demonstrated and verified the DEFORM™ defect deformation code for analysis of titanium alloy defects during the rotor disk forging process.
- Proved that the fleet octane requirement is the single most critical parameter for development of high octane unleaded aviation gasoline and that the motor octane rating of any potential candidate must be 100 or greater.
- Defined detonation detection procedures that were adopted by the American Society for Testing and Materials as a test standard (ASTM D6424) for use on candidate unleaded replacement fuels.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for surface damage of turned surfaces and blade slots.

Unleaded Fuels and Fuel System Safety Research

- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas including ethanol and ethanol blends.
- Complete research on the effects of molecular markers in Jet A fuel.
- Continue research and engine tests on blended fuels containing ethanol for piston engines.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Continue to advance DARWIN™, the probabilistically based turbine engine rotor design and life management code to enhance its predictive capability. This code is an FAA approved means to support a damage tolerant based certification enhancement to the current safe life design approach.
- Continue to develop advanced damage tolerance methods for turbine rotor disks through experimentation and modeling to address the effects of complex time-temperature stress histories, small crack sizes, anomalies in nickel alloys, crack geometries, and surface residual stress on fatigue crack growth life.

- Continue to develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- Continue to assess industry-provided lead free fuel formulation candidates, including petrochemical and ethanol based fuels to replace 100LL avgas.

New Initiatives

No new initiatives are planned in FY 2009

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for automatic rotor modeling.
- Complete experiments to calibrate and verify analytical methods for time-dependent crack growth and thermo-mechanical fatigue crack growth.

Unleaded Fuels and Fuel System Safety Research

- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas including ethanol and ethanol blends.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$93,830
FY 2008 Appropriated	4,086
FY 2009 Request	3,669
Out-Year Planning Levels (FY 2010-2013)	14,906
Total	$116,491

Budget Authority ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Contracts:					
Propulsion And Fuel Systems	6,089	4,508	2,592	2,463	2,415
Personnel Costs	922	1,155	1,366	1,476	1,168
Other In-house Costs	104	78	90	147	86
Total	**7,115**	**5,741**	**4,048**	**4,086**	**3,669**

OMB Circular A-11, Conduct of Research and Development ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Basic	0	0	0	0	0
Applied	7,115	5,741	4,048	4,086	3,669
Development (includes prototypes)	0	0	0	0	0
Total	**7,115**	**5,741**	**4,048**	**4,086**	**3,669**

A11b - Propulsion and Fuel Systems Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
063-110 Propulsion and Fuel Systems							
Turbine Engine Research	**2,415**						
Continue to advance the Probabilistic Rotor Design and Life Management code (DARWIN™) to enhance its predictive capability.		♦	◊	◊	◊	◊	◊
Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for surface damage of turned surfaces and blade slots.		♦					
Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for automatic rotor modeling.			◊				
Continue to develop advanced damage tolerance methods for turbine rotor disks.		♦	◊	◊	◊	◊	◊
Complete experiments to calibrate and verify analytical methods for time-dependent crack growth and thermo-mechanical fatigue crack growth.			◊				
Continue to develop a design methodology for use by industry to prevent cold dwell fatigue and for assessing the fleet risk.		♦	◊	◊	◊	◊	◊
Unleaded Fuels and Fuel System Safety Research	**0**						
Complete research on the effects of molecular markers in Jet A fuel		♦					
Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100 octane low-lead gasoline, including ethanol and ethanol blends		♦	◊	◊	◊	◊	◊
Continue the evaluation of the feasibility of using ethanol and ethanol blends as a general aviation fuel		♦	◊	◊			
Evaluate the feasibility of modifying general aviation piston engine controls to accommodate alternative fuels for 100LL				◊	◊	◊	◊
Personnel and Other In-House Costs	**1,254**						
Total Budget Authority	**3,669**	**4,086**	**3,669**	**3,720**	**3,724**	**3,729**	**3,733**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.c.	**Advanced Materials/Structural Safety**	**$2,920,000**

GOALS:

Intended Outcomes: The Advanced Materials/Structural Safety Program helps FAA achieve its strategic goal of increasing aviation safety by preventing accidents that would occur as a result of structural failure. The Advanced Materials/Structural Safety Program assesses the safety implications of new and present day composites, alloys, and other materials, and associated structures and fabrication techniques that can help to reduce aviation fatalities. The program is also enhancing aircraft crashworthiness.

Agency Outputs: The Advanced Materials/Structural Safety Program provides technical support for rule making and develops guidance to help the aviation industry comply with agency regulations.

Advanced Materials

The FAA establishes rules for the certification of safe and durable materials for use in aircraft construction. While the rules are the same for composite or metal structures, different behavioral characteristics of structural materials call for different means of compliance. Although Advisory Circular (AC) 20-107A, "Composite Structure" has been published, advances in technologies and materials require periodic updates and expansion of the AC. The FAA Chief Scientist/Technical Advisor Program disseminates current technical information to regulatory personnel through technical reports, handbooks, and guidance. The goal of this data exchange is to allow regulatory processes to keep pace with industry advances and benefit from state-of-the-art technology and design.

Structural Safety

The FAA revises or updates crashworthiness-related Federal Aviation Regulations to accommodate new information for overhead stowage bins, auxiliary fuel tanks and fuel systems, aircraft configurations, seat and restraint systems, and human tolerance injury criteria. The FAA is developing alternative methods to streamline the certification process (i.e. certification by analysis and component tests in lieu of full-scale tests).

Research Goals: To prevent accidents associated with the airframe and to improve the crashworthiness of airframes in the event of accidents, the Advanced Materials/Structural research focuses on developing analytical and testing methods for standardization; understanding how design, loading, and damage can affect the remaining life and strength of composite aircraft structures; developing maintenance and repair methods that are standardized and correlated with training and repair station capabilities; enhancing occupant survivability and reducing personal injury from accidents; improving crash characteristics of aircraft structures, cabin interiors, auxiliary fuel tanks, fuel systems, and occupant seat and restraint systems; and improving the efficiency of aircraft certification through the use of better analytical modeling of crash events.

- By FY 2009, generate composite material dynamic properties.
- By FY 2009, develop analytical modeling techniques of aircraft structures.
- By FY 2010, generate data using full-scale structure with a goal of uniform, accepted certification methodology for damage tolerance and fatigue of composite airframe.
- By FY 2010, develop test and analysis protocols for repeated loads and damage threats.
- By FY 2011, identify required data and test methods for high temperature materials to assure safety of new constructions.
- By FY 2012, initiate study of ceramics as they are used in engine components.
- By FY 2013, develop criteria for damage tolerance assessments of laminate composite structures.
- By FY 2013, generate methodology for demonstrating aircraft structure crashworthiness certification by analysis.

Customer/Stakeholder Involvement: The Advanced Materials/Structural Safety Program complies with or cooperates with the following legislation and industrial and government groups:

- Public Law 100-591, the Aviation Safety Research Act of 1988, and House of Representatives Report 100-894 – sets priorities to develop technologies, conduct data analysis for current aircraft, and anticipate problems related to future aircraft.
- The Aviation Rulemaking Advisory Committee (ARAC) – this FAA committee and its subcommittees help to ensure the effectiveness of the agency's rule making by identifying R&D requirements and priorities, providing guidance for the update of documents, such as AC20-107A, and encouraging industry's full participation in implementing new rules.
- Aircraft Safety Subcommittee of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.

R&D Partnerships: The Advanced Materials/Structural Safety Program benefits from a close working relationship with the FAA Center of Excellence lead by Wichita State University's National Institute of Aviation Research and the University of Washington. The research performed under this program is leveraged by the monetary and intellectual contributions of its core universities.

Advanced Materials

With the cooperation of other government agencies, FAA sponsors a primary, authoritative handbook (Composite Materials Handbook 17) facilitating the statistical characterization data of current and emerging composite materials. The best available data and technology source for testing and analysis, this international reference tool also includes guidance on data development and usage. On recommendations by the ARAC, material data contained in this handbook are acceptable for use in the certification process.

Structural Safety

The program maintains cooperative interagency agreements in the structural safety area with the U.S. Army and Navy in the analytical modeling area.

Memoranda of cooperation and exchange of personnel have been established between the program and the French, Italian, and Japanese governments in the crash testing area. The program has worked closely with Drexel University to develop dynamic crash computer modeling codes for transport airplane structures.

Accomplishments: The Advanced Materials/Structural Safety Program provides technical reports (available on-line at http//actlibrary.tc.faa.gov), handbooks, ACs, and certification guidance to aircraft manufacturers, maintainers, and operators. Outstanding program accomplishments include:

FY 2007:

- Completed the validation of analytical methodology to predict residual strength of a composite sandwich structures following an impact event.
- Established feasibility of embedded sensors to track damage in composite structures.
- Evaluated aging composite aircraft by a destructive evaluation and testing.
- Developed an updated ATR 42-300 model to analyze critical fuselage frame failure observed in the vertical drop test.
- Developed occupant protection criteria for side facing seats commonly used in business jets. Currently, no criteria exist.
- Evaluated the use of reticulated foam to mitigate post-crash fires using full-scale sled tests.

FY 2006:

- Developed software for analyzing bonded joints that can be used by the general aviation industry.
- Developed a web-based course on maintenance of composite airframe structures.
- Developed analytical models that predict durability of braided materials.
- Generated data on human neck injury criteria for side-facing aircraft seats that may be used to develop safety criteria for business jet with side-facing seats. Currently, no criteria exist for these seats.

FY 2005:

- Developed an aircraft seat cushion replacement methodology that may have the potential to replace future requirement for full-scale sled test currently required when replacing aircraft seat cushions.
- Established common practices for bonded joints in composites structures that served as a basis for an AC.

Previous years:

- Developed data on the procurement and processing of composites that resulted in a published AC.
- Analyzed data from ATR42-300 drop test to help establish crashworthiness criteria for commuter aircraft.
- Developed an economical data reduction method, characterizing statistically composite materials through shared databases, that is now used worldwide by the general aviation industry.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Assess the severity of control surface stiffness degradation and its effect on dynamic characteristics.
- Develop chemical characterization tests to ensure adequate surface preparation for bonded joints.
- Develop safety criteria for damage tolerance of fiber/metal laminates and friction stir welded joints.

Structural Safety

- Develop analytical models of aircraft crash events to reduce the number of full-scale tests and thus reduce the cost of certification.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

The program will continue to focus on damage tolerance and fatigue issues of composite airframes. In addition it will focus on the aging of composite materials. Composite control surfaces degradation on transport airplanes will be explored and linked to aircraft safety issues. Bonded joints will be studied for damage tolerance and durability. Researchers will also explore savings in maintenance costs, of using embedded sensors to monitor in-service damage and will investigate the long-term safety friction stir-welded parts and fiber/metal laminates proposed for use in new aircraft. In addition, they will collect data for new materials and applications, such as ceramics and high temperatures.

Research will continue to develop analytical models of aircraft crash events. This will focus on the development of criteria and methodologies to validate analysis techniques and assess the effectiveness of the analysis to properly describe the crash event.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Generate composite material dynamic properties.

Structural Safety

- Develop analytical modeling techniques of aircraft crash conditions.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$90,998
FY 2008 Appropriated	7,083
FY 2009 Request	2,920
Out-Year Planning Levels (FY 2010-2013)	11,923
Total	$112,924

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Advanced Materials	5,087	4,383	1,211	6,054	1,838
Structural Safety	96	174	165	0	0
Personnel Costs	1,345	1,247	1,394	945	1,022
Other In-house Costs	115	77	73	84	60
Total	**6,643**	**5,881**	**2,843**	**7,083**	**2,920**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	6,643	5,881	2,843	7,083	2,920
Development (includes prototypes)	0	0	0	0	0
Total	**6,643**	**5,881**	**2,843**	**7,083**	**2,920**

A11c – Advanced Materials/Structural Safety Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
062-111 Advanced Materials Structures							
Advanced Materials	**1,838**						
Ascertain the effect of stiffness loss due to damage for dynamic characteristics		◆					
Develop safety criteria as they concern damage tolerance of fiber/metal laminates and friction stir welded joints		◆					
Develop chemical characterization tests to assure adequate surface preparation for bonded joints		◆					
Generate composite materials dynamic properties			◊				
Verify accepted certification methodology for damage tolerance and fatigue using full-scale test data.				◊			
Develop test and analysis protocols for repeated loads and damage threats				◊			
Identify data and test for materials at elevated temperatures					◊		
Initiate research in ceramic composites						◊	
develop criteria for damage tolerance assessments of laminate composite structures							◊
062-110 Structural Safety	**0**						
Structural Safety							
Develop analytical models of aircraft crash events		◆					
Develop analytical modeling techniques of aircraft structures crash conditions			◊				
Develop analytical model protocols and detailed requirements for crashworthiness certification analysis							◊
Personnel and Other In-House Costs	**1,082**						
Total Budget Authority	**2,920**	**7,083**	**2,920**	**2,965**	**2,975**	**2,986**	**2,997**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.d.	**Atmospheric Hazards/Digital System Safety**	**$4,838,000**

GOALS:

Intended Outcomes: The Atmospheric Hazards/Digital System Safety (DSS) Research Program supports FAA's strategic goal of increased safety by reducing the number of accidents or potential accidents associated with aircraft icing and failures to software-based digital flight controls and avionics systems. The program supports FAA's aviation safety goal by developing and testing technologies that detect frozen contamination, predict anti-icing fluid failure, and ensure safe operations both during and after flight in atmospheric icing conditions. To improve digital system safety, researchers are working to ensure the safe operation of emerging, highly complex software-based digital flight controls and avionics systems.

A major goal of the program is to reduce aviation's vulnerability to all in-flight icing hazards through the application of its research to improve certification criteria. Commercial airplanes are not yet certified to fly in icing conditions to an icing envelope that includes supercooled large droplet (SLD) icing conditions. The program's researchers have contributed to the development of technical data and advisory materials to correct this omission. A study by the Engine Harmonization Working Group indicates that over 100 in-service engine events, many resulting in power loss and at least six in multiple engine flameouts, occurred in high ice water content environments over the period 1988 to 2003. A future collaborative research effort will focus on this issue.

The program will develop new guidelines for testing, evaluating, and qualifying digital flight controls and avionics systems for the certification of aircraft platforms. Additionally, the program supports development of policy, guidance, technology, and training needs of the Aircraft Certification Service and Flight Standards Service that will assist and educate FAA and industry specialists in understanding digital systems safety and assessing how it may be safely employed in systems such as fly-by-wire, augmented manual flight controls, navigation and communication equipment, and autopilots.

Agency Outputs: The FAA establishes rules for the certification and operation of aircraft that encounter icing conditions as well as rules for the use of software, digital flight controls, and onboard avionics systems. The agency uses the research results to generate Advisory Circulars (ACs), and various other forms of technical information detailing acceptable means for meeting requirements, to guide government and industrial certification and airworthiness specialists and inspectors.

Research Goals: To reduce the number and severity of accidents, or potential accidents, associated with icing and failures to software-based digital flight controls and avionics systems, the program develops and assesses ways to ensure that airframes and engines can safely operate in atmospheric icing conditions, and ensure the proper operation of software, complex electronic hardware, and digital systems.

Atmospheric Hazards

- By FY 2010, complete characterization of high ice water content atmospheric environments potentially hazardous to engines.
- By FY 2011, complete experimental work on the physics of engine icing in high ice water content environments.
- By FY 2012, develop methods for the airworthiness testing of engines in simulated high ice water content environments.
- By FY 2013, develop data and methods supporting the evaluation of aircraft engines for operation in high ice water content environments.

Digital System Safety

- By FY 2010, evaluate complex hardware techniques and tools for qualification, verification, and assurance to develop additional evaluation methods that may improve the certification process for complex hardware.

- By FY 2010, determine potential safety, security, and certification issues of connecting aircraft systems to external systems, per onboard network security and integrity.
- By FY 2010, determine software development assurance levels.
- By FY 2011, evaluate the obsolescence and life cycle maintenance of aviation electronics to determine the availability and affordability of digital avionics repair parts.
- By FY 2011, evaluate model-based development criteria to promote faster development and shorter certification times for aircraft systems with safety-critical software and complex electronic hardware.
- By FY 2012, evaluate alternatives to existing verification and validation techniques; improved techniques will provide a way to identify system requirement errors early in the development process before implementation into the system.
- By FY 2013, determine applicability of safety engineering and reliability engineering to software development assurance standards (i.e., DO-178B).

Customer/Stakeholder Involvement: The Atmospheric Hazards/Digital System Safety Research Program collaborates with a broad segment of the aviation community to improve aircraft certification, inspection, and maintenance, including:

- Aircraft Safety Subcommittee of the FAA Research, Engineering, and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the Atmospheric Hazards/Digital System Safety Research Program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that the program's R&D projects support new rule making and the development of alternate means of compliance with existing rules.
- Ice Protection Harmonization Working Group and Engine Harmonization Working Group of the FAA Aviation Rulemaking Advisory Committee – groups that ensure the effectiveness of the agency's rule making. Members of the working group and full committee identify research requirements and priorities.
- G-12 Aircraft Ground Deicing Committee of the Society of Automotive Engineers (SAE) – this subcommittee assists in updating holdover time guidelines and establishing standards for de/anti-icing methodologies, deicing fluids, and ground ice detection.
- SAE AC-9C Aircraft Icing (In-flight) Subcommittee – this subcommittee assists in updating the Aircraft Icing Handbook, including the Icing Bibliography, and in establishing standards for icing simulation methods.
- RTCA (formerly known as Radio Technical Commission for Aeronautics) – members of this U.S. Federal Advisory Committee and its special committees help to ensure the effectiveness of the agency's rulemaking by identifying research requirements and priorities and providing guidance for Aircraft Certification Office engineers and the update of documents, such as avionics software, and electromagnetic hazards.
- Certification Authorities Software Team (CAST) – a group of international certification software and complex electronic hardware (CEH) specialists who collaborate and make recommendations to regulatory authorities on the resolution of software and CEH aspects of safety.

R&D Partnerships: The program maintains a number of cooperative relationships:

- National Aeronautics and Space Administration (NASA) Glenn Research Center – includes various cooperative efforts on aircraft icing activities.
- Transport Canada – based on an international agreement on research on aircraft ground deicing issues.
- Environment Canada – based on an international memorandum of cooperation for research on in-flight icing conditions.

- NASA Langley Research Center – assesses software-based digital flight controls and avionics systems and electromagnetic hazards research.
- Aerospace Vehicle Systems Institute (AVSI) – cooperative industry, government, and academia venture for investigation and standardization of aerospace vehicle systems to reduce life-cycle cost and accelerate development of systems, architectures, tools, and processes.

Accomplishments: Significant program accomplishments include:

Aircraft Icing

FY 2007:

- Conducted propeller icing test in McKinley Climatic Chamber and processed and published data.
- Conducted testing at flight Reynolds numbers on full-scale airfoil model of simulated runback ice for a thermal ice protection system.
- Developed technical data for the use of ground ice detectors.

FY 2006:

- Developed snow generation system to test the time of effectiveness of modern de/anti-icing fluids in a controlled laboratory environment.
- Completed development of facility simulation capability for SLD icing testing to show safe operation in SLD environments in accordance with new proposed rules.
- Completed documentation and analysis of residual and inter-cycle ice for pneumatic boots at low airspeeds to provide data for guidance to ensure safe operation of pneumatic boots on low speed aircraft in icing conditions.

FY 2005:

- Investigated and documented characteristic features of runback ice for thermal ice protection systems to provide data for guidance to ensure safe operation of thermally protected aircraft in icing conditions.
- Enhanced in-flight icing simulation capability at the McKinley Climatic Laboratory suitable for testing of full scale engines and rotor blades for substantiation of safe operation of engines and helicopters in icing conditions.

FY 2004:

- Investigated and analyzed atmospheric icing environment - supercooled water and mixed-phase conditions – to provide data for formulation of expanded atmospheric icing envelopes for new proposed rules.

Digital System Safety

FY 2007:

- Completed analysis of aspects of commercial off-the-shelf (COTS) component integration related to the verification of the integration of components into a generic aviation platform that includes a handbook that will be useful for FAA and industry practitioners of integrating IMA systems on aircraft. Results published in a technical report.
- Developed evaluation criteria for airworthiness of newly proposed databuses that will define a suitable approach to develop and evaluate data networks for safety-critical avionics; results will provide guidance to FAA certification engineers. Results published in a technical report.
- Defined a safe, secure process for implementing LANs onboard aircraft; results will provide a network assurance process for FAA certification engineers. Results published in a technical report.

FY 2006:

- Completed research on object-oriented technology (OOT) in aviation that will provide input for policy and guidance on the use of OOT systems and support harmonization with international certification authorities on the use of OOT.
- Completed research on component integration and verification considerations in integrated modular avionics (IMA) systems; results will lead to more effective systems development and enhance the certification of digital flight controls and avionics systems.
- Evaluated the criteria and use of microprocessors in aviation and the identification of safety concerns for microprocessors; results will be used to develop test methods for modern, complex microprocessors that will improve the process of certifying aircraft avionics.

FY 2005:

- Studied deterministic operations of Ethernet equipment and provided evaluation criteria for the certification of Ethernet databases; results were incorporated into a handbook that provides network designers with guidelines for developing Ethernet databases that will be deployable in certifiable avionics systems.
- Completed research on software development tools that led to a handbook for developers and certifying authorities to use to evaluate the tools from the system and software safety perspective and provided a basis for future software development tool qualification guidelines.
- Completed research on software verification tools that identified specific evaluation criteria that could be used to determine whether the performance of the tool was acceptable and thereby improve the ability of the certification engineer to qualify software using these tools.

Previous Years:

- Investigated issues concerning the structural coverage of object-oriented software that clearly showed that there is a desire and emerging trend by suppliers of commercial airborne safety-critical systems toward the use of object-oriented technology (OOT), and thereby an increasing need by certifiers for the proper application of structural coverage analysis to OOT.
- Investigated three forms of the modified condition decision coverage (MCDC) criterion that assists with the assessment of the requirements-based testing process for Level A software and provided data to support the right choice for the type of structural coverage to use.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Complete analysis of data from propeller icing test at McKinley Climatic Laboratory to provide data for guidance to ensure safe flight of propeller aircraft in icing conditions.
- Continue research to characterize high ice water content environments for engines to ensure their safe operation in such conditions.
- Continue experimental work on the physics of engine icing in high ice water content environments
- Develop improved methods for simulation of ice pellet, mixed, and other conditions for determination of fluid failure and holdover times.
- Continue study of aerodynamic effects of runback ice for thermal ice protection for simulated flight conditions.

Digital System Safety

- Complete and document methods to improve software velocity in production certification timeframes.
- Determine additional microprocessor evaluation issues pertaining to risk and safety.
- Evaluate onboard network security and integrity issues.
- Evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.
- Evaluate COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Researchers will continue to refine laboratory methods to determine de-icing fluid holdover times in a variety of environmental conditions. Study of the enhancement and validation of icing simulation methods, with an emphasis on engine testing in high ice water content conditions will continue. Researchers will also continue to evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.

New Initiatives

No new initiatives are planned for FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Continue collaborative flight research to acquire atmospheric data for high ice water content environments. Initiate processing and analysis of data.
- Continue experimental work on the physics of engine icing in high ice water content environments.
- Complete the development of methods for simulation of ice pellet and mixed conditions for determination of fluid failure and holdover times.
- Develop methods to test engines in simulated high ice water content environments.
- Complete investigation of runback ice formation and size and velocity effects on aerodynamic impact of runback ice for thermal ice protection for simulated flight conditions.

Digital System Safety

- Complete an additional microprocessor evaluation pertaining to risk and safety.
- Evaluate onboard network security and integrity issues.
- Evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.
- Evaluate COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics.
- Determine software development assurance level.
- Evaluate verification and validation techniques.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$86,819
FY 2008 Appropriated	3,574
FY 2009 Request	4,838
Out-Year Planning Levels (FY 2010-2013)	19,859
Total	$115,090

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Digital System Safety	440	232	842	737	1,080
Atmospheric Hazards	1,864	1,287	1,316	1,052	1,811
Personnel Costs	1,621	1,786	1,614	1,653	1,832
Other In-house Costs	161	102	76	132	115
Total	**4,086**	**3,407**	**3,848**	**3,574**	**4,838**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	4,086	3,407	3,848	3,574	4,838
Development (includes prototypes)	0	0	0	0	0
Total	**4,086**	**3,407**	**3,848**	**3,574**	**4,838**

A11d – Atmospheric Hazards/Digital System Safety Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
064-110 Digital System Safety							
Digital System Safety	**1,080**						
Determine software velocity in production		◆					
Determine additional microprocessor evaluation issues		◆	◊				
Evaluate onboard network security and integrity		◆	◊	◊			
Evaluate complex electronic hardware techniques and tools		◆	◊	◊			
Evaluate obsolescence and environmental qualification of electronic components		◆	◊	◊	◊		
Determine software development assurance level			◊	◊			
Evaluate model-based development criteria				◊	◊		
Evaluate verification and validation techniques			◊	◊	◊		
Determine applicability of safety engineering and reliability engineering					◊	◊	◊
064-111 Atmospheric Hazards							
Aircraft Icing	**1,811**						
Complete analysis of propeller icing test data from McKinley Climatic Laboratory		◆					
Characterize high ice water content atmospheric environments for engines		◆	◊	◊			
Conduct experimental work on the physics of engine icing in high ice water content environments.		◆	◊	◊	◊		
Develop improved methods for simulation of ice pellet, mixed, and other conditions for determination of fluid failure and holdover times		◆	◊				
Develop methods to test engines in simulated high ice water content environments			◊	◊	◊	◊	
Investigate scaling of formation and aerodynamic effects of runback ice for thermal ice protection for simulated flight conditions.		◆	◊				
Develop data and methods supporting the evaluation of aircraft engines for operation in high ice water content environments					◊	◊	◊
Personnel and Other In-House Costs	**1,947**						
Total Budget Authority	**4,838**	**3,574**	**4,838**	**4.921**	**4,949**	**4,979**	**5,010**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.e.	**Aging Aircraft / Continued Airworthiness**	**$14,589,000**

GOALS:

Intended Outcomes: The Aging Aircraft/Continued Airworthiness Program (formerly known as the Aging Aircraft Program) contributes to FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with failure of aircraft structure, engines, and systems. The program supports FAA's aviation safety goal by developing technologies, procedures, technical data, and performance models to prevent accidents and mitigate accident severity related to civil aircraft failures as a function of their continued operation and usage. The program is focused on the structural integrity of fixed wing aircraft and rotorcraft, continued safety of aircraft engines, development of inspection technologies, and safety of electrical wiring interconnect systems (EWIS), mechanical systems, and flight controls.

Agency Outputs: The FAA issues rules and advisory materials for regulating aircraft design, construction, operation, modification, inspection, maintenance, repair, and safety. Technologies, procedures, technical data, and analytical models produced by the Aging Aircraft/Continued Airworthiness Program provide a major source of technical information used in developing these regulations and related advisories. Through this research, FAA also provides the aviation community with critical new safety technologies and data.

Research Goals: The goal of the Aging Aircraft/Continued Airworthiness Program is to understand and develop methods to counter the effects of age and usage on the airworthiness of an aircraft over its lifetime, including potential effects of modifications and repairs. The program conducts research, develops technologies and processes, and assesses current practices in order to eliminate or mitigate the potential failures related to aircraft aging processes, thereby reducing the number and severity of accidents.

To satisfy these goals the program conducts research to assess causes and consequences of airplane structural fatigue, corrosion, and other structural failures, and develop effective analytical tools to predict the behavior of these conditions. This includes development of nondestructive inspection technologies to detect these conditions. Similar research is conducted on aircraft engines and rotorcraft. Aircraft systems research to understand the causes and consequences of EWIS and mechanical systems failures, and the relationship of these failures to other aircraft systems and safety completes the program.

- By FY 2010, develop EWIS separation and segregation advisory guidance. This research supports development of guidelines for the design and modification of aircraft EWIS and improves safety by ensuring that adequate clearances for EWIS separation and segregation are provided in EWIS installation.
- By FY 2010, develop and validate a model-assisted probability of detection methodology to determine quantitative inspection reliability data, eliminating the need to conduct expensive and time consuming tests currently required to establish inspection reliability. Accurate probability of detection data is critical to determining the life of safety critical components.
- BY FY 2011, complete a study of risk-based fleet management for small-airplane continued operational safety.
- BY FY 2011, assess performance of in-situ damage detection technologies for inspection of remote and inaccessible areas in aircraft. In-situ monitoring provides the means to monitor structural behavior and identify damage not normally found between major maintenance checks.
- By FY 2011, complete study to assess need for new rudder design standards in transport category aircraft and need for new pilot training standards with regard to rudder usage.
- BY FY 2012, develop damage tolerance methodologies and standards for rotorcraft to establish guidance for certification.
- BY FY 2012, assess performance of traditional and advanced inspection systems necessary for evaluating the strength of bonded aircraft structures. The continued airworthiness of bonded aircraft structures, whose use is increasing, will require technologies to find hidden damage in these joints.

- By FY 2013, develop standards for rotorcraft that provide guidance for certification of Health and Usage Monitoring Systems (HUMS) for usage credits.
- By FY 2013, develop a predictive methodology for damage tolerance risk assessment and risk management for continued operational safety of small airplanes.

Customer/Stakeholder Involvement: The Continued Airworthiness Program coordinates with an extensive network of government and industry groups, including:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- The Aviation Rulemaking Advisory Committee – Industry representatives propose cost-effective rulemaking and research to address aircraft safety issues.
- Aircraft manufacturers, operators, foreign airworthiness authorities, academia, and industry trade groups consult on a wide range of current and future aging aircraft and continued airworthiness issues.

R&D Partnerships: The Aging Aircraft/Continued Airworthiness Program activities are closely coordinated with industry, NASA, and DoD. The FAA maintains interagency agreements with NASA, the U.S. Navy, the U.S. Air Force, and the Department of Energy (DOE). The FAA, DoD, and NASA have co-sponsored 10 joint aging aircraft conferences.

The FAA collaborates closely with several private and public organizations, including:

- The Joint Council on Aging Aircraft – leverages resources and coordinates the efforts of all DoD service organizations for common aging aircraft issues.
- The National Rotorcraft Technology Center – comprised of the U.S. Army, U.S. Navy, FAA, and NASA.
- Metallic Materials Properties Development and Standardization (MMPDS) Government/Industry Steering Group – a joint government and industry working group that funds and develops the metallic materials properties handbook.

Accomplishments: The Aging Aircraft/Continuing Airworthiness Program conducts a broad array of projects to meet the goals described above. Technical reports documenting the accomplishments of most projects are available on-line at http://aar400.tc.faa.gov/Programs/AgingAircraft/index.htm.

Outstanding program accomplishments include:

FY 2007:

- Completed the airworthiness evaluation of an aged Raytheon Beech 1900D.
- Completed the destructive and extended fatigue testing of fuselage sections from a retired Boeing 727. Results support formulation of policy on use of teardown data for airworthiness certification.
- Conducted the field test of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components.
- Completed assessment of ASTM and new fatigue crack growth test methods for use in addressing rotorcraft fatigue life.

- Developed methodology to evaluate mechanical systems on current transport category aircraft for safety and reliability.

FY 2006:

- Completed development of the MMPDS Handbook of FAA accepted material properties, which replaces MIL-HDBK-5 previously cancelled by the DoD. The MMPDS Handbook is an essential reference for aircraft manufacturer design engineers and is used by FAA for aircraft certification.
- Completed aircraft wire degradation research on common types of aircraft electrical wire as a function of laboratory controlled aging processes. Data generated are used to evaluate potential methods of monitoring wire performance in aircraft and wire reliability assessment methods.
- Completed research on the use of composite doublers as a safer, more cost-effective means for repair of damaged metallic aircraft structure.
- Completed development of a low cost, field prototype, generic scanning and imaging system that can be readily coupled to existing aircraft inspection devices, thereby improving flaw detection in metal and composite structure.
- Completed second-phase development of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components. This technology is a potential replacement of fluorescent penetrant inspection.

FY 2005:

- Completed airworthiness evaluations of two aging Cessna airplanes, a 402A and 402C, and a teardown evaluation of a T-34A accident aircraft.
- Evaluated and verified methods to assess multiple site damage.
- Developed the fatigue crack growth database that is used in support of damage tolerance assessments of airframe structure.
- Developed and demonstrated a prototype micro-energy, high-voltage nondestructive test method for inspecting aircraft wiring.
- Completed research to determine the interrelationship of landing gear lateral loads on the body and wing gear during ground turns of FAA's multiple main gear B-747SP aircraft. Results of this research support development of landing gear certification standards.

Previous Years:

- Established the FAA Arc Fault Evaluation Laboratory and initiated the evaluation of advanced circuit protection technologies and experiments to quantify damage created by arc fault conditions.
- In cooperation with industry, developed, validated, and facilitated the adoption of improved inspection procedures for detecting cracks and corrosion in rotorcraft.
- Demonstrated phased array inspection technology for critical engine titanium forgings. Phased array technology reliably detects smaller material flaws in critical engine component forgings.
- Developed rotorcraft component damage part database that allows determination of the origin and causal factors of rotorcraft structure and component failures.
- Developed and flight tested aircraft arc-fault circuit breaker prototypes; they mitigate the hazardous effects of potentially catastrophic arc-faults.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a predictive methodology for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Complete loads characterization of B-737/700 (transports) and B-767 (cargo) airplanes in typical operations (altitude, airspeed, acceleration, ground-air-ground cycles, and kinematics of flight and ground operation). Data will be used to assess assumptions in design and certification.
- Complete assessment of reliability of various advanced inspection technologies in detecting second layer cracks in typical transport aircraft fuselage structure.
- Initiate research on damage tolerance and durability issues for emerging structural technologies entering service, to ensure safety, support maintenance, and establish future certification policies and guidance.

- Complete validation of HUMS flight regime recognition methods for rotorcraft using the HUMS advisory circular.
- Complete an advanced risk assessment tool for conducting hazard analysis of EWIS systems. The tool will use a probabilistic method to support compliance with FAR 25.1309 requirements.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

The FY 2009 funding request will support Aging Aircraft/Continued Airworthiness research requirements that contribute to FAA's aviation safety goal. The program will continue its focus on developing technologies, technical information, procedures, and practices that help ensure the safety of aircraft structures and systems in the civil aircraft fleet. Research will continue on the development of damage tolerance methods and health and usage monitoring systems for rotorcraft. Research will continue on the development and evaluation of risk assessment and risk management methods for the continued operational safety of small airplanes. Research will continue on flight controls and mechanical systems, focusing on design, maintenance and pilot training to increase safety. Researchers will also continue efforts on engine airworthiness and propeller damage tolerance. Research in nondestructive inspection will continue its focus on the development of methods and technologies to assure the long term safety of metallic and composite structures.

New Initiatives

The program will begin research that investigates issues related to flight control safety for general aviation.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a comprehensive analysis tool for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Complete studies to quantitatively determine the impact of process variables on the performance of fluorescent penetrant inspection (FPI) and integrate results into industry inspection standards.
- Develop a rotorcraft certification plan for the use of HUMS.
- Continue research on damage tolerance and durability issues for emerging structural technologies entering service, to ensure safety, support maintenance, and establish future certification policies and guidance.
- Complete the evaluation of thermal acoustic technology as a potential replacement for FPI in inspecting critical engine components.
- Complete the evaluation of nondestructive inspection (NDI) technologies for identifying small cracks and corrosion in propeller systems.
- Complete testing of single-element, dual-load-path flight control linkages from transport category aircraft for corrosion and other anomalies that could affect safety.
- Complete upgrade of Arc Fault Evaluation Laboratory to accommodate more sophisticated separation and segregation testing of aircraft wiring (EWIS research).

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$375,009
FY 2008 Appropriated	15,946
FY 2009 Request	14,589
Out-Year Planning Levels (FY 2010-2013)	59,114
Total	$464,658

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Aging Aircraft	13,852	14,881	14,211	11,680	9,839
Personnel Costs	4,609	4,631	4,159	3,946	4,447
Other In-house Costs	537	295	251	320	303
Total	**18,998**	**19,807**	**18,621**	**15,946**	**14,589**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	18,998	19,807	18,621	15,946	14,589
Development (includes prototypes)	0	0	0	0	0
Total	**18,998**	**19,807**	**18,621**	**15,946**	**14,589**

A11e – Aging Aircraft/Continued Airworthiness Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
065-110 Continued Airworthiness							
Structural Integrity and Inspection Systems Research	**4,904**						
Develop risk-based fleet management methods for small-airplane continued operational safety		◆	◊	◊	◊	◊	◊
Initiate research on application of damage tolerance methods to emerging structural technologies		◆	◊	◊	◊		
Complete operational loads characterization of Boeing 737/700 and 767 aircraft		◆					
Complete assessment of reliability of NDI techniques for second layer cracks in transports		◆					
Assess the effect of FPI process variables on inspection performance and reliability		◆	◊				
Develop and validate a model-assisted methodology to predict inspection reliability data		◆	◊	◊			
Assess performance of in-situ damage detection technologies for inspection of remote and inaccessible areas in aircraft		◆	◊	◊	◊		
Assess performance of advanced inspection systems to determine strength of bonded aircraft structures		◆	◊	◊	◊	◊	◊
Rotorcraft Structural Integrity and Safety	**1,995**						
Develop rotorcraft damage tolerance methodologies and standards to establish guidance for certification		◆	◊	◊	◊	◊	◊
Establish guidance for certification of HUMS applications for usage credits		◆	◊	◊	◊	◊	◊
Continued Airworthiness of Aircraft Engines	**0**						
Evaluate thermal acoustic technology as a potential replacement of FPI for critical engine components		◆	◊				
Evaluate advanced techniques to detect manufacturing-induced surface anomalies on critical engine components		◆	◊	◊			
Investigate suitability of NDI technologies for detection of small cracks and corrosion in propeller systems		◆	◊				
Develop standard propeller load spectrum for damage tolerant design methodologies		◆	◊	◊			
Continued Airworthiness of Aircraft Systems	**2,940**						
Assess pilot rudder usage, design, and training		◆	◊	◊	◊		
Assess single element, dual-load path flight control linkages for corrosion		◆	◊				
Complete advanced risk assessment tool for aircraft electrical systems		◆					
Assess EWIS separation and segregation standards and develop advisory guidance		◆	◊	◊			
Personnel and Other In-House Costs	**4,750**						
Total Budget Authority	**14,589**	**15,946**	**14,589**	**14,780**	**14,779**	**14,778**	**14,777**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.f.	**Aircraft Catastrophic Failure Prevention Research**	**$436,000**

GOALS:

Intended Outcomes: The Aircraft Catastrophic Failure Prevention Program supports FAA's strategic goal of increasing aviation safety by reducing the number of fatal accidents from uncontained engine failures and engine malfunctions. The program supports FAA's safety goal by developing technologies and methods to assess risk and prevent occurrence of potentially catastrophic defects, failures, and malfunctions in aircraft, aircraft components, and aircraft systems. Its researchers assess the use of advanced materials to protect aircraft critical systems and passengers in the event of catastrophic engine failures. The program also uses historical accident data and National Transportation Safety Board recommendations to examine and investigate:

- Turbine engine uncontainment events, including the mitigation and modeling of aircraft vulnerability to uncontainment parameters stated in Advisory Circular (AC) 20-128, Phase II.
- Fan blade out analysis and other engine related impact events like bird strike and ice ingestion.
- Propulsion malfunction indications in response to Aerospace Industries Association (AIA) recommendations and proposed solutions.

Agency Outputs: With technical data from the Aircraft Catastrophic Failure Prevention Program, FAA establishes certification criteria for aircraft and revises regulations to certify new technologies. The agency also publishes ACs to outline acceptable means for meeting these rules. The program's objective is to ensure safe aircraft operation in the public domain.

Research Goals: To reduce the number of fatal accidents from uncontained engine failures, the program develops data and methods for evaluating aircraft vulnerability to uncontained engine failures and provides analytical tools for protecting identified critical systems that may need shielding from uncontained engine debris. Through the LSDYNA Aerospace Users Group, FAA is working with industry to establish standards for finite element analysis and guidance for use in support of certification.

- By 2010, develop a modular Uncontained Engine Debris Damage Assessment Model (UEDDAM) (version 4) to be compatible with Department of Defense code upgrades for supportability and incorporate industry recommended improvements.
- By 2012, develop revised guidance for fuselage protection from uncontained engine failure fragments that includes multiple fragment analysis.
- In the area of propulsion malfunctions, the program develops guidance on the symptoms that can be expected when malfunctions occur and evaluates the ability of available technologies to detect and annunciate the malfunctions to the flight crew. An important factor is to identify which engine is malfunctioning so that in the event of a commanded engine shutdown, the crew will not mistakenly shut down a good engine.
- By 2011, conduct a propulsion indication system demonstration bench test that will combine the sustained thrust anomaly recommendations with the engine damage recommendations into a complete indication system.
- By 2013, conduct propulsion indication system simulator flight evaluation to provide a visualization of the cockpit indication in the flight environment.

Customer/Stakeholder Involvement: The program collaborates with a broad cross section of the aviation community, including:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.
- The Aviation Rulemaking Advisory Committee (ARAC) – helps to ensure the effectiveness of the agency's rule making. Members of the subcommittee and full committee identify research requirements, priorities, and provide guidance for the update of documents such as AC20-128, and encourage industry's full participation in implementing new rules.

R,E&D Partnerships: The Aircraft Catastrophic Failure Prevention Program partners with industry and other government agencies including:

- The National Aeronautics and Space Administration (NASA) and industry in support of the development and validation of explicit finite element analysis. The industry participates in the LSDYNA Aerospace Users Group to support quality control reviews of the code and also critique research objectives in material testing, model development and verification. NASA and FAA are teamed to develop high quality test data and analytical models that support the Aerospace Users Group efforts. The end goal is to develop guidance for the use of LS-DYNA in the certification process.
- The AIA Transport Committee – with participation of FAA and industry, has examined propulsion system malfunctions, identified inappropriate crew response, and recommended development of specific regulations and advisory materials to correct safety hazards. AIA has completed some preliminary efforts on propulsion issues with implications for follow-on ARAC work on FAR 25.1305.

Accomplishments: Results of Aircraft Catastrophic Failure Prevention Program research provide the technical basis for FAA rule changes and new or modified ACs. Researcher results are also provided to airframe and engine manufacturers and designers.

Engine Uncontainment Research

FY 2007:

- Complete testing and modeling of fabrics used in gas turbine engine containment systems. Test results will be compared with analytical results from fabric model version 3.1
- Complete testing and material model development for aluminum using the Johnson-Cook formula.
- Develop an oversight process for generic aerospace problems run in LSDYNA that ensures consistent results as computers and programs continue to evolve.

FY 2006:

- Delivered the UEDDAM, version 3.0 for evaluation of uncontained engine debris hazards to aircraft. UEDDAM uses a Monte Carlo approach to perform the vulnerability analysis in design cases where the released multiple fragments are analyzed.
- Conducted a workshop for the Department of Defense and ARAC on UEDDAM in November 2005.

FY 2005:

- Developed fabric attachment data and designs for fuselage shielding. Fabric material models were used to design full scale shields to be tested in an aircraft fuselage.
- Completed full-scale fabric shielding demonstration test of various fabric attachment designs in a retired commercial airplane at Naval Air Warfare Center (NAWC), China Lake.

FY 2004:

- Developed test data using spherical projectiles on aluminum, Lexan and composites, then evaluated material model ability to accurately predict the results.
- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Los Angeles Aircraft Certification Office (ACO).

Previous Years:

- Completed a collaborative effort with NASA, the U.S. Navy, and the U.S. Air Force to perform the first full-scale engine disk crack detection demonstration.
- Developed test data and improved analytical modeling of fabric shielding with revision to the fabric material model.
- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Boston ACO.
- Developed a significant database of small and full-scale test data to understand the interaction of multiple ballistic fabric layers in engine fan blade out containment systems.
- Completed a mitigation test for debris damage to pressurized fuel lines inside the aircraft due to an uncontained engine failure; prototype power panels showed promise.

Propulsion Malfunction

FY 2007:

- Completed detailed study of propulsion malfunctions classified as mechanical damage. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine. This effort recommended a focused follow-on effort to study an information based oil system display.

FY 2005:

- Completed detailed study of propulsion malfunctions classified as Sustained Thrust Anomalies. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine.

FY 2003:

- Completed an in-depth analysis of 80 in-service propulsion system malfunctions and developed recommendations for potential propulsion indication improvement.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Engine Uncontained Research

- Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).
- Improve material models for incorporation into the LSDYNA model that are verified and accepted by the aerospace users group as standardized models.

Propulsion Malfunction

- Continue development of an information based oil system display that can replace the prescriptive engine oil system gauges and minimize pilot interpretation and troubleshooting.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Research will continue on the NASA/FAA/industry program for modeling aircraft engine failures in LSDYNA. The FAA/NASA/academia will continue to evaluate improved material models and incorporate them into LSDYNA upon acceptance by the Aerospace Users Group. Users guidelines and training will continue to be developed and made available through George Washington University.

Propulsion malfunction research will complete a demonstration of the information-based display for the engine lubrication system. This demonstration is a key stepping stone to moving beyond the prescriptive instrument displays to an information based system intended to inform the pilot and connect the information with procedures which will minimize both pilot troubleshooting efforts and un-annunciated checklists.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Engine Uncontained Research

- Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).

Propulsion Malfunction

- Complete demonstration of an information based cockpit display for the engine lubrication system.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$33,872
FY 2008 Appropriated	2,202
FY 2009 Request	436
Out-Year Planning Levels (FY 2010-2013)	1,971
Total	$38,481

Budget Authority ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Contracts:					
Aircraft Catastrophic Failure Prevention Research	833	2,703	947	1,684	0
Personnel Costs	241	566	533	482	415
Other In-house Costs	33	37	32	36	21
Total	**1,107**	**3,306**	**1,512**	**2,202**	**436**

OMB Circular A-11, Conduct of Research and Development ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Basic	0	0	0	0	0
Applied	1,107	3,306	1,512	2,202	436
Development (includes prototypes)	0	0	0	0	0
Total	**1,107**	**3,306**	**1,512**	**2,202**	**436**

A11f - Aircraft Catastrophic Failure Prevention Research Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
066-110 Aircraft Catastrophic Failure Prevention Research							
Engine Uncontainment Research	**0**						
Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA)		♦	◊	◊	◊	◊	◊
Develop improved material models for use in LSDYNA model that are verified and accepted as standardized models		♦					
Develop modular UEDDAM Code (version 4)				◊			
Develop revised guidance for protection from uncontained engine failure with multiple fragment analysis						◊	
Propulsion Malfunction	**0**						
Demonstrate an information based cockpit display for the engine lubrication system		♦	◊				
Develop propulsion indication system demonstration bench test					◊		
Conduct propulsion indication simulator flight evaluation							◊
Personnel and Other In-House Costs	**436**						
Total Budget Authority	**436**	**2,202**	**436**	**458**	**480**	**504**	**529**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Target-Level Request
A11.g.	**Flight Deck/Maintenance/System Integration Human Factors**	**$7,465,000**

GOALS:

Intended Outcomes: The Flight Deck/Maintenance/System Integration Human Factors Program helps achieve FAA's Flight Plan goals for increased safety and greater capacity by:

- Developing more effective methods for pilot, inspector, and maintenance technician training.
- Enhancing the understanding and application of error management strategies in flight and maintenance operations.
- Increasing human factors considerations in certifying new aircraft and in equipment design and modification.
- Improving pilot, inspector, and maintenance technician task performance.
- Developing methodologies to identify and mitigate risk factors in automation-related operator errors.
- Developing requirements, knowledge, guidance, and standards for design, certification, and use of automation-based technologies, tools, and support systems.
- Addressing human performance and human-system performance requirements associated with transitioning from 2015 to 2025 NextGen capabilities.

Agency Outputs: The Human Factors Research and Engineering program provides the research foundation for FAA guidelines, handbooks, advisory circulars, rules, and regulations that help to ensure the safety and efficiency of aircraft operations. It also develops human performance information that the agency provides to the aviation industry for use in designing and operating aircraft and training pilots and maintenance personnel.

Research Goals:

By FY 2008:

- Evaluate methods to mitigate the potential for incidents and accidents by assessing and removing causal factors of human error from flight deck operations and aviation maintenance.
- Begin analysis of how advanced technology in air and ground systems will impact inspection and maintenance processes in the future. Begin developing guidance on how advanced technology can be used for inspection training and reducing errors in transport and general aviation maintenance.
- Facilitate the operational implementation of the Human Factors Certification Job Aid, Version 8 for Parts 25 (Airworthiness Standards for Transport Category Airplanes) and 23 (Airworthiness Standards including Commuter Category Airplanes). This tool will support FAA certification personnel, aircraft designers, and researchers in addressing possible human factors concerns related to displays, controls, flight deck systems, pilot tasks, and procedures. It will also address equipment and testing assumptions.

By FY 2009:

- Develop a system safety approach to understand error patterns of pilots, maintenance personnel, and inspectors, and identify intervention strategies.
- Develop certification guidelines and human factors standards for integrating advanced technologies.
- Develop training guidelines for flight deck error management.
- Develop training guidelines for repair stations and maintenance shops. Include guidance on dealing with automation and new technologies.

By FY 2012:

- Provide guidance to improve design of computer-human interfaces to reduce information overload and resulting errors.
- Improve pilot situational awareness, and provide corrective mechanisms to compensate for pilot skills degradation or automation failure.
- Assess cognitive and contextual factors to improve operator performance and reduce errors.
- Apply program-generated knowledge of human factors to improve selection and training of aviation system personnel.
- Examine effective roles for pilots and how those roles are best supported by allocation of functions between human operators and automation.
- Address human automation integration issues regarding the certification of pilots, procedures, training, maintenance, and equipment associated with enhanced CNS/ATM operations necessary to achieve NextGen capabilities**.**

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- NASA's Aviation Safety Program.
- The FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- The FAA/Industry Safer Skies initiative – analyzes U.S. and global data to find the root causes of accidents and proposes the means to prevent their occurrence.
- The FAA Research, Engineering and Development Advisory Committee – Representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flight Deck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Joint Safety Analysis Teams and Joint Safety Implementation Teams within the Safer Skies Agenda – coordinated with NASA and industry, these efforts stress human factors issues in developing intervention strategies for the reduction of air carrier and general aviation accidents.
- DoD Human Factors Engineering Technical Advisory Group – FAA participates in this group to promote a joint vision for automation and related technical areas.
- Domestic and international aviation maintenance industry partners like Boeing, Continental Airlines, British Airways, and the International Association of Machinists– the emphasis is on achieving research results that can be applied to real-world problems.
- Society of Automotive Engineers G-10 subcommittees – FAA participates on all of the Society's subcommittees involving human factors to adapt their findings to aviation standards, guidelines, etc.
- Nineteen FAA grants to universities supporting research on air carrier training, flight deck automation, aviation accident analysis, general aviation, and aviation maintenance technician and inspector training.

Accomplishments: The program's accomplishments include:

FY 2007:

- Completed development of human factors Certification Job Aid for FAR Parts 25 and 23 flight decks.

- Developed reference manual describing pilot awareness, knowledge and skill elements for Technically Advanced Aircraft.
- Developed a "best practices" document to inform the aviation community of potential problems associated with fatigue in combination with environment when performing liquid penetrant and fluorescent magnetic particle inspection.
- Evaluate how well civilian, instrument rated helicopter pilots maintain control of their aircraft after inadvertent VFR flight into IMC across a variety of flight altitudes and speeds.
- Provided an understanding of how broadband technology may aid maintenance personnel in their tasks and improve the work environment
- Completed an international survey of maintenance human factors programs in maintenance organizations focused on training, error management, fatigue management, and other issues.
- Performed a field study of maintenance human factors issues in UAV systems to identify areas that will need new maintenance human factors guidance.
- Completed technical guidance for updating regulations regarding allowable manual control forces in aircraft control systems.
- Provided technical information for training and regulatory guidance consideration on pilot training and experience with transport category rudder control systems.
- Provided human factors guidance for design and use of synthetic vision systems.
- Completed initial technical assessment and recommendations for sensory deficiencies in the operation of unmanned aircraft.
- Provided guidance for the development of proficiency standards for very light jets.
- Completed electronic flight bag industry review, providing information on design characteristics, FAA approvals, and environmental qualifications.
- Completed validation study on the effectiveness of the Full Flight Training Simulator.
- Completed phase one study to identify current industry air carrier training issues.

FY 2006:

- Provided guidance for precision visual flight rules and simultaneous non-interfering routes that will allow rotorcraft with global positioning system navigation capabilities to stay within narrow, defined horizontal airspace limits while operating under visual flight rules.
- Completed detailed general aviation fatal accident human error analysis by using the Human Factors Analysis and Classification System to determine how often each error type is in the causal chain of events and finding the exact types of errors committed that lead to a fatal accident.
- Developed an industry-wide benchmark for aviation maintenance inspection. This computer based inspection training program will standardize inspection training processes in the general aviation industry.
- Provided guidance on an acceptable vision standard for personnel involved in nondestructive inspection and testing and visual inspection of aircraft and aircraft components.
- Improved a Line Operations Safety Audit (LOSA) methodology that has been adopted by the International Civil Aviation Organization (ICAO) to help air carriers identify human-centered safety vulnerabilities.
- Completed a Flight Plan Target automation report specifying pilot proficiency standards for Technically Advanced Aircraft.

FY 2005:

- Developed a manual adopted for use by ICAO that addresses appropriate human factors considerations in designing flight deck operating documents.
- Produced human factors design and evaluation considerations for aviation applications, such as electronic flight bags and head-up displays in air transports.
- Completed initial mapping of flight data parameters onto AQP qualification standards.
- Developed initial performance models for the use of automation in air carrier cockpits.
- Developed and validated a proceduralized pilot Crew Resource Management (CRM) training and assessment system.

FY 2004

- Developed an inexpensive, reliable method to measure night vision goggle cockpit lighting compatibility.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Identify human factors issues in instrument procedures design.
- Identify pattern of aircrew error associated with general aviation accidents where flight from VFR into instrument meteorological conditions is a factor.
- Continue developing maintenance human factors "best practices" documents, practical tools, and surveillance tools to aid industry.
- Continue to identify factors that can maximize the likelihood of successful implementation of ASAP for aircraft maintenance programs.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B certification and operational approval.
- Distribute automation knowledge assessment, diagnosis and remediation methodology for air carrier training guidance development.
- Explore improved automation training for pilots, reflecting results from industry survey.
- Begin the investigation of automation and new technology impacts on maintenance process, safety, technician skills, and need for regulation.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Complete detailed general aviation fatal accident human error analysis, using Human Factors Analysis and Classification System, to determine how often each error type is the "initiating" error in the causal chain of events and what are the exact types of errors committed that lead to a fatal accident.
- Develop improved methods to record and analyze flight safety data to reduce the likelihood of air carrier incidents and accidents.
- Investigate methods to encourage air carriers to expand ASAP programs to other segments of operations.
- Study the decision process of voluntary safety teams to improve the accuracy and reliability of safety event classifications.
- Develop advanced data analysis methods for linking various voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for low-time regional pilots.
- Identify the impact of selected weather-related training products on knowledge and behavior of general aviation pilots related to weather accident causes.
- Investigate methods to improve unexpected event pilot training.
- Investigate methods to incorporate safety data into scenario-based pilot training.

- Develop advanced methods to improve training and procedures for flight deck distractions during critical flight phases.
- Develop methods to incorporate situationally-oriented flight tasks into scenario-based training.
- Identify what human factors maintenance unmanned aircraft issues need be addressed so that FAA can begin to develop policies, procedures, and approval processes to enable operation of unmanned aerial vehicles.
- Develop educational materials that will help reduce general aviation accidents.
- Develop and evaluate off-the-shelf advanced technologies, such as virtual reality, for training and evaluation in aviation maintenance.
- Provide guidance and develop educational tools for the FAA/Industry Training Standards program that will integrate different technologies into any aircraft platform.
- Develop guidance for maintenance and operator training and qualification requirements related to the operation of unmanned aerial vehicles within the NAS.
- Investigate methods to improve new-hire pilot training for high density operations; develop guidelines.

FY 2009 PROGRAM REQUEST:

The program will continue to focus on providing technical information and advice to improve pilot, inspector, maintenance technician, and aviation system performance. The emphasis will remain on developing guidelines, tools, and training to enhance error capturing and mitigation capabilities in the flight deck and maintenance environments, and on developing human factors tools to ensure that human performance considerations are adequately addressed in the design, certification, and operational approval of flight decks, equipment, and procedures. Additional emphasis will be placed on encouraging maintenance shops and repair stations to have human factors maintenance programs and to offer maintenance human factors training.

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Develop human factors guidance for instrument procedures design.
- Report on methodology to encourage air carriers to implement Aviation Safety Action Program across operations.
- Investigate methods to apply Voluntary Aviation Safety Information-Sharing Program taxonomies to pilot training data.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B equipment certification operational approval.
- Develop improved automation training methods for new hire pilots.
- Continue the investigation of automation and new technology impacts on maintenance process, safety, technical skills, and need for regulation. Begin formulation of strategies to deal with these issues.
- Determine training vulnerabilities and investigate advanced training methods to address issues identified in automation survey of pilots.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.

- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Identify intervention strategies to either prevent or reduce the likelihood of general aviation accidents.
- Develop improved methods to record and analyze flight safety data to reduce the likelihood of air carrier incidents and accidents.
- Distribute recommendations on establishing effective decision-making strategies within voluntary safety program teams.
- Distribute report on financial analysis methods to determine the cost of FOQA events.
- Explore methods for advancing the linking of voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for both low-time regional pilots and pilots transitioning to new aircraft.
- Develop training tools to quickly incorporate safety data into scenario-based pilot training and evaluation.
- Report on training methods to prepare new-hire pilots to handle unexpected events in high density operations.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Develop human factors guidance for instrument procedures design.
- Complete guidance on communicating maintenance ASAP derived actions and recommendations using the web-based ASAP safety-information and program-tracking tool.
- Develop maintenance human factors “best practices” documents, practical tools, and surveillance tools to aid industry.
- Report on methodology to encourage air carriers to implement ASAP across operations.
- Investigate methods to apply VASIP taxonomies to pilot training; prepare phase I report.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B equipment certification and operational approval.
- Update automation knowledge assessment and diagnosis tool, and update remediation methodology and training guidelines; distribute report to industry.
- Develop new guidelines for training automation skills for new-hire pilots.
- Identify human error risks and mitigation strategies associated with new air carrier operations.
- Investigate automation and new technology impacts on maintenance human factors process, safety, technician skills, and need for regulation. Results can become the basis for strategies for dealing with maintenance of automation and new technologies as well as identifying best practices and tools for dealing with the issues identified.
- Based on results of the earlier air carrier pilot automation survey, determine training vulnerabilities and investigate advanced training methods to address the topic areas.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Distribute recommendations on establishing effective decision-making strategies within voluntary safety program teams.
- Provide a report on current LOSA analysis results.
- Distribute a report on financial analysis methods to determine the cost of FOQA events.
- Explore methods for advancing the linking of voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for both low-time regional pilots and pilots transitioning to new aircraft.
- Test the application of advanced training technology, like virtual reality, for maintenance.
- Report on methods to link Threat and Error Management ASAP classification schemes to LOSA and AQP data.
- Develop training tools to quickly incorporate safety data into scenario-based pilot training and evaluation.
- Update training guidelines and procedures for flight deck distractions during critical flight phases.
- Develop new methods for improved jet upset training.
- Explore methods to overcome the expectancy effect in pilot simulator training and evaluation.
- Develop and validate standards to evaluate training methodologies proposed by air carriers.
- Report on training methods to prepare new-hire pilots to handle unexpected events in high-density operations.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$203,863
FY 2008 Appropriated	9,200
FY 2009 Request	7,465
Out-Year Planning Levels (FY 2010-2013)	30,470
Total	$250,998

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Flight deck/Maintenance/System Integration Human Factors	8,157	5,338	4,954	5,957	4,714
Personnel Costs	2,664	2,626	2,902	3,066	2,587
Other In-house Costs	879	135	143	177	164
Total	**11,700**	**8,099**	**7,999**	**9,200**	**7,465**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	11,700	8,099	7,999	9,200	7,465
Development (includes prototypes)	0	0	0	0	0
Total	**11,700**	**8,099**	**7,999**	**9,200**	**7,465**

A11g – Flight Deck/Maintenance/System Integration Human Factors Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
081-110 Flightdeck/Maintenance/System Integration Human Factors							
Selection and Training	**1,514**						
Develop training guidelines to improve new-hire pilot training for high density operations		♦	◊				
Validate simulator training requirements for low-time regional pilots and pilots transitioning to new aircraft		♦	◊	◊			
Develop training for critical skill retention		♦	◊	◊	◊	◊	◊
Provide guidance/develop educational tools for FAA/Industry Training Standards program that will integrate technologies into any aircraft platform		♦	◊	◊			
Develop and evaluate off-the-shelf advanced technologies, such as virtual reality, for training and evaluation in aviation maintenance		♦	◊				
Develop guidance on how advanced technology can be used for inspection training and reducing errors in general aviation maintenance		♦	◊	◊			
Human Performance Assessment	**1,000**						
Develop recommendations for effective decision-making among voluntary safety program teams		♦	◊	◊	◊	◊	◊
Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS		♦	◊	◊			
Identify intervention strategies to either prevent or reduce the likelihood of general aviation accidents		♦	◊	◊	◊		
Human-Centered Automation	**950**						
Develop human factors guidance for ADS-B certification and operational approval		♦	◊	◊	◊		
Develop certification guidelines for integrated technology in general aviation cockpits		♦	◊	◊	◊	◊	◊
Investigate automation and new technology impacts on maintenance process, safety, technician skills, and need for regulation.		♦	◊	◊			
Information Management and Display	**1,250**						
Develop guidelines for instrument procedures design		♦	◊	◊	◊	◊	◊
Develop proactive methods for general aviation data collection		♦	◊	◊			
Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays		♦	◊				
Develop maintenance human factors “best practices” documents, practical tools, and surveillance tools to aid industry		♦	◊				
Identify factors that can maximize the likelihood of successful implementation of ASAP for aircraft maintenance programs		♦	◊	◊			
Personnel and Other In-House Costs	**2,751**						
Total Budget Authority	**7,465**	**9,200**	**7,465**	**7,580**	**7,604**	**7,630**	**7,656**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.h.	**Aviation Safety Risk Analysis/System Safety Management**	**$12,488,000**

Goals:

Intended Outcomes: The Aviation Safety Risk Analysis/System Safety Management Program (formerly known as the Aviation Safety Risk Analysis Program) helps achieve FAA's strategic goal of increasing aviation safety by promoting and expanding safety information sharing and safety risk management initiatives efforts. The program develops risk management methodologies, prototype tools, technical information, and safety management system procedures and practices that will improve aviation safety. In addition, the program aims to develop an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner. It also conducts research to evaluate proposed new technologies and procedures, which will improve safety by making relevant information available to the pilot during terminal operations.

Agency Outputs: The program will develop an infrastructure that enables the free sharing of de-identified, safety information that is derived from various government and industry sources in a protected, aggregated manner. In addition, the program is providing methodologies, research studies, and guidance material that provide aviation safety inspectors, aircraft certification engineers, analysts, and managers the capabilities of systematically assessing potential safety risks and applying proactive solutions to reduce aviation accidents and incidents. The program is also conducting research and analysis to maintain the desired level of safety while accommodating the need for more efficient use of the terminal area.

Research Goals: To reduce the number of aviation accidents and incidents by developing a secured safety information and analysis system that provides access to numerous databases, maintains their currency, enables interoperability across their different formats, provides the ability to identify future threats, conducts a causal analysis of those threats, and recommends solutions.

- By 2011, develop automated tools to monitor each database for potential safety issues and to analyze disparate data drawn from multiple sources, enhancing discovery, identification, and evaluation of safety risks.
- By 2012 develop advanced software capable of automatically gathering information from other databases and providing safety management personnel with information integrated with their day-to-day operations and duties.
- By 2013, expand the secured safety information and analysis system to other aviation users beyond the commercial operators.

To reduce the risk for passengers and crews and enhance the traffic control process in the terminal area operations, pilot-in-the-loop simulation evaluations and operational flight data analysis will be conducted.

- By 2010, characterize risks associated with undesired laser cockpit illumination, providing FAA with data to determine mitigation strategies.
- By 2011, complete an evaluation of air traffic and flight procedures for terminal area operations by using pilot-in-the-loop flight simulator.
- By 2012, develop methods to model unusual attitude encounters outside the normal operating envelope, allowing FAA to approve advanced flight simulators that more realistically model the behavior of an actual aircraft.
- By 2012, identify new navigation technologies and data requirements for the development of new procedures to enhance the capacity and safety of the terminal area.
- By 2013, identify contributing factors and develop models for landing performance of selected make, model, and series aircraft using standard operating practices to improve the safety and capacity in terminal areas.

Customer/Stakeholder Involvement: The program encourages broad industry and government participation across all projects.

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- JPDO, Safety Working Group – a national-level integrated safety management framework that addresses all facets of the air transportation system, building safety design assurance into operations and products.
- Commercial Aviation Safety Team – a FAA/industry collaborative effort to develop and implement data-driven safety initiatives.

R&D Partnerships: The Program partners with industry, academia, and other governmental agencies, including:

- National Aeronautics and Space Administration via collaborative agreements to integrate advanced research text and digital analysis products into the Aviation Safety Information and Analysis Sharing (ASIAS) research efforts.
- The Civil Aviation Authority of the Netherlands to conduct joint research on aviation system safety initiatives via a Memorandum of Cooperation.
- Technical expertise from air carriers to provide industry reviews and recommendations regarding safety and efficiency of terminal area operations as well as air carriers' cooperation with data sharing agreements and governance models that allow for the free sharing of aviation data in accordance with approved voluntary safety information sharing agreements.

Accomplishments: Significant accomplishments from prior years include:

Risk Management Decision Support

FY 2007:

- Produced technical descriptions of the various business relationships between Title 14 Code of Federal Regulations (14 CFR 121) operators and 14 CFR 145 repair stations; the models will be used to identify the hazards and assess the risks involved these types of relationships.
- Completed a prototype software tool that contains an integrated framework and methodology for the identification, classification, and assessment of aviation maintenance and flight operations hazards.

FY 2006:

- Released a working prototype of an integrated framework that describes the methodology for identification, classification, and assessment of aviation system hazards and risks.
- Developed a preliminary methodology which provides a baseline assessment of the current safety oversight for effectiveness, efficiency, and sustainability and identifies data inputs and could provide metrics such as the responsiveness of the air carriers to corrective and preventive actions, effects of oversight on safety precursors, inspection output and inspector workload and readiness.

Aviation Safety Information and Analysis Sharing

FY 2007:

- Released first draft of the ASIAS Concept of Operations (CONOPS) that is focused on the new data sharing concepts among commercial aviation stakeholders.

Aircraft Maintenance - Maintainability and Reliability

FY 2007:

- Proposed a new quality management system to perform and monitor tool calibration at maintenance facilities; the new system will improve safety by reducing aircraft maintenance errors due to the use of out-of-tolerance tools.

FY 2005:

- Completed enhancements to the Maintenance Malfunction Information Reporting (MMIR) System with capability to collect usage and flight profile data – the helicopter industry and FAA are using the MMIR data to improve maintenance reliability and product design.

FY 2004:

- Provided technical data and recommendations for designing an effective repair station training program, including the recommended number of hours and topics for training mechanics, managers, supervisors, and inspectors. The FAA issued Advisory Circular (AC) 145-10 "Repair Station Training Program" in July 2005.

FY 2003:

- Developed an all-encompassing quality audit and quality assurance system that is referenced in AC 120-79, "Developing and Implementing a Continuing Analysis and Surveillance System (CASS)" that provides guidance to air operators in meeting the CASS requirement of 14 CFR Parts 121.373 and 135.431.

Safety Analysis Methodology

FY 2007:

- Completed a methodology to provide a different level of certification credit for design features intended to reduce flight crew errors.

FY 2005:

- Provided technical data on standard probabilities of certain environmental and operational conditions to support transport airplane certification or safety assessment purposes.

Terminal Area Safety

FY 2007:

- Completed flight evaluation of the critical terminal area situations under which red Land and Hold Short Operations lights must be illuminated and extinguished during high capacity operations at an airport by using pilot-in-the-loop flight simulation.
- Developed assessment tools and procedures to evaluate pilot workload during various flight conditions by using the LifeShirt® technology in simulated flight operations.

FY 2006:

- Developed methods to identify commercial aircraft touchdown points during commercial operations by using ILS or non-ILS information, these methods will aid in understanding causes of aircraft overruns and runway excursions.

FY 2005:

- Provided measures of pilot reaction to laser illumination collected using FAA's B-737 flight simulator to support AC 70-1 "Outdoor Laser Operations" and AC 70-2 "Reporting of Laser Illumination of Aircraft".

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety Information and Analysis Sharing

- Complete the ASIAS CONOPS that is focused on the new data sharing concepts among commercial aviation stakeholders.

- Develop ASIAS architecture for the implementation of emerging technologies and system to support the sharing of information between commercial aviation stakeholders.
- Develop automated tools to monitor databases for potential safety issues.
- Develop prototype ASIAS system and associated reports that show the benefit of using diverse textual and digital data sets for analyzing commercial aviation safety metrics and enhancements.
- Conduct analytical studies using ASIAS and other aviation safety data to (a) address hazards and risks of operating aircraft in the National Airspace System, and (b) to determine the effectiveness of FAA recommended and industry implemented safety enhancements.

Risk Management Decision Support

- Release a prototype decision support system that provides the FAA with improved certificate management and oversight capabilities. The major products will be identification of databases within FAA purview, redesigned databases, and possible location of and access to existing databases needed to populate the described methodology.

Aircraft Maintenance - Maintainability and Reliability

- Complete technical data for the purpose of preparing standards for carbon monoxide detection devices and inspection methods to determine the integrity of exhaust systems.

Safety Analysis Methodology

- Determine injury ratios for well-defined unsafe conditions (e.g., structure failure, electrical system failure, landing gear vibration, powerplant failure, and so forth) on aircraft systems or components.

Terminal Area Safety

- Evaluate the use of pilot-in-the-loop flight simulators for training of advanced maneuvers related to terminal area operations.
- Develop testing procedures and requirements to identify required navigational performance (RNP) constraints related to terminal area operations.
- Evaluate air traffic and flight procedures for terminal area operations by using the pilot-in-the-loop flight simulator.
- Evaluate devices and risks associated with undesired laser cockpit illumination.
- Analyze operational landing distance performance of selected aircraft make/model/series.
- Develop tools to model the safety hazards of rejected landing procedure and to identify possible training solutions.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Government, industry, and academia aviation safety subject matter experts will be invited to demonstrate a working prototype of a network-based integration of information extracted from diverse, distributed sources. The research will continue to develop innovative, advanced tools and methodologies that will for the first time be able to convert and integrate aviation safety data that is currently distributed across multiple organizations and archives into information on the operational performance and safety of the aviation system. Using ASIAS and other aviation safety data, analytical studies to identify safety issues and verify mitigation and safety enhancements will continue. Research and analysis will continue to ensure that the FAA maintains a desired level of safety while accommodating the need for more efficient use of the terminal area.

New Initiatives

No new initiatives are planned for FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety information Analysis and Sharing (ASIAS)

- Expand ASIAS architecture to include the sharing of air traffic information and air carrier information among industry stakeholders.
- Continue development of automated tools to monitor databases for potential safety issues.
- Expand prototype system to include the concepts of sharing information and applications among industry stakeholders from an enterprise-level, allowing diverse industry stakeholders to analyze data on an industry-wide basis rather than individual organizational level. The prototype system will contain a technical process to query de-identified safety data from any participating airline Flight Operations Quality Assurance or Aviation Safety Action Program, aggregate it through a distributed database and make it accessible to appropriate industry stakeholders.
- Conduct analytical studies, e.g., aircraft hazard analysis, determination of risk values for potential unsafe conditions, and flight crew intervention design credit, using ASIAS and other aviation safety data. .
- Develop methods and risk models to evaluate advanced aircraft systems and component integration.

Terminal Area Safety

- Complete testing procedures and requirements to identify RNP constraints related to terminal area operations.
- Evaluate air traffic and flight procedures for terminal area operations by using the pilot-in-the-loop flight simulator.
- Analyze the operational landing distance performance of selected aircraft make/model/series.
- Evaluate devices and risks associated with undesired laser cockpit illumination.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$69,398
FY 2008 Appropriated	9,517
FY 2009 Request	12,488
Out-Year Planning Levels (FY 2010-2013)	49,787
Total	$141,190

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Aviation Safety Risk Analysis	6,260	3,303	3,232	6,402	9,608
Personnel Costs	2,091	1,494	1,947	2,892	2,669
Other In-house Costs	220	86	113	223	211
Total	**8,571**	**4,883**	**5,292**	**9,517**	**12,488**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	8,571	4,883	5,292	9,517	12,488
Development (includes prototypes)	0	0	0	0	0
Total	**8,571**	**4,883**	**5,292**	**9,517**	**12,488**

A11h - Aviation Safety Risk Analysis/System Safety Management Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
060-110 Aviation Safety Risk Analysis							
Risk Management Decision Support							
Release a prototype decision support system that provides the FAA with improved certificate management and oversight capabilities oversight capabilities		♦					
Aviation Safety Information Analysis and Sharing	7,613						
Complete ASIAS Concept of Operations (CONOPS) focused on the new data sharing concepts among commercial aviation stakeholders.		♦					
Develop an architecture for ASIAS		♦	◊				
Develop automated tools to monitor databases for potential safety issues		♦	◊	◊	◊		
Develop prototypeASIAS system and associated reports		♦	◊	◊	◊	◊	
Conduct analytical studies using ASIAS and other aviation safety data		♦	◊	◊	◊	◊	◊
Develop methods and risk models to evaluate advanced aircraft systems and component integration.		♦	◊	◊	◊		
Aircraft Maintenance – Maintainability & Reliability							
Develop standards for carbon monoxide detection devices and inspection methods to determine the integrity of exhaust systems		♦					
Safety Analysis Methodology							
Determine the injury ratio for a limited number of well-defined unsafe conditions		♦					
Terminal Area Safety	1,995						
Complete pilot-in-the-loop flight simulators for training of advanced maneuvers in terminal area operations		♦					
Develop testing procedures and requirements to identify RNP constraints		♦	◊				
Evaluate air traffic and flight procedures for terminal area operations by using pilot-in-the-loop flight simulator		♦	◊	◊	◊		
Evaluate devices and risks associated with undesired laser cockpit illumination		♦	◊	◊			
Identify contributing factors and develop models for landing performance of selected make/model/series aircraft using standard operating practices to improve the safety and capacity in terminal areas		♦	◊	◊	◊	◊	◊
Complete development of tools to model the safety hazards of rejected landing procedure and to identify possible training solutions.		♦					
Personnel and Other In-House Costs	2,880						
Total Budget Authority	12,488	9,517	12,488	12,589	12,497	12,401	12,300

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Request
A11.i.	**Air Traffic Control/Technical Operations Human Factors**	**$10,469,000**

GOALS:

Intended Outcomes: The Air Traffic Control/Technical Operations (ATC/TO) Human Factors Program supports FAA strategic goals for increased safety, greater capacity, and organizational excellence by developing research products and promoting the use of those products to meet the future demands of the aviation system. This research examines the roles of controllers and maintainers at increased capacity levels and how those roles are best supported by allocation of functions between human operators and automation. The ATC/TO program generates requirements for human interface characteristics of future air traffic workstations. It is enhancing our understanding of the role that ATC supervisors play in mitigating operational errors and runway incursions. The program also provides material to reduce human error incidents associated with the performance of controllers, system maintainers, and others who fill important safety roles. In addition, researchers are determining effective methods to present weather information to air traffic specialists for severe weather avoidance and accident prevention, developing methods to select new air traffic service providers and maintainers so that the applicant screening process is valid, reliable, and fair, and improving human-system integration in a manner that allows controllers to manage an increased number of aircraft in a sector while reducing task loading.

The research program works to improve system safety by:

- Developing:
  - Methods to identify new potential human error problems as the air traffic service providers' roles and responsibilities change as a result of increasing automation levels.
  - Organizational changes to transform the Technical Operations ATO safety culture.
  - Effective methods to present air traffic specialists weather information for accident prevention through severe weather avoidance.
- Improving:
  - Supervisory best practices so that first-line ATC supervisors can implement effective methods that suppress the operational error rate and reduce existing error severity.
  - Methods to select new air traffic service providers and maintainers so that the applicant screening process is valid, reliable, and fair.

The program works to improve the ATC contribution to system capacity by:

- Developing:
  - Integrated workstations that allow air traffic service providers to meet increased service demand at a reduced staffing level.
  - Methods to assess the value of proposed changes to workstations to determine if human-in-the-loop performance is enhanced to the required level.
  - Advanced workstation concepts for airport traffic control towers that use automation and advanced technology to increase services, increase capacity, and decrease the cost of air traffic services.
- Improving:
  - Human-system integration in a manner that allows air traffic service providers and pilots to cooperatively manage traffic loads as cockpit technology and air traffic workstations are more closely connected to efficiently move NAS air traffic.
  - Roles and responsibilities between air traffic service providers and pilots as technology evolves to meet future demands.

Agency Outputs: The Air Traffic Control/Technical Operations Human Factors Research Program provides leadership and products to motivate NAS evolution to assure that the system's human component will reliably perform to meet the flying public's needs. Outputs include:

- Air traffic workstations and concepts that increase workforce productivity by identifying key workload factors that must be mitigated to enable the humans in the system to manage the future NAS traffic flow.
- Candidate technology evaluations that purport to provide a specified human-in-the-loop performance level or safety benefit when used by the ATO workforce.
- ATO safety culture transformation through research in the Technical Operations community to identify needed effective interventions to move the ATO toward a "Just Culture."
- Future air traffic service provider and maintainer personnel selection criteria to enhance screening process efficiency and effectiveness.

Research Goals:

- By FY 2009, complete the future en route workstation second development stage that demonstrates potential controller productivity and sector capacity increases.
- By FY 2009, identify efficient automation use and the sharing of responsibilities between air traffic service providers and NAS users such as pilots and dispatchers.
- By FY 2012, improve computer-human interface design to reduce information overload and resulting errors.
- By FY 2012, apply program-generated human factors knowledge to improve aviation system personnel selection and training.

Customer/Stakeholder Involvement: The ATC/ATO Human Factors research program receives requirements from its internal FAA sponsoring organizations, primarily the following FAA Air Traffic Organization Air Traffic/Technical Operations research groups:

- Advanced Air Traffic Systems Requirements Group – En Route and Terminal Service units as well as System Engineering in Operations Planning operational personnel and systems developers articulate human factors research requirements for measuring the proposed technology benefits to controllers and maintainers. FAA Flight Standards and Aircraft Certification organizations will participate in the research requirements definition associated with pilot/controller interface with air-ground integration weather aspects as the FAA moves toward a future NAS vision.
- Individual and Team Performance Requirements Group – ATO Safety, En Route, Terminal, Technical Operations and System Engineering service units participate to identify human performance research needs involving safety culture, human error hazard identification, age, operational errors, runway incursion prevention, and employee attitudes.
- Technical Operations Requirements Group – The Technical Operations, En Route, and Terminal service units recommend NAS infrastructure operational and maintenance research including ATC systems displays, controls, and maintainability features specification.
- Personnel Selection and Training Requirements Group – ATO Technical Training and Development, Human Resources, FAA Academy, Workforce Services, and the Financial Services groups address personnel selection, training, and retention including the ability to successfully screen applicants for controller positions and for reduced training cost and time.

R&D Partnerships:

- Collaborative research with NASA includes identifying future NAS human factors air-ground integration research issues as technology brings changes to flight deck capabilities.

- Collaboration with EUROCONTROL includes participation in semi-annual Air Traffic Management (ATM) Seminars, leadership of an Action Plan 15 Safety workgroup for human reliability, and ATM Safety Research symposia participation.
- Program personnel represent the agency in the Normal Operations Safety Survey (NOSS) Study Group of ICAO.
- The University of Texas has performed NOSS research at ATM facilities in New Zealand, Australia, Canada, and Finland with ICAO endorsement.
- Cooperative research grants are in place with Massachusetts Institute of Technology (MIT), St. Louis University, New Mexico State University, Texas Tech University, and American Institutes for Research.

Accomplishments: Program highlights include:

FY 2007:

- Completed simulations that evaluate capacity enhancements when en route workstations are provided with data communications and aircraft self-spacing and self-separation provisions.
- ATC safety alerts study completion in response to National Transportation Safety Board concerns that controllers are not responding properly to prevent mid-air collisions and controlled flight into terrain accidents.
- Tower situation display demonstration with integrated flight data to reduce display clutter and integrate tower controller tasks.
- Initiation of a tower controller external vision requirements study to support staffed virtual tower development with no direct airport surface view.
- Safety Culture improvement project expansion to more facilities enabling the technical operations community to improve safety
- Transfer of the National Air Traffic Professionalism Program (NATPRO) to the En Route service unit as a research product that is making the transition to the operational domain.
- Updated en route and terminal job task analyses and developed air traffic controller performance standards

FY 2006:

- Explored human performance limitations to find controller workload limits using current technology and procedures as traffic levels increase.
- Completed an initial effort to transform the ATO work force safety culture.
- Initiated data collection to update the anthropometric database to guide maintenance workstation ergonomic design.
- Developed a maintenance domain alerts and alarms human factors design standard.
- Initiated development of a pre-screening alternative form for air traffic controller job applicants that are selected to take the Air Traffic Selection and Training (AT-SAT) test battery.
- Initiated a tower controller duties and functions task analysis to enhance the terminal training option method of selecting candidates.

FY 2005:

- Completed a proposed en route display systems performance analyses to determine if projected controller time and error savings were achievable.
- Performed a simulation that assessed the benefits of improved terminal weather displays for severe weather avoidance and demonstrated a potential six to 10 percent capacity enhancement.
- Developed a human error hazard analysis method for use in the early investment analysis stages to include the human error risk in the early requirement and decision process.
- Developed a safety audit method for air traffic controllers to manage risk during normal operations.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Initiation of an advanced terminal workstation demonstration to increase terminal airspace throughput, respond to changes in aircraft mix in the terminal environment including very light jets and Unmanned Aircraft Systems, and decrease environmental impact.
- Conduct an advanced integrated en route controller workstation assessment to move toward the goal of demonstrating a 66 percent increase in controller efficiency.
- Develop initial requirements for an advanced TRACON workstation that will increase capacity by at least 30 percent.
- Demonstrate integrated tower electronic flight data handling human factors aspects as the initial phase of staffed virtual tower development.
- Complete supervisory best practices development to reduce runway incursions.
- Complete the first stage of transforming the safety culture of the Technical Operations organization and assess intervention effectiveness.
- Complete data collection for the technical operations work force anthropometric measurement database.
- Complete method validation to assign applicants to tower versus radar training.
- Assess new technology and advance automation impact on selection and training for future air traffic service providers and maintainers.
- Completed tower supervisor best practices for the prevention of runway incursions.
- Developed interim color vision test for air traffic controller evaluation.

FY 2009 PROGRAM REQUEST

The program will continue to provide research that addresses human performance issues in ATC systems acquisition, design, operation, and maintenance over the next several years. The development of human factors concepts for future air traffic workstations that will accommodate increases in air traffic. The proactive analysis of human error causal factors continues to be the focus of a portion of this research program.

Advanced Air Traffic Systems

- Defining the characteristics of methods to meet the goal in the National Aviation Research Plan (NARP) to increase en route controller efficiency by 66 percent including air-ground integration aspects.
- Investigating human factors challenges in terminal airspace to increase traffic flow and integrate new procedures and technology such as data communications and fuel-efficient approaches that are forecast to be part of trajectory based operations.
- Simulating traffic loads predicted for the 2015 period and assessing how automation should be used at the controller workstation to meet capacity goals.
- Develop the airport traffic control workstation concept with emphasis on maintaining the day VFR operational tempo under reduced visibility operations.

Individual and Team Performance

- Continue work in human error analysis and reporting by expanding the application of research in transformation of the ATO safety culture.
- Refresh research in controller fatigue to develop scheduling tools and other mitigation methods as countermeasures for fatigue as a result of controller shift rotations.

Advanced Technical Operations (TO) Systems

- Assessing methods to reduce the potential for human error in system maintenance to enhance NAS reliability and availability.
- Design and develop training system and job aid specifications that reduce the amount of time that technicians spend away from their job in training.

Personnel Selection and Training

- Perform a strategic job task analysis based on the NextGen Concept of Operations to determine the knowledge, skills and abilities that will be needed by service providers in the future NAS.
- Refine the air traffic selection processes using the results of the updated Job Task Analysis activities to derive measures of controller performance for use in selection, training, and system development.
- Identify the critical performance requirements of the NAS maintainer job and the skills required to effectively perform on-the-job to develop personnel selection criteria.
- Conduct a task analysis for selected Technical Operations functions to identify a set of knowledge and skills, equipment, technical data, and discrete/critical steps required for the development of job aids.

New Initiatives

New initiatives will focus on the terminal portions of the ATC system. The NAS architecture plan introduces several automation concepts including variable separation minima and continuous decent approaches as methods to use automation and decision support tools to increase services, increase capacity in response to changes in demand, and decrease the cost of air traffic services. The research will address advanced terminal workstations:

- Perform an analysis to determine the human factors aspects of changes to services in the terminal area that emerge through the introduction of technology such as data communications.
- Determine air-ground integration issues particularly as they affect roles and responsibilities of pilots and air traffic service providers when servicing an environment with mixed aircraft equipage.
- Develop an advanced workstation concept for the terminal area to assure that the air traffic service provider can manage an increase in traffic.
- Plan and prepare for simulations of advanced terminal workstation concepts to determine the displays, controls, communication needs, surveillance information, and flight data information required to provide services and assure safety in the terminal area.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Air Traffic Systems

- Develop concept and design guidelines for standard automation platforms usable by controllers in converging TRACON and en route domains.
- Conduct simulations to determine the appropriate use of data communications in terminal airspace.
- Conduct an air-ground integration simulation regarding improved weather products at the controller workstation to enhance safety in the NAS.

Individual and Team Performance

- Develop the transition plan and educational material to transfer control of the technical operations safety culture project to a national level under operational management and funding.
- Develop a tool for human reliability analysis in collaboration with EUROCONTROL human factors experts to assess the impact of changes to air traffic management planned by both the US and European air traffic service providers.

Advanced Technical Operations (TO) Systems

- Deliver a human factors specification/standard for the design of TO workstations.
- Initiate a Human System Integration Study of the impact future air traffic maintenance concepts on the Technical Operations workforce.

Personnel Selection and Training

- Deliver the results of the strategic job task analysis to determine if changes to technology and operation of the NAS will demand a change to the selection and training of Air Traffic Service providers.

- Prepare strategic training analyses for new roles and responsibilities of Air Traffic Service providers in the future NAS.
- Undertake a task analysis for Technical Operations that provides a set of knowledge and skills, equipment, technical data, and discrete/critical steps required to perform tasks and develop job aid guidelines.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$162,105
FY 2008 Appropriated	10,000
FY 2009 Request	10,469
Out-Year Planning Levels (FY 2010-2013)	44,500
Total	$227,074

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Air Traffic Control/Technical Operations	2,756	4,234	4,130	4,333	4,042
Personnel Costs	4,765	5,079	5,285	5,443	6,128
Other In-house Costs	1,870	245	239	224	299
Total	**9,391**	**9,558**	**9,654**	**10,000**	**10,469**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	9,391	9,558	9,654	10,000	10,469
Development (includes prototypes)	0	0	0	0	0
Total	**9,391**	**9,558**	**9,654**	**10,000**	**10,469**

A11i – Air Traffic Control/Technical Operations Human Factors Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
082-110 Air Traffic Control/Technical Operations Human Factors							
Advanced Air Traffic Systems	1284						
Develop low visibility tower display concepts			◊	◊	◊		
Develop common automation platform concept and guidelines			◊	◊	◊		
Conduct simulations to determine appropriate use of data communications in terminal airspace		♦	◊	◊	◊	◊	
Conduct simulation to assess improved weather products for controllers			◊	◊	◊	◊	
Individual and Team Performance	1,354						
Transform the technical operations work force safety culture		♦	◊				
Develop Human Reliability Analysis tool		♦	◊				
Technical Operations (TO)	450						
Develop human factors specification for TO workstations		♦	◊	◊	◊		
Conduct Human System Integration study of the impact of maintenance concepts on the Technical Operations workforce			◊	◊			
Personnel Selection and Training	954						
Conduct Strategic job task analysis for air traffic personnel selection		♦	◊	◊	◊		
Conduct strategic training analysis for new air traffic roles and responsibilities in the future NAS		♦	◊				
Conduct job task analysis for Technical Operations supporting personnel selection criteria		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	6,427						
Total Budget Authority	10,469	10,000	10,469	10,768	10,998	11,240	11,494

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.j.	**Aeromedical Research**	**$8,395,000**

GOALS:

Intended Outcomes: The Aeromedical Research Program supports FAA's Flight Plan Goal for Increased Safety by:

- Investigating and analyzing injury and death patterns in civilian flight accidents and incidents to determine their cause and develop preventive strategies.
- Supporting FAA regulatory and medical certification processes that develop safety and health regulations covering all aerospace craft occupants and their flight environments.
- Recommending and developing equipment, technology, and procedures for optimal:
  - Evacuation and egress of humans from aerospace craft;
  - Dynamic protection and safety of humans on aerospace craft; and
  - Safety, security and health of humans on aerospace craft.

Research program outcomes include improved safety, security, protection, survivability and health of aerospace craft passengers and aircrews. The Aeromedical Research Program supports FAA's Flight Plan goals to reduce the commercial fatal accident rate and the number of general aviation fatal accidents by:

- Exploiting new and evaluating existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures and environments.
- Providing research data to serve as the basis for new regulatory action in evaluation of existing regulations to continuously optimize human performance and safety at a minimum cost to the aviation industry.
- Analyzing pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability.
- Evaluating the complex mix of pilot, flight attendant and passenger activities in a wide range of environmental, behavioral, and physiological situations to propose standards and guidelines that will enhance the health, safety, and security of all aerospace travelers.

Agency Outputs: The Civil Aerospace Medical Institute (CAMI) is uniquely positioned to exploit new and evaluate existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures, and environments. Aeromedical research serves as the basis for new regulatory action and evaluation of existing regulations to continuously optimize human performance and safety at a minimum cost to the aviation industry. This research program analyzes pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability. The complex mix of pilot, flight attendant, and passenger activities in a wide range of environmental, behavioral, and physiological situations is evaluated to propose standards and guidelines that will enhance the health, safety, and security of all aerospace travelers.

Research Goals:

- By FY 2008, publish an assessment of the clarity and utility of signs and symbols used in passenger safety information. Research directly supports certification and harmonization.
- By FY 2009, develop enhanced medical/toxicological intervention methodologies to support standards and guidelines that will enhance the health, safety, and security of pilots, flight attendants and passengers.
- By FY 2010, establish fact-based criteria for the design of occupant restraint systems that will support occupant crash protection that is equivalent to the aircraft structure.

- By 2012, accomplish experimental projects in support of the following regulatory and certification operations:
  - Integrate analysis of biomedical, toxicological and molecular biological factors and stressors in uneventful flight and in aerospace craft incidents and accidents.
- Developing quantitative bioengineering criteria related to:
  - Optimum aerospace craft seat and restraint system certification.
  - Enhanced egress, flotation and onboard life support/rescue equipment certification.
- Developing quantitative bioaeronautical data associated with:
  - Regulatory oversight of health, safety and security risks for flight deck, cabin crew, and other occupants.
  - Aerospace radiation and environmental factors and their threat to all aerospace craft occupants.
  - Bioaeronautical, bioengineering and performance factors required to support cabin evacuation certification.
- Developing quantitative biomedical and performance criteria and recommendations to support development of:
  - Optimum life support equipment, emergency medical equipment, and operational procedures certification.
  - Aircrew medical standards, assessment/certification procedures, and pilot special medical issuance.

Customer/Stakeholder Involvement: The Aeromedical Research Program:

- Directly supports the bioaeronautics agenda set forth in the 2008 National Aviation Research Plan.
- Provides research for FAA, European Aviation Safety Authority and Transport Canada under the Aircraft Cabin Safety Research Plan. This is a coordinated, living plan to maximize the cost/benefit of aerospace craft cabin safety research nationally and internationally.
- Supports multi-year collaborative studies by FAA and other government and industrial entities to evaluate flight crew and passenger symptomatology, disease, and impairment.

R&D Partnerships: Staff members collaborate with and hold memberships, fellowships, and leadership positions in the following scientific, medical, and bioengineering societies associated with aerospace medicine and safety:

- Cabin Safety Harmonization Working Group.
- Seat Certification Streamlining Effort.
- The National Safety Council.
- Society of Automotive Engineers committee addressing safety research related to the work of this program.
- Aerospace Medical Association.
- Civil Aviation Medical Association.
- Professional Aeromedical Transport Association.
- American Society of Mechanical Engineers.
- American Opthomological Society.
- Direct collaboration with the DoD and NASA on crashworthiness, in-flight turbulence, aerospace medicine, ocular injury from lasers, and exposure to cosmic radiation.
- Participates in NATO aerospace medical advisory groups, the European Union, and many independent scientific organizations and academic institutions.
- Develops cooperative research and development agreements with industry to ensure collaborative projects benefiting both FAA and the aviation industry.

- Established National Research Council (NRC) postdoctoral associates to conduct research in molecular biology and environmental physiology at the Civil Aerospace Medical Institute.
- Collaborated academically with over 30 students/faculty members annually participating in aeromedical research.

Accomplishments:

FY 2007:

- Determined the distribution of fluoxetine, vardenafil, glucose, hemoglobin A1c, and sedating antihistaminics levels in postmortem cases from aviation accidents.
- Validated the differential expression of select biologically interesting genes discovered by microarray analysis during the course of an alcohol study using amplified RNA.
- Determined molecular changes as a result of decreased cabin oxygen levels at altitudes with significance to both the aviation industry and military pilots.
- Determined the clinical aspects of radiation exposure resulting from a terrorist attack, estimated the radiation levels in low-earth orbits, including radiation in Van Allen radiation belts, and estimated contribution of alpha particles from the sun to radiation levels at specific flight-altitudes and latitudes, during solar particle events.
- Evaluated atrial fibrillation in civil aviation.
- Compared personality inventories used in aviation research data.
- Developed cabin evacuation design computer model for very large transport aircraft and developed passenger management strategies using research data from flight attendant location trials.
- Conducted research to assess passenger safety awareness, evaluated the comprehensibility of graphical symbols for use on signs and placards aboard transport aircraft, and evaluated presentation media for maximum effectiveness in passenger safety briefings.
- Assessed head/neck injury potential for various aircraft interiors; assessed the injury potential in aircraft side-facing seats, and provided engineering/biodynamic requirements to support revision to TSO-C100 and SAE AS5276.
- Initiated collaborative research with industry partners to develop modeling strategies and validation techniques applicable to aircraft seat certification by analysis..
- Provided recommendations for life support equipment and medical requirements in civilian spacecraft
- Assessed risk of extended flight at altitudes less than 25,000 feet above sea level.
- Reviewed accidents involving Commemorative Air Force Aircraft 1968 to 2005.
- Evaluated design requirements for pulse oxygen systems to support development of engineering certification criteria.
- Evaluated the medical aspects of extending first-class FAA medical certificate for pilots under age 40 to 12 months.
- Developed software and procedures to support quality assurance evaluation of airman medical records.
- Presented analysis of civilian air show accidents.
- Evaluated the effectiveness of simulators in upset recovery training.
- Developed an Aircraft Accident/Injury and Autopsy Data System (AA-IADS) to provide injury description and injury mechanisms analysis to support the development of prevention/mitigation strategies.
- Evaluated aircraft windscreen transmittance characteristics as they relate to emerging laser technologies employed in the NAS, and evaluated potential vision protection modalities and/or procedures available to civilian aviators and ground-crew personnel.

FY 2006:

- Completed gene expression research review to identify fatigue in collaboration with the US Air Force.

- Conducted biodynamic evaluations to assess the head/neck injury potential relative to head impact with various aircraft interior structures. Research included initial evaluations of lap belt and shoulder strap mounted airbags to determine their potential for head/neck injury mitigation.
- Developed mathematical techniques to assess the performance of the above-mentioned test devices and aid the development of advanced modeling capability. Development of computer-modeling methods will provide faster, safer, more cost-effective aircraft certification decisions.
- Provided advisory materials for enhancing human health relative to in-flight cosmic and solar radiation exposures and cabin air quality via the internet and through other widely available media for all participants in aerospace flight. The solar radiation alert system provided near real-time warning of solar events, with recommendations for reduced aircraft flight altitudes and potential diversions for polar routes.

FY 2005:

- Continuously provided integrated toxicological and biomedical data on all aerospace accidents and significant incidents. Current findings indicate that about one in five pilots fatally injured in a civilian aircraft accident shows evidence of using a prescription drug; one in six has taken an over-the-counter drug; 1 in 20 has alcohol in excess of FAA regulations; and 1 in 12 is using a significant controlled dangerous substance. State-of-the-art techniques and methodology are continuously maintained in this world-class research program.
- Developed a research program to evaluate the potential use of centrifuge-based simulators for aircraft upset recovery training. Established a cooperative research grant with Embry-Riddle University to conduct background research relative to the use of centrifuge based simulators in upset recovery and to evaluate the effectiveness of simulator training in actual aircraft upset recovery situations. Established a contract with an industrial manufacturer to develop and demonstrate basic simulator methodology to perform upset recovery training using a short arm centrifuge based training device.
- Initiated development of cabin evacuation computer modeling to evaluate aircraft evacuation from current transport aircraft. Transport aircraft are currently certified by manned testing to determine if the aircraft evacuation capability meets requirements. Certification tests are expensive, can result in injured test subjects, and generally evaluate specific scenarios that may not be representative of actual evacuation requirements. Advancements in bioinformatics and the high costs of human subject testing have driven the development of cabin evacuation models to replace and/or streamline portions of manned tests.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Assess flight crew health risks during a flying career.
- Analyze the suitability for component tests and mathematical modeling as an alternative for showing regulatory compliance with crashworthiness standards for aircraft.
- Assess impact protection performance of aircraft seating systems.
- Develop protective equipment fit, comfort, and performance standards.
- Develop dynamic modeling capabilities in support of cabin safety, protection, and aircraft accident research.
- Assess guidelines to reduce in-flight sudden/subtle incapacitation.
- Evaluate autopsy data from fatal aviation accidents to determine protective equipment and design practices.
- Optimize life support equipment, emergency medical equipment, and operational procedures certification.
- Develop processes to ensure laboratory accreditation and ISO-9000 competency.
- Continue epidemiological assessments of biochemical, toxicological and molecular biological factors associated with fatal civilian aviation accidents.
- Develop advanced molecular biochemical techniques to enhance aviation forensic toxicology.
- Complete recommendations for life support equipment and medical requirements in civilian spacecraft.

- Complete technical and customer reports on the physiological evaluation of pulse oxygen systems for general aviation aircraft.
- Evaluate potential for airbag and advanced occupant restraint systems to reduce injury and allow unassisted aircraft evacuation.
- Develop advanced database technology to provide statistical and graphical analysis to evaluate medical certification criteria and mechanisms of injury in aircraft accidents/incidents.
- Support research conducted by industrial organizations to develop/analyze methods to detect/mitigate aircraft cabin contamination.
- Evaluate performance and protection characteristics of aircrew eye/respiratory protective equipment, including protection from chemical/biological agents.
- Develop research recommendations for Aviation Rule-Making Advisory Committee reviews of cabin air quality and altitude safety rules.
- Complete guidelines for maintaining aircraft cabin occupant health to include re-evaluation of the effectiveness of Automatic External Defibrillators (AED's) and the use of medical kit components in the flight environment.
- Evaluate physiological effect of hypoxia at altitudes that, under current regulations, do not require the use of supplemental oxygen.
- Develop instructional material on the radiation (cosmic and visual) environment during air travel.
- Establish an aircraft accident medical database.
- Develop vision standards for maintenance non-destructive inspection and testing.
- Conduct advanced aeromedical accident and pilot certification data analyses.
- Develop research program on crew and passenger safety requirements for very high altitude air or spacecraft.
- Develop data to support medical certification related to the use of vision testing technology developments.

FY 2009 PROGRAM REQUEST:

Complex medical decisions, based on epidemiological assessments, accompany initial and follow-up medical assessments of airmen who request special medical certification to allow continued flying despite clinical abnormalities. Cabin safety, health, and security for all human occupants of civilian aerospace craft require careful, cost-effective certification and regulation. To ensure fact-based scientific decisions concerning these issues, the following research will ensure optimal human safety, security, and health by providing a scientific basis for all decisions.

Ongoing Activities

Evaluate:

- Trends in toxicological, biochemical, molecular biological, physiological, and clinical findings from all major civil aviation aircraft crashes using advanced bioinformatic analytical systems.
- Effectiveness of programs dedicated to the enhancement of passenger safety, health, security, and performance in emergencies and uneventful flight.
- Risk posed by pilots with special medical issuances.
- Sensor systems to provide real time warning and support actions to mitigate the effects of intentional or unintentional chemical or biological aircraft contaminants.

Recommend:

- Safer aircraft cabin evacuation certification guidelines/procedures.
- Effective limits to radiation exposure (laser and ionizing).
- Methods to reduce head, neck, torso, and extremity injuries in aircraft crash environments to improve evacuation capability and improve certification procedures.

- Development of functional genomics technology to support accident investigation and fatigue identification in aircrew aerospace stress response analysis.

Initiatives:

- Implement molecular biological techniques in forensic toxicological investigations of aircraft accidents.
- Conduct collaborative research linking medical aircraft accident investigation with biodynamic and cabin evacuation research programs to develop bioaeronautical safety criteria.
- Expand biodynamic mathematical modeling and model validation to allow partial or full certification of aircraft restraint systems to include complex occupant protection systems.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Integrate analysis of biomedical, toxicological and molecular biological factors and stressors in uneventful flight and in aerospace craft incidents and accidents:
  - Analyze accuracy of pilot-reported medication usage compared with actual toxicology findings.
  - Perform epidemiological assessment of toxicology factors from fatal civilian aviation accidents.
  - Analyze use of molecular biological laboratory methods to enhance forensic toxicological investigation of aircraft accidents/incidents.
  - Analyze the rate at which postmortem alcohol can be produced in specimens from fatal aviation accident victims to aid in the discrimination between ethanol ingestion and postmortem formation.
  - Analyze application of gene expression technology in prevention of fatigue related accidents.
  - Develop instructional material on the radiation (cosmic and visual) environment during air travel.
  - Develop guidelines to reduce in-flight sudden/subtle incapacitation.
  - Establish an aircraft accident medical database.
  - Conduct advanced aeromedical accident and pilot certification data analyses.
  - Evaluate autopsy data from fatal aviation accidents to determine protective equipment and design practices.
- Develop quantitative bioengineering criteria:
  - Develop process to evaluate the use of component tests and mathematical modeling for improved aircraft seat certification criteria and anthropomorphic test devices to establish the correlation of occupant injury and measured impact dynamics.
  - Assess impact protection performance of aircraft seating systems.
  - Develop performance-based narrow and wide bodied aircraft cabin evacuation approval guidelines.
  - Develop protective equipment fit, comfort, and performance standards.
  - Develop dynamic modeling capabilities in support of cabin safety, protection, and aircraft accident research.
- Develop quantitative bioaeronautical data:
  - Enhance guidelines for maintaining aircraft cabin occupant health, including the CARI-6 radiobiological computer program covering large solar particle events.
  - Support research conducted by industrial organizations to develop/analyze methods to detect/mitigate aircraft cabin contamination.
  - Assess flight crew health risks during a flying career.
  - Develop quantitative biomedical and performance criteria and recommendations.
  - Analyze effectiveness of oxygen systems at very high altitudes.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$124,658
FY 2008 Appropriated	7,760
FY 2009 Request	8,395
Out-Year Planning Levels (FY 2010-2013)	36,515
Total	$177,328

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Aeromedical Research	3,776	3,569	1,504	1,712	2,038
Personnel Costs	4,761	5,091	5,383	5,893	6,177
Other In-house Costs	1,542	140	145	155	180
Total	**10,079**	**8,800**	**7,032**	**7,760**	**8,395**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	10,079	8,800	7,032	7,760	8,395
Development (includes prototypes)	0	0	0	0	0
Total	**10,079**	**8,800**	**7,032**	**7,760**	**8,395**

A11j – Aeromedical Research Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
086-110 Aeromedical Research	**2,038**						
Quantitative bioaeronautical data							
Assess flight crew health risks during a flying career		♦	◊	◊	◊	◊	
Support research conducted by industrial organizations to develop / analyze methods to detect / mitigate aircraft cabin contamination		♦	◊	◊			
Quantitative bioengineering criteria							
Analyze the suitability for component tests and mathematical modeling as an alternative for showing regulatory compliance with crashworthiness standard for aircraft		♦	◊	◊	◊		
Assess impact protection performance of aircraft seating systems		♦	◊	◊	◊	◊	◊
Develop performance-based narrow and wide bodied aircraft cabin evacuation approval guidelines		♦	◊	◊	◊	◊	◊
Develop protective equipment fit, comfort, and performance standards		♦	◊	◊	◊		
Develop dynamic modeling capabilities in support of cabin safety, protection, and aircraft accident research		♦	◊	◊	◊	◊	◊
Integrate analysis of biomedical, toxicological and molecular biological factors and stressors in uneventful flight and in aerospace craft incidents and accidents							
Perform epidemiological assessment of toxicology factors from fatal civilian aviation accidents		♦	◊	◊	◊	◊	◊
Develop guidelines to reduce in-flight sudden/subtle incapacitation		♦	◊	◊	◊	◊	◊
Evaluate autopsy data from fatal aviation accidents to determine protective equipment and design practices		♦	◊	◊	◊	◊	◊
Develop advanced molecular biochemical techniques to enhance aviation forensic toxicology		♦	◊	◊	◊	◊	◊
Develop instructional material on the radiation (cosmic and visual) environment during air travel		♦	◊				
Establish an aircraft accident medical database		♦	◊	◊	◊	◊	◊
Develop vision standards for maintenance non destructive inspection and testing							
Conduct advanced accident and pilot certification data analyses		♦	◊	◊	◊	◊	◊
Quantitative biomedical and performance criteria and recommendations							
Analyze effectiveness of oxygen systems		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	**6,357**						
Total Budget Authority	**8,395**	**7,760**	**8,395**	**8,699**	**8,976**	**9,267**	**9,573**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.k.	**Weather Program**	**$16,968,000**

GOALS:

Intended Outcomes: The Weather Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with hazardous weather conditions. The Weather Program strives to increase capacity by reducing the impacts of adverse weather events on the operational capacity of the National Airspace System (NAS). This research program also supports FAA Flight Plan goals of greater capacity. The FAA efforts undertaken in collaboration with the National Weather Service (NWS) and NASA increase FAA's ability to provide improved short-term and mid-term forecasts of naturally occurring atmospheric hazards, such as turbulence, severe convective activity, icing, and restricted visibility. Improved forecasts enhance flight safety, reduce air traffic controller and pilot workload, enable better flight planning, increase productivity, and enhance common situational awareness.

Agency Outputs: The weather research program develops new and improved weather algorithms for NAS platforms such as the Weather and Radar Processor, the Integrated Terminal Weather System, the Operational and Supportability Implementation System, the Advanced Technologies and Oceanic Procedures, the Dynamic Ocean Track System, and the Enhanced Traffic Management System. The NWS platforms also use these improved algorithms. The weather research program also provides knowledge that can be used by the FAA to support design approvals for weather data link systems and to issue appropriate operational approvals for weather products for use in the cockpit.

The weather capabilities developed by FAA provide the following benefits:

- Depiction of current and forecasted in-flight icing areas – enhances safety and regulatory adherence.
- Interactive data assimilation, editing, forecast and dissemination tools – improves aviation advisories and forecasts issued by the NWS as well as accessibility to users of aviation weather information.
- Depiction of current and forecast precipitation type and rate – enhances safety in the terminal area.
- Depiction of current and forecast terminal and en route convective weather – enhances terminal and en route capacity.
- Short-term prediction and forecast of ceiling and visibility in the national area – enhances en route safety.
- In-situ, remote detection, and forecast of en route turbulence, including clear-air turbulence – enhances en route safety.
- Design approval guidance for weather products, enabling depiction hardware, weather product software, and archiving weather data.
- Operational approval guidance for new products and non-government vendors.

Research Goals: Research is on-going to provide weather observations, warnings, and forecasts that are more accurate, accessible, and efficient, and to meet current and planned regulatory requirements. The goals of the research are:

- By FY 2009, develop a baseline consolidated convective weather forecast capability.
- By FY 2015, develop high-glance-value weather capabilities with longer forecast lead times and increased accuracy, for turbulence, severe convective activity, icing, and restricted visibility to be available electronically to all aviation users.
- By FY 2015, employ the aircraft as a node in the NAS. Enable flight deck weather information technologies that allow pilots and aircrews to engage in shared situation awareness and shared responsibilities with controllers, dispatchers, Flight Service Station specialists, pertaining to preflight, en route and post flight aviation safety decisions involving weather.

Customer/Stakeholder Involvement: The Weather Program works within FAA, industry and government groups to assure its priorities and plans are consistent with user needs. This is accomplished through:

- Close collaboration with FAA organizations such as the Air Traffic Organization Oceanic and Off-Shore Programs Office, various Aviation Safety Offices .
- Guidance from the FAA Research, Engineering, and Development Advisory Committee.
- Inputs from the National Aviation Weather Initiatives, which are strongly influenced by other NAS drivers including "Safer Skies" and Flight Plan Safety Objectives.
- Guidance from the Joint Planning and Development Office Next Generation Air Transportation System initiative.
- Inputs from the aviation community, such as the annual National Business Aircraft Association /Friends/Partners in Aviation Weather Forum, and scheduled public user group meetings.
- Feedback received from documents and publications.

R&D Partnerships: The Weather Program collaborates with the Department of Commerce in promoting and developing meteorological science, and in fostering support of research projects through the use of private and governmental research facilities. The program also leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research (in-flight icing, convective weather, turbulence, ceiling and visibility, modeling, weather radar techniques).
- National Oceanic and Atmospheric Administration laboratories (convective weather, turbulence, modeling, weather radar techniques, quality assessment/verification).
- Massachusetts Institute of Technology's Lincoln Laboratory (convective weather).
- National Weather Service's Aviation Weather Center and Environment Modeling Center (modeling).
- Naval Research Laboratory (volcanic ash, flight level winds, ceiling and visibility).
- NASA Research Centers (in-flight icing, turbulence, satellite data).
- Army Cold Regions Research and Engineering Laboratory (in-flight icing).
- Universities (modeling).
- Airlines, port authorities, cities (user assessments).

Accomplishments:

FY2007:

- Implemented in-flight icing severity nowcast capability operationally
- Obtained approval of turbulence detection algorithm by NWS NEXRAD System Recommendation and Evaluation Committee for operational implementation.
- Provided Helicopter Emergency Medical Services Aviation Digital Data Service (ADDS) enhancement to enable pilots to make NO-GO weather decisions.

FY2006:

- Obtained approval of in-flight icing severity nowcast capability for operational use.
- Implemented four-hour winter precipitation capability into Weather Support to Decision Making System, including Liquid Water Equivalent technology.
- Implemented terminal convective weather forecast capability into Integrated Terminal Weather System.

FY2005:

- Implemented improved accuracy and resolution of data on upper winds, temperature, and moisture through 13 kilometer rapid-update-cycle analyses and forecasts at the NWS.
- Implemented in-flight icing nowcast capability with higher resolution into ADDS.

FY2004:

- Implemented, up to 12-hour forecast of in-flight icing conditions into ADDS.
- Implemented up to 12-hour forecast of marine stratus burn-off at San Francisco International Airport.

Previous Years:

- Achieved the Department of Commerce 2003 Silver Medal.
- Implemented operationally new capabilities of:
  - Current and up to two-hour forecast of convective weather.
  -
  - Current and up to 12-hour forecasts of clear-air turbulence above 30,000 feet.
- Implemented operationally at the NWS the enhanced ADDS with a flight path tool depicting vertical cross sections of weather along user-specified flight routes.
- Completed convective storm growth and decay field tests in Dallas, Orlando, Memphis, and New York. This research resulted in the accurate short-term prediction of the initiation, growth, and decay of storm cells, and enhanced the strategic and tactical flow management planning that allows more effective routing of traffic to and from airports and runways.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Approved in-flight icing severity forecast capability for operational readiness.
- Implemented mid-level turbulence forecast capability operationally.
- Developed a baseline consolidated convective weather forecast capability.
- Developed continental states display of ceiling, visibility, and flight category analysis capability.
- Implemented an experimental Rapid Refresh Weather Research and Forecast (WRF) model.
- Developed volcanic ash dispersion forecast capability.
- Implemented turbulence detection algorithm into NEXRAD operations.
- Developed network enabled operations capability to interface ADDS to the System Wide Information Management platform.
- Conducted quality assessment evaluations utilizing the Real-Time Verification System (RTVS) of weather research capabilities to support the FAA/NWS aviation weather technology transfer process.
- Demonstrated capability to provide metadata tags via the RTVS to the SWIM architecture for JPDO verification.
- Completed a study to baseline weather products and determine pilot weather information needs in the cockpit.
- Completed revised Minimum Performance Standards Technical Standard Order (TSO)-C63c and certification methodology for certification of airborne weather radar with turbulence detection capability.
- Developed a database of pilot deviations, emergencies, and Air Traffic Flight Assists related to weather that will be used to define improvements to private pilot and instrument training for general aviation operators.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Develop consolidated convective weather forecast capability.
- Develop volcanic ash dispersion forecast capability.
- Transition weather research capabilities to operations in the NWS, FAA, and industry weather systems.
- Develop weather product evaluation process for certification and operational guidance.
- Define and validate pilot training requirements needed to effectively operate and interpret weather products correctly.
- Develop and validate software to assist the GA pilot with weather related decision-making, both pre-flight and en route.
- Identify, validate, and document data link system attributes that may affect the provision and use of weather-in-the-cockpit products and services.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop in-flight icing nowcast and forecast capabilities for Alaska.
- Test baseline consolidated convective weather forecast capability.
- Implement probabilistic and mountain-wave turbulence forecast capabilities for experimental use.
- Develop continental states display of ceiling, visibility, and flight category forecast capability.
- Integrate Canadian radar data into the real-time national three dimensional radar mosaics.
- Obtain FAA approval to test the flight level winds capability.
- Implement the Rapid Refresh Weather Research and Forecast model into NWS operations.
- Conduct quality assessment evaluations utilizing the RTVS of weather research capabilities to support the FAA/NWS aviation weather technology transfer process.
- Develop prototype RTVS-NEXGEN for meeting SWIM architecture requirements
- Define a weather product evaluation process for certification and operational guidance.
- Commence turbulence radar and Turbulence Auto-PIREP System infusion into the NAS.
- Complete development of software algorithms to assist GA pilot with weather related decision making in-flight.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$354,725
FY 2008 Appropriated	16,888
FY 2009 Request	16,968
Out-Year Planning Levels (FY 2010-2013)	65,713
Total	$454,294

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Weather Program	19,248	19,212	18,432	15,936	15,855
Personnel Costs	1,224	1,074	1,035	863	979
Other In-house Costs	199	90	78	89	134
Total	**20,671**	**20,376**	**19,545**	**16,888**	**16,968**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	20,671	20,376	19,545	16,888	16,968
Development (includes prototypes)	0	0	0	0	0
Total	**20,671**	**20,376**	**19,545**	**16,888**	**16,968**

A11k – Weather Program – Product and Activities	FY 2009 Request ($000)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
		Program Schedule					
041-110 Aviation Weather Analysis and Forecasting							
Convective Analysis and Forecast Improvement	3,497						
Develop consolidated conv wx forecast capability		◆		◊	◊		
Test baseline consolidated conv wx forecast capability			◊				
Implemented turbulence detection alg. into NEXRAD ops.		◆					
Integrate Canadian radar data into rl/tme nat'l 3D mosaic			◊				
Analysis and Forecast Improvement	5,058						
Approved icing severity frcast capability for operational readiness		◆					
Develop icing nowcast & forecast capabilities for Alaska			◊	◊			
Approve AK icing forecast for operational readiness					◊		
Implement AK icing forecast capability for AK operationally						◊	
Implemented experimental rapid refresh WRF model		◆					
Implement rapid refresh WRF model into NWS operations			◊				
Implemented mid-level turbulence forecast capability operationally		◆					
Implement probabilistic & mountain wave turbulence forecast capabilities for experimental use			◊				
Implement convectively-induced turbulence forecast capability operationally					◊		
Implement turbulence forecast capability for all flight levels operationally							◊
Developed continental states display of ceiling, vis. & flt. category analysis capability		◆					
Develop CONUS ceil, vis, and flt cat forecast capabilities			◊				
Implement AK C&V analysis products operationally							◊
Developed vol ash dispersion forecast capability		◆					
Obtain approval to test the flight level winds capability			◊				
Implement vol ash dispersion forecast operationally							◊
Verification and Technology Implementation	4,250						
Demonstrated capability to provide metadata tags via RTVS to SWIM architecture for JPDO verification		◆					
Develop prototype RTVS-NEXGEN for SWIM arch req.			◊				
Implement AWTT approved products at the AWC		◆	◊	◊	◊	◊	◊
Conduct QA evaluations for AWTT process		◆	◊	◊	◊	◊	◊
Developed NEO capability to interface ADDS to SWIM		◆					
Define weather prod evaluation process for certification & operational guidance		◆	◊				
Completed guidance for certification of airborne weather radar with turbulence detection capability		◆					
Complete tech guidance to implement weather technologies for use in the cockpit							◊
Information Management and Display	3,050						
Complete baseline of weather products & determine pilot information needs		◆					
Developed a database of incidents related to weather to define improvements to GA weather training		◆					
Identify changes to flight training, recurrency requirements, and guidance materials		◆	◊				
Complete development of software algorithms to assist GA pilot with weather related decision making in-flight		◆					
Define and validate pilot training requirements needed to operate and interpret weather products		◆	◊	◊	◊	◊	◊
Document data link system attributes for use of weather-in-the-cockpit products and service		◆	◊	◊	◊	◊	
Personnel and Other In-House Costs	1,113						
Total Budget Authority	**16,968**	**16,888**	**16,968**	**16,954**	**16,615**	**16,259**	**15,885**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.l.	**Unmanned Aircraft Systems Research**	**$1,876,000**

GOALS:

Intended Outcomes: The Unmanned Aircraft System (UAS) Research Program supports FAA's strategic goal of increasing safety by conducting research needed to ensure the safe integration of the UAS in the NAS. The program's research activities focus on technology surveys, methodology development, data collection and generation, laboratory and field validation, and technology transfer.

Agency Outputs: Researchers are developing methodologies and tools to define UAS design and performance characteristics. They are evaluating technologies, conducting laboratory and field tests, performing analyses and simulations, and generating data to support standardization of UAS civil operations. New standards are being implemented to establish UAS certification procedures, airworthiness standards, operation requirements, inspection and maintenance processes, and safety oversight responsibilities. Policies and guidance materials are also being published to equip FAA certification engineers and safety inspectors with the knowledge and tools they need to ensure the safe integration of UAS into the NAS.

Research Goals: To safely integrate UAS into the NAS, FAA needs to develop airworthiness standards, devise operational requirements, establish maintenance procedures, and conduct safety oversight activities. The program is structured into seven research areas: technology survey; detect, sense and avoid (DSA); control, command, and communication (C3); flight termination, system safety, certification and airworthiness standards, and maintenance and repairs. The research will begin with a baseline survey to determine the existing technologies used in UAS. Technologies used to avoid mid-air collusions due to UAS operations will be examined. Communications issues that may arise due to the introduction of UAS into the NAS, as well as necessary safety procedures for the flight termination of UAS, will be researched. A system safety approach will be used to identify the severity of potential hazards, perform risk assessments, and evaluate mitigation strategies for UAS safe operations in the NAS. Data systems will be established to collect data on UAS design, operation, and maintenance that will provide required information to establish design and operation standards and provide technical basis for safety oversight.

- By FY 2010, complete UAS technology survey and gap analysis and document results in a technical report.
- By FY 2012, determine performance characteristics and operational requirements for DSA technologies.
- By FY 2012, analyze data on the safety implications of system performance impediments to C3 in different classes of airspaces and operational environment.
- By FY 2015, conduct field evaluations of UAS technologies in an operational environment, including DSA, C3, and flight termination technologies. The documented results will be used to develop certification and airworthiness standards.

Customer/Stakeholder Involvement: Full and safe integration of UAS into civil aviation requires FAA to work closely with other government and private agencies that have experience in developing and operating UAS:

- FAA Research, Engineering, and Development Advisory Committee (REDAC) Aircraft Safety Subcommittee – subcommittee representatives from industry, academia, and other government agencies annually review the activities of the program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that the program's R&D projects support new rule making and the development of alternate means of compliance with existing rules.

- Department of Defense (DoD) – the DoD is the largest UAS user requesting unrestricted access to the NAS. The FAA will collaborate with DoD through Memorandum of Understanding (MOU) and Interagency Agreements (IA) to leverage resources and implement new technologies for civil applications.
- JPDO – the JPDO has identified UAS integration to NAS as one of the emerging challenges to the nation's air transportation system.

R&D Partnerships:

- IA's with other government agencies (DoD and Department of Homeland Security) and Memorandum of Cooperation with foreign civil aviation authorities.
- The FAA Air Transportation Center of Excellence – various consortiums of university and industry partners who conduct R&D for FAA on a cost-matching basis, which currently consists of seven centers in different technical disciplines.
- The Civil Aviation Authority of the Netherlands to conduct joint research on unmanned aircraft system initiatives via a Memorandum of Cooperation.

Accomplishments:

FY2007:

- Established UAS research program plan.
- Completed the first sets of FAA-USAF joint flight tests to evaluate a DSA technology.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete survey of existing DSA capabilities and publish technical reports on UAS technology survey and gap analysis results.
- Conduct technology survey on UAS designs and operations.
- Determine performance characteristics and operational requirements for DSA technologies.
- Establish UAS data collection and information system.
- Determine potential safety implications of system performance impediments to C3.
- Determine initial system-level hazard identification for UAS operations in the NAS, determine their severities, analyze mitigation strategies, and make safety recommendations.
- Develop UAS system safety management framework as well as methods, and tools to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.

FY 2009 PROGRAM REQUEST:

New Initiatives

- A safety mitigation strategy for particular UAS operations in given classes of airspaces will be initiated. This effort will be based on results of the initial study on UAS hazards and recommendations from the UAS Systems Safety Risk Working Group.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete technology survey on UAS designs and operations.
- Determine performance characteristics and operational requirements for DSA technologies.
- Determine potential safety implications of system performance impediments to C3.
- Complete the initial system-level hazard identification for UAS operations in the NAS, determine their severities, analyze mitigation strategies, and make safety recommendations.

- Develop UAS system safety management framework as well as methods, and tools to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.
- Establish UAS data collection and information system and conduct system safety analysis on specific UAS operations.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$1,200
FY 2008 Appropriated	2,920
FY 2009 Request	1,876
Out-Year Planning Levels (FY 2010-2013)	7,968
Total	$13,964

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Unmanned Aircraft System Research	0	0	1,200	2,768	735
Personnel Costs	0	0	0	136	1,080
Other In-house Costs	0	0	0	16	61
Total	**0**	**0**	**1,200**	**2,920**	**1,876**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	0	0	1,200	2,920	1,876
Development (includes prototypes)	0	0	0	0	0
Total	**0**	**0**	**1,200**	**2,920**	**1,876**

A11.l. – Unmanned Aircraft Systems Research Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
069-110 Unmanned Aircraft System Research							
Technology Surveys							
Conduct survey of existing DSA capabilities		◆					
Conduct technology survey on UAS designs and operations		◆	◊				
Detect, Sense, and Avoid (DSA) Research							
Determine performance characteristics and operational requirements for DSA technologies		◆	◊	◊	◊		
Conduct field evaluation of DSA technology						◊	◊
Command, Control, and Communications (C3)							
Determine potential safety implications of system performance impediments to C3		◆	◊	◊			
Study requirements of Ground Control System for certification and operations					◊		
Conduct C3 field tests and evaluate technologies						◊	◊
Flight Termination							
Determine requirements, risks, and mitigation strategies for flight termination				◆	◊		
Conduct flight termination procedure field test and evaluate technologies						◊	◊
UAS System Safety Management	**735**						
Determine initial system-level hazard identification for UAS operations in the NAS, determine their severities, analyze mitigation strategies, and make safety recommendations.		◆	◊				
Develop UAS system safety management framework as well as methods, and tools to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.		◆	◊	◊	◊	◊	◊
Establish UAS data collection and information system and conduct system safety analysis on specific UAS operations.		◆	◊	◊	◊	◊	◊
Development of UAS Certification and Airworthiness Standards							
Conduct dada analyses to determine UAS design and airworthiness certification requirements				◊	◊	◊	◊
Develop methodologies and analysis tools				◊	◊	◊	◊
UAS Maintenance and Repair Issues							
Identify requirements of UAS maintenance and repairs for continuing airworthiness				◊	◊	◊	◊
Develop tools and methods to support safety oversight by FAA aviation safety inspectors				◊	◊	◊	◊
Personnel and Other In-House Costs	**1,141**						
Total Budget Authority	**1,876**	**2,920**	**1,876**	**1,929**	**1,970**	**2,012**	**2,057**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.a.	**Joint Planning and Development Office**	**$14,494,000**

GOALS:

Intended Outcomes: As the steward of NextGen, the JPDO seeks to address long-term imbalances in aviation capacity and demand. At the same time, it seeks to ensure that the future operating environment is safe, well managed, environmentally responsible, and harmonized with international standards. JPDO's mission is to lead the transformation of today's aviation system into that of the future, the scope of which contributes to all of FAA's current strategic goals.

Agency Outputs: The JPDO is responsible for defining and facilitating the implementation of NextGen. At this stage in the transformation, outputs are a series of plans and analyses that define a proposed end-state and a path for achieving it. The objective is to drive collaborative decisions—involving government and industry—that will ultimately achieve the transformation.

Research Goals:

FY 2009

- Continue to refine and update the NextGen Enterprise Architecture products: Concept of Operations, Enterprise Architecture, Integrated Work Plan.
- Continue to coordinate with aviation and aeronautics research programs to ensure that research results in decisions that influence the most effective investment and implementation decision-making.
- Consistent with the enterprise architecture, continue to identify and facilitate all pre-implementation activities to support identification and resolution of policy issues, optimized technology transfer, risk management and a broad range of analysis to support decision-making.
- Track and ensure that partner agencies are implementing programs that support a transition to the end-state architecture as defined in the Integrated Work Plan.
- Develop FY 2011 Formulation Package to support NextGen resource planning and development of the NextGen business case and work with partner agencies to ensure alignment of partner agency budgets to the FY 2011 budget request.
- Continue NextGen modeling and simulation efforts that result in improved NextGen alternatives analysis, cost/benefits estimation, and integrate rationale and decisions into the NextGen business case.
- Develop FY 2011 NextGen business case.
- Continue to coordinate and conduct demonstrations that will test operational concepts, address operational challenges, and provide alternatives for architectural trade-offs. Demonstrations will explore human factors and safety characteristics of trajectory-based operations, high-density airport operations, airspace security, and globally interoperable system integration.

FY 2010

- Continue research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management as well as other priority areas identified in the Integrated Work Plan.
- Based on research results, assist agencies in deploying critical infrastructure for NextGen operations.
- Establish Policy for NAS wide aircraft equipage rules and Airspace/Route access.
- Initiate research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management.

FY 2011-2013

- Continue research and development to support all OEP solution sets.

FY 2014 and Beyond

- Continue development to support all OEP solution sets.
- Identify alternatives as a result of needed research that may be immature.

Customer/Stakeholder Involvement: The JPDO is truly a collaborative enterprise. Employees from NASA and the Departments of Transportation, Commerce, Defense, and Homeland Security actively lead and/or participate in JPDO activities. Similarly, the JPDO Board includes executives from each department/agency, as well as the White House Office of Science and Technology Policy. And the Senior Policy Committee includes Secretaries, Deputy Secretaries, and/or Administrators from the participating organizations, as well as the Director of the Office of Science and Technology Policy.

The private sector is also an integral part of JPDO's work. In FY 2006, the NextGen Institute was established as an alliance of major aviation stakeholder communities. The Institute operates under guidelines set forth in the funding agreement between FAA/JPDO and the host organization, the National Center for Advanced Technologies. The agreement states that the Institute will be governed by a 16-member council that is broadly representative of the aviation community. The Institute supports JPDO by recruiting and assigning industry experts to participate in forums and perform funded technical work. The Institute has already hosted a series of workshops to gather input on research, demonstrations, operational concepts, and financial implications. The Institute performs a variety of tasks in support of the planning process including studies, demonstration support, and strategic assessments and recommendations for NextGen design issues.

Accomplishments: Major accomplishments and associated benefits of the JPDO efforts include:

FY 2007

- Released Version 2 of the Enterprise Architecture and Concept of Operations.
- Released the initial baseline version of the Integrated Work Plan, which outlines the steps necessary to achieve the ConOps.
- Completed the NextGen Research and Development Plan, a five year view of the research and investment activities required to revise, coordinate, and cost the research and implementation agendas.
- Completed the first NextGen business case (Exhibit 300).

FY 2006

- Developed the NextGen Block-to-Block Concept of Operations and coordinated it through the NextGen stakeholder community for comment and feedback.
- Developed the NextGen Block-to-Block Enterprise Architecture, aligned the Architecture with the Concept of Operations, and began coordination and review through the NextGen stakeholder community.
- Baselined the Operational Improvement Roadmap to set research targets for the Integrated Product Teams.
- Published the NextGen FY 2008 Agency Budget Guidance for Research and Implementation, which begins to align programs to NextGen and identify key research areas.
- Delivered the FY 2005 Progress Report to Congress describing the JPDO's progress in carrying out the NextGen Integrated Plan.
- Developed initial JPDO Systems Engineering Management Plan (SEMP) to facilitate interaction with other agencies and stakeholders.
- Established the Architecture Integration Council, which includes the chief architects for all partner agencies. This body will ensure the cooperation and engagement of the relevant agencies' chief architects during development of the NextGen architecture.

FY 2005

- Made significant progress in resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced and updated the NextGen Integrated Plan as the long-term strategic business plan, detailing goals, objectives, and requirements for eight transformational areas.
- Established and staffed—with federal and industry participants—eight integrated product teams to work collaboratively with government and industry to develop research agendas and strategies for achieving NextGen.
- Performed the first major evaluation of the Operational Vision in Portfolio Segments, to validate the ability to deliver two to three times today's capacity.
- Established the NextGen Operational Improvement Roadmap to guide the transition from today's system to the next generation.
- Developed initial NextGen Segment Portfolios of policy, research and modernization requirements based on the OI Roadmap.

FY 2004

- Initiated resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced the outline for the Integrated National Plan as the long-term strategic business plan for NextGen that detailed NextGen goals and objectives, and requirements for transformation in eight specific areas, each individually significant yet interdependent on the others.
- Produced the framework for establishing with federal and industry participants eight integrated product teams that would work collaboratively with government and industry to plan for and develop research agendas and strategies for achieving NextGen.
- Established the framework for the NextGen Operational Improvement (OI) Roadmap to guide the transition from today's system to the NextGen.
- Developed initial plan for the NextGen Segment Portfolio's of needed policy, research and modernization requirements based on the NextGen OI Roadmap.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

FY 2008

- Released refinements and updates to the Enterprise Architecture and Concept of Operations.
- Released the Integrated Work Plan Version 1.
- Conducted analysis, modeling, and simulations to support FY 2010 business case development.
- Released the FY 2010 NextGen Business Case and Exhibit 300.
- Refined program management processes including risk management.
- Defined NextGen National Information Sharing framework and multi-agency governance.
- Developed NextGen Weather Functional Requirements and established NextGen Network Enabled Weather Program Office and multi-agency governance.
- Defined Aviation Safety Information Analysis and Sharing Concept and multi-agency governance.
- Developed National Safety Management System Standard and National Aviation Safety Strategic Plan.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Continue modeling, simulation, and evaluation to ensure benefits, costs, and trade-offs are understood across the full range of goals.

- Revise, coordinate, and cost the research and implementation agendas for subsequent years.
- Refine NextGen business case and work with agencies and industry on research areas and implementation of NextGen-related programs.
- Continue refining Concept of Operations, Enterprise Architecture, and Integrated Work Plan in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Continue facilitating strategic alignment of agency goals and objectives with NextGen goals and objectives and performance metrics.

New Initiatives

- Conduct demonstrations that will test operational concepts, demonstrate technologies that could address operational challenges, and provide alternatives for architectural tradeoffs.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA, FAA, DHS and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Planning and Agency/Industry Alignment

- Update, coordinate, validate and begin implementing the early opportunity for NextGen, and identify other opportunities for subsequent implementation.
- Coordinate aviation and aeronautics research programs to achieve the goal of more effective and directed research that will result in only performing the most promising and applicable research.
- Set goals, priorities and metrics and reporting structure, and coordinate research activities within JPDO member agencies and with U.S. aviation and aeronautical firms.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate.

Systems Integration and Transformation Analysis

- Continue to refine research plans, which will describe research and supporting activities required to drive implementation decisions to effect the NextGen transformation.
- Continue refining Concept of Operations, Enterprise Architecture, and Integrated Work Plan in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Continue modeling planned improvements to test their efficacy in accomplishing NextGen goals.
- Conduct analyses, trade studies, and demonstrations to select the best approaches/alternatives for transforming the current air transportation system to NextGen.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	44,078
FY 2008 Appropriated	14,321
FY 2009 Request	14,494
Out-Year Planning Levels (FY 2010-2013)	57,136
Total	130,029

Budget Authority ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Contracts:					
Joint Planning & Development Office	3,659	16,539	16,112	12,910	12,088
Personnel Costs	1,200	1,313	1,867	1,256	2,173
Other In-house Costs	200	67	121	155	233
Total	**5,059**	**17,919**	**18,100**	**14,321**	**14,494**

OMB Circular A-11, Conduct of Research and Development ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Basic	0	0	0	0	0
Applied	5,059	17,919	18,100	14,321	14,494
Development (includes prototypes)	0	0	0	0	0
Total	**5,059**	**17,919**	**18,100**	**14,321**	**14,494**

A12.a - Joint Planning & Development Office Product and Activities	FY 2009 Request ($000)	Program Schedule FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Joint Planning & Development Office	12,088						
Planning and Agency/Industry Alignment:							
Update and carry out an integrated plan for a Next Generation Air Transportation System.		◆	◊	◊	◊	◊	◊
Coordinate and facilitate the transfer of technologies from aeronautics research programs and direct research that will result in achieving NextGen.		◆	◊	◊	◊	◊	◊
Systems Integration and Transformation Analysis:							
Accomplish the coordination to create and carry out the plan to achieve more directed programs through applicable research and systems integration.		◆	◊	◊	◊	◊	◊
Develop Enterprise Architecture for systems-of systems engineering and expand lower levels of the enterprise.		◆	◊	◊	◊	◊	◊
Evaluate and validate cross Working Groups, integrated system-wide concepts, procedures, policies, business cases, etc. to assure potential alternatives exist that could meet all the National Plan Objectives.		◆	◊	◊	◊	◊	◊
Conduct policy analyses that focus on early decisions to establish guiding principles for the transformation		◆	◊	◊	◊	◊	◊
Model the planned system improvements to validate their efficacy in accomplishing the NextGen goals. Update roadmaps and research agenda's as required.		◆	◊	◊	◊	◊	◊
Assist agencies in selecting the best approaches/alternatives for transforming the current air transportation system to NextGen;		◆	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	2,406						
Total Budget Authority	14,494	14,321	14,494	14,560	14,382	14,195	13,999

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Request
A12.b.	**Wake Turbulence**	**$10,132,000**

GOALS:

Intended Outcomes: The Wake Turbulence Program addresses FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." The program was originally focused on the near-term objectives of increasing airport capacity and the capacity of terminal airspace during inclement weather by developing modifications to air traffic control wake turbulence mitigation procedures used during these weather conditions. The program, in FY 2009, will address the broader research agenda required to progress to the envisioned NextGen. The Wake Turbulence Research Program will address how to mitigate wake turbulence and collision risk impacts to enable more efficient use of congested airspace and existing/future runways at the nation's busiest airports. Program outcomes include:

- Increased NextGen capability for more flights during less than visual flight rules conditions.
- Aircraft are able to fly closer together with the same or reduced safety risk

Agency Outputs: The Wake Turbulence Program conducts applied research to develop improved air traffic control aircraft separation processes that will help solve operational problems associated with today's generalized and static air navigation service provider (ANSP) wake turbulence and collision risk mitigation based separation standards. As an example, during periods of less than ideal weather and visibility conditions, implementation of an ANSP decision support tool that adjusts required wake separations based on wind conditions will allow air traffic control to operate these airports at arrival rates closer to their design capacity. Additionally, the research program will develop wake mitigation and collision risk technology application solutions that safely enable reduced aircraft separations in congested air corridors and during arrival and departure operations at our nation's busiest airports. The research program in FY 2009 will continue work begun in FY 2008 to address the feasibility and benefit of a wake/collision avoidance decision support capability for the flight deck.

Research Goals:

- By FY 2010, determine pilot and ANSP situational aircraft separation display concepts required for implementation of the NextGen "Trajectory Based Operation" and "High Density" concepts.
- By FY 2012, determine the NAS infrastructure requirements (ground and aircraft) for implementing the NextGen "Trajectory Based Operation" and "High Density" concepts within the constraints of aircraft generated wake vortices and aircraft collision risk.

Customer/Stakeholder Involvement: The program addresses the needs of the ATO and works with the agency's Aviation Safety organization to ensure new procedures and technology solutions are safe and that the airports and air routes targeted for their implementation are those with critical needs to reduce airport capacity constraints and air route congestion. The program works with controllers, airlines, pilots and aircraft manufacturers to include their recommendations and ensure that training and implementation issues are addressed in the program's research from the start.

Customers:

- Pilots;
- Air navigation service provider personnel;
- Air carrier operations; and
- Airport operations.

Stakeholders:

- Joint Planning and Development Office;
- Commercial pilot unions;
- FAA air navigation service provider unions;
- Other ICAO air navigation service providers; and
- Aircraft manufacturers.

R&D Partnerships: In addition to maintaining its partnership with the agency's Aviation Safety organization, this research program accomplishes its work via working relationships with industry, academia, and other government agencies. The coordination and tasking are accomplished through joint planning/reviews, contracts and interagency agreements with the program's partners:

- Volpe National Transportation Center;
- Mitre/Center for Advanced Aviation and Systems Development (CAASD);
- NASA Ames and Langley Research Centers;
- EUROCONTROL and associated research organizations; and
- Massachusetts Institute of Technology's Lincoln Laboratory.

Accomplishments: The following represent major accomplishments of the wake turbulence program:

- FY 2007 - Implement dependent staggered ILS approaches to St. Louis closely spaced parallel runways 12R/L and 30R/L.
- FY 2007 - Complete FAA assessment of NASA's concept for wind dependent wake turbulence mitigation procedure for aircraft arriving on closely spaced parallel runways.
- FY 2005-2007 – By analysis, simulation and evaluation prototype; demonstrated feasibility of a cross-wind based air traffic wake turbulence mitigation decision support tool concept for enabling more closely spaced departures from an airport's closely spaced parallel runways.
- FY 2005-2007 – Provided wake turbulence evaluation support in the integration of a new aircraft into the National Airspace System.
- FY 2004-2007 – Cooperative data exchange with European wake turbulence data collection efforts.
- FY 2002-2007 – Developed the most extensive wake turbulence transit and characterization data base in the world, used to determine feasibility of proposed changes to air traffic control's wake turbulence mitigation procedures.
- FY 2006 – Provided wake turbulence information necessary for the ICAO determination of wake turbulence mitigation separations required for the A-380 aircraft.
- FY 2006 – Completed a detailed proposal for modifying the current air traffic wake turbulence mitigation procedures used for dependent staggered instrument landing system (ILS) approaches to an airport's CSPR.
- FY 2005-2006 – Enhanced the pulsed Light Detection and Ranging (LIDAR), which can measure distance, speed and rotation, for wake data collection capability, enabling it to capture wakes from both arriving and departing aircraft.
- FY 2005 – Utilizing analyses of the wake turbulence data collected at San Francisco International Airport (SFO) and Lambert – St. Louis International Airport (STL) upgraded FAA's wake turbulence encounter model used for evaluating proposed changes to air traffic control procedures for routing aircraft into and out of airports.
- FY 2003-2004 – Three prototype pulsed LIDAR systems purchased and added to the STL wake turbulence data collection facility.
- FY 2003 – Provided for the development of a ground based pulsed Light Detection and Ranging (LIDAR) prototype system for detecting and tracking aircraft generated wake vortices.
- FY 2003 – Wake turbulence data collection facility established at STL.
- FY 2002 – Continued wake turbulence data collection at SFO.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a national change to Air Traffic Order 7110.65 as it applies to the use of closely spaced parallel runways for dependent integrated landing system approach operations.
- Continue wake data collection and analyses at additional airports to support national and airport specific changes to air traffic control procedures for dependent integrated landing system approaches to an airport's closely spaced parallel runways.
- Evaluate reports of wake turbulence encounter as part of the FAA Safety Management System assurance process for changes to air traffic control procedures.
- Complete development of the enhanced suite of wake turbulence encounter analysis tools and begin their application in the evaluation of air route changes, modifications to en route air traffic control aircraft separation procedures changes and introduction of new aircraft designs.
- Analysis of wake turbulence data base to upgrade computational models of wake vortex transport and decay.
- Accomplish air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter analysis tools.
- Develop airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Development of wind prediction algorithm suitable for use in the development of a cross wind dependent wake mitigation for ground based decision support tool for approaches of 757 and "heavy" category aircraft to closely spaced parallel runways.
- Initiate development of ground and aircraft based situational display concepts (joint work with EUROCONTROL) relative to separation constraints (wake, weather, and visibility) required for implementation of the NextGen concept for air routes and approach/departure paths.
- Initiate program to evaluate the impact to fuel efficiency from the addition of a spiroid winglet to an aircraft's wing.

FY 2009 PROGRAM REQUEST:

In FY 2009, FAA must continue developing the capabilities needed to enable aircraft separation processes supportive of NextGen shared separation and dynamic spacing super density operations. These capabilities are highly dependent on technologies that accurately predict aircraft tracks, the track/decay of their generated wake vortices and provide this information to pilots and controllers. Some aspects of the NextGen Concept of Operations are dependent upon the aircraft being a participant in efficient, safe air traffic control processes that would minimize the effects of wake turbulence, reduce collision risk and keep traffic flowing in all weather and visibility conditions. The Wake Turbulence Program's research will result in enhanced technology assisted processes for safely mitigating aircraft wake encounter and collision risks while optimizing capacity, for all flight regimes, including the effects of weather.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Incorporate wake transport/decay and aircraft navigation performance analysis results into FAA wake encounter and collision risk models.
- Accomplish air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter and collision risk analysis tools.
- Complete two airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Continued data collection to determine the characteristics of wake vortices generated by departing and arriving aircraft. Data will be used in development of air navigation service provider decision support tools in reducing the required wake mitigation separation applied to airport single runway arrivals and departures.
- Continue development of ground and flight deck based situational display concepts (joint work with EUROCONTROL) for showing separation constraints (driven by collision risk, wake encounter risk, weather, and visibility) for aircraft operating in NextGen air corridors and high density airspace.

- Initiate development (joint work with EUROCONTROL) of analytical capability-benefit tradeoff models of potential procedures/processes/systems that would provide the desired Flight Deck capability for self separating from adjacent aircraft and their wakes.
- Complete development of approach to evaluate system-wide safety risk associated with the NextGen pair-wise separation concepts.
- Conduct experiments/analyses and aviation community forums to define in terms of collision and wake encounter hazard – what is a low, major and catastrophic impact safety event and acceptable safety risk for each.
- Initiate development of an air navigation service provider prototype decision support system for use in reducing required wake mitigation separations in dependent instrument landing system arrivals of B-757 and heavier aircraft on an airport's closely spaced parallel runways.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$22,223
FY 2008 Appropriated	12,813
FY 2009 Request	10,132
Out-Year Planning Levels (FY 2009-2012)	41,601
Total	86,769

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts					
Wake Turbulence	3,966	2,036	2,833	12,543	9,734
Personnel Costs	163	225	222	251	374
Other In-house Costs	133	12	11	19	24
Total	**4,262**	**2,273**	**3,066**	**12,813**	**10,132**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	4,262	2,273	3,066	12,813	10,132
Development (includes prototypes)	0	0	0	0	0
Total	**4,262**	**2,273**	**3,066**	**12,813**	**10,132**

A12.b.- Wake Turbulence Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
041-150 - Wake Turbulence							
Incorporate Wake Transport/decay and aircraft navigation performance into FAA models	600	◆	◊	◊	◊	◊	◊
Continued data collection to determine the characteristics of wake vortices generated by arriving and departing aircraft – for use in determining potential achievable separation reduction in single runway operations	1,600	◆	◊	◊	◊	◊	
Development of enhanced analysis tools for evaluating wake encounter and collision risk resulting from the design of airspace efficient routes, air traffic procedure changes, and the introduction of new aircraft designs	800	◆	◊	◊			
Accomplish wake turbulence and collision risk assessments of potential air traffic routing and separation changes associated with evolution to NextGen	830	◆	◊	◊	◊	◊	◊
Develop national modification to Air Traffic Control Order 7110.65 as it affects closely spaced parallel runway approaches		◆					
Develop airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways	600	◆	◊	◊	◊		
Development of ground based and flight deck based situational display concepts for showing separation constraints for aircraft operating in NextGen air corridors and high density airspace	1,438	◆	◊	◊	◊	◊	
Initiate development of analytical capability-benfit tradeoff models of potential procedures/processes/systems that would provide the desired Flight Deck capability for self separating from adjacent aircraft and their wakes.	800		◊	◊			
Conduct experiments/analyses and aviation community forums to define in terms of allowable safety risk for potential results from wake encounter or blunder in aircraft navigation	900		◊	◊			
Development of ANSP prototype decision support system for use in reducing required wake mitigation separations in dependent instrument landing system arrivals of 757 and heavier aircraft on an airport's closely spaced parallel runways	1,448	◆	◊	◊	◊		
Develop an approach and evaluate system-wide safety risk for NextGen era reduced separation standards	718	◆	◊	◊	◊	◊	◊
Evaluate the fuel efficiency impact from addition of a spiroid winglet to an aircraft's wing		◆	◊				
Personnel and Other In-House Costs	398						
Total Budget Authority	10,132	12,813	10,132	10,369	10,580	10,409	10,235

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.c.	**NextGen – Air Ground Integration**	**$2,554,000**

GOALS:

Supports FAA Strategic Goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Supports FAA R&D Goal: Air-Ground Integration.

Intended Outcomes: Demonstrate that operations (e.g., day and night, all weather), procedures and information can be standard and predictable for users (e.g., pilots, controllers, airlines, passengers) at all types of airports and for all aircraft.

Integration of air and ground capabilities poses challenges for pilots and controllers. A central core human factors issue is ensuring the right information is provided to the right human operators at the right time to make the right decisions. Transitions of increasingly sophisticated automation and procedures must be accompanied by supporting interoperability, with baseline systems and refinement of procedures to ensure efficient operations and mitigate potential automation surprises.

The safety factors that primarily have an impact on separation assurance must be jointly approached by both the flight deck and air traffic research communities. The increased levels of automation and new enabling technologies that will likely transform the NAS in the future will bring new and interesting human factors challenges.

REDAC findings are being addressed in both the baseline research programs and as part of future research planning. Ongoing research efforts support human factors guidelines for the design of instrument procedures, including the development of future procedures based on area navigation (RNAV) and the required navigation performance (RNP) of the aircraft. Execution of robust and leveraged research plans will be commensurate with program funding to address the most critical issues.

Other research efforts address operational and design constraints affecting human error detection and recovery, error prediction, and managing distractions in order to ensure continued situation awareness by the air crew. Training of pilots must be designed to ensure adequate understanding of avionics and automation capabilities, which are key to ensuring efficiency and effectiveness as pilots take on increased spacing and separation responsibilities.

Operational Improvements include provision for self-spacing, merging and passing in en route airspace via CDTI and ADS-B, with procedures based on RTSP for less than three-mile separation. Lateral and in-trail separation would be reduced to near VFR levels for single runway and for converging and closely spaced parallel runway operations using CDTI, ADS-B and wake vortex ground detection. Aircraft-to-aircraft separation would be delegated to the flight deck in oceanic airspace, with reduced longitudinal and lateral spacing via RNP, ADS/CDTI and data communication.

Agency Outputs: The Flightdeck/Maintenance/System Integration Human Factors Program addresses the pilot side of the air-ground integration challenge, and collaborates with the Air Traffic Control/Technical Operations Human Factors Program to ensure robust air-ground integration research. Through use of modeling, simulation, and demonstration, the program assesses interoperability of tools, develops design guidance, determines training requirements, and verifies procedures for ensuring efficient and effective human system integration in transitions of NextGen capabilities.

Outputs include:

- Define the changes in roles and responsibilities between pilots and controllers, and between humans and automation, required to implement NextGen.

- Define human and system performance requirements for design and operation of aircraft and air traffic management systems.
- Develop and apply error management strategies, mitigate risk factors, and reduce automation-related errors.
- Demonstrate the transition of self-separation responsibility to pilots.

Research Goals:

By FY 2008:

- Evaluate methods to mitigate the potential for incidents and accidents by assessing and removing causal factors of human error from flight deck operations and aviation maintenance.
- Begin developing guidance on how advanced technology can be used for inspection training and reducing errors in general aviation maintenance.
- Facilitate the operational implementation of the Human Factors Certification Job Aid, Version 8 for Parts 25 (Airworthiness Standards for Transport Category Airplanes) and 23 (Airworthiness Standards including Commuter Category Airplanes). This tool will support FAA certification personnel, aircraft designers, and researchers in addressing possible human factors concerns related to displays, controls, flight deck systems, pilot tasks, and procedures. It will also address equipment and testing assumptions.

By FY 2009:

- Develop a system safety approach to understand error patterns of pilots, maintenance personnel, and inspectors, and identify intervention strategies.
- Develop certification guidelines and human factors standards for integrating advanced technologies.
- Develop training guidelines for flight deck error management.

By FY 2012:

- Improve design of computer-human interfaces to reduce information overload and resulting errors.
- Improve pilot situational awareness, and provide corrective mechanisms to compensate for pilot skills degradation or automation failure.
- Assess cognitive and contextual factors to improve operator performance and reduce errors.
- Apply program-generated knowledge of human factors to improve selection and training of aviation system personnel.
- Examine effective roles for pilots and how those roles are best supported by allocation of functions between human operators and automation.
- Address human automation integration issues regarding the certification of pilots, procedures, training, and equipment associated with enhanced CNS/ATM operations necessary to achieve NextGen capabilities.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- NASA's Aviation Safety Program.
- FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flightdeck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Collaborative research with NASA on its safety, airspace and air portal projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities. Complex full mission demonstrations using a distributed simulation architecture will leverage NASA cockpit and ATM simulation facilities and other resources.
- Grants will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators.

Accomplishments: This is a new program starting in FY 2009.

FY 2009 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and ATM leading to a full mission demonstration.

Roles and Responsibilities

- Define a transition roadmap for delegating spacing and separation responsibilities to the pilot, while ensuring concomitant changes in controller roles and procedures.

Human System Integration

- Develop certification and operational approval guidelines for NextGen integrated technology and applications.
- Identify requirements for collaborative ATM in use of probabilistic weather information by pilots and controllers.

Error Management

- Assess information requirements for use of pilot-automation interfaces necessary for NextGen separation.

Integrated Demonstrations

- Define a plan to integrate complex demonstrations, simulations, and field trials, which includes goals, operational environments, NextGen separation procedures, participants, roles and responsibilities, and measurements, supporting incremental transitions of NextGen concepts and capabilities.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Roles and Responsibilities

- Develop guidance addressing allocation of functions between the aircrew and automation, including information automatically displayed to the pilot compared to manually requested information.
- Develop guidance in changing roles as responsibilities shift from air traffic controllers to pilots.

Human System Integration

- Develop guidance for certification of NextGen avionics and flight deck integration.
- Identify human factors issues in the operational approval of NextGen avionics enabled capabilities.
- Complete a preliminary cognitive task analysis supporting common information between pilots and controllers in use of probabilistic weather information.
- Assess communication and display issues in use of NextGen weather information supporting collaborative ATM.

Error Management

- Develop guidance for use of pilot-automation interfaces necessary for NextGen separation.

Integrated Demonstrations

- Develop a simulation and demonstration roadmap laying out incremental objectives, simulation requirements, assumptions, and risks for assessing integration of controller tools, including for weather and wake separation.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$0
FY 2008 Appropriated	0
FY 2009 Request	2,554
Out-Year Planning Levels (FY 2010-2013)	45,900
Total	$48,454

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
NextGen-Air Ground Integration					2,485
Personnel Costs					69
Other In-house Costs					0
Total					**2,554**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic					0
Applied					2,554
Development (includes prototypes)					0
Total					**2,554**

A12.c. – NextGen Air - Ground Integration	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
111-110 NextGen Air-Ground Integration							
Roles and Responsibilities	**697**						
Develop a transition plan to implement pilot separation			◊	◊	◊	◊	◊
Develop guidance in changing roles as responsibilities shift from air traffic controllers to pilots			◊	◊	◊	◊	
Human System Integration	**788**						
Develop guidance for certification of NextGen avionics and flight deck integration			◊	◊	◊	◊	
Identify human factors issues in the operational approval of NextGen avionics enabled capabilities			◊	◊	◊	◊	◊
Complete a preliminary cognitive task analysis for use of NextGen concepts and capabilities in technically advanced aircraft				◊	◊		
Identify training issues for assessing pilot proficiency for NextGen advanced avionics. Assess preliminary simulator training requirements for NextGen advanced avionics				◊	◊	◊	◊
Complete a preliminary cognitive task analysis supporting common information between pilots and controllers in use of probabilistic weather information			◊	◊	◊		
Assess communication and display issues in use of NextGen weather information supporting collaborative ATM				◊	◊	◊	
Define procedural requirements for separation				◊	◊		
Identify requirements for use of probabilistic weather information by pilots and controllers			◊	◊	◊	◊	
Error Management	**500**						
Provide interface design guidance			◊	◊	◊	◊	
Develop training and procedural requirements for automation failure				◊	◊	◊	◊
Develop guidance to reduce cognitive errors				◊	◊	◊	◊
Integrated Demonstrations	**500**						
Develop roadmap for integrated demonstrations			◊				
Define simulation requirements				◊	◊		
Develop a framework for a data repository				◊	◊	◊	◊
Demonstrate transition to airborne separation				◊	◊	◊	◊
Demonstrate procedures for airborne weather and wake separation				◊	◊	◊	
Demonstrate integrated pilot and controller functional capabilities				◊	◊	◊	◊
Field trial to demonstrate core pilot separation responsibilities				◊	◊	◊	◊
Personnel and Other In-House Costs	**69**						
Total Budget Authority	**2,554**	**0**	**2,554**	**11,337**	**11,720**	**11,521**	**11,322**

Notes: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.d.	**NextGen – Self-Separation**	**$8,025,000**

GOALS:

Supports FAA Strategic Goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Supports FAA R&D Goal: Self-Separation.

Intended Outcomes: By 2015, develop initial standards and procedures for self-separation.

New technologies such as GPS, ADS-B, and CDTI afford the possibility of transitioning from classic air traffic control separation assurance procedures to aircraft self-separation. Many NextGen enhanced capabilities are based on various aircraft oriented activities such as spacing, merging, passing, etc. Research will assess the human factors risks and requirements associated with these various separation policies, procedures and maneuvers. The research results will provide technical information to support the development of standards, procedures, and training by Flight Standards to implement the JPDO plan for separation. Human factors research required to provide the scientific and technical information to address human performance issues include:

- Providing human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.
- Providing robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts. The NextGen benefits associated with reduced aircraft spacing at high density arrival and departure terminal and airports also leaves less buffer to accommodate non-normal events. The impact on safety and efficiency will be addressed.
- Understanding changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Developing advanced methods to certify pilots and automation for different separation operations.
- Developing error management strategies to identify and mitigate human-system errors in separation operations.
- Providing guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

This effort intends to support several NextGen Operational Improvements including:

- Self-spacing, merging and passing in en route airspace is allowed under certain conditions in certain airspace via cockpit display of traffic information (CDTI) and ADS-B.
- Procedures based on required total system performance (RTSP) for less than three mile separation are implemented.
- Trajectories are exchanged via data communications.

Procedural requirements need to be assessed for use of CDTI-assisted visual separation for increasing arrival and departure capacity including during instrument meteorological conditions. This would support several NextGen Operational Improvements including:

- In-trail separation is reduced to near VFR levels for single runway departure operations using ground based wake vortex prediction and detection, CDTI, and ADS-B.
- In-trail separation is reduced to near VFR levels for converging and closely spaced parallel runways based on ground based wake vortex prediction and detection, CDTI, and ADS-B.

The research program will develop plans addressing human performance requirements in transitions to airborne separation assurance and self-separation consistent with the NextGen Concept of Operations. This includes total system performance requirements, human error reduction, and mixed equipage with the effort supporting Operational Improvements such as:

- Aircraft-to-aircraft separation is delegated to the flight deck in oceanic airspace via CDTI and improved CNS (lower RTSP) and oceanic automation (satellite, aircraft, ground surface).
- Aircraft-to-aircraft oceanic longitudinal and lateral spacing is reduced to 15 X 15 nm by use of RNP, ADS/CDTI and data communications.

A**gency Outputs:** The Flightdeck/Maintenance/System Integration Human Factors Program develops human factors technical information to address roles and responsibilities for pilots and air service providers, human system integration, and error management strategies to implement Trajectory Based Operations, High-Density Arrival/Departure Airports, Flexible Terminal and Airports, and Networked Facilities capabilities. Human factors technical information will also support the standards, procedures, training, and policy required to implement the operational improvements leading to self-separation.

Outputs include:

- Define human factors technical information needed to support the development of standards, procedures, and training by Flight Standards to implement plans for aircraft separation.
- Develop and implement human-systems integration process for separation activities, e.g., spacing, merging, and passing, leading to self-separation.
- Define the changes in roles and responsibilities between pilots and controllers and between humans and automation required to implement separation activities.
- Define human and system performance requirements for separation activities, e.g., spacing, merging, and passing, leading to self-separation.
- Define the potential impact and human factors issues of new technologies such as enhanced vision, synthetic vision, and electronic flight bags on separation activities.
- Develop and apply error management strategies, mitigate risk factors, and reduce automation-related errors associated with separation activities.
- Develop the human factors criteria for the successful use of conflict alerts as they relate to separation maneuvers and how they are communicated and resolved between flight deck and ground monitors.

Research Goals: Conduct R&D to support the standards, procedures, training, and policy required to implement the NextGen operational improvements leading to self-separation including improved awareness of surface/runway operations, reduced separation, and shared separation.

- By 2011, enable oceanic and en route pair-wise separation.
- By 2015, complete research to enable surface movement in zero visibility conditions guided by cockpit display of aircraft and ground vehicles and associated procedures.
- By 2015, complete research and provide human factors guidance to reduce arrival and departure spacing including variable separation in a mixed equipage environment.
- By 2015, enable self-separation in oceanic airspace and high density en route corridors.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- Guidance from the Joint Planning and Development Office Next Generation Air Transportation System initiative.
- NASA's Aviation Safety Program.
- Close collaboration with FAA organizations, notably Flight Standards and Aircraft Certification in the AVS line of business.

- FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flightdeck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Collaborative research with NASA on its aviation safety and airspace projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities. Complex full mission simulations using a distributed simulation architecture will leverage NASA cockpit and ATM simulation facilities and other resources.
- Grants will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators.
- Coordination will occur with appropriate RTCA Committees, e.g., Airborne Separation Assistance System.

Accomplishments: This is a new program starting in FY 2009.

FY 2009 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and ATM leading to a full mission simulation in 2015.

Level 1 – Surface/Runway Operations Awareness

- Address human factors issues for the cockpit display of aircraft and ground vehicles to guide surface movement during low visibility conditions including runway queuing and runway configuration change.
- Develop human factors criteria for conflict alerting for use in modeling collision risk in surface movement.
- Develop the aircrew requirements for aircraft display and certification criteria necessary for use of staffed virtual towers.

Level 2 – Reduced Separation

- Assess human factors issues to support performance-based ATM.
- Define human factors issues and develop guidance for integrating RSP and RCP with RNP.
- Assess human factors issues for transition to RNP.
- Conduct modeling and simulation to assess pilot performance in reducing separation.
- Assess human factors issues in cockpit display requirements to transition from current operations to the 2015 goal of reduced arrival and departure spacing, including variable separation in a mixed equipage environment.

Level 3 – Shared Separation

- Develop human factors criteria for pilot training in use of limited delegation of separation authority in the oceanic environment.

Level 4 – Self-Separation

- Conduct modeling and simulation to assess human factors issues for airborne self-separation in classic and ANSP flow airspace involving high density en route corridors.

Cross-cutting all four levels

- Provide human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.

- Provide robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Assess changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Develop advanced methods to certify pilots and automation for different separation operations.
- Develop error management strategies to identify and mitigate human-system errors in separation operations.
- Provide guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Level 1 – Surface/Runway Operations Awareness

- Define pilot information requirements for runway queuing and runway configuration change during low visibility conditions.
- Assess standards for conflict alerting of aircraft and ground vehicles in surface movement.
- Complete a cognitive task analysis for surface movement for different aircraft types and mixed equipage for use of staffed virtual towers.

Level 2 – Reduced Separation

- Address pilot performance requirements in use of automatic maneuvers.
- Assess interoperability and procedural issues for integrating RSP and RCP with RNP.
- Identify pilot training and procedures for transition to RNP.
- Through modeling and simulation, assess pilot use of flight deck decision support for reduced separation.
- Define human factors issues for display requirements to support reducing arrival and departure spacing, including closely spaced parallel runways.

Level 3 – Shared Separation

- Evaluate pilot training requirements for use of limited delegation of separation authority in the oceanic environment.

Level 4 – Self-Separation

- Conduct preliminary modeling and simulation to assess pilot performance during self separation in classic and ANSP flow airspace.

Cross-cutting all four levels

- Provide human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.
- Provide robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Assess changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Develop advanced methods to certify pilots and automation for different separation operations.
- Develop error management strategies to identify and mitigate human-system errors in separation operations.
- Provide guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$0
FY 2008 Appropriated	0
FY 2009 Request	8,025
Out-Year Planning Levels (FY 2010-2013)	39,694
Total	$47,719

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
NextGen- Self Separation					7,956
Personnel Costs					69
Other In-house Costs					0
Total					**8,025**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic					0
Applied					8,025
Development (includes prototypes)					0
Total					**8,025**

A12.d.– NextGen – Self-Separation Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
111-120 NextGen – Self Separation							
Surface/Runway Operations Awareness	**1, 619**						
Complete human factors guidance for staffed virtual towers			◊	◊			
Model collision risk for surface movement				◊	◊		
Display aircraft and vehicles in the cockpit			◊	◊	◊		
Assess surface movement in zero visibility conditions			◊	◊	◊	◊	◊
Reduced Separation	**1,850**						
Develop guidance for pilot use of automatic maneuvers				◊	◊		
Assess training and procedural issues with RNP			◊	◊	◊		
Complete human factors guidance for closely spaced parallel runways			◊	◊	◊	◊	◊
Assess procedures for flight deck decision support			◊	◊	◊	◊	◊
Shared Separation	**1,375**						
Evaluate pilot training requirements for limited delegation of separation authority			◊				
Complete assessment of issues in oceanic pair-wise separation			◊	◊	◊		
Complete assessment of issues in en route pair-wise separation				◊	◊		
Self-Separation	**750**						
Assess pilot performance in classic and ANSP flow airspace				◊	◊	◊	
Define guidance for self-separation in oceanic airspace and high density en route corridors			◊	◊	◊	◊	◊
Cross-Cutting	**2,362**						
Provide human factors assessments of new information requirements			◊	◊	◊	◊	
Provide robust assessment of separation procedures to ensure non-normal and emergency operations are evaluated, including system failures and reversion impacts				◊	◊	◊	◊
Assess impacts of changing roles and responsibilities			◊	◊	◊		
Develop advanced methods to certify pilots and automation for different separation operations			◊	◊	◊	◊	◊
Develop error management strategies to identify and mitigate human-system errors				◊	◊	◊	
Provide guidance for training pilots for automation use in separation operations			◊	◊	◊	◊	◊
Personnel and Other In-House Costs	**69**						
Total Budget Authority	**8,025**	**0**	**8,025**	**9,805**	**10,136**	**9,963**	**9,790**

Notes: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.e.	**NextGen – Weather Technology in the Cockpit**	**$8,049,000**

GOALS:

Intended Outcomes: By 2015, demonstrate common real-time awareness of current and forecast weather data by pilots and controllers.

To achieve a three times increase in capacity, increase arrival rates to 95 percent, and reduce gate-to-gate transit time by 30 percent – while maintaining safe operations – there must be a common weather picture to pilots, controllers, and users. Weather data, combined with other ATM system data, shall support a common situational awareness by pilots and controllers and automated and collaborative flight planning and decision making.

Although in many cases Part 121 operators have onboard weather, there are incongruities between how pilots view weather and what is used by controllers. NextGen intends to provide increasingly sophisticated weather products to controllers that should more closely parallel capabilities on the flight deck. Accruing NextGen benefits for weather necessitates effective integration of what information is provided to pilots and controllers and the training and procedures for its use.

For Part 91 operators failing to recognize and flying into adverse weather conditions is the leading factor of GA fatalities. There is a wide spectrum of weather products available to GA pilots and research is necessary to support the development of standards for weather products and weather data available to pilots and the appropriate use of weather data.

Use of weather information in Part 135 operations varies by size and type of aircraft. Research needs to examine differences and develop standards on its use.

Several Operational Improvements (OIs) identified by the JPDO Weather IPT (OIs #2, 12, 13, 22, and 29) can not be implemented without the completion of the research within the weather technology in the cockpit program.

Agency Outputs: Weather technology in the cockpit enables pilots and aircrews to engage in shared situational awareness and shared responsibilities with controllers, dispatchers, Flight Service Station (FSS) specialists, and others, pertaining to safe and efficient preflight, en route, and post flight aviation safety decisions involving weather.

There are two parts to this program: Cockpit Weather Technologies and Human Factors for Cockpit Weather Technologies. Cockpit Weather Technologies develops policy and standards for hardware and software requirements, including update rates, and guidelines and procedures for testing, evaluating, and qualifying weather systems for certification and operation on aircraft. Human Factors for Cockpit Weather Technologies addresses policy, standards, and guidance for the display of weather information and its use, including design guidance, training, procedures, and error management.

Research Goals: Research will enable development of policy, standards, and guidance needed to safely implement weather technologies in the cockpit to provide shared situational awareness and shared responsibilities. The goals of the research are:

- By 2010, develop design approval guidance for hardware and software standards.
- By 2010, develop design approval guidance for archiving weather data.
- By 2010, develop initial guidance for operational approval of new products and products from non-government vendors.
- By 2015, support a full mission demonstration assessing weather information in integrated NextGen air and ground capabilities for controllers and pilots.

Customer/Stakeholder Involvement: The Weather Program works within FAA, industry and government groups to assure its priorities and plans are consistent with user needs. This is accomplished through:

- Guidance from the JPDO Next Generation Air Transportation System initiative.
- Inputs from the aviation community, such as the annual National Business Aircraft Association conference, the Friends/Partners in Aviation Weather Forum, scheduled public user group meetings, and domestic and international aviation industry partners including Boeing.
- Subcommittees of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.
- RTCA SC-206 and Society of Automotive Engineers G-10 subcommittees.

R&D Partnerships: The Weather Program leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research.
- NASA Langley and Glenn Research Centers.
- Army Cold Regions Research and Engineering Laboratory.
- Universities.
- Airlines, pilots, and manufacturers.

Accomplishments: This narrative describes additional funding requested in FY 2009 for the weather technology in the cockpit initiative. The base funding for the weather technology in the cockpit initiative is described in the base Weather Program (A11.k). Accomplishments prior to FY 2009 are listed there.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

FY 2008 major accomplishments and activities are listed in the base Weather Program (A11.k) narrative.

FY 2009 PROGRAM REQUEST:

Ongoing Activities (Acceleration of activities in the base program)

- Identify, validate, and document data link system attributes that may affect the provision and use of weather-in-the-cockpit products and services.
- Develop initial guidance for operational approval of new products and products from non-government vendors.
- Accelerate turbulence radar and Turbulence Auto-PIREP System infusion into the NAS.

New Initiatives (Additions to those listed in the base program)

- Develop CONOPS for weather-in-the-cockpit, including GA operations.
- Evaluate use of aircraft to collect, process, and disseminate weather data (aircraft as a node in the system).
- Develop prototype weather products for use in the cockpit.

- Develop standards and guidance for design approval of weather decision support for cockpit use including integration of weather information with existing CNS/ATM information on multi-function displays.
- Develop guidance to weather program to enhance usability of forecasting products for pilot decision making.
- Evaluate procedures to include weather information into the flight deck decision process to include the use of internal, e.g., onboard weather radar, and external sources of weather information.
- Develop guidelines to identify and mitigate pilot errors related to weather information usage.
- Develop methods for effective cooperative use of weather information among pilots, controllers, dispatch, and Air Traffic Operation Centers to enhance weather-related safety and efficiency decisions.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop CONOPS for weather in the cockpit, including integration of weather information into flight deck decision support tools, weather dissemination management.
- Initiate feasibility study for use of aircraft to collect, process, and disseminate weather information.
- Develop standards and guidance for design approval of weather decision support for cockpit use including integration of weather information with existing CNS/ATM information on multi-function displays.
- Develop guidance to weather program to enhance usability of forecasting products for pilot decision making.
- Evaluate procedures to include weather information into the flight deck decision process to include the use of internal, e.g., onboard weather radar, and external sources of weather information.
- Develop guidelines to identify and mitigate pilot errors related to weather information usage.
- Develop methods for effective cooperative use of weather information among pilots, controllers, dispatch, and Air Traffic Operation Centers to enhance weather-related safety and efficiency decisions.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$0
FY 2008 Appropriated	0
FY 2009 Request	8,049
Out-Year Planning Levels (FY 2010-2013)	39,987
Total	$48,036

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts					7,894
Personnel Costs					155
Other In-house Costs					0
Total					**8,049**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic					0
Applied					8,049
Development (includes prototypes)					0
Total					**8,049**

A12.e –Weather Technology in the Cockpit Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
111-140 Weather in the Cockpit							
Cockpit Weather Technologies	**2,702**						
Develop CONOPS for weather in the cockpit			◊	◊			
Conduct feasibility study for aircraft as a node				◊	◊		
Develop weather technology roadmaps			◊	◊			
Develop initial guidance for operational approval of primary products				◊			
Assess safety impact of weather products used in cockpit					◊		
Select concept and initial systems engineering of weather decision support into cockpit system					◊	◊	
Develop and test operational prototype for weather decision support tools in the cockpit						◊	◊
Human Factors for Cockpit Weather Technologies	**5,192**						
Develop guidance for airman training and evaluation criteria				◊	◊	◊	◊
Develop standards and guidance for design approval of weather decision support tools			◊	◊	◊	◊	
Develop guidance to enhance use of forecasting products for pilot decision making			◊	◊	◊	◊	◊
Evaluate procedures to include weather information into the flight deck decision process			◊	◊	◊	◊	
Develop guidelines to identify and mitigate pilot errors related to weather information usage			◊	◊	◊	◊	◊
Develop methods for cooperative use of weather information among pilots, controllers, and dispatch			◊	◊	◊	◊	◊
Personnel and Other In-House Costs	**155**						
Total Budget Authority	**8,049**	**0**	**8,049**	**9,867**	**10,202**	**10,040**	**9,878**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A13.a.	**Environment and Energy**	**$15,608,000**

GOALS:

Intended Outcomes: The Environment and Energy Program helps achieve FAA's environmental compatibility goal and supports the FAA *Flight Plan*. The program also provides fundamental knowledge and tools to support the Next Generation Air Transportation System (NextGen) research and development plan. The efforts complement activities in technology and operational solutions and environmental management systems and models development under NextGen research.

The Program specifically supports the following outcomes:

The *Flight Plan* Noise Exposure Performance Target to reduce the number of people exposed to significant noise by four percent per year through FY 2012 as measured by a three-year moving average, from the three-year average for calendar year 2000 – 2002. Specific activities include:

- Conduct research and develop analytical tools to understand better the relationship between noise and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision-making.
- Through the PARTNER Center of Excellence (COE) identify and better measure the issues and impacts associated with aircraft noise, and generate improved solutions to mitigate these problems.
- Identify and assess the impact and enable implementation of operational procedures to reduce noise in the NAS.
- Minimize the impact of aircraft noise – actions include: advancing the state of science/knowledge concerning effects of aircraft noise; improving aircraft certification standards and existing operational procedures; and implementing improved noise control and mitigation measures.

The *Flight Plan* Aviation Fuel Efficiency Performance Target improves aviation fuel efficiency per revenue passenger-mile by one percent each year through FY 2012, as measured by a three-year moving average, from the three-year average for calendar years 2000-2002.

Specific activities include:

- Conduct research and develop analytical tools to understand better the relationship between noise and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision making.
- Through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) identify and better measure the issues and impacts associated with aviation emissions, and generate improved solutions to mitigate these problems.
- Assess the impact and enable implementation of operational procedures to reduce aviation emissions in the NAS.
- Minimize the impact of aviation emissions – actions include: advancing the state of science/knowledge concerning atmospheric/health effects of aviation emissions; and improving aircraft certification standards and operational procedures; and implementing improved emissions control and mitigation measures.

Flight Plan International targets include fostering international environmental standards, recommended practices, and guidance material that are technically feasible, economically reasonable, provide a measurable environmental benefit and take interdependencies between various emissions and between missions and noise into account. Specific activities include:

- Working with the international aviation community to reduce aircraft noise and emissions – actions include:
  - Improving aircraft certification standards and operational procedures.
  - Promoting compatible land use.
  - Assessing the benefits of abatement measures around populations exposed to aircraft operations.

The Program also contributes to the following outcomes:

- NextGen goal to promote environmental stewardship by reducing significant community noise and local air quality emissions impacts in absolute terms, limiting or reducing the impact of aviation greenhouse gas emissions on global climate, and balancing aviation's environmental impact with other societal objectives. Specific activities include:
  - Develop fundamental knowledge to aid in better science-based understanding of impacts of aircraft noise and aviation emissions on local air quality and climate change to enable the NextGen goal of three-fold growth in capacity by 2025, while reducing significant community noise and local air quality emissions in absolute terms.
  - Developing tools to assess the ability of technologies for airframes, more efficient engines, advanced propulsion concepts, new fuels and materials to reduce source noise and emissions.

Agency Outputs: The program is developing and validating methodologies, models, metrics, and tools to assess and mitigate the effect of aircraft noise and aviation emissions in a manner that balances the interrelationships between emissions and noise and considers economic consequences. It is also developing computer models and impact criteria for use by civil aviation authorities in assessing proposed actions. Researchers are also developing a better science-based understanding of the effects of aircraft noise and aviation emissions.

Research Goals:

- By FY 2009, develop and distribute a second generation of more robust integrated noise and emission prediction and modeling tools for global applications.
- By FY 2009, develop a second generation airline and technology environmental cost module for integrated noise and emissions tools using updated methodologies.
- By FY 2009, continue to develop and implement as they become available methods and models to analyze aircraft, auxiliary power units, and ground support equipment emissions and their impact on air quality.
- By FY 2009, implement a methodology for assessing hazardous air pollutant emissions in the vicinity of an airport; issue updated guidelines for national consistency in environmental assessment.
- By FY 2009, exercise databases of particulate matter emissions to assess trends as a function of engine combustor technology and other emissions, and impacts on health and welfare, in order to advise options for mitigation, as required.
- By FY 2009, advance our understanding of the evolution of volatile particulate matter emissions in order to specify measurement and sampling procedures for regulatory consideration.
- By FY 2009, complete an assessment of technology response to more stringent oxides of nitrogen (NOx) emissions standards, taking into account interdependencies and any tradeoffs among emissions and with noise.

- By FY 2009, establish benefits of implementation of a new continuous-descent arrival (CDA) noise abatement and fuel burn (emissions) reduction procedure at low-traffic airports during nighttime operations.
- By FY 2009, develop new technical guidance for noise and aircraft engine emissions certification.
- By FY 2010 provide computer models and impact criteria for use by civil aviation authorities in environmental assessments.
- By FY 2010, test and deploy first elements of the website to educate and inform the public about aviation and the environment and to enable the community to participate actively in public processes.
- By FY 2011, develop and disseminate a preliminary planning version of Aviation Environmental Design Tool that will allow integrated assessment of noise and emissions impact at the local and global levels.
- By FY 2013, develop and field a fully validated suite of tools, including the Environmental Design Space (EDS) and Aviation Environmental Portfolio Management (APMT) tools, which will allow cost benefit analyses.
- By FY 2013, use hazardous air pollutants and particulate matter direct measurements from engines to replace approximation methods and factors used in modeling tools.

In addition, the program is conducting government-industry sponsored research through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) to identify and measure more accurately the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.

Specifics of these cooperative research efforts include:

- By FY 2009 develop and disseminate new standards and methodologies to quantify and assess the impact of aircraft noise and aviation emissions for use by industry, government, and the public – also suggest a new metric to assess the acceptability of sonic boom from supersonic aircraft.
- By FY 2009, develop preliminary methodologies to quantify and assess the impact of Particulate Matter and Hazardous Air Pollutants (HAP).
- By FY 2010, assess the impacts of aviation on regional air quality including the effects of NOx emissions that result when aircraft climb and cruise.
- By FY 2010 test and deploy elements of an Internet capability to educate and inform the public about aviation and the environment.
- By FY 2011, assess the level of certainty of aviation's impact on climate change and advance the state of practical science research, with special emphasis on addressing the identified major uncertainties and gaps in our understanding of current and projected impacts of aviation on climate and to develop metrics that will enable us to characterize those impacts for purposes of advising options for mitigation.

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation. This unified regulatory approach to research identifies and influences technologies, models, regulations, and certification criteria that can improve our present and future global environment.

- *The FAA Aviation Rulemaking Advisory Committee* -- a formal standing committee composed of representatives from aviation associations and industry. The committee conveys its recommendations, advice, and information to FAA for consideration in rule making activities, and its harmonization working groups ensure that domestic and international aircraft noise certification regulations impose uniform standards upon the aircraft of all countries.
- *International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP)* -- this committee establishes and continually assesses the adequacy of international aviation environmental standards for aircraft noise and engine exhaust emissions.

- *The Federal Interagency Committee on Aviation Noise (FICAN)* -- encourages debate and agreement over needs for future aviation noise abatement and resulting new research efforts. FICAN conducts annual public forums in different geographic regions with the intent to better align noise abatement research with local public concerns.
- *Aviation Emissions Characterization (AEC) Roadmap* – developed by government and industry to coordinate research and regulatory activities. The objective of this long-range action plan is to gain the necessary understanding of particle formation, composition, and growth and transport mechanisms for assessing aviation's particulate emissions, and hazardous air pollutants, and understanding their impact on human health and the environment. Ultimately, if warranted, this activity will guide the development of aviation related technology that results in reduced particulate emissions.
- *NextGen* -- FAA is leading an Environmental Working Group (E-WG) responsible for leading environmental dimensions of the JPDO. The WG comprises FAA, NASA, the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the E-WG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on "Aviation and the Environment."
- *Climate Change Science Program (CCSP)* – The FAA is working with the CCSP program office and its individual member agencies to focus research efforts that address the uncertainties and gaps in our understanding of current and projected impacts of aviation on climate, and to develop metrics to characterize these impacts.

R&D Partnerships: Through a series of Memorandums of Agreement (MOA), FAA works closely with NASA to identify long-term source abatement technologies for noise and emissions. Together, the agencies also work with industry and academia to assess the possible global impact of aircraft engine exhaust emissions. In FY 2005, FAA signed an MOA with DoD to pursue joint activities to understand and mitigate aviation noise and emissions. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation's environmental impact.

- Through the JPDO NextGen, the program supports the E-WG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The EWG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures, as well as other relevant tools, metrics, and products to address aviation's environmental impact.
- The Volpe National Transportation Systems Center continues, in collaboration with the Environment and Energy Program, to provide substantial technical assistance in the areas of aircraft noise and engine emissions measurement and assessment.
- FICAN also offers a forum for partnership, as the Committee comprises all federal agencies concerned with aviation noise. The FAA works with this committee to foster greater, more cost-effective partnering in aviation noise research among all agencies.

Accomplishments: The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2007. Today's aircraft are also 70 percent more fuel-efficient-per-passenger-mile than jet aircraft of the 1960s. Reduced fuel consumption and technologies to reduce emissions have also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions. Specific recent accomplishments include:

FY 2007:

- Developed and demonstrated the first versions of AEDT, EDS and APMT. These tools will revolutionize approaches to aviation environmental assessment and regulation by enabling a comprehensive approach that assesses interdependencies and optimizes solutions based on cost-benefit analyses of impacts and mitigation. The tools will provide significant cost savings and other benefits to users.

- Released new versions of computer models to assess noise and emissions exposure incorporating the latest science and methodologies
- Completed the analyses supporting a Report to Congress, jointly with EPA, on the impact of aircraft emissions on air quality in nonattainment areas; ways to promote measures that allow aviation to enhance fuel efficiency and to reduce emissions; and opportunities to reduce air traffic inefficiencies that both waste fuel and increase emissions.
- Completed an assessment of the feasibility of using alternative fuels in commercial aviation. The assessment included a comprehensive assessment of well to tail emissions from coal and gas derived and renewable alternative fuels.

FY 2006:

- Released advanced version of highly influential advanced computer models for airport and heliport noise analysis –over 1000 users in over 40 countries. The models are used in over 160 U.S. airport studies involving more than $1.8 billion in airport noise compatibility grants, and recently provided the basis for an aircraft noise exposure prediction model for air tours in the Grand Canyon National Park.
- Released advanced version of a computer model that is used extensively by over 300 domestic and international users in airport air quality analyses and has won the EPA's highest endorsement.
- JPDO Environmental Integrated Product Team (E-IPT, now E-WG) instituted a framework for establishing national goals for aviation and the environment and completed a "gap analysis" of environmental R&D programs necessary to meet NextGen goals.
- Reported to Congress regarding a comprehensive national study of ways to reduce aircraft noise and emissions.

FY 2005:

- Developed a handbook on aviation emissions that serves as the definitive source on this evolving issue.
- Developed a first order approximation to help airports assess aircraft particulate emissions and demonstrate compliance with the National Environmental Policy Act and the Clean Air Act.
- Developed a novel methodology for assessing noise, local air quality emissions, and aviation climate impacts using a common currency.

FY 2004:

- Initiated a long-term, strategic effort to develop analytical tools to address the relationship between noise and emissions and different types of emissions. The long-term aim is a comprehensive approach to addressing all aspects of noise and emissions. The tools will facilitate better-informed decisions that can cost in excess of $10 billion to government and industry.
- Developed a modeling capability to produce annual inventories of aircraft greenhouse gas emissions and to assess aviation's forecasted global emissions.

FY 2003:

- Established the PARTNER COE to allow partnerships with universities, research institutions, and industry to conduct exploratory research to identify and better measure the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Demonstrated new Continuous Descent Arrival noise abatement procedures in collaboration with NASA, academia, manufacturers, and airline and airport operators.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Complete an annual assessment of noise exposure and fuel burn.
- Deliver Aviation Environmental Design Tool (AEDT) Version 2.0, including Environmental Design Space (EDS), capability for ICAO Committee on Aviation Environmental Protection (CAEP)/8 Application.
- Deliver Aviation Portfolio Management Tool (APMT) Version 2.0 for CAEP/8 Application.

- Develop alpha version of AEDT tool for local application.
- Assess noise and emissions for various technology, operational, and airspace enhancement scenarios.
- Demonstrate a new comprehensive approach to aviation environmental impact mitigation through a significant example problem.
- Continue upgrades to Integrated Noise Model (INM), Emissions and Dispersion Modeling System (EDMS), Modeling System For Assessing Global Noise Exposure (MAGENTA), and System For Assessing Aviation Global Emissions (SAGE) modules for incorporation into AEDT and to support existing customers as necessary.
- Develop business case and cost allocation for implementation of clean and quiet operational procedures.
- Work with candidate airports to identify opportunities to implement clean and quiet operational procedures.
- Explore provisions for clean and quiet procedure usage in airspace redesign projects.

Aircraft noise

- Promulgate new procedures and technical guidance for noise certification for aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft) that are both harmonized and simplified.
- Recommend and develop widely accepted impact metrics within noise community on sleep disturbance, annoyance, speech interference and perceptible vibration.
- Investigate the role of aviation noise in combined transportation noise around airports and its impact to communities.
- Investigate how average Day-Night-Level (DNL) performs compared to other noise impact metrics;
- Complete Land Use metrics study and publish a report.
- Conduct a study to analyze the four elements of the Balanced Approach (technology to reduce noise at the source, land use planning and management, quieter operational procedures, and operational restrictions) to noise abatement and their relationships.
- Continue to assess potential benefits of using newly developed noise reduction technologies and operational procedures; identify technology and operational goals for long-term reduction of aircraft noise.
- Continue developing interactive website/software to communicate complex noise technical information in a manner suitable for public distribution (NoiseQuest) and complete educational component of NoiseQuest.
- Advance the sonic boom metric definition and continue to assess the applicability of existing noise metrics to sonic boom and determined annoyance of low boom waveforms to inform future decision-making regarding supersonic flight over land.
- With the “Aviation emissions activity,” conduct two COE focused sessions at a national and an international conference.

Aviation emissions

- Continue to develop and publish procedures and technical guidance materials for aircraft engine exhaust emissions testing and certification that are internationally harmonized and simplified, taking into account modernization in measurement methodologies and advancements in technical understanding.
- Continue to develop and disseminate methodologies and procedures to quantify and assess the impact of Particulate Matter and Hazardous Air Pollutant emissions on the environment.
- Conduct analysis of actual aircraft engine emissions measurements to better understand the generation of emissions during engine start-up, ground idle and taxi operation, during aircraft ground roll immediately prior to takeoff, and under varying ambient conditions.
- Continue to:
    - Assess potential benefits of using newly developed engine emissions reduction technologies, monitor state of technology advancements against the established goals for long term

reduction of aircraft engine NOx emissions, and initiate establishment of aircraft technology goals for long term reduction of fuel burn.

- Assess potential benefits of optimized operational procedures to reduce emissions and fuel burn
- Assess the atmospheric and health effects of aviation related emissions through the PARTNER COE.
- Test and analyze particulate matter emissions and hazardous air pollutants from aircraft engines as identified under the AEC Roadmap; establish databases of PM emissions from aircraft engines that can be used for trends assessment.

- Initiate effort required to plan an additional study to collect particulate matter and plume evolution/expansion data using light detection and ranging (LIDAR) technology that can be used to enhance dispersion analytical models embodied in our local air quality tools.
- Develop preliminary agreed upon methods to measure PM emissions from commercial aircraft engines, taking into account an assessment of the impact of PM emissions.
- Assess whether there are unique health effects associated with particulate matter emissions and hazardous air pollutants from aviation sources.
- Initiate assessment of uncertainty of impact of aviation on climate change with special emphasis on practical application of research results to aid the development of models to assess mitigation options.
- Initiate an assessment of the impacts of aviation on regional air quality including the effects of emissions attributable to aircraft climb and cruise activities.
- With the "Aircraft noise activity," conduct two COE focused sessions at a national and an international conference.

FY 2009 PROGRAM REQUEST:

In accordance with the National Environmental Policy Act, FAA must consider and mitigate the environmental consequences of its actions. The FAA will continue to work with NASA, the manufacturing industry, and international authorities to support the development and implementation of aircraft environmental certification regulations through proactive response to changes in airplane and engine technology, measurement/analysis technology, regulatory policy, and international regulatory initiatives.

FAA will continue to work with NASA in research efforts identifying noise and emissions reduction technologies that may enter the marketplace within the next 10-15 years. The agency will use these research findings to consider new environmental certification standards and procedures for the next generation of transport aircraft.

Ongoing Activities

Aerospace systems have historically been designed – and regulations for their certification and use have been written – as though aviation noise and various emissions had nothing to do with one another. However, aviation noise and emissions are highly interdependent phenomena. Future environmentally responsible aviation policy and rule making must be based on a new, interdisciplinary approach. Furthermore, this approach must be made as affordable as it is effective.

Existing analytical tools are inadequate to assess interdependencies between noise and emissions or analyze the cost/benefit of proposed actions. Accordingly, FAA is developing a robust new comprehensive framework of aviation environmental analytical tools and methodologies to perform these functions. The long-term aim is to provide a seamless, comprehensive set of tools to address all aspects of noise and emissions. The elements of this framework include:

- EDS capability to provide integrated analysis of noise and emissions at the aircraft level.
- AEDT comprises EDS and other integrated aviation noise and emissions modules – will provide integrated capability of generating interrelationships between noise and emissions and among emissions at the local and global levels.

- APMT comprises AEDT and other modules – will provide the common, transparent cost/benefit methodology needed to optimize national aviation policy in harmony with environmental policy.
- These AEDT and APMT tools will allow:
  - Government agencies to understand how proposed actions and policy decisions affect aviation noise and emissions.
  - Industry to understand how operational decisions affect proposed projects affecting aviation noise and emissions.
  - The public to understand how actions by government and industry affect aviation noise and emissions.

Anticipated benefits of this initiative include the ability to:

- Optimize environmental benefits of proposed actions and investments.
- Improve data and analysis on airport/airspace capacity projects.
- Increase capability to address noise and emissions interdependencies in the resolution of community concerns.
- Aid in more effective R&D portfolio management.
- Remove environmental roadblocks to capacity growth.
- Continue global leadership for the United States in environmentally responsible aviation.

Other activities include:

- Continue activities through the COE to identify and measure better the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Continue updating and enhancing existing analytical tool modules (e.g., INM, EDMS, SAGE, MAGENTA), as necessary, to support existing customers and transition to AEDT.
- Support FAA role in the ICAO CAEP working groups for assessing the technological, scientific, operational, and economic aspects associated with maintaining international standards and recommended practices for aircraft noise and engine exhaust emissions.
- Continue efforts to maintain the currency of the regulation and technical guidance materials concerning aircraft noise and engine exhaust emissions certification requirements.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Complete an annual assessment of noise exposure and fuel burn.
- Complete a significant example analysis to demonstrate the benefit of cost-benefit analyses.
- Deliver Aviation Environmental Design Tool (AEDT) Version 3.0 for CAEP/8 application.
- Deliver Aviation Portfolio Management Tool (APMT) Version 3.0 for CAEP/8 application.
- Deliver Environmental Design Tool Version 3.0, including validated vehicle library and demonstrated capability within AEDT framework for CAEP/8 application.
- Complete integrated system level analyses of NextGen scenarios and strategies (e.g., operations, technologies, policies, etc.).
- Continue upgrades to INM, EDMS, MAGENTA, and SAGE modules for incorporation into AEDT and to support existing customers as necessary.
- Continue working with candidate airports for appropriate implementation of continuous descent arrival (CDA).
- Develop tools to aid in demonstrating CDA procedures in high-density environment.

Aircraft noise

- Promulgate new procedures and technical guidance for noise certification for aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft) that are both harmonized and simplified.
- Continue comprehensive noise annoyance survey.
- Assess potential health impacts of aircraft noise and investigate methodologies to incorporate these impacts in the APMT framework.
- Publish report on noise annoyance metrics, including new metric for supersonic aircraft.
- Complete peer review of noise annoyance data.
- Continue to develop guidance on land use best practices.
- Continue to assess potential global benefits of using newly-developed noise reduction technologies; identify technology goals for long term reduction of aircraft noise.
- Continue advancement of NoiseQuest website.
- With the "Aviation emissions activity," conduct two COE focused sessions at a national and an international conference.

Aviation emissions

- Continue to develop and publish:
  - Procedures and technical guidance materials for affordable engine exhaust emissions testing and certification that are both harmonized and simplified.
  - Develop and disseminate standards and methodologies to quantify and assess the impact of Particulate Matter (PM) and Hazardous Air Pollutants (HAPs) emissions in the aviation environment.
  - Assess potential global benefits of using newly developed emissions reduction technologies, and identify technology goals for long term reduction of aircraft engine emissions and fuel burn.
  - Advance best practices in aviation emissions PM and HAPs measurements.
  - Continue collecting PM and HAPs profiles and measurement data to improve and/or replace approximation methods and advance those data sources in models used to isolate sources, and identify aviation's contribution to impacts.
- Continue assessment of the relative effect of various emissions on climate forcing functions.
- Continue comparison of detailed chemistry computations to aviation environmental tools approximations.
- Continue developing a model of near field plume evolution/expansion to feed local air quality models.
- Assess whether there are unique health impacts or other environmental effects, particularly for NextGen scenarios, associated with particulate matter emissions and hazardous air pollutants from aviation sources, with specific focus on the aircraft engine.
- Continue assessment of uncertainty of impact of aviation on climate change.
- Complete assessment of the impacts of aviation on local and regional air quality including the effects of emissions attributable to aircraft climb and cruise activities.
- Initiate development of guidance material related to dispersion, chemical and transport modeling (i.e., assessment of aviation-related air pollutant concentrations that effect local and regional air quality).
- Continue evaluation of the necessity for establishing standards pertaining to particulate matter emissions from aircraft engines.
- With the "Aircraft noise activity," conduct two COE focused sessions at a national and an international conference.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$153,001
FY 2008 Appropriated	15,469
FY 2009 Request	15,608
Out-Year Planning Levels (FY 2010-2013)	61,418
Total	$245,496

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
Aircraft Noise	1,164	1,366	1,367	1,359	13,172
Engine Emissions	467	1,596	1,766	1,600	0
Noise & Emissions Analyses	8,436	10,748	10,700	10,213	0
Personnel Costs	1,575	1,985	2,015	2,036	2,127
Other In-house Costs	153	145	170	261	309
Total	**11,795**	**15,840**	**16,018**	**15,469**	**15,608**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	11,795	15,840	16,018	15,469	15,608
Development (includes prototypes)	0	0	0	0	0
Total	**11,795**	**15,840**	**16,018**	**15,469**	**15,608**

A13.a- Environment and Energy Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
091-016 Noise and Emissions Analysis							
Noise and Emissions Analysis	**9,900**						
Develop architecture for noise/emissions modules communication		◆			◊	◊	
Develop model for assessing global exposure to noise from transport aircraft		◆			◊	◊	
Validate the methodologies used to assess aircraft noise exposure and impact (INM, AEM)		◆		◊			
Release INM updates			◊				
Enhance aircraft noise and emissions modeling for airspace management activities			◊		◊	◊	
Release EDMS updates		◆	◊				
Forecast future global emissions and complete updates to the SAGE model		◆					
Release screening model for airport air quality, version 1, and updates			◊				
Validate methodologies used to assess aviation emissions and their impact on air quality		◆		◊		◊	
Develop first-order approximation method for aircraft engine PM emissions		◆					
Publish handbook for airport air quality analysis and updates		◆	◊	◊	◊	◊	◊
Guidance document for estimating and reducing emissions from ground support equipment							
Resource and guidance materials, and assessment protocol concerning hazardous air pollutants		◆		◊		◊	
Develop AEDT		◆	◊	◊	◊	◊	◊
Release AEDT for local applications					◊		◊
Develop EDS		◆		◊		◊	
Develop APMT		◆		◊		◊	
Harmonize AEDT and APMT databases and code management protocols			◊		◊	◊	
Integrate cost and socioeconomic data			◊		◊	◊	◊
Aircraft Noise	**1,572**						
Assess aircraft noise reduction strategies research		◆	◊	◊	◊	◊	◊
Assess land use practices and metrics		◆	◊	◊	◊	◊	◊
Publish Advisory Circular 36-4 (and updates)		◆		◊		◊	
Develop a new international noise standard for subsonic jets and large airplanes					◊		◊
Develop a new international noise standard for small props and helicopters				◊			
Apply methodologies used to assess aircraft noise exposure and impact (AEM)			◊	◊			
Prepare COE reports, findings, and other activities		◆	◊	◊	◊	◊	◊
Engine Emissions	**1,700**						
Assess technological and scientific bases to support future ICAO engine emission standards		◆		◊		◊	
Develop alternative, simplified engine exhaust emissions certification test procedures		◆	◊		◊	◊	◊
Update Advisory Circular 34-1			◊		◊	◊	
Develop measurement/sampling protocol for PM emissions from aircraft engines		◆	◊		◊	◊	◊
Develop science/metrics and reduce uncertainties to assess impact of aviation on climate change			◊	◊			◊
Prepare COE reports, findings, and other activities		◆	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	**2,436**						
Total Budget Authority	**15,608**	**15,469**	**15,608**	**15,670**	**15,467**	**15,253**	**15,028**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A13.b.	**NextGen Environmental Research–Aircraft Technologies, Fuels and Metrics**	**$ 16,050,000**

Goals:

Intended Outcomes: The NextGen Technologies, Fuels and Metrics program helps achieve the NextGen goals to increase capacity by reducing significant community noise, local air quality emissions impacts in absolute terms and aviation greenhouse gas emissions impacts on the global climate. The program is focused on reducing current levels of aircraft noise, local air quality and greenhouse gas emissions and energy use and advancing alternative fuels for aviation use.

The Program specifically supports the following outcomes:

Demonstrate aircraft and engine technologies that reduce noise and local air quality and greenhouse gas emissions at the source to a developmental level that will allow quicker industry uptake of these new environmental technologies in order to produce a fleet that will operate more efficiently with less energy usage and permit expansion of airports in a manner consistent with the environmental goals of the NextGen plan.

Specific activities include developing and demonstrating:

- Certifiable aircraft technology that increases aircraft fuel efficiency by 25 percent relative to 1997 subsonic aircraft technology;
- Certifiable engine technology that reduces landing and takeoff cycle (LTO) nitrogen oxide emissions by 50 percent, without increasing other gaseous or particle emissions, over the ICAO standard adopted in 2004;
- Certifiable aircraft technology that reduces noise levels by 10 dB at each of the three certification points relative to 1997 subsonic jet aircraft technology; and
- Determination of the extent to which new engine and aircraft technologies may be used to retrofit or re-engine aircraft so as to increase the level of penetration into the commercial fleet.

Demonstrate alternative fuels for aviation to reduce emissions affecting local air quality and greenhouse gas emissions and increase energy supply security for NextGen.

Specific activities include developing and demonstrating:

- The feasibility of use of alternative fuels in aircraft systems, including successful demonstration and quantification of benefits; and
- Ensuring safety and devising transition strategies that enable “drop in” replacement for petroleum derived turbine engine fuels.

Determining the appropriate goals and metrics to manage NextGen aviation environmental impacts that are needed to support Environmental Management Systems (EMSs) and allow a three times capacity growth.

Specific activities include:

- Establish and implement metrics to better assess and control noise, air quality and climate impacts from anticipated NextGen commercial aircraft operations.
- Evaluate and establish required technology and operational goals and targets to mitigate the environmental impact of projected NextGen and support EMSs implementation.

Agency Outputs: The program is protecting the environment by reducing significant aviation environmental impacts associated with noise, emissions, global climate impact, and energy production. The program will advance and mature, collaboratively with industry, engine and airframe technologies to reduce aviation noise, local air quality and greenhouse gas emissions and energy use. It will also assess the feasibility of and developing alternative aviation fuels that could serve as “drop in” replacements for today’s petroleum derived turbine engine fuels. Ultimately the program will demonstrate advanced technologies and alternative fuels in integrated ground and flight demonstrations.

The program is also helping to achieve NextGen goals by develoing metrics to define and measure significant aviation environmental impacts. The program will improve the fundamental understanding of aviation environmental health and welfare and climate impacts and translate impact into improved metrics that can be used to better assess and mitigate aviation’s contribution. This program will identify the gaps in scientific knowledge to support NextGen; focus research in areas that will reduce key uncertainties to levels that allow action; and develop metrics to enable sound analyses. Ultimately, the program will enable establishing goals and targets to support establishing dynamic EMSs to better manage and reduce aviation’s environmental impacts.

Research Goals:

- By FY 2009, establish consortium for Continuous Low Energy, Emissions and Noise (CLEEN) Technologies and award grants and contracts to conduct research.
- By FY 2009, complete detailed feasibility study, including economic feasibility, environmental impacts, and assessment of “drop in” potential for gas turbine alternative fuels.
- By FY 2010, complete system analyses and identify and pursue the development of first round engine and airframe technologies that will be the most effective at producing environmental benefits.
- By FY 2010, complete effort to experimentally measure environmental impacts of “drop in” alternative turbine engine fuels.
- BY FY 2010, initiate demonstration of CLEEN technologies in ground rig tests
- By 2010, estimate how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- By FY2010, establish the relationship between aircraft engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- By FY2010, establish preliminary metrics and goals to guide CLEEN technology and alternative fuels development and support EMSs.
- By FY 2011, initiate effort to experimentally assess environmental impacts and benefits and costs of renewable alternative turbine engine fuels.
- By FY2011, complete assessment of aviation’s impact on climate change.
- By FY 2012, complete demonstration of CLEEN technologies in ground rig tests.
- By FY 2013, demonstrate airframe and engine technologies to reduce noise, emissions and fuel burn in integrated ground demonstrations for large and regional jets.
- By FY 2013, complete system analyses to identify the most promising CLEEN technologies for flight tests.
- By FY 2012, conduct significant demonstration of “drop in” alternative turbine engine fuels.
- By FY 2012, conduct renewable alternative turbine engine fuels safety, environmental and business case assessments.
- By FY 2013, complete assessment of “drop in” alterative turbine engine fuels and develop implementation plan.
- By FY2013, reduce key uncertainties of aviation impacts to levels that better inform appropriate action.
- By FY 2014, complete system analyses and identify and pursue the development of second round engine and airframe technologies that will be the most effective at producing environmental benefits.

- By FY 2014, demonstrate first round of CLEEN airframe and engine technologies to reduce noise, emissions and fuel burn in integrated flight demonstrations for large and regional jets.
- By FY2014, refine metrics that more accurately capture aviation emissions health and welfare and climate impact and goals to facilitate EMSs implementation.

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation and explore alternative gas turbine fuels.

- *NextGen* -- FAA leads an Environmental Working Group (E-WG) responsible for leading environmental dimensions of the JPDO. The E-WG comprises FAA, NASA, the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the WG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on "Aviation and the Environment", including advanced technology and alternative fuels development.
- *Commercial Alternative Aviation Fuel Initiative (CAAFI)* -- Concerns about rising fuel costs, energy supply security and the environmental effects of aviation are providing a significant stimulus to take a fresh look at the use of alternative fuels for aviation. To forge a way ahead, FAA founded the Commercial Aviation Alternative Fuels Initiative (CAAFI) together with Airports Council International-North America (ACI-NA), the Air Transport Association (ATA) and the Aerospace Industries Association (AIA). CAAFI is teaming with the DoD to leverage their substantial efforts advancing alternative fuels for military aviation– driven by energy security considerations. CAAFI is also working with other Federal agencies such as NASA.

R&D Partnerships: As does the Environment and Energy Research Program and other NextGen activities, the NextGen AircraftTechnologies, Fuels and Metrics Program relies on a series of Memorandums of Agreement (MOA), to work closely with NASA and DoD. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation's environmental impact.

- Through the JPDO NextGen, the program supports the E-WG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The E-WG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures, as well as other relevant tools, metrics, and products to address aviation's environmental impact.

Accomplishments: This is a new effort to address the challenges of NextGen. However, relevant stakeholders have achieved significant accomplishments mitigating aviation's environmental impact. The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2006. Today's aircraft are also 70 percent more fuel-efficient-per-passenger-mile than jet aircraft of the 1960s. Reduced fuel consumption has also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

There were no activities in FY 2008 as this is an FY 2009 new initiative.

FY 2009 PROGRAM REQUEST:

Anticipated increases in air transportation demand will place significant environmental pressures on various segments of the NextGen. The primary environmental constraints on the capacity and flexibility of the NextGen could be community noise, local air quality, global climate impacts, and energy production and consumption. Environmental issues have constrained airport and airspace growth over the past decade. To ensure environmental impacts don't become a constraint on growth in NexGen, we need to accelerate introduction of quieter and cleaner technology in our fleets. Ninety percent of the environmental improvements (noise and emissions reductions) in the aviation system in the last 30 years have come from improved technology. Without a pipeline of near term (5-10 years) technology improvements, we cannot achieve the absolute reduction of significant noise and air quality impacts that we believe are necessary to enable NextGen growth. We need robust research and development to enable technology solutions to manage and mitigate environmental constraints. The goal is to have a fleet of quieter, cleaner aircraft that operate more efficiently with less energy.

We are currently facing larger research and development challenges at a time when we need to make larger technological leaps. Solutions that involve technology improvements in engines and airframes in a foreseeable timeframe require successful maturation and certification of new technologies within the next 5-10 years. This initiative establishes a world-class research consortium that can pursue technology goals to significantly reduce aviation noise, emissions, and fuel consumption. Establishing a world-class research consortium with industry- targeted on maturing technology- will help accelerate introduction of quieter and cleaner technology in our fleets so environmental issues do not become constraints.

The NextGen environmental goal is to reduce significant health and welfare impacts of aviation community noise and local air quality (namely NOx) emissions in absolute terms, notwithstanding growth. Although there is no quantitative goal for greenhouse gas emissions, the NextGen environmental goal does call for limiting or reducing the impact of aviation greenhouse gas emissions on global climate. There is a need to explore the appropriate metrics and system goals to establish significant impacts. There is also a need to develop a robust science-based understanding of impacts of NextGen aviation emissions on earth's climate and translate these impacts into improved metrics that can be used to better assess and mitigate aviation's contribution to climate change. These goals and metrics will enable Environmental Management Systems (EMSs) to mitigate impacts in a dynamic and cost-beneficial manner.

Elements of this initiative include:

- In collaboration with industry, mature noise, emissions and fuel burn reductions technologies (previously conceived by NASA and industry to Technology Readiness Levels (TRL) of 3-4) to levels (TRL 6) that enable industry to expedite introduction of these technologies into current and future products.
- Assess and advance the development of alternative "drop in" and renewable turbine fuels for aviation.
- Develop metrics to better assess and control noise, air quality and climate impacts from NextGen commercial aircraft operations and establish goals and targets to support EMSs implementation to mitigate impacts.

Ongoing Activities

- This is a new activity.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise, emissions and fuel burn reduction technologies maturation

- Establish consortium for Continuous Low Energy, Emissions and Noise (CLEEN) Technologies.
- Award grants and contracts to conduct research.
- Develop a detailed plan to achieve NextGen environmental goals.

- Identify promising noise, local air quality and greenhouse gas, and fuel burn reduction technologies for maturation.
- Conduct component level analyses for promising technologies to optimize environmental and fuel burn performance.
- Conduct detailed integrated system level analyses for large and regional jets to identify the most promising technologies for further maturation.
- Initiate design of demonstration experiments.

Alternative turbine engine fuels

- Complete detailed feasibility study, including economic feasibility of “drop in” alternative turbine engine fuels.
- Initiate planning for experimentally quantifying environmental impacts of “drop in” gas turbine fuels in commercial aircraft engines.
- Initiate efforts to explore the potential of renewable gas turbine fuels for commercial applications.

NextGen Environmental Metrics, Goals and Targets

- Initiate efforts to determine how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- Determine research efforts necessary to reduce key uncertainties and enhance models.
- Initiate comprehensive modeling efforts to establish the relationship between aviation engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- Identify and assess potential metrics to quantify the climate related impacts of commercial aircraft operations.
- Initiate baseline analyses of potential climate response due to aviation emissions with quantified uncertainties, based on the best available science and modeling tools.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$0
FY 2008 Appropriated	0
FY 2009 Request	16,050
Out-Year Planning Levels (FY 2010-2013)	79,802
Total	$95,852

Budget Authority ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Contracts:					
NextGen Environmental Research—Aicraft Technologies, Fuels and Metrics					15,829
Personnel Costs					221
Other In-house Costs					0
Total					**16,050**

OMB Circular A-11, Conduct of Research and Development ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Basic					0
Applied					16,050
Development (includes prototypes)					0
Total					**16,050**

A13.b.- NextGen Environmental Research—Aircraft Technologies, Fuels and Metrics Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
111-150 NextGen Environmental Research							
Technology Maturation	**11,329**						
Establish CLEEN Consortium			◊				
System Level Assessments			◊	◊	◊	◊	◊
Component Assessments				◊		◊	
Rig Tests – Round 1			◊		◊		
Rig Tests – Round 2						◊	
Integrated Ground Demonstrators					◊		◊
Flight Demonstrations						◊	◊
Prepare Annual Report			◊	◊	◊	◊	◊
Alternative Turbine Fuels	**2,000**						
"Drop in" Fuels Feasibility Study			◊	◊			
Renewable Fuels Feasibility Study				◊		◊	
"Drop in" Fuels environmental Assessment			◊	◊			
Renewable Fuels Environmental Assessment				◊		◊	
"Drop in" Safety Assessment				◊		◊	◊
Transition Plans						◊	◊
Prepare Annual Report			◊	◊	◊	◊	◊
Metrics, Goals and Targets	**2,500**						
Define potential metrics			◊	◊			
Evaluate metrics and models			◊	◊		◊	
Advance measurement approaches				◊		◊	
Climate impact assessments			◊	◊	◊		
Air Quality assessments				◊		◊	
Noise assessments				◊		◊	
Refine metrics				◊	◊	◊	
Assess efficacy of metrics				◊		◊	
Upgrade Assessment Models							◊
Publish Research Reports			◊	◊	◊	◊	◊
Personnel and Other In-House Costs	**221**						
Total Budget Authority	**16,050**	**0**	**16,050**	**19,700**	**20,368**	**20,034**	**19,700**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Contract Dollars
A14.a.	**System Planning and Resource Management**	**$1,817,000**

Goals:

Intended Outcomes: Demonstrate the value of working with international partners to leverage research programs and studies in order to improve safety and promote seamless operations worldwide. The ongoing activity will manage the FAA's R,E&D portfolio, meet the President's criteria for R&D, increase program efficiency, and maintain management and operating costs.

This activity produces the National Aviation Research Plan (NARP), an annual strategic plan for FAA R&D; administers the congressionally mandated R,E&D Advisory Committee (REDAC); conducts external program coordination; fosters future research opportunities; and provides program advocacy and outreach.

Agency Outputs: In FY 2009 FAA will:

- Publish the annual National Aviation Research Plan.
- Host two REDAC meetings and multiple subcommittee meetings. The Committee provides advice on and reviews plans for the annual FAA R&D budget, and produces periodic and special reports providing advice and recommendations to FAA on its R&D program.
- Support the NextGen initiative.
- Prepare the annual R,E&D budget submission.
- Manage the R,E&D portfolio.
- Coordinate research activities with NASA through FAA's R&D Field Offices.
- Investigate measures for the exchange of research information.

Research Goal:

- In FY 2009 through FY 2013, the FAA will maintain an R,E&D management workforce of no more than 10 percent of the total R,E&D workforce and will sustain the System Planning and Resource Management budget at two percent or less of the total R,E&D budget.
- Develop a strategic mapping for international collaboration.
- Identify a process to measure quality, timeliness, and value of collaboration.

Customer/Stakeholder Involvement: The REDAC reviews FAA research commitments annually and provides guidance for future R,E&D investments. The members of this committee and its associated subcommittees are subject matter experts drawn from various associations, user groups, corporations, government agencies, as well as universities and research centers. Their combined presence in the REDAC fulfills a congressional requirement for FAA R&D to be mindful of aviation community and stakeholder input.

R&D Partnerships: DOT, JPDO, NASA and other Federal Agencies, and EUROCONTROL.

Accomplishments: Program accomplishments include:

- Published the National Aviation Research Plan (February 2007) and submitted to Congress with The President's FY 2008 Budget.
- Managed two REDAC meetings and over twelve subcommittee meetings, which reviewed FAA's proposed FY 2009 R,E&D program.
- Developed the FY 2009 R,E&D budget submission.
- Supported the JPDO's NextGen activities.
- Met the research goal for R,E&D management workforce and funding for System Planning and Resource Management in FY 2007.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Deliver the National Aviation Research Plan to Congress (February 2008) and submit to Congress with The President's FY 2009 Budget.
- Provide strategic direction for the FAA R,E&D program.
- Obtain REDAC guidance for the FY 2010 R,E&D Program.
- Obtain REDAC review of and recommendations for FY 2010 R,E&D Program.
- Developed the FY 2010 R,E&D budget submission.
- Coordinate R&D activities with NASA and other partners.
- Support NextGen activities.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

FAA will continue supporting the work of the REDAC in its task to advise the Administrator on the R&D Program. In particular, it will seek the counsel and guidance of the committee for the FY 2011 program, review the proposed FY 2011 program prior to submission of the budget requirements to the DOT, and seek the committee's guidance during the execution of the R&D program. The agency will publish, as required by Congress, the National Aviation Research Plan and submit it to Congress concurrent with The FY 2010 President's Budget Request.

The program will review the President's R&D criteria, ensuring that the agency's R&D program remains viable and meets national priorities. It will also publish program activities and accomplishments, as well as foster external review of and encourage customer input to the R&D program.

The agency will maintain its field offices at the NASA Ames and Langley Research Centers as a vital part of efforts to coordinate and integrate the research and development programs of NASA and the FAA.

New Initiatives

The new initiative starting in FY 2009 is to provide management for the NextGen R&D program. The purpose is to identify high value products being produced by the R&D program and to promote the use of these products globally, generating value in the international market.

In FY 2009 this initiative will investigate measures for the exchange of research information and begin to examine strategies and processes for international collaboration.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Deliver the National Aviation Research Plan to the Congress (February 2009) and submit to Congress with The President's FY 2010 Budget.
- Administer and facilitate REDAC activities by:
  - Obtaining REDAC recommendations on planned R,E&D investments for FY 2011.
  - Aiding the REDAC in its preparation of other reports, as requested by the Administrator.
- Prepare the FY 2011 R,E&D budget submission.
- Manage FAA's R&D portfolio.
- Support NextGen activities.
- Coordinate R&D activities with NASA and other partners.
- Investigate measures for the exchange of research information.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	39,319
FY 2008 Appropriated	1,184
FY 2009 Request	1,817
Out-Year Planning Levels (FY 20010-2013)	7,546
Total	49,866

Budget Authority ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Contracts:					
R,E&D Plans and Programs	455	1,143	1,192	1,075	1,648
Personnel Costs	53	46	39	37	98
Other In-house Costs	8	0	3	72	71
Total	**516**	**1,189**	**1,234**	**1,184**	**1,817**

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request
Basic	0	0	0	0	0
Applied	516	1,189	1,234	1,184	1,817
Development (includes prototypes)	0	0	0	0	0
Total	**516**	**1,189**	**1,234**	**1,184**	**1,817**

A14a – System Planning and Resource Management Product and Activities	FY 2009 Request ($000)	Program Schedule					
		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
011-130 R,E&D Plans and Programs							
R,E&D Portfolio Development	**225**						
Prepare guidance for budget formulation		◆	◊	◊	◊	◊	◊
Conduct R,E&D financial management		◆	◊	◊	◊	◊	◊
Prepare annual budget submissions		◆	◊	◊	◊	◊	◊
Congressionally Mandated	**425**						
Publish National Aviation Research Plan (NARP)		◆	◊	◊	◊	◊	◊
Conduct REDAC Meetings		◆	◊	◊	◊	◊	◊
NASA Field Offices	**350**	◆	◊	◊	◊	◊	◊
Research Collaborations (NextGen)	**648**						
Determine measures for exchange of research information			◊	◊			
Develop a strategic mapping for international collaboration			◊	◊	◊	◊	
Identify a process to measure quality, timeliness, and value of collaboration			◊	◊	◊	◊	
Calculate values of collaboration					◊	◊	◊
Personnel and Other In-House Costs	**169**						
Total Budget Authority	**1,817**	**1,184**	**1,817**	**2,136**	**1,839**	**1,803**	**1,768**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A14.b.	**William J. Hughes Technical Center Laboratory Facility**	**$3,536,000**

GOALS:

Intended Outcomes: FAA sustains research facilities located at the William J. Hughes Technical Center (WJHTC) in support of its R&D program goals. These facilities consist of the Research and Development Flight Program (Aircraft), Simulation facilities, and the Research and Development Human Factors Laboratory (RDHFL).

Agency Outputs: R&D programs require specialized facilities to emulate and evaluate field conditions. For example, human factors projects require ground-based laboratories to perform human-in-the-loop simulations, measure human performance, and evaluate human factors issues. These laboratories are comprised of integrated cockpit and air traffic control workstation simulators, and the performance issues they delve into reflect the perspectives of the pilot and flight crew. Airborne and navigation projects require additional "flying laboratories" that are specially instrumented and reconfigurable to support a variety of projects.

Customer/Stakeholder Involvement: The WJHTC facilities directly support agency projects and integrated product teams in the following areas:

- Capacity and air traffic management technology.
- Communications, Navigation, And Surveillance.
- Operational Evolution Plan (OEP) concept validation.
- NextGen.
- Weather.
- Airport technology.
- Aircraft safety technology.
- Human Factors.
- Information Security.
- Environment and Energy.
- Automated Dependent Surveillance-Broadcast.
- Terminal Instrumentation Procedures (TERPS).
- Wide Area Augmentation System.

R&D Partnerships: In addition to FAA's research programs, WJHTC laboratories cooperate with the Canadian Ministry of Transport, NASA, U.S. Air Force, EUROCONTROL, RTCA, Aircraft Owners and Pilots Association, International Civil Aviation Association, academia, and industry.

Accomplishments: The technical laboratory facilities provide the reliable test bed infrastructure to support R&D program goals and outputs.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

The following programs are supported by the laboratories:

- Runway Incursion.
- Information Security.
- Separation Standards.

- Wide Area Augmentation System (WAAS).
- TERPS.
- Satellite Communication.
- Data Link.
- Acquisition Human Factors.
- Delay Reduction.
- Dynamic Vertical Reduced Separation Minima (DRVSM).
- The OEP.
- Airspace Re-sectorization Studies.

FY 2009 PROGRAM REQUEST:

The WJHTC will sustain technical laboratories/facilities that support R&D programs.

Ongoing Activities

- NextGen.
- Capacity Initiatives (Airspace, Procedures).
- Information Security.
- Satellite Communication and Navigation Programs.
- Separation Standards.
- Wide Area Augmentation System.
- TERPS.
- Runway Incursion.
- Aircraft Safety.
- Air Traffic Control/Airway Facilities Human Factors.
- OEP Concept Validation.
- DRVSM.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

The test beds at the WJHTC provide the necessary infrastructure for R&D programs to achieve agency goals. Specific milestones and products are contained within individual programs.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2007)	$103,475
FY 2008 Appropriated	3,415
FY 2009 Request	3,536
Out-Year Planning Levels (FY 2010-2013)	15,503
Total	$125,929

Budget Authority ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Contracts:					
WJHTC Laboratory Facility	983	572	779	667	684
Personnel Costs	2,293	2,712	2,584	2,642	2,672
Other In-house Costs	86	75	67	106	180
Total	**3,362**	**3,359**	**3,430**	**3,415**	**3,536**

OMB Circular A-11, Conduct of Research and Development ($000)	**FY 2005 Enacted**	**FY 2006 Enacted**	**FY 2007 Enacted**	**FY 2008 Enacted**	**FY 2009 Request**
Basic	0	0	0	0	0
Applied	3,362	3,359	3,430	3,415	3,536
Development (includes prototypes)	0	0	0	0	0
Total	**3,362**	**3,359**	**3,430**	**3,415**	**3,536**

A14.b – WJHTC Laboratory Facility Product and Activities	FY 2009 Request ($000)	Program Schedule FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
011-140 WJHTC Laboratory Facility							
Simulation Facilities (Target Generator Facility, Cockpit Simulators)	**54**						
Approach Procedures		◊	◊				
Next Generation Air Traffic System (NextGen)		◊	◊	◊	◊	◊	◊
Airspace Design		◊	◊	◊	◊	◊	◊
Operational Evolution Plan Concept Validation		◊	◊	◊	◊	◊	◊
Dynamic Vertical Reduced Separation Minima (DRVSM)		◊	◊	◊	◊	◊	◊
Research & Development Flight Program (Aircraft)	**576**						
Satellite Communications and Navigation Programs		◊	◊	◊	◊	◊	◊
Separation Standards		◊	◊	◊	◊	◊	◊
Wide Area Augmentation System (WAAS).		◊	◊	◊	◊	◊	◊
TERPS		◊	◊	◊	◊	◊	◊
Aircraft Safety		◊	◊	◊	◊	◊	◊
Runway Incursion		◊	◊	◊	◊	◊	◊
Next Generation Air Transportation System (NextGen)							
Research and Development Human Factors Laboratory	**54**						
Air Traffic Control Human Factors		◊	◊	◊	◊	◊	◊
Airway Facilities Human Factors		◊	◊	◊	◊	◊	◊
Operational Evolution Plan Concept Validation		◊	◊				
Personnel and Other In-House Costs	**2,852**						
Total Budget Authority	**3,536**	**3,415**	**3,536**	**3,674**	**3,804**	**3,941**	**4,084**

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

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GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(LIMITATION ON OBLIGATIONS)
(AIRPORT AND AIRWAY TRUST FUND)

For liquidation of obligations incurred for grants-in-aid for airport planning and development, and noise compatibility planning and programs as authorized under subchapter I of chapter 471 and subchapter I of chapter 475 of title 49, United States Code, and under other law authorizing such obligations; for procurement, installation, and commissioning of runway incursion prevention devices and systems at airports of such title; for grants authorized under section 41743 of title 49, United States Code; and for inspection activities and administration of airport safety programs, including those related to airport operating certificates under section 44706 of title 49, United States Code, $3,600,000,000, to be derived from the Airport and Airway Trust Fund and to remain available until expended: Provided, That none of the funds under this heading shall be available for the planning or execution of programs the obligations for which are in excess of $2,750,000,000 in fiscal year 2009, notwithstanding section 47117(g) of title 49, United States Code: Provided further, That none of the funds under this heading shall be available for the replacement of baggage conveyor systems, reconfiguration of terminal baggage areas, or other airport improvements that are necessary to install bulk explosive detection systems: Provided further, That notwithstanding any other provision of law, of funds limited under this heading, not more than $87,454,232 shall be obligated for administration, not less than $15,000,000 shall be available for the Airport Cooperative Research program, and not less than $19,347,834 shall be for Airport Technology Research program.

Program and Financing (in millions of dollars)

Identification code: 69-8106-0-7-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
	Direct Program:			
00.01	Grants-in-aid for airports	3,578	. . . .	2,629
00.02	Personnel and related expenses	75	81	87
00.03	Airport technology research	18	3	19
00.05	Small community air service	10	. . . .	. . . .
00.06	Airport Cooperative Research	10	. . . .	15
01.00	Total direct program	3,691	84	2,750
09.01	Reimbursable program	0	1	1
10.00	Total new obligations	3,691	85	2,751
	Budgetary resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	40	203	34
22.00	New budget authority (gross)	3,677	-168	2,751
22.10	Resources available from recoveries of prior year obligations	177	84	. . . .
23.90	Total budgetary resources available for obligation	3,894	119	2,785
23.95	Total new obligations	-3,691	-85	-2,751
24.40	Unobligated balance carried forward, end of year	203	34	34
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (trust fund)	4,399	4,399	3,600
40.49	Portion applied to liquidate contract authority	-4,399	-4,399	-3,600
43.00	Appropriation (total discretionary)	. . . .	. . . .	. . . .
49.00	Contract authority	. . . .	. . . .	. . . .
49.35	Contract authority Permanently reduced	. . . .	. . . .	. . . .
49.36	Unobligated balance permanently reduced	. . . .	. . . .	. . . .
49.90	Contract authority (total discretionary)	. . . .	. . . .	. . . .
	Mandatory:			
66.10	Contract authority (Vision 100)	3,700	. . . .	. . . .
66.10	Contract authority (49 USC 48112)	592	. . . .	. . . .
66.10	Contract authority (HJ Res 52)	. . . .	17	. . . .
66.10	Contract authority	. . . .	. . . .	2,750
66.35	Contract authority permanently reduced	-621	-186	. . . .
66.90	Contract authority (total mandatory)	3,671	-169	2,750
58.90	Spending authority from offsetting collections	6	1	1
70.00	Total new budget authority (gross)	3,677	-168	2,751
	Change in obligated balances:			
72.40	Obligated balance, start of year	5,734	5,368	2,398
73.10	Total new obligations	3,691	85	2,751
73.20	Total outlays (gross)	-3,878	-2,971	-4,091
73.45	Recoveries of prior year obligations	-177	-84	. . . .
74.00	Change in uncollected customer payments	-2	. . . .	. . . .
74.40	Obligated balance, end of year	5,368	2,398	1,058
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	685	16	583
86.93	Outlays from discretionary balances	3,193	2,955	3,508
87.00	Total outlays (gross)	3,878	2,971	4,091
	Offsets:			
	Against gross budget authority and outlays:			
88.40	Offsetting collections (cash) from: Non-Federal sources	6	1	1

	Net budget authority and outlays:			
89.00	Budget authority	3,671	-169	2,750
90.00	Outlays	3,874	2,970	4,090

Subchapter I of chapter 471, title 49, U.S. Code (formerly the Airport and Airway Improvement Act of 1982, as amended) provides for airport improvement grants, including those emphasizing capacity development, safety and security needs; and chapter 475 of title 49 provides for grants for aircraft noise compatibility planning and programs.

Object Classification (in millions of dollars)

Identification code: 69-8106-0-7-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct obligations:			
	Personnel compensation			
11.1	Full-time permanent	49	53	56
11.3	Other than full-time permanent	1	1	1
11.5	Other personnel compensation	1	1	1
11.9	Total personnel compensation	51	55	58
12.1	Civilian personnel benefits	13	13	14
21.0	Travel and transportation of persons	3	3	3
25.2	Other services	31	13	46
26.0	Supplies and materials	1	. . . .	. . . .
31.0	Equipment	1	. . . .	1
41.0	Grants, subsidies, and contributions	3,591	. . . .	2,628
99.0	Subtotal, direct obligations	3,691	84	2,750
99.0	Reimbursable obligations	. . . .	1	1
99.9	Total new obligations	3,691	85	2,751

Personnel Summary

Identification code: 69-8106-0-7-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct:			
1001	Civilian full-time equivalent employment	513	540	550
	Reimbursable:			
2001	Civilian full-time equivalent employment	4	6	6

EXHIBIT III-1

GRANTS-IN-AID FOR AIRPORTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2007 ACTUAL	*FY 2008 ENACTED	FY 2009 REQUEST	CHANGE FY 2008-2009
Grants-in-Aid for Airports	3,577,742	3,395,112	2,628,198	-766,914
Personnel & Related Expenses	75,029	80,676	87,454	6,778
Airport Technology Research	17,748	18,712	19,348	636
Small Community Air Service	10,000	10,000	0	-10,000
Airport Cooperative Research	9,969	10,000	15,000	5,000
TOTAL	**3,690,488**	**3,514,500**	**2,750,000**	**-764,500**
FTEs				
Direct Funded	554	540	550	10
Reimbursable	4	6	6	0

* In FY2008, the Grants-in-Aid to Airports program has an Obligation Limitation of $3,514,500,000, but only $16 million in new Contract Authority (which is the total amount obligated under the Continuing Resolution). The program cannot award new grants until sufficient Contract Authority is provided for FY2008.

Program and Performance Statement

This account provides funds for planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment.

EXHIBIT III-2

GRANTS-IN-AID FOR AIRPORTS
SUMMARY ANALYSIS OF CHANGE FROM FY 2008 TO FY 2009
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Item	Change from FY 2008 to FY 2009	FY 2009 PC&B by Program	FY 2009 FTEs by Program	FY 2009 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2008 Base *					
Grants-in-aid for Airports Appropriations, Obligations, Limitations, and Exempt Obligations		**67,919**	**540**	**37,919**	**$3,514,500**
Adjustments to Base [include items from Exhibit II-6]					
Decrease to AIP Grants	(776,914)				
Annualized FTEs	218	218	2.0		
Annualized FY 2008 Pay Raise	786	786			
FY 2009 OSI	2,037	2,037			
FY 2009 SCI	321	321			
Non-pay Inflation	954			640	
One Less Compensable Day	(284)	(284)			
ACRP Unavoidable Decrease	(232)				
Subtotal, Adjustments to Base	**(773,114)**	**3,078**	**2.0**	**640**	**($773,114)**
New or Expanded Programs					
Equipment to support Airport-GIS	500				
Engineering Specialist	74	74	0.5		
Airport Safety Management Systems (SMS) specialist	74	74	0.5		
Airports GIS	74	74	0.5		
Grant Management Staff Increase	370	370	5.0		
Enterprise Architecture Staff Increase	74	74	0.5		
Safety Certification Inspector Increase	148	148	1.0		
SOAR	1,200			1,200	
Environmental Review Evaluation (Mandate)	100			100	
Non-Primary Evaluation	500			500	
Airport Obstruction Evaluation and Analysis	500			500	
Airport Cooperative Research Program (ACRP)	5,000			5,000	
Subtotal, New or Expanded Program Increases/Decreases	**8,614**	**814**	**8.0**	**7,300**	**$8,614**
Total FY 2009 Request	**(764,500)**	**71,811**	**550**	**45,859**	**$2,750,000**
* FY08 base assumes contract authority will be enacted at or above $3,514,500,000.					

Detailed Justification for Grants-in-Aid for Airports

Grants-in-Aid for Airports	**FY 2009 Request: $2,628,198**

Overview:

Airports are an essential part of aviation system infrastructure. Their design, structural integrity, and ongoing maintenance have a direct impact on safety, capacity and efficiency. Through the Airport Improvement Program (AIP), the agency funds a range of activities to ensure the safety and capacity of U.S. airports. The proposed AIP funding level of $2.63 billion, when combined with programmatic changes we recommend for AIP and passenger facility charge reauthorization, will provide sufficient funding for all high priority safety, capacity, and security projects.

***FY 2008 Base:**

In FY 2008, FAA is emphasizing initiatives to implement airport Safety Management Systems (SMS), to continue the reduction in runway incursions caused by vehicle/pedestrian deviations, and to continue progress at improving Runway Safety Areas (RSAs). In addition, the AIP program provides priority consideration for funding safety-related development for airports that benefit both commercial service and general aviation operations.

In FY 2008, the Office of Airports (ARP) will increase capacity at the 35 Operational Evolution Partnership (OEP) airports or major metropolitan areas by supporting, processing, and approving Airport Master Plans and Environmental Studies and by directing funding investments toward the construction of runway projects (new runways, runway extensions, and airfield reconfigurations) as the most effective method of increasing throughput. ARP expects to administer the AIP program by issuing approximately 2,200 grants to airport sponsors. We will also strive to increase the safety, security and capacity of the global civil aerospace system in an environmentally sound manner.

***Anticipated FY 2008 Accomplishments:**

- Continue improvements to RSAs. 41 RSAs will be improved in FY 2008.
- Continue Airport Cooperative Research, working with the Transportation Research Board to select and fund projects.
- Analyze results of Airport SMS pilot projects initiated in FY 2007.
- Continue rulemaking process to implement Airport SMS.
- Provide AIP funding for three rural airports permitting a minimum 24 hour Visual Flight Rules (VFR) access.
- Implement AIP funding for all approved Runway Safety Action Team (RSAT) recommendations identified in the FY 2008 Airport Capital Improvement Program.
- Provide technical assistance for Master Plan studies for Airfield improvements at South Suburban (Chicago), Southern Nevada Supplemental, Baltimore/Washington and West Palm Beach Airports.
- Continue work on EIS Study for project(s) selected under Executive Order 13274, Environmental Stewardship and Transportation Infrastructure Project Reviews (Philadelphia).
- Monitor and maintain scheduled progress for Environmental Impact Statements at Ft. Lauderdale, South Suburban (Chicago), West Palm Beach, Houston-George Bush, and Southern Nevada Supplemental Airport and Philadelphia.
- Direct AIP funding to address up to 75 surveys and/or infrastructure needs in support of WAAS/LPV approaches.
- Continue support of Airports working group for NextGen.
- Continue work on Future Airport Capacity and Task (FACT) next steps.
- Continue or complete regional studies in the New York, San Diego, San Francisco, Atlanta and Los Angeles metropolitan areas.
- Complete the Addendum to the "*Capacity Needs in the National Airspace System*" report.

- Open new center taxiway at Los Angeles Airport - LAX
- Provide AIP funding for OEP runways identified in the Airports Capital Improvement Program.
- Ensure approximately 20,000 people (residents and school students) in the Day-Light average sound level (DNL) 65dB (decibels) or greater receive benefits from noise compatibility projects funded under AIP.

*** FY08 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

FY 2009 Budget Request:

Safety-related development receives priority consideration for AIP funding. The FY 2009 request would allow the agency to continue supporting the following key initiatives:

Improvements to runway safety areas that do not conform to FAA standards: The agency's long-term goal is to eliminate airport conditions that contribute to accidents by improving RSAs. Since FY 2000, FAA has completed more than 200 RSA projects. As of September 2007, 172 RSAs remain to be upgraded. Forty-one RSAs will be brought up to standards or improved to the extent practicable in FY 2008. By 2010, eighty seven percent of practicable improvements will be completed, with all practicable improvements completed by 2015. RSA projects will continue to carry a high priority for obtaining AIP funding.

Runway incursion reduction: The FAA places a high priority on initiatives that reduce runway incursions. AIP funding will continue to be targeted to implement RSAT recommendations that reduce runway incursions. AIP funding will be used to install additional signs and lights, construct perimeter roads, reconfigure airport taxiways, increase training, and improve procedures.

Airport Safety Management System (SMS): FAA is implementing SMS at airports to harmonize with the ICAO standard. An Airport SMS Advisory Circular (AC) was issued in FY 2007. With the issuance of the AC development of an airport's initial SMS plan/manual became eligible for funding under AIP planning grants. In addition a pilot program was initiated to implement SMS at up to 20 airports in FY 2007. The pilot program will provide useful information as we proceed with an Airport SMS rulemaking action.

Infrastructure condition: The agency recognizes the safety benefits of ensuring that pavement, marking and lighting at airports identified in the National Plan of Integrated Airport Systems (NPIAS) meet current safety and design standards. AIP funding will be directed to ensure that 93 percent of runways at airports in the NPIAS are maintained in good or fair condition, ensure support of the Military Airport Program, develop reliever airports, and support research of airfield pavements to carry existing and new generation aircraft. AIP funding will continue to support this goal by funding: airport pavement and lighting system rehabilitation projects, treatments to minimize hydroplaning in wet conditions, obstruction removal in runway approach zones, perimeter fencing to prevent wildlife entry, and aircraft firefighting equipment. This also includes establishment of navigation aids (NAVAID) such as: instrument landing systems, runway end identifier lights, precision approach path indicators, and non-directional beacons to assist in approach and landing. The AIP and ATO capital programs share the same eligibility for funding NAVAID projects. AIP flexibility will continue to be used to maximize the funding of eligible NAVAID projects.

The agency has a special emphasis in directing AIP investments to reduce accidents in Alaska for general aviation and all Part 135 operations. AIP funding will be directed, where practical, to continue improving rural airports to provide at a minimum 24 hour Visual Flight Rules (VFR) access.

ARP will issue a *Desk Reference for Airport Actions*. This will be a comprehensive reference book explaining how ARP fulfills laws outside NEPA, like the Endangered Species Act, the National Historic Preservation Act, the Clean Air Act specifically for airport actions. ARP analysts will use the *Desk Reference* with Order 5050.4B during their reviews of airport projects.

ARP will publish a list of agency actions that are Presumed to Conform with air quality standards under EPA's general conformity regulations. The List will describe those airport projects that are unlikely to cause significant air quality impacts and provide the analytical rationale for the actions on the List. This effort will enable ARP to quicken its approval of minor airport projects that otherwise would have required more intensive air quality analyses.

ARP will also complete a comprehensive updating of Advisory Circular 150/5020-1, on noise control and Land use compatibility planning.

The 35 airports included in the Operational Evolution Partnership (OEP) account for about 75 percent of all passenger enplanements. Much of the delay to air traffic can be traced to inadequate throughput (measured as arrival and departure rates) at these airports. Airfield construction (new runways, runway extensions, new taxiways, end around perimeter taxiways, and airfield reconfigurations) is the most effective method of increasing throughput. Consequently, constructing new and/or extending runways, taxiways, and airfield reconfiguration are solution sets of the OEP's Airport Development Domain. Arrival and departure rates at the nation's busiest airports are constrained by the limited number of runways that can be in active use simultaneously. The addition of new and extended runways or airfield reconfigurations will expand airport throughput at the target airports, and possibly for other airports in the same metropolitan area. In most cases the airfield projects are sufficient to keep pace with forecasted demand. Since FY 2000, 14 new runway projects have been opened at the 35 OEP airports, allowing 1.6 million more annual operations. Currently, seven OEP Airports have airfield projects (3 new runways, two airfield reconfigurations, one runway extension, and 1 end around taxiway) under construction. These projects will be commissioned through 2011 providing these airports with the potential to accommodate 400,000 more annual operations and significantly reduce runway crossings. The complete listing of airfield projects included in the OEP is shown in the table below.

Airport	Anticipated Opening Date	Status
Los Angeles (Reconfig, safety)	Relocate RW New TW June 2008	Runway Re-opened 3/07 Construction started 3/07
Philadelphia (Extension)	TBD	Under construction
Seattle-Tacoma	November 2008	Under construction
Washington Dulles	November 2008	Under construction
Chicago O'Hare (Reconfig.; Phase 1 w/3 projects)	November 2008 November 2008 TBD	Under construction (9L/27R) Under Construction (9R/27L Ext) TBD (10C/28C)
Charlotte	February 2010	Under construction
Dallas-Ft. Worth (End Around Taxiway)	October 2008	Under Construction

In addition ten other OEP projects (three airfield reconfiguration, and seven new runway/ runway extensions) are currently in various stages of the planning and environmental processes. New projects are included in the OEP when the environmental processing has been completed, the Record of Decision has been issued, and the sponsor has provided the FAA with the dimensions, timing, alignment, and planned use of the runway. For details on these proposed projects, see the table below. In addition, there are seven projects that are beyond the 2017 OEP horizon.

Airport or Metropolitan Area	Project	ROD will be Issued (Est.)	Status
Ft. Lauderdale	Extension	2008	EIS began in February 2005
Philadelphia	Reconfiguration	2009	Master Plan completed. EIS underway.
Portland Int'l	Extension	2010	Pre-NEPA studies underway

Houston Intercontinental	New Runway	TBD	Planning completed. EIS to begin shortly.
Denver Int'l	New Runway	TBD	Study underway
Chicago O'Hare	Reconfiguration Phase 2	2005	ROD issued
Los Angeles	Reconfiguration – North Runway Complex	2005	ROD issued
Washington Dulles	New Runway	2005	ROD issued
Salt Lake City	Runway Extension	TBD	Begin planning around 2010
Tampa	Runway	TBD	Begin planning around 2013

For runways, runway extensions and airfield reconfigurations included in the OEP, a horizontal integration team was established, comprised of all involved FAA lines of business along with a military representative. The team develops a runway template action plan comprised of tasks that must be considered when commissioning that runway and assigns accountability to the airport, airline, and FAA. This allows for early identification and resolution of issues that might impact the runway schedule. Quarterly meetings are held with airport operators and airlines. The FAA provides vital technical and financial assistance for planning, environmental analysis, and construction/rehabilitation of runways, taxiways, and aprons as well as other measures to expand and make more efficient use of airports. AIP funding plan will reflect a special emphasis on increasing capacity and improving the airport arrival efficiency rate. AIP funding of the following airport projects contributes to these goals:

- Construct, rehabilitate or overlay existing runways, taxiways, and aprons.
- Extend runways, taxiways, and aprons.
- Construct/improve terminal buildings.
- Acquire and install visual approach aids.
- Acquire and install Instrument Landing Systems (ILS).
- Acquire and install weather-reporting equipment.
- Bring pavement and other facilities up to design standards.
- Construct new airports/heliport

ARP assesses the environmental impacts of proposed airport projects submitted for AIP and Passenger Facility Charge (PFC) program funding or other approval, and provides technical and funding support to mitigate impacts. Noise is still the impact of greatest concern, and the AIP and PFC programs provide funding to assist in abating the impacts of aircraft noise in the neighborhoods surrounding airports.

ARP strives to reduce undue delays in the environmental review of airport projects while maintaining the integrity of the environmental process and complying with all environmental protection requirements. ARP has streamlined environmental documentation requirements; undertaken actions to improve interagency coordination; issued revised environmental guidance for airport development; and has developed and utilizes recommended best practices for conducting environmental analysis and processing. In addition, efforts have been taken to integrate the airport planning and environmental processes. This will help streamline these processes and provide airport sponsors with opportunities for early input on both planning and environmental issues.

In FY 2009, ARP will continue to implement environmental streamlining provisions for capacity enhancement projects at congested airports, as specified by Congress in the Vision 100-Century of Aviation Reauthorization Act. Commissioning of new commercial service runways is dependent on the timely completion of environmental reviews. FAA staff will continue to apply new streamlining provisions of Executive Order 13274 on Environmental Stewardship and Transportation Infrastructure Project Reviews in order to facilitate the completion of designated airport projects.

After the identification of the impacted areas, often through AIP-funded studies, funding may help to purchase and relocate residences and businesses, soundproof residential homes or buildings used for educational or medical purposes, and purchase and install noise barriers or monitors. The AIP funding plan contributes to mitigating the harmful effects of aircraft noise for those living, working or going to school inside the significant aviation noise footprint. AIP funding will be provided for noise compatibility projects that benefit an expected population of 100,000 for FYs 2006 – 2010, measured on an annual basis with a rolling average of 20,000 per year. The annual population and school benefits is an "expected" number based on the number of residential units and schools specified in grant applications, census data on average household occupancy, and school records for school occupancy for the area.

The grants issued under the AIP also provide funding to airports for equipment and facilities used to control access to their critical operations areas. In order to receive funding, projects must have been identified in TSA-approved security plans for airports covered by Part 1542, Airport Security or at airports not covered by Part 1542 and having security requirements.

Security projects required by statute or regulation carry a high priority for AIP funding. Projects providing for the security of passengers and other persons in the terminal, as well as the terminal buildings themselves, are treated equally with projects to secure aircraft and the aircraft operations area. ARP will continue to work with both airport owners and TSA representatives in identifying security requirements and discussing appropriate funding sources. The most common type of security project supported by AIP funding is the installation of access control equipment. This includes perimeter fencing, security gates, security lighting, and cameras.

Explanation of Funding Changes for Grants-in-Aid for Airports

	Dollars ($000)	FTE
Grants-in-aid for Airports (Net change from FY 2008)	**-766,914**	**0**
Overview: For FY 2009, the Associate Administrator for Airports requires $2,628,197,934 to meet the mission of planning and developing a safe and efficient national airport system. This represents a decrease of $766,914,066 from the FY 2008 Obligation Limitation.		
Airport Improvement Program (AIP) Grants: The $2.75 billion requested for AIP, when combined with programmatic changes for AIP and passenger facility charge reauthorization will enable the FAA to meet all national priorities for safety, security and capacity and assure stable capital funding across all sizes of airports. Our proposal will assure stable AIP funding to smaller airports that are most dependent on AIP to meet their capital needs. The proposal will also assure that AIP discretionary funding will be available to airports of all sizes to help finance costly capacity and safety initiatives such as new runways at OEP airports and runway safety area improvements. Under our reauthorization proposal for AIP will be supplemented by modifications to the PFC program to enhance PFC's as a tool to enhance airport self-sufficiency and to meet airport capital needs.	-766,914	0

Detailed Justification for Personnel & Related Expenses

Personnel & Related Expenses	FY 2009 Request: $87,454

Overview:

The Associate Administrator for Airports (ARP) provides leadership in planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment. The Management Staff (ARP-10) is the principal advisor to the associate administrator in the management and administrative requirements areas, provides the focal point for coordination, and represents the Associate Administrator in matters relating to planning and utilization of agency resources. The Office of Airport Safety and Standards (AAS) is the principal FAA organization responsible for all airport program matters pertaining to standards for airport design, construction, maintenance, operations, safety, and data, including ensuring adequacy of the substantive aspects of FAA rulemaking actions relating to the certification of airports. The Office of Airport Planning and Programming (APP) is the principal FAA organization responsible for all program matters pertaining to national airport planning and environmental requirements, airport grants, property transfers, passenger facility charges, and ensuring adequacy of the substantive aspects of FAA rulemaking actions relating to these programs.

***FY 2008 Base:**

ARP establishes regulations for safe operation of commercial service airports and regularly inspects certificated airports for compliance. In FY 2008, we are emphasizing efforts to continue the reduction in runway incursions caused by vehicle/pedestrian deviations. This will require ensuring airports maintain effective driver training programs as well as implementing approved Runway Safety Action Team recommendations. We also have a special emphasis program to accelerate improvements to runway safety areas that do not meet current standards. Another significant initiative is implementation of Safety Management Systems (SMS) at airports to harmonize with ICAO standards. Further, AIP provides priority consideration for funding safety-related development for airports that benefit both commercial service and general aviation operations.

In FY 2008, ARP will increase capacity at the 35 Operational Evolution Partnership (OEP) airports or major metropolitan areas by supporting, processing, and approving Airport Master Plans and Environmental Studies, directing funding investments toward capacity and delay reduction development, increasing the safety and capacity of the global civil aerospace system in an environmentally sound manner, and ensuring the success of its mission through stronger leadership, a better-trained workforce, a closer eye on spending, and improved decision-making based on reliable data.

***Anticipated FY 2008 Accomplishments:**

- Publish Advisory Circulars (AC) in FY 2008 that were contracted in FY 2007 or FY 2006.
- Award contracts for ACs in FY 2008 within 60 days of funds authorization as funding permits.
- Reduce average age of ACs to 5.2 years by the end of FY 2008. The average age of ACs was 13.5 when we started this initiative in FY 2002.
- Continue implementation of Airport Safety Management Systems (SMS).
- Manage and execute Part 139 Airport Safety Certification program.
- Meet Part 16 compliance schedules.
- The AAS and Regional team will conduct two on-site airport compliance inspections for revenue diversion by September 30, 2008.
- Each region will conduct at least two land use inspections at General Aviation airports by September 30, 2008.
- Support the Joint Planning Development Office by identifying and implementing operational improvements from CONOPS.

- Support the President's Management Agenda for E-Government by participating and providing resources to the Grants.gov and DOT grants portal initiative.
- Establish and implement ARP performance target for administering AIP based on identified Best Practices and Program Review.
- Administer the $2.75 billion AIP by issuing approximately 2,200 grants meeting FAA Flight Plan and ARP Business Plan performance targets.
- Close out 95 percent of grants, except those covered by extraordinary or unusual circumstances (litigation, SBG, etc.) issued for FY 2004 and prior years by September 30, 2008.
- Assure that no grants still open on September 30, 2007, will have been inactive for 18 months or more on September 30, 2008 except for special circumstances (project in litigation, etc.).
- Issue 90 percent of grants (reported by number of grants) based on bids (for construction and equipment) by September 30, 2008.
- Fund WAAS/LPV surveys and/or infrastructure needs by September 30, 2008.

*** FY08 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

FY 2009 Budget Request:

FY 2009 funding will continue supporting the establishment and maintenance of high safety standards for U.S. airports. High standards reduce risks and contribute directly to a reduction in fatal accidents.

Under Part 139 of the Federal Aviation Regulations, FAA certifies airports with air carrier service for aircraft with more than nine passenger seats. The purpose of this regulation is to reduce commercial accidents by making the airport environment safe, which is accomplished by establishing and enforcing minimum safety standards. The FAA is also implementing Safety Management Systems (SMS) at airports to harmonize with ICAO SMS standards. There are 35 FAA airport certification safety inspectors, who inspect about 600 civilian airports. The inspections take anywhere from a day to more than a week, depending on the size and complexity of the airport. If an airport is found to be noncompliant with the regulation, the airport inspector may issue a letter of correction or take civil action, such as fining the airport or, in extreme cases, revoking the airport's certificate. The FY 2009 requests includes and increase of two airport certification safety inspectors to bring this staff total to 37.

Through the Airport Safety Data Program, the agency gathers information on all public-use airports for dissemination to pilots. The information is gathered by FAA's airport certification safety inspectors and through state inspectors funded by the agency. Information on the airport, such as lighting systems, pavement condition, runway lengths, and type of fuel available is entered into the National Flight Data Center database. The information is used to publish the Airport Facility Directory as well as for incorporation on aeronautical charts.

The FAA's engineering and technical support staff develops ACs and technical specifications. These technical documents provide airports with guidance on how to comply with airport safety regulations. ACs and technical specifications are maintained for areas such as airport signage, airport design and planning, airport rescue and firefighting, and on reducing wildlife hazards near airports. Regional engineers also review proposed airport safety and development projects.

ARP staff manages and executes the AIP grant program, providing funding for eligible Part 1542 security requirements identified in security plans approved by the Transportation Security Administration (TSA). ARP staff provides guidance on AIP eligibility, formulate the Airports Capital Improvement Program (ACIP) identifying security needs, and work closely with the respective airport owners and TSA to fund eligible security requirements. The Office of Airports will continue to work with both airport owners and TSA representatives in identifying security requirements and discussing appropriate funding sources.

ARP will provide vital technical and financial assistance for planning, environmental analysis, and construction, rehabilitation, or overlays of runways, taxiways, and aprons as well as other measures to expand and make more efficient use of airports. ARP staff actively participates in developing and maintaining the Runway Template Action Plan (RTAP) supporting the timely commissioning of the runways. ARP staff will continue to ensure timely review of planning, environmental and financial efforts for infrastructure development with an emphasis on capacity enhancing projects.

ARP staff assesses the environmental impacts of proposed airport projects submitted for AIP funding or other approval, and provide technical and funding support to mitigate impacts. Noise and air quality are the impacts of greatest concern, and the AIP and Passenger Facility Charge (PFC) programs provide funding to assist in abating the impacts of aircraft noise and emissions in the neighborhoods surrounding airports. In addition, ARP staff will continue to apply new streamlining provisions in both the Executive Order 13274 on Environmental Stewardship and Transportation Infrastructure Project Reviews and Vision 100 to OEP projects.

ARP also promotes improved international safety and regulatory oversight by participating in International Civil Aviation Organization (ICAO) panels and workgroups and by providing technical assistance to countries seeking to improve airport safety and operations.

Explanation of Funding Changes for Personnel & Related Expenses

	Dollars ($000)	FTE
Personnel and Related Expenses (Net change from FY 2008)	**6,778**	**9**
Overview: For FY 2009, the Associate Administrator for Airports requires $87,454,232 and 527.5 FTEs to meet its mission of providing leadership in planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment. Covering the administrative expenses for the Office of Airports, this request represents an increase of $6,778,062 from the FY 2008 Obligation Limitation. The increase is due to a combination of several program increases, unavoidable pay raises, inflation, and discretionary increases.		
Annualized FTEs: This represents the net annualized cost of FY2008 new hires.	145	1.5
Annualized FY 2008 Pay Raise: This increase is needed to provide for the full-year cost associated with the pay raise in January 2008. The actual factor used is 4.4 percent (3.5 percent average government-wide pay raise plus 0.9 percent). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY2008.	749	
FY 2009 Organizational Success Increase (OSI): This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2008 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.	1,942	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees providing superior contributions to the organization. The factor used is 0.63 percent, which is the remaining portion of the eliminated Within-Grade increases.	306	

	Dollars ($000)	FTE
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	367	
One Less Compensable Day in FY 2009	-271	
Airport Safety Management Systems (SMS): The requested increase will provide an FTE to support FAA in implementing SMS at airports to harmonize with the International Civil Aviation Organization Safety Management Systems (ICAO SMS) standards. The additional SMS staff is required to manage the SMS implementation at almost 600 certificated airports. The person will prepare guidance for airports, update Advisory Circulars, conduct training for airport safety and certification inspectors, conduct the SMS rulemaking process, and coordinate SMS implementation with the airport associations and the airports.	74	0.5
Airport Certification Safety Specialists: Two certification and safety specialists (1.0 FTE) are required to support increased workload on inspectors. Currently we have 35 inspectors and their workload is significantly increasing because of the amendment to Part 139 that required certification of smaller airports – those with commercial service with aircraft over 9 seats. In addition FAA is undertaking a major initiative to implement Safety Management Systems (SMS) at airports to harmonize with ICAO standards. The certification and safety inspectors will be responsible for reviewing airport SMS plans at certificated airports to ensure they conform to FAA requirements.	148	1.0
Airport Geographic Information System (GIS): FAA is developing a unified database to maintain airport survey data. The database will be used to prepare electronic obstruction charts, and electronic Airport Layout Plans. One position is required to manage this program, as it will involve collecting and validating data from all public use airports (5,261). The software and database are under development and will be operational in FY-09. The funding request will support one person needed to prepare guidance for airports and update advisory circulars on data format and requirements. The position will also coordinate implementation of this program with airports and the airport associations.	74	0.5

	Dollars ($000)	FTE
Airport Obstruction Evaluation and Analysis: Every 28 days, updated National Airspace System (NAS) data is published. In order for the Office of Airports to meet its responsibilities in the maintenance of the NAS, a viable and vital Obstruction Evaluation and Airport Airspace Analysis (OEAAA) program is required. OEAAA is the primary mechanism for the collection of airport/runway data and the coordination of airport projects. With the reorganization of the Air Traffic Organization it is imperative for the Office of Airports to undertake a complete review of its responsibilities and guidance under the OEAAA program. This thorough analysis will yield the critical obstruction evaluation and non-rulemaking airport enhancements to the OEAAA software used by all the FAA lines of business. Secondly, the analysis will clearly define the current and future manpower requirements of the Office of Airports to meet our airspace obligations. The analysis will further the process of integrating all airport data (OEAAA, 5010, GIS, eALP, etc.) under single leadership, eliminating duplication of effort and improving the integrity and availability of the data. To standardize the process and provide definitive guidance to the airports regional and district offices charged with implementing the program, we will prepare the necessary revisions to FAA Order 7400.2 "Procedure for Handling Airspace Matters", Part 3 "Airport Airspace Analysis". The changes to the directives and software will allow us the opportunity to prepare and deliver basic OEAAA computer program training to our field personnel, increasing their efficiency while reducing their workload. Basic OEAAA training includes: (1) the immediate development of training on the use of the current OEAAA computer system, as well as its delivery to the 9 Regions and ADOs, and the 3 ATO Service Areas and (2) the development of an Academy level airspace class from an Airports perspective to train Airports personnel in their role in the airspace process. All training will emphasize the importance of Airports role in data management and data quality in the maintenance of the NAS. Contract support of $300,000 will be for the analysis and preparation of updated and new Advisory circulars and orders. The remaining $200,000 is to support workgroups developing updated OEAAA training requirements and materials, and conducting training for field personnel.	500	0
System of Airport Reports (SOAR): The increase is requested for contractor support and materials to perform several modifications to the system that will result in performance and quality improvements, cost reductions, federal requirement compliance and increased customer satisfaction. These modifications will include a technology refresh to make SOAR a completely Web-based architecture application (this will eliminate the current need for special thin-client "CITRIX" desktop software and related servers, reducing the complexity of the system, lower cost and increased reliability), and the implementation of Single Sign On (SSO) to the active directory (allowing end users to access the system with their initial intranet logon). Modifications will also be made to support programmatic business processes, including the development of additional software functionality to allow end users to create and	1,200	0

	Dollars ($000)	FTE
share queries and reports with peers (including grant performance tracking and metrics, increased oversight and system usability while reducing long term contractor dependency). This request will also be used to create new interfaces to the Agency's accounting system and for an external user to enter Air Carrier and Public Agency data into the Passenger Facility Charge (PFC) and Air Carrier Activity Information System (ACAIS), which is now done by contractors. Additionally, this funding will be used to implement the modifications specified in the strategy being developed by the Department of Transportation to comply with the Federal Funding Accountability and Transparency Act of 2006 (FFATA) requirements.		
Environmental Evaluation Review: The requested increase will be used to provide a program evaluation of the ARP Environmental Streamlining process as mandated in the Government Performance and Results Act (GPRA). This evaluation will assess the environmental process and provide an understanding of our achievements to date and how we might achieve more effective results or address future conditions. These results are also important in identifying human resources, programs, capital needs, information technology and other resources needed to achieve future outcomes for environmental stewardship and streamlining the environmental review process. This evaluation will provide insight on aviation infrastructure improvements, while enhancing the natural and human environment.	100	0
Enterprise Architecture Specialist: This funding request will support a full-time government employee to fulfill the role of Enterprise Architect Specialist to perform the following duties: Design, implement and operate processes for maximizing the value and assessing the risks of the organizations IT acquisitions, develop processes for selecting, managing and evaluating the IT investments, and developing criteria to apply in considering investments in information systems. This position will also identify quantifiable measurements to determine the net benefits and risks of investments and identify information systems investments that may result in shared benefits or costs. Additionally, the position will develop the Enterprise Architecture strategic and technical planning, policy development, capital planning and investment control, change management, systems engineering and architectural design, business process reengineering, and large scale program management.	74	0.5
Nonprimary Evaluation: This request will be used to provide contract support for a study to evaluate the impact of nonprimary airport apportionments. The study will evaluate the criteria used for including nonprimary	500	0

	Dollars ($000)	FTE
airports in the National Plan of Integrated Airports System (NPIAS) and the application of those criteria in the most recently published plan; the changes in nonprimary airport capital needs between fiscal year 2001 and fiscal year 2007 as reported in the plan, as compared with the amounts apportioned to individual nonprimary airports over the same period of time; the amounts of Airport Improvement Program funds granted to nonprimary airports during said period, by category of nonprimary airport apportionment, state apportionment, and discretionary, as compared with capital needs as reported in the plan; and the exercise of authority to transfer nonprimary airport apportionments		
Grant Management Staff Increase: This funding request is to support 10 additional full time staff positions to provide additional resources for Airport Improvement Programming (AIP) planning and programming activities. The positions will support headquarters, regions and field operations increased workloads. The increased workload is as a result of changes to the non-primary entitlement (NPE) program and increased requirements identified by program audits for increased grant management standardization. The NPE program added over 1,000 grants per year to the workload, and labor and cost accounting data shows that these grants on average require the same or more staff attention than grants at larger airports. Even though the program is mature, with five years of experience, the workload has not abated. Additionally, the added grant activity has also increased demands substantially on the planning staff through all planning phases, including master plan review, Airport Layout Plan review and airspace review coordination. Finally, our programs are being subjected to increasing outside review and audits to comply with new mandates for oversight and accountability of government programs. The requested increase for resources is needed to support these oversight activities.	370	5.0
Equipment to support Airport-GIS program: The Office of Airports requests Computer Aided Drafting and Design (CADD) computers and equipment to evaluate electronic Airport Layout Plans (ALPs) and to support all current airport planning and engineering functions utilizing electronic data. The projected cost of $500,000 will provide computer hardware, plotters, and software to each of our nine (9) regional and twenty-two (22) field offices. The equipment will be used under the Airport-GIS program being implemented in FY-08/09. All future planning documents submitted by an airport will need to be in electronic form. Without the hardware to review and edit those submissions, the process will be severely crippled or negated by still relying on a paper process.	500	

Detailed Justification for Airport Technology Research (ATR)

Airport Technology Research	FY 2009 Request: $19,348

Overview:

For FY 2009, research will be conducted in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to ACs, manuals, and technical specifications that airports rely on when expending AIP funds.

***FY 2008 Base:**

FAA managers and engineering staff both at Headquarters and at the William J. Hughes Technical Center review projects proposed for research. The FAA's Research and Advisory Airport Subcommittee meets with FAA engineers and managers every six months to review research progress as well as the proposed future research requirements and priorities that are reflected in this submittal. The Subcommittee includes representatives from airports, aviation associations, aviation industry, aircraft manufacturers, and the Airline Pilots Association. This mix of airport users ensures that the research proposed is what the airport community needs and reflects their priorities.

The research conducted is producing significant benefits in increased safety and potential cost savings. For example, a GAO report in February 2002 estimated the costs to widen taxiways from 75 feet to 100 feet to meet the standard for new large aircraft such as the A-380 would be $509 million. As a result of research efforts that measured B-747 taxiway deviations at the John F. Kennedy and Anchorage airports, FAA was able to conduct a rigorous risk assessment that justified modification to standards that will permit operations of A-380 aircraft on existing 75-foot-wide taxiways with some conditions. This research project alone could avoid expenditure of hundreds of millions in AIP funds to unnecessarily widen taxiways. Other ongoing pavement research has produced a new pavement design procedure - FAA Rigid and Flexible Integrated Elastic Layered Design (FAARFIELD) - for thickness design, rehabilitation and overlay design using improved material specifications that promise to reduce pavement thickness while maintaining pavement life. New design procedures also promises to save hundreds of millions of dollars in pavement construction and rehabilitation.

In support of safety, research is being conducted in airport lighting and marking to improve pilot situational awareness and reduce runway incursions. Research in innovative methods to reduce the hazard of wildlife strikes to aircraft is also ongoing. Research results are published in a widely distributed manual that provides practical techniques for controlling wildlife near airports. The FAA is evaluating bird detection radar in a cooperative program with the Department of Defense and industry to provide real-time bird hazard data to airport users. Ongoing research is also conducted in aircraft rescue and firefighting and in the use of runway deicers and associated environmental issues.

***Anticipated FY 2008 Accomplishments:**

- Complete evaluation of NextGen High Reach Extendable Turret (HRET) prototype on FAA Fire Research Vehicle.
- Complete technical evaluations of radar systems for the detection of birds.
- Complete studies on methods for wildlife hazards management.
- Complete evaluation of fire modeling for fuselage shapes and dimensions.
- Complete evaluation of radar-based FOD detection system.
- Complete remote airfield lighting system evaluation.
- Conduct field testing of new heliport visual aids.
- Complete airport capacity and delay desktop model.

- Complete the update of Advisory Circular AC 150/5320-6E of FAARFIELD computer program for pavement thickness design.
- Complete asphalt mix design for gyratory compactor.
- Modify the National Airport Pavement Test Facility (NAPTF) test machine for eight and ten wheel landing gears.

*** FY08 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

FY 2009 Budget Request:

The table below summarizes the research activities funded by this request. ($000)

Research Project	FY 2008*	FY 2009	Increase/
		Request	Decrease
Contracts			
Advanced Airport Pavement Design	750	450	(300)
Pavement Design & Evaluation Methodology	900	900	0
National Airport Dynamic Tests	2,500	2,500	0
Field Instrumentation & Testing	540	540	0
Improved Paving Materials	1,100	1,100	0
Non-Destructive Pavement Testing	760	980	220
Pavement Roughness	370	420	50
Material Testing Laboratory	300	300	0
CEAT-University of Illinois		300	300
Airport Planning	500	350	(150)
Airport Design	700	700	0
Operation of NLA	771	800	29
Composite Materials Firefighting	0	436	436
Airport Wildlife Hazards Abatement	2,500	2,500	0
Airport Visual Guidance/Incursions Reduction	2,050	1,825	(225)
Soft Ground Systems Follow on	300	300	0
Surface Technology	1,000	1,000	0
Rescue and Fire Fighting	600	600	0
Subtotal--Contracts	**15,641**	**16,001**	**360**
In-House (FTEs)	**3,071**	**3,347**	**276**
TOTAL	**18,712**	**19,348**	**636**

There are several projects from FY 2008 for which reduced funding is requested in FY 2009. With the release of FAARFIELD, the advanced design project will focus on maintaining the software and continue at a much-reduced funding level ($450,000). Funding for the Improved Paving Material project ($1,350,000) will be complemented with continuing requirements for Field Instrumentation and Testing

($540,000). Work on another new project, Pavement Design and Methodology, will be continued in FY 2009 to investigate and develop the next phase of rigid pavement design procedures, characterization of curling for design, and pavement material characterization ($900,000).

For the Wildlife Hazard Abatement program funding, we are not requesting any increase in FY 2009. We have made considerable progress in recent years evaluating and developing performance standards for radar systems to detect birds in the vicinity of airports, and we will continue improvements to the radar and demonstrate operations at large airports. We will focus research in the human factors aspect of incorporating the bird detection radar information into a user friendly format available to airport users that will support notification of the presence of birds at or near airports.

Explanation of Funding Changes for Airport Technology Research (ATR)

	Dollars ($000)	FTE
Airport Technology Research (Net change from FY 2008)	**636**	**1.0**
Overview: For FY 2009, the Associate Administrator for Airports requires 19,347,834 and 21.5 FTEs to conduct research in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to Advisory Circulars, manuals, and technical specifications that airports rely on when expending Airport Improvement Program (AIP) grant funds.		
Annualized FTEs: This represents the net annualized cost of FY2008 new hires.	73	0.5
Annualized FY 2008 Pay Raise: This increase is needed to provide for the full-year cost associated with the pay raise in January 2008. The actual factor used is 4.4 percent (3.5 percent average government-wide pay raise plus 0.9 percent). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY2008.	36	
FY 2009 Organizational Success Increase (OSI): This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2008 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.	92	
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees providing superior contributions to the organization. The factor used is 0.63 percent, which is the remaining portion of the eliminated Within-Grade increases.	14	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	360	

	Dollars ($000)	FTE
One Less Compensable Day in FY 2009	-13	
Engineering Specialist: The requested increase for an additional position (one half FTE) in FY 2009; will bring the total staffing in the Airport Technology Research Program to 22 positions and 21.5 FTE. The requested increase for an additional position is required because funding for the Airport Technology Research Program has increased dramatically, from approximately $5.0 million in FY 2000 to over $19.0 million in FY 2009. This combination of significantly increased funding and complexity of research projects requires additional engineering staff to effectively manage the work and ensure timely and high quality research products. Without the staffing increase, we anticipate possible project delays and missed opportunities in developing new methodologies, products, and collaboration with other organizations.	74	0.5

Detailed Justification for Airport Cooperative Research Program (ACRP)

Airport Cooperative Research Program	FY 2009 Request: $ 15,000

Overview:

For FY 2009, FAA proposes to continue funding this program from the Grants-in-Aid for Airports appropriation and increase the amount from $10 million to $15 million. ACRP was authorized by section 712 of Vision 100 – Century of Aviation Reauthorization Act. ACRP was authorized at $10 million per year for a four-year pilot program to identify problems that are shared by airport operating agencies and can be solved through applied research, but that are not being adequately addressed by existing Federal research programs. Environmental issues impact every aspect of airport operations, and research is needed in order to plan for, study, and mitigate the impact future environmental requirements will place on airports. Current environmental research in the ACRP includes: minimizing the impact of deicing and anti-icing fluids through new formulations and improved runoff management; airport related hazardous air pollutants and particulate emissions; aircraft noise impacts on the local community; climate change implications from airport operations; and the evaluation of alternative aviation fuels. However, much more research is needed as our society's awareness and sensitivity to environmental issues increases in the future.

The ACRP is uniquely qualified to carry out applied airport environmental research. Increased funding will significantly increase the ability of airport operators to cope with future environmental issues, such as water quality of airport runoff, air quality from engine emissions and aircraft noise.

The Administration's reauthorization includes authorizing ACRP at the $15 million level, with up to $5 million for environmental research studies.

***FY 2008 Base:**

The Secretary of Transportation signed the Memorandum of Agreement among DOT, FAA, and National Academy of Sciences to implement the ACRP. The Secretary also appointed the 13 members of the board of governors of the ACRP. The Transportation Research Board (TRB) of the National Academy is administering the program. The ACRP board of governors has met every 6 months to review progress and select additional topics to fund. Over 130 submitted topics will be reviewed at the July 2007 meeting and the most promising topics selected for contract award in FY 2008. The Board of Governors selects the highest rated topics, subject to the funds available, to proceed to contract solicitation and award. The TRB appoints expert technical panels for each selected project. The technical panels convert the topics into requests for proposals to select contractors to perform the research. The panels also monitor each project to ensure it stays on track and meets project deliverables.

The ACRP program is off to a good start. Over 70 research projects are underway. The first two studies were delivered in FY 2007.

***Anticipated FY 2008 Accomplishments:**

- ACRP Technical Panels monitor progress and deliverables on research projects awarded in FY 2007 and FY 2008.
- Board of governors meet twice during FY 2008 to select projects to fund with the funds appropriated in FY 2008.
- TRB appoint project technical panels to monitor FY 2008 research projects awarded.

*** FY08 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

Explanation of Funding Changes for Airport Cooperative Research Program (ACRP)

	Dollars ($000)	FTE
Airport Cooperative Research Program (Net change from FY 2008)	**5,000**	**0**

Overview:

For FY 2009, FAA requests $15 million for ACRP. There is a discretionary reduction in the contracts portions to offset unavoidable personnel increase. The board of governors will select the most highly rated topics to fund in FY 2008. The Board of Governors will meet twice during FY 2009 to review and select research projects to fund in FY 2009. In 2009, the research reports from the projects started in FY 2007 will be published by the Transportation Research Board (TRB) and made available to airports and the aviation community.

ACRP Projects currently underway include:

- Best Practices for Managing General Aviation and Small Airports.
- Research Needs Associated with Particulate Emissions at Airports.
- Airport-related Hazardous Air Pollutants Analysis.
- Planning Guidelines and Best Practices for Aircraft Deicing Runoff Management Systems.
- Alternative Aircraft and Airfield Deicing and Anti-Icing Formulation with Reduced Aquatic Toxicity and Biological Oxygen Demand.
- Guidebook for Airport-User Survey Methodology.
- Enhancing Airport Land Use Compatibility.
- Airline Passenger Processing Rates.
- Light Detection and Ranging (LIDAR) Deployment Standard for Airport Obstruction Analysis.
- Detection and Mitigation of Potential Lightening Hazards in the Vicinity of Airport Aprons.
- Aircraft Overrun and Undershoot Analysis for Runway Safety Areas.
- Airport Strategies to handle a Chemical/Biological Attack on an Airplane.
- Airport Curbside Capacity Analysis and Operations Management.
- Airport Roadway Level of Service.
- Planning Guidelines for Alternative to Traditional Airport Terminal, Curb and Garage Functions that Enhance Security, Efficiency, Intermodal Connections, and Elderly and Disabled Passenger Access.
- Development of a Reliable Geospatial Data Collection and Management System for Airport Pavement Inspection and Evaluation.
- Guidelines for Establishing, Operating, and Maintaining Full-Service Offsite Terminals.
- Improved Understanding of Aircraft Anti-Icing and Deicing Requirements.

Annualized FY 2008 Pay Raise: This increase is needed to provide for the full-year cost associated with the pay raise in January 2008. The actual factor used is 4.4 percent (3.5 percent average government-wide pay raise plus 0.9 percent). The FY 2008 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY2008.	1	
FY 2009 Organizational Success Increase (OSI): This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.9 percent, composed of the projected 2.9 percent government-wide pay raise in January 2008 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of FAA's pay-	4	

	Dollars ($000)	FTE
for-performance system, this increase assumes FAA will meet most of its FY 2008 performance goals.		
FY 2009 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees providing superior contributions to the organization. The factor used is 0.63 percent, which is the remaining portion of the eliminated Within-Grade increases.	0.5	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2009 GDP price index (year over year) of 2.3 percent.	227	
One Less Compensable Day in FY 2009	-0.5	
ACRP Contracts Decrease There is a discretionary reduction in contracts to offset unavoidable personnel increases.	-232	
Discretionary Increase: The requested increase will be used primarily to support increased research on airport environmental issues. This funding will support research needed in order to plan for, study, and mitigate the impact future environmental requirements will place on airports. Potential research areas include: minimizing the impact of deicing and anti-icing fluids through new formulations and improved runoff management; airport related hazardous air pollutants and particulate emissions; aircraft noise impacts on the local community; climate change implications from airport operations; and the evaluation of alternative aviation fuels. The ACRP is uniquely qualified to carry out applied airport environmental research. The additional funding will significantly increase the ability of airport operators to cope with future environmental issues.	5,000	

AIRPORT IMPROVEMENT PROGRAM
Grants-in-Aid to Airports Planned Distribution
($000)
(Totals may not add due to rounding)

	FY 2007 Enacted	**FY 2008 Enacted	FY 2009 Request
Formula Grants			
Primary Airports	857,687	716,500	620,136
Cargo Service Airports	119,058	118,829	79,615
Alaska	21,345	21,345	18,474
States (General Aviation)	680,332	770,511	600,505
Carryover (from Formula Grants)	447,779	447,779	447,779
Subtotal, Formula Grants	2,126,201	2,074,964	1,766,509
Discretionary Grants			
Discretionary Set-Aside: Noise Compatibility	282,990	271,609	210,256
Discretionary Set-Aside: Reliever*	5,336	0	0
Discretionary Set-Aside: Military Airport Program*	32,342	0	0
Discretionary Set-Aside: Small/NonHub/GA Advanced*	0	264,030	172,338
C/S/S/N	365,906	588,382	359,322
Pure Discretionary	121,969	196,127	119,773
Subtotal, Discretionary Grants	808,543	1,320,148	861,689
Small Airport Fund	466,915	0	0
Total Grants	**3,401,659**	**3,395,112**	**2,628,198**

* Proposed Reauthorization changes applicable for FY08 and FY09
** FY08 amounts are consistent with Obligation Limitation of $3,514,500. However, the program only has $16 million in new contract authority and cannot award new grants until sufficient contract authority is provided for FY2008

AIRPORT IMPROVEMENT PROGRAM
Personnel and Related Expenses
($000)

The request for Personnel and Related Expenses under the Grants-in-Aid for Airports for FY 2009 is $87.454 million, an increase of $6.778 million from the FY 2008 level of $80.676 million. This increase is the result of unavoidable personnel increases of $3.238 million and discretionary increases of $3.540 million. Details on these discretionary increases can be found in the Explanation of Funding Changes table for Personnel and Related Expenses.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2008 Enacted	520	518.5	80,676
FY 2009 Unavoidable Adjustments		1.5	3,238
FY 2009 Discretionary Increases	15	7.5	3,540
FY 2009 Proposed Program Level	**535**	**527.5**	**87,454**

FY 2009 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's	145
2. Annualized FY 2008 Pay Raise	749
3. FY 2009 Organizational Success Increase (OSI)	1,942
4. FY 2009 Superior Contribution Increase (SCI)	306
5. Non-Pay Inflation	367
6. One Less Compensable Day in FY 2009	-271
Subtotal, Unavoidable Adjustments	**3,238**

FY 2009 Discretionary Increases

	Dollars ($000)
1. Airport Safety Management System (SMS) Specialist	74
2. Airport Geographic Information System (GIS) Program Analyst	74
3. Certification and Safety Inspectors	148
4. System of Airport Reports (SOAR)	1,200
5. Environmental Evaluation Review	100
6. Nonprimary Evaluation Review	500
7. Airport Obstruction and Evaluation	500
8. Enterprise Architecture Specialist	74
9. Grants Management Staff	370
10. Equipment to support Airport (GIS)	500
Subtotal, Discretionary Increases	**3,540**

AIRPORT IMPROVEMENT PROGRAM
Airport Technology Research
($000)

The request for Airport Technology Research under the Grants-in-Aid for Airports for FY 2009 is $19.348 million, an increase of $0.636 million from the FY 2008 level. This increase is a result of a discretionary increase of $0.074 million, and annualization of the FTEs. Details on this discretionary increase can be found in the Explanation of Funding Changes table for Airport Technology Research.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2008 Enacted	21	20.5	18,712
FY 2009 Unavoidable Adjustments....................		0.5	562
FY 2009 Discretionary Increases.......................	1	0.5	74
FY 2009 Program Level.............................	**22**	**21.5**	**19,348**

FY 2009 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's..	73
2. Annualized FY 2008 Pay Raise	36
3. FY 2008 Organizational Success Increase (OSI)	92
4. FY 2008 Superior Contribution Increase (SCI)..	14
5. Non-Pay Inflation..	360
6. One Less Compensable Day in FY 2009..	-13
Subtotal, Unavoidable Adjustments..	**562**

FY 2009 Discretionary Increases

	Dollars ($000)
1. Engineer	74
Subtotal, Discretionary Increases...	**74**

AIRPORT IMPROVEMENT PROGRAM
Airport Cooperative Research
($000)

The request for Airport Cooperative Research Program under the Grants-in-Aid for Airports for FY 2009 is $15.000 million. Details can be found in the Explanation of Funding Changes table for Airport Cooperative Research.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2008 Enacted	1	1	10,000
FY 2009 Unavoidable Adjustments			0
FY 2009 Discretionary Increase			5,000
FY 2009 Proposed Program Level	**1**	**1**	**15,000**

FY 2009 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's	0
2. Annualized FY 2008 Pay Raise	1
3. FY 2008 Organizational Success Increase (OSI)	4
4. FY 2008 Superior Contribution Increase (SCI)	0.5
5. Non-Pay Inflation	227
6. One Less Compensable Day in FY 2009	-0.5
7. ACRP Unavoidable Decrease	-232
Subtotal, Unavoidable Adjustments	**0**

FY 2009 Discretionary Increases

	Dollars ($000)
1. Airport Cooperative Research Program	5,000
Subtotal, Discretionary Increases	**5,000**

Passenger Facility Charge (PFC) Approved Locations

As of December 31st, 2007
(Whole Dollars)

PFC APPROVED LOCATIONS
Locations approved to collect at a $4.50 PFC level are indicated by shaded row.

Associated City	State	Airport Name	LOC ID	Hub Size	Level	Total Approved	Duration	Start Date	Est. Expir.Date
Birmingham	AL	Birmingham International	BHM	S	$3.00	$24,548,436	6y3m	8/1/1997	11/1/2003
Birmingham	AL	Birmingham International	BHM	S	$3.00	$21,560,387	4y10m	12/1/2003	10/1/2008
Dothan	AL	Dothan Regional	DHN	N	$3.00	$5,515,948	3y6m	2/1/1998	8/1/2001
Dothan	AL	Dothan Regional	DHN	N	$4.50	**	19y4m	8/1/2001	12/1/2020
Huntsville	AL	Huntsville International - Carl T. Jones Field	HSV	S	$3.00	$18,224,625	12y3m	6/1/1992	9/1/2004
Huntsville	AL	Huntsville International - Carl T. Jones Field	HSV	S	$4.50	$13,629,033	5y8m	9/1/2004	5/1/2010
Mobile	AL	Mobile Regional	MOB	N	$3.00	$4,757,761	6y7m	12/1/1997	7/1/2004
Mobile	AL	Mobile Regional	MOB	N	$3.00	$5,457,218	5y5m	3/1/2005	8/1/2010
Montgomery	AL	Montgomery Regional (Dannelly Field)	MGM	N	$4.50	$28,599,933	21y8m	5/1/2005	1/1/2027
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$3.00	$267,600	11y4m	6/1/1992	10/1/2003
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$3.00	$57,355	4y5m	12/1/2004	4/1/2009
Anchorage	AK	Ted Stevens Anchorage International	ANC	M	$3.00	$36,000,000	8y9m	10/1/2000	7/1/2009
Fairbanks	AK	Fairbanks International	FAI	S	$3.00	$5,196,252	3y6m	10/1/2000	4/1/2004
Fairbanks	AK	Fairbanks International	FAI	S	$4.50	**	2y6m	4/1/2004	10/1/2006
Fairbanks	AK	Fairbanks International	FAI	S	$4.50	$33,217,000	20y	10/1/2006	10/1/2026
Juneau	AK	Juneau International	JNU	S	$3.00	$1,552,249	2y4m	10/1/1998	2/1/2001
Juneau	AK	Juneau International	JNU	S	$4.50	$7,108,472	7y1m	8/1/2001	9/1/2008
Ketchikan	AK	Ketchikan International	KTN	N	$3.00	$6,644,400	2y6m	2/1/1999	8/1/2001
Ketchikan	AK	Ketchikan International	KTN	N	$4.50	**	16y8m	8/1/2001	4/1/2018
Sitka	AK	Sitka Rocky Gutierrez	SIT	N	$4.50	$1,100,000	4y11m	7/1/2007	6/1/2012
Pago Pago	AS	Pago Pago International	PPG	N	$3.00	$1,236,306	4y11m	7/1/1995	6/1/2000
Pago Pago	AS	Pago Pago International	PPG	N	$4.50	$765,000	4y	9/1/2001	9/1/2005
Pago Pago	AS	Pago Pago International	PPG	N	$4.50	$5,848,954	14y6m	6/1/2006	12/1/2020
Flagstaff	AZ	Flagstaff Pulliam	FLG	N	$3.00	$2,463,581	22y1m	12/1/1992	1/1/2015
Peach Springs	AZ	Grand Canyon West	1G4/PGS	N	$3.00	$308,210	2y	9/1/2004	9/1/2006
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$3.00	$300,411,920	6y	4/1/1996	4/1/2002
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$4.50	$645,852,900	10y1m	7/1/2002	8/1/2010
Tucson	AZ	Tucson International	TUS	M	$3.00	$100,461,860	8y8m	2/1/1998	10/1/2006
Tucson	AZ	Tucson International	TUS	M	$4.50	**	6y6m	10/1/2006	4/1/2013
Tucson	AZ	Tucson International	TUS	M	$4.50	$44,194,512	4y5m	4/1/2013	9/1/2017
Yuma	AZ	Yuma MCAS/Yuma International	YUM	N	$3.00	$2,390,423	12y10m	12/1/1993	10/1/2005
Yuma	AZ	Yuma MCAS/Yuma International	YUM	N	$4.50	**	1y6m	10/1/2005	4/1/2007
Yuma	AZ	Yuma MCAS/Yuma International	YUM	N	$4.50	$1,155,674	5y2m	11/1/2007	1/1/2013
Bentonville	AR	Northwest Arkansas Regional	XNA	S	$3.00	$125,005,518	2y4m	12/1/1998	4/1/2001
Bentonville	AR	Northwest Arkansas Regional	XNA	S	$4.50	**	39y2m	4/1/2001	6/1/2040
Fayetteville	AR	Drake Field	FYV		$3.00	$2,221,887	5y	1/1/1996	1/1/2001
Fort Smith	AR	Fort Smith Regional	FSM	N	$3.00	$4,088,371	13y6m	8/1/1994	2/1/2008
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	**	11m	2/1/2008	1/1/2009
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	$1,250,000	3y	1/1/2009	1/1/2012
Little Rock	AR	Adams Field	LIT	S	$3.00	$24,383,919	6y4m	5/1/1995	9/1/2001
Little Rock	AR	Adams Field	LIT	S	$4.50	$45,259,131	8y4m	9/1/2001	1/1/2010
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$3.00	$649,532	6y7m	2/1/1995	9/1/2001
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$4.50	$258,861	3y6m	9/1/2001	3/1/2005
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$188,500	1y1m	2/1/1993	3/1/1994
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$594,758	3y	11/1/1994	11/1/1997
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$1,482,300	5y2m	4/1/1998	6/1/2003
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$671,450	1y9m	6/1/2003	3/1/2005
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$392,265	3m	7/1/2005	10/1/2005
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	*	4m	12/1/2005	4/1/2006
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$1,511,500	2y11m	4/1/2006	3/1/2009
Bakersfield	CA	Meadows Field	BFL	N	$3.00	$1,941,105	6y11m	6/1/1995	5/1/2002

Bakersfield	CA	Meadows Field	BFL	N	$4.50	$9,086,000	12y8m	5/1/2002	1/1/2015
Burbank	CA	Bob Hope	BUR	M	$3.00	$107,029,194	8y7m	9/1/1994	4/1/2003
Burbank	CA	Bob Hope	BUR	M	$4.50	**	4y9m	4/1/2003	1/1/2008
Burbank	CA	Bob Hope	BUR	M	$4.50	$51,268,951	4y8m	1/1/2008	9/1/2012
Chico	CA	Chico Municipal	CIC	N	$3.00	$232,643	4y9m	12/1/1993	9/1/1998
Chico	CA	Chico Municipal	CIC	N	$3.00	$25,000	1y8m	6/1/1999	2/1/2001
Chico	CA	Chico Municipal	CIC	N	$3.00	$536,747	8y1m	11/1/2001	12/1/2009
Crescent City	CA	Jack McNamara Field	CEC	N	$3.00	$58,330	1y9m	9/1/1998	6/1/2000
Crescent City	CA	Jack McNamara Field	CEC	N	$3.00	$223,807	2y5m	1/1/2001	6/1/2003
Crescent City	CA	Jack McNamara Field	CEC	N	$4.50	**	3y10m	6/1/2003	4/1/2007
Crescent City	CA	Jack McNamara Field	CEC	N	$4.50	$253,123	5y5m	4/1/2007	9/1/2012
Fresno	CA	Fresno Yosemite International	FAT	S	$3.00	$55,936,482	8y	12/1/1996	12/1/2004
Fresno	CA	Fresno Yosemite International	FAT	S	$4.50	**	15y1m	12/1/2004	1/1/2020
Imperial	CA	Imperial County	IPL	N	$4.50	$892,781	9y	4/1/2003	4/1/2012
Inyokern	CA	Inyokern	IYK	N	$3.00	$395,852	10y	3/1/1993	3/1/2003
Inyokern	CA	Inyokern	IYK	N	$3.00	$51,000	6m	4/1/2004	10/1/2004
Inyokern	CA	Inyokern	IYK	N	$4.50	$89,999	2y5m	9/1/2006	2/1/2009
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$3.00	$69,493,089	15y4m	8/1/2003	12/1/2018
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$168,397,846	2y6m	7/1/1993	1/1/1996
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$700,000,000	5y5m	2/1/1998	7/1/2003
Los Angeles	CA	Los Angeles International	LAX	L	$4.50	**	2y5m	7/1/2003	12/1/2005
Los Angeles	CA	Los Angeles International	LAX	L	$4.50	$352,249,968	4y7m	12/1/2005	7/1/2010
Mammoth Lakes	CA	Mammoth Lakes	MMH		$3.00	$166,632	10y	9/1/1995	9/1/2005
Modesto	CA	Modesto City County-Harry Sham Field	MOD	N	$3.00	$506,179	10y7m	8/1/1994	3/1/2005
Monterey	CA	Monterey Peninsula	MRY	N	$3.00	$5,617,846	9y6m	1/1/1994	7/1/2003
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$2,199,929	2y9m	7/1/2003	4/1/2006
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$2,153,658	2y3m	5/1/2006	8/1/2008
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$82,578,755	6y9m	9/1/1992	6/1/1999
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$77,631,844	3y8m	9/1/1999	5/1/2003
Oakland	CA	Metropolitan Oakland International	OAK	M	$4.50	**	4m	5/1/2003	9/1/2003
Oakland	CA	Metropolitan Oakland International	OAK	M	$4.50	$190,867,000	7y	9/1/2003	9/1/2010
Ontario	CA	Ontario International	ONT	M	$3.00	$27,333,931	3y5m	7/1/1993	12/1/1996
Ontario	CA	Ontario International	ONT	M	$3.00	$118,454,000	9y4m	7/1/1998	11/1/2007
Ontario	CA	Ontario International	ONT	M	$4.50	$96,648,998	5y6m	11/1/2007	5/1/2013
Oxnard	CA	Oxnard	OXR	N	$4.50	$872,000	9y2m	1/1/2002	3/1/2011
Palm Springs	CA	Palm Springs International	PSP	S	$3.00	$88,415,656	9y4m	9/1/1992	1/1/2002
Palm Springs	CA	Palm Springs International	PSP	S	$4.50	**	27y6m	1/1/2002	7/1/2029
Redding	CA	Redding Municipal	RDD	N	$3.00	$1,009,264	5y	4/1/1997	4/1/2002
Redding	CA	Redding Municipal	RDD	N	$4.50	**	8m	4/1/2002	12/1/2002
Redding	CA	Redding Municipal	RDD	N	$4.50	$1,251,567	4y4m	12/1/2002	4/1/2007
Redding	CA	Redding Municipal	RDD	N	$4.50	$809,295	3y1m	8/1/2007	9/1/2010
Sacramento	CA	Sacramento International	SMF	M	$3.00	$112,695,090	8y9m	4/1/1993	1/1/2002
Sacramento	CA	Sacramento International	SMF	M	$4.50	**	1y1m	1/1/2002	2/1/2003
Sacramento	CA	Sacramento International	SMF	M	$3.00	$163,923,407	6m	2/1/2003	9/1/2003
Sacramento	CA	Sacramento International	SMF	M	$4.50	**	7y6m	9/1/2003	3/1/2011
Sacramento	CA	Sacramento International	SMF	M	$4.50	$11,141,350	4m	3/1/2011	7/1/2011
San Diego	CA	San Diego International	SAN	L	$3.00	$155,869,570	7y10m	10/1/1995	8/1/2003
San Diego	CA	San Diego International	SAN	L	$4.50	$193,140,299	5y8m	8/1/2003	4/1/2009
San Francisco	CA	San Francisco International	SFO	L	$4.50	$833,142,518	15y3m	10/1/2001	1/1/2017
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$3.00	$164,233,114	8y7m	9/1/1992	4/1/2001
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	**	2y	4/1/2001	4/1/2003
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	$808,004,527	23y8m	4/1/2003	12/1/2026
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$615,677	2y	2/1/1993	2/1/1995
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$7,432,277	7y3m	6/1/1995	9/1/2002
San Luis Obispo	CA	San Luis County Regional	SBP	N	$4.50	**	11y10m	9/1/2002	7/1/2012
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$1,040,111	3y	7/1/2012	7/1/2015
San Luis Obispo	CA	San Luis County Regional	SBP	N	$4.50	$3,681,070	6y6m	7/1/2015	1/1/2022
Santa Ana	CA	John Wayne Airport -Orange County	SNA	M	$4.50	$321,351,002	15y6m	7/1/2006	1/1/2022
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$3.00	$9,499,365	4y10m	1/1/1998	11/1/2003
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	**	2y3m	11/1/2003	2/1/2006
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	$6,944,000	3y8m	2/1/2006	10/1/2009
Santa Maria	CA	Santa Maria Public/Capt G Allan Hancock Field	SMX	N	$4.50	$5,380,346	21y	10/1/2007	10/1/2028
Santa Rosa	CA	Sonoma County	STS		$3.00	$719,797	7y11m	5/1/1993	4/1/2001
Santa Rosa	CA	Sonoma County	STS		$4.50	**	4y	4/1/2001	4/1/2005
South Lake Tahoe	CA	Lake Tahoe	TVL		$3.00	$928,747	14y7m	8/1/1992	3/1/2007
Stockton	CA	Stockton Metropolitan	SCK	N	$4.50	$322,665	2y6m	2/1/2007	8/1/2009

Alamosa	CO	San Luis Valley Regional/Bergman Field	ALS	CS	$3.00	$288,836	27y2m	3/1/1997	5/1/2024
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$3.00	$3,869,200	7y10m	7/1/1995	5/1/2003
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$4.50	$713,146	1y3m	5/1/2003	8/1/2004
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$4.50	$4,352,162	5y7m	1/1/2005	8/1/2010
Colorado Springs	CO	City of Colorado Springs Municipal	COS	S	$3.00	$56,229,685	16y5m	3/1/1993	8/1/2009
Cortez	CO	Cortez Municipal	CEZ	CS	$3.00	$200,078	8y4m	11/1/1999	3/1/2008
Denver	CO	Denver International	DEN	L	$3.00	$3,137,099,200	8y9m	7/1/1992	4/1/2001
Denver	CO	Denver International	DEN	L	$4.50	**	25y9m	4/1/2001	1/1/2026
Denver	CO	Denver International	DEN	L	$4.50	$80,386,000	3y1m	1/1/2026	2/1/2029
Durango	CO	Durango-La Plata County	DRO	N	$3.00	$534,282	2y6m	2/1/1995	8/1/1997
Durango	CO	Durango-La Plata County	DRO	N	$3.00	$1,289,455	5y6m	9/1/1997	3/1/2003
Durango	CO	Durango-La Plata County	DRO	N	$4.50	$1,604,120	4y1m	6/1/2005	7/1/2009
Eagle	CO	Eagle County Regional	EGE	N	$3.00	$8,855,961	7y7m	9/1/1993	4/1/2001
Eagle	CO	Eagle County Regional	EGE	N	$4.50	**	8y2m	4/1/2001	6/1/2009
Eagle	CO	Eagle County Regional	EGE	N	$3.00	$300,000	1m	6/1/2009	7/1/2009
Eagle	CO	Eagle County Regional	EGE	N	$4.50	$13,713,255	15y	7/1/2009	7/1/2024
Fort Collins-Loveland	CO	Fort Collins-Loveland Municipal	FNL	N	$3.00	$307,046	5y7m	10/1/1993	5/1/1999
Fort Collins-Loveland	CO	Fort Collins-Loveland Municipal	FNL	N	$4.50	$705,884	5y3m	8/1/2004	11/1/2009
Grand Junction	CO	Grand Junction Regional	GJT	N	$3.00	$4,925,652	13y5m	4/1/1993	9/1/2006
Grand Junction	CO	Grand Junction Regional	GJT	N	$4.50	$8,330,000	16y11m	9/1/2006	8/1/2023
Gunnison	CO	Gunnison-Crested Butte Regional	GUC	N	$3.00	$1,089,036	7y5m	11/1/1993	4/1/2001
Gunnison	CO	Gunnison-Crested Butte Regional	GUC	N	$4.50	$2,758,804	13y2m	4/1/2001	6/1/2014
Hayden	CO	Yampa Valley	HDN	N	$3.00	$2,190,009	7y8m	11/1/1993	7/1/2001
Hayden	CO	Yampa Valley	HDN	N	$4.50	**	7m	7/1/2001	2/1/2002
Hayden	CO	Yampa Valley	HDN	N	$4.50	$4,423,828	10y6m	2/1/2002	8/1/2012
Montrose	CO	Montrose Regional	MTJ	N	$3.00	$1,422,535	9y9m	11/1/1993	8/1/2003
Montrose	CO	Montrose Regional	MTJ	N	$4.50	$821,694	2y10m	8/1/2003	6/1/2006
Montrose	CO	Montrose Regional	MTJ	N	$4.50	$1,386,487	4y	8/1/2006	8/1/2010
Pueblo	CO	Pueblo Memorial	PUB	CS	$3.00	$395,322	21y1m	11/1/1993	12/1/2014
Steamboat Springs	CO	Steamboat Springs/Bob Adams	SBS		$3.00	$159,576	4y2m	4/1/1993	6/1/1997
Telluride	CO	Telluride Regional	TEX	N	$3.00	$778,287	9y2m	2/1/1993	4/1/2002
Telluride	CO	Telluride Regional	TEX	N	$4.50	$6,268,750	16y9m	4/1/2002	1/1/2019
New Haven	CT	Tweed-New Haven	HVN	N	$3.00	$983,636	4y4m	12/1/1993	4/1/1998
New Haven	CT	Tweed-New Haven	HVN	N	$4.50	$572,848	3y9m	10/1/2001	7/1/2005
New Haven	CT	Tweed-New Haven	HVN	N	$4.50	$663,054	2y	5/1/2006	5/1/2008
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$9,257,000	2y2m	10/1/1993	12/1/1995
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$3,263,971	6m	7/1/1996	1/1/1997
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$27,572,641	2y11m	9/1/1997	8/1/2000
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$257,534,407	14y10m	5/1/2001	3/1/2016
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$4,152,000	6m	3/1/2016	9/1/2016
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$2,374,574	2m	9/1/2016	11/1/2016
Daytona Beach	FL	Daytona Beach International	DAB	N	$3.00	$29,469,817	8y1m	7/1/1993	8/1/2001
Daytona Beach	FL	Daytona Beach International	DAB	N	$3.00	*	3y8m	2/1/2002	11/1/2005
Daytona Beach	FL	Daytona Beach International	DAB	N	$4.50	**	14y4m	11/1/2005	3/1/2020
Fort Lauderdale	FL	Fort Lauderdale/Hollywood International	FLL	L	$3.00	$228,064,335	10y10m	1/1/1995	10/1/2005
Fort Lauderdale	FL	Fort Lauderdale/Hollywood International	FLL	L	$4.50	$343,226,845	9y	10/1/2005	10/1/2014
Fort Myers	FL	Southwest Florida International	RSW	M	$3.00	$109,252,734	11y	11/1/1992	11/1/2003
Fort Myers	FL	Southwest Florida International	RSW	M	$4.50	**	2y10m	11/1/2003	9/1/2006
Fort Myers	FL	Southwest Florida International	RSW	M	$4.50	$137,410,598	8y5m	9/1/2006	2/1/2015
Gainsville	FL	Gainsville Regional	GNV	N	$3.00	$484,900	1y7m	7/1/2000	2/1/2002
Gainsville	FL	Gainsville Regional	GNV	N	$4.50	$4,637,954	8y1m	1/1/2003	2/1/2011
Jacksonville	FL	Jacksonville International	JAX	M	$3.00	$40,141,463	9y1m	4/1/1994	5/1/2003
Jacksonville	FL	Jacksonville International	JAX	M	$4.50	$340,670,875	20y7m	5/1/2003	12/1/2023
Key West	FL	Key West International	EYW	N	$3.00	$1,922,283	3y5m	3/1/1993	8/1/1996
Key West	FL	Key West International	EYW	N	$3.00	$4,272,834	5y7m	12/1/1997	6/1/2003
Key West	FL	Key West International	EYW	N	$4.50	$2,108,950	2y1m	6/1/2003	7/1/2005
Key West	FL	Key West International	EYW	N	$4.50	$49,283,306	32y5m	10/1/2005	3/1/2038
Marathon	FL	Marathon	MTH		$3.00	$390,001	5y3m	3/1/1993	6/1/1998
Melbourne	FL	Melbourne International	MLB	N	$3.00	$11,080,917	20y4m	5/1/1997	9/1/2017
Miami	FL	Miami International	MIA	L	$3.00	$337,041,000	7y2m	11/1/1994	1/1/2002
Miami	FL	Miami International	MIA	L	$4.50	**	1y2m	1/1/2002	3/1/2003
Miami	FL	Miami International	MIA	L	$4.50	$2,420,400,341	34y7m	3/1/2003	10/1/2037
Naples	FL	Naples Municipal	APF	N	$3.00	$899,685	6y	2/1/1995	2/1/2001
Naples	FL	Naples Municipal	APF	N	$3.00	$92,000	2y3m	2/1/2002	5/1/2004

Orlando	FL	Orlando International	MCO	L	$3.00	$550,351,180	14y2m	2/1/1993	4/1/2007
Orlando	FL	Orlando International	MCO	L	$4.50	$998,313,474	11y6m	4/1/2007	10/1/2018
Orlando	FL	Orlando International	MCO	L	$3.00	$48,580,000	7m	10/1/2018	5/1/2019
Orlando	FL	Orlando Sandford International	SFB	S	$1.00	$1,192,352	2y9m	3/1/2001	12/1/2003
Orlando	FL	Orlando Sandford International	SFB	S	$2.00	$13,312,090	10y7m	12/1/2003	7/1/2014
Panama City	FL	Panama City - Bay County International	PFN	N	$3.00	$8,238,499	10y3m	2/1/1994	5/1/2004
Panama City	FL	Panama City - Bay County International	PFN	N	$4.50	**	4y11m	5/1/2004	4/1/2009
Pensacola	FL	Penscola Regional	PNS	S	$3.00	$29,845,500	9y10m	2/1/1993	12/1/2002
Pensacola	FL	Penscola Regional	PNS	S	$4.50	**	4y9m	12/1/2002	9/1/2007
Pensacola	FL	Penscola Regional	PNS	S	$4.50	$119,352,000	23y1m	9/1/2007	10/1/2031
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$3.00	$60,882,956	9y8m	9/1/1992	5/1/2002
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$4.50	**	11y9m	5/1/2002	2/1/2014
St Petersburg	FL	St Petersburg-Clearwater International	PIE	N	$3.00	$3,357,639	1y6m	5/1/2005	11/1/2006
St Petersburg	FL	St Petersburg-Clearwater International	PIE	N	$4.50	**	2y3m	11/1/2006	2/1/2009
Tallahassee	FL	Tallahassee Regional	TLH	S	$3.00	$11,236,492	9y8m	2/1/1993	10/1/2002
Tallahassee	FL	Tallahassee Regional	TLH	S	$4.50	$36,852,800	13y3m	10/1/2002	1/1/2016
Tampa	FL	Tampa International	TPA	L	$3.00	$170,777,120	8y8m	10/1/1993	6/1/2002
Tampa	FL	Tampa International	TPA	L	$4.50	$574,718,374	13y9m	6/1/2002	3/1/2016
Valparaiso	FL	Eglin AFB	VPS	N	$3.00	$34,407,710	1y5m	1/1/2001	6/1/2002
Valparaiso	FL	Eglin AFB	VPS	N	$4.50	**	16y2m	6/1/2002	8/1/2018
Valparaiso	FL	Eglin AFB	VPS	N	$4.50	$4,028,761	1y11m	8/1/2018	7/1/2020
West Palm Beach	FL	Palm Beach International	PBI	M	$3.00	$122,491,222	14y3m	4/1/1994	7/1/2008
West Palm Beach	FL	Palm Beach International	PBI	M	$4.50	$22,283,317	2y3m	7/1/2008	10/1/2010
Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$362,561	2y9m	9/1/1995	6/1/1998
Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$540,050	3y8m	6/1/1999	2/1/2003
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	**	6m	2/1/2003	8/1/2003
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	$512,749	4y6m	8/1/2003	2/1/2008
Athens	GA	Athens/Ben Epps	AHN	CS	$3.00	$187,628	4y5m	8/1/1997	1/1/2002
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$3.00	$1,463,359,982	3y11m	5/1/1997	4/1/2001
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$4.50	**	7y6m	4/1/2001	10/1/2008
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$4.50	$1,894,837,362	11y6m	10/1/2008	4/1/2020
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$3.00	$31,482,000	1y10m	9/1/1999	7/1/2001
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	**	29y	7/1/2001	7/1/2030
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	$2,007,000	2y1m	7/1/2030	8/1/2032
Brunswick	GA	Brunswick Golden Isles	BQK	N	$3.00	$813,170	2y6m	5/1/2001	11/1/2003
Brunswick	GA	Brunswick Golden Isles	BQK	N	$4.50	**	7y10m	11/1/2003	9/1/2011
Columbus	GA	Columbus Metropolitan	CSG	N	$3.00	$530,103	1y9m	12/1/1993	9/1/1995
Columbus	GA	Columbus Metropolitan	CSG	N	$3.00	$1,251,387	2y10m	8/1/2000	6/1/2003
Columbus	GA	Columbus Metropolitan	CSG	N	$4.50	**	3y5m	6/1/2003	11/1/2006
Macon	GA	Middle Georgia Regional	MCN	N	$4.50	$1,052,392	9y2m	3/1/2002	5/1/2011
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$49,908,639	8y9m	7/1/1992	4/1/2001
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	**	9y8m	4/1/2001	12/1/2010
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$1,439,445	4m	12/1/2010	4/1/2011
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	$11,554,741	2y7m	4/1/2011	11/1/2013
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$369,077	6y7m	3/1/1993	10/1/1999
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$230,300	1y2m	4/1/2000	6/1/2001
Valdosta	GA	Valdosta Regional	VLD	N	$4.50	**	3m	6/1/2001	9/1/2001
Valdosta	GA	Valdosta Regional	VLD	N	$4.50	$440,422	3y	9/1/2001	9/1/2004
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$67,858	3m	2/1/2006	5/1/2006
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$12,140	2m	11/1/2006	1/1/2007
Agana	GU	Guam International	GUM	S	$3.00	$258,602,097	9y9m	2/1/1993	11/1/2002
Agana	GU	Guam International	GUM	S	$4.50	**	22y4m	11/1/2002	3/1/2025
Hilo	HI	Hilo International	ITO	S	$3.00	$781,000	4y5m	2/1/2007	7/1/2011
Honolulu	HI	Honolulu International	HNL	L	$3.00	$110,346,468	6y9m	10/1/2004	7/1/2011
Kahului	HI	Kahului	OGG	M	$3.00	$22,629,349	6y9m	10/1/2004	7/1/2011
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$3.00	$8,497,888	6y9m	10/1/2004	7/1/2011
Lihue	HI	Lihue	LIH	S	$3.00	$4,835,763	6y9m	10/1/2004	7/1/2011
Boise	ID	Boise Air Terminal/ Gowen Field	BOI	S	$3.00	$20,191,058	7y	8/1/1994	8/1/2001
Boise	ID	Boise Air Terminal/ Gowen Field	BOI	S	$4.50	$102,262,147	18y	8/1/2001	8/1/2019
Hailey	ID	Friedman Memorial	SUN	N	$3.00	$188,000	1y1m	9/1/1993	10/1/1994
Hailey	ID	Friedman Memorial	SUN	N	$3.00	$1,721,835	10y3m	3/1/1995	6/1/2005
Hailey	ID	Friedman Memorial	SUN	N	$4.50	$1,435,356	4y6m	6/1/2005	12/1/2009
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$1,473,899	5y	1/1/1993	1/1/1998
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$836,239	2y8m	2/1/1998	10/1/2000
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$8,950,000	6m	10/1/2000	4/1/2001
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$4.50	**	19y3m	4/1/2001	7/1/2020

Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$3.00	$2,509,907	7y	5/1/1994	5/1/2001
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$4.50	**	5y5m	5/1/2001	10/1/2006
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$4.50	$1,171,746	9y9m	10/1/2006	7/1/2016
Pocatello	ID	Pocatello Regional	PIH	N	$3.00	$814,719	6y8m	9/1/1994	5/1/2001
Pocatello	ID	Pocatello Regional	PIH	N	$4.50	**	5m	5/1/2001	10/1/2001
Pocatello	ID	Pocatello Regional	PIH	N	$4.50	$1,249,580	9y8m	10/1/2001	6/1/2011
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$3.00	$1,628,107	8y7m	11/1/1992	6/1/2001
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$4.50	**	6y	6/1/2001	6/1/2007
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$4.50	$560,416	4y3m	7/1/2007	10/1/2011
Belleville	IL	Scott AFB/Midamerica	BLV		$3.00	$7,000,000	41y4m	11/1/2005	3/1/2047
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$3.00	$28,084,564	6y5m	11/1/1994	4/1/2001
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$4.50	**	16y6m	4/1/2001	10/1/2017
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$4.50	$1,161,019	7m	10/1/2017	6/1/2018
Champaign/Urbana	IL	University of Illinois-Willard	CMI	N	$3.00	$2,745,800	8y2m	12/1/1995	2/1/2004
Champaign/Urbana	IL	University of Illinois-Willard	CMI	N	$4.50	$2,135,160	3y9m	10/1/2005	7/1/2009
Chicago	IL	Chicago Midway International	MDW	L	$3.00	$698,199,230	13y4m	9/1/1993	1/1/2007
Chicago	IL	Chicago Midway International	MDW	L	$4.50	**	5y11m	1/1/2007	11/1/2012
Chicago	IL	Chicago Midway International	MDW	L	$4.50	$1,176,512,492	25y9m	11/1/2012	8/1/2038
Chicago	IL	Chicago Midway International	MDW	L	$3.00	$2,850,000	2m	8/1/2038	10/1/2038
Chicago	IL	Chicago O'Hare International	ORD	L	$3.00	$1,701,450,995	7y7m	9/1/1993	4/1/2001
Chicago	IL	Chicago O'Hare Intenational	ORD	L	$4.50	**	4y10m	4/1/2001	2/1/2006
Chicago	IL	Chicago O'Hare International	ORD	L	$4.50	$2,716,344,271	18y5m	2/1/2006	7/1/2024
Chicago	IL	Chicago O'Hare International	ORD	L	$3.00	$53,983,000	5m	7/1/2024	12/1/2024
Decatur	IL	Decatur	DEC	N	$4.50	$732,628	12y9m	6/1/2006	3/1/2019
Marion	IL	Williamson County Regional	MWA	N	$4.50	$509,499	10y6m	9/1/2005	3/1/2016
Moline	IL	Quad City International	MLI	S	$3.00	$29,523,476	7y11m	12/1/1994	1/1/2002
Moline	IL	Quad City International	MLI	S	$4.50	**	14y6m	1/1/2002	7/1/2016
Moline	IL	Quad City International	MLI	S	$4.50	$1,520,320	1y	7/1/2016	7/1/2017
Peoria	IL	Greater Peoria Regional	PIA	N	$3.00	$8,145,036	6y7m	12/1/1994	7/1/2001
Peoria	IL	Greater Peoria Regional	PIA	N	$4.50	**	5y7m	7/1/2001	2/1/2007
Peoria	IL	Greater Peoria Regional	PIA	N	$4.50	$1,476,770	1y6m	2/1/2007	8/1/2008
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	$115,517	2y9m	10/1/1994	7/1/1997
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	$298,153	7y7m	11/1/1997	6/1/2005
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	*	2y2m	11/1/2005	1/1/2008
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$4.50	$635,573	11y2m	1/1/2008	3/1/2019
Rockford	IL	Chicago/ Rockford International	RFD	N	$3.00	$385,681	4y	10/1/1992	10/1/1996
Rockford	IL	Chicago/ Rockford International	RFD	N	$3.00	$7,066,659	10y1m	5/1/1997	6/1/2007
Rockford	IL	Chicago/ Rockford International	RFD	N	$4.50	**	6y11m	6/1/2007	5/1/2014
Springfield	IL	Abraham Lincoln Capital	SPI	N	$3.00	$4,901,693	9y11m	6/1/1992	5/1/2002
Springfield	IL	Abraham Lincoln Capital	SPI	N	$4.50	**	5y5m	5/1/2002	10/1/2005
Springfield	IL	Abraham Lincoln Capital	SPI	N	$4.50	$1,173,000	3y7m	10/1/2005	5/1/2009
Evansville	IN	Evansville Regional	EVV	N	$4.50	$1,270,789	1y3m	8/1/2007	11/1/2008
Fort Wayne	IN	Fort Wayne International	FWA	N	$3.00	$26,563,457	12y5m	7/1/1993	12/1/2005
Fort Wayne	IN	Fort Wayne International	FWA	N	$4.50	**	10y10m	12/1/2005	10/1/2016
Fort Wayne	IN	Fort Wayne International	FWA	N	$4.50	$2,045,000	1y5m	10/1/2016	3/1/2018
Indianapolis	IN	Indianapolis International	IND	M	$3.00	$80,978,605	7y7m	9/1/1993	4/1/2001
Indianapolis	IN	Indianapolis International	IND	M	$4.50	**	6m	4/1/2001	10/1/2001
Indianapolis	IN	Indianapolis International	IND	M	$4.50	$444,022,707	20y10m	10/1/2001	9/1/2022
Indianapolis	IN	Indianapolis International	IND	M	$3.00	$59,000	1m	9/1/2022	10/1/2022
South Bend	IN	South Bend Regional	SBN	S	$3.00	$34,172,802	26y11m	11/1/1994	10/1/2021
Burlington	IA	Southeast Iowa Regional	BRL	CS	$3.00	$521,304	4y2m	7/1/1997	9/1/2001
Burlington	IA	Southeast Iowa Regional	BRL	CS	$4.50	**	9y5m	9/1/2001	2/1/2011
Cedar Rapids	IA	The Eastern Iowa	CID	S	$3.00	$11,716,385	7y5m	1/1/1995	6/1/2002
Cedar Rapids	IA	The Eastern Iowa	CID	S	$4.50	**	1y9m	6/1/2002	3/1/2004
Cedar Rapids	IA	The Eastern Iowa	CID	S	$4.50	$11,459,311	5y6m	5/1/2004	11/1/2009
Des Moines	IA	Des Moines International	DSM	S	$3.00	$18,133,870	7y5m	3/1/1994	8/1/2001
Des Moines	IA	Des Moines International	DSM	S	$4.50	**	9m	8/1/2001	5/1/2002
Des Moines	IA	Des Moines International	DSM	S	$4.50	$50,826,342	15y3m	5/1/2002	8/1/2017
Dubuque	IA	Dubuque Regional	DBQ	N	$3.00	$1,144,527	8y4m	1/1/1993	5/1/2001
Dubuque	IA	Dubuque Regional	DBQ	N	$4.50	$2,144,553	11y8m	5/1/2001	1/1/2013
Fort Dodge	IA	Fort Dodge Regional	FOD	CS	$3.00	$169,517	6y6m	3/1/1995	9/1/2001
Fort Dodge	IA	Fort Dodge Regional	FOD	CS	$4.50	$315,570	9y3m	1/1/2002	4/1/2011
Mason City	IA	Mason City Municipal	MCW	N	$3.00	$302,090	5y9m	2/1/1996	10/1/2001
Mason City	IA	Mason City Municipal	MCW	N	$4.50	**	1y6y	10/1/2001	4/1/2003

Mason City	IA	Mason City Municipal	MCW	N	$4.50	$379,500	6y	8/1/2003	8/1/2009
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$3.00	$204,465	1y	6/1/1993	6/1/1994
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$3.00	$2,505,560	7y1m	2/1/1995	3/1/2002
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$4.50	**	1y10m	3/1/2002	1/1/2004
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$4.50	$969,350	5y4m	11/1/2004	3/1/2010
Spencer	IA	Spencer Municipal	SPW		$3.00	$77,638	10y6m	9/1/1995	3/1/2006
Waterloo	IA	Waterloo Regional	ALO	N	$3.00	$628,088	4y	6/1/1994	6/1/1998
Waterloo	IA	Waterloo Regional	ALO	N	$3.00	$784,036	1y10m	9/1/1999	7/1/2001
Waterloo	IA	Waterloo Regional	ALO	N	$4.50	**	1y10m	7/1/2001	5/1/2003
Waterloo	IA	Waterloo Regional	ALO	N	$4.50	$967,906	7y10m	5/1/2003	3/1/2011
Manhattan	KS	Manhattan Regional	MHK	N	$3.00	$401,978	3y5m	10/1/1998	3/1/2002
Manhattan	KS	Manhattan Regional	MHK	N	$4.50	**	7y1m	3/1/2002	4/1/2009
Topeka	KS	Forbes Field	FOE	N	$4.50	$823,720	15y7m	8/1/2007	3/1/2023
Wichita	KS	Wichita Mid-Continent	ICT	S	$3.00	$25,595,806	10y6m	12/1/1994	5/1/2005
Wichita	KS	Wichita Mid-Continent	ICT	S	$4.50	**	2y1m	5/1/2005	6/1/2007
Wichita	KS	Wichita Mid-Continent	ICT	S	$4.50	$3,918,050	1y3m	7/1/2007	10/1/2008
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$170,617,555	6y2m	6/1/1994	8/1/2000
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$77,390,829	2y1m	7/1/2001	8/1/2003
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$4.50	$268,108,000	8y3m	8/1/2003	11/1/2011
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$99,290,000	5y	11/1/2011	11/1/2015
Lexington	KY	Blue Grass	LEX	S	$3.00	$13,503,607	7y7m	11/1/1993	6/1/2001
Lexington	KY	Blue Grass	LEX	S	$4.50	**	2y	6/1/2001	6/1/2003
Lexington	KY	Blue Grass	LEX	S	$3.00	$500,557	4m	8/1/2003	12/1/2003
Lexington	KY	Blue Grass	LEX	S	$4.50	$50,404,396	18y8m	12/1/2003	8/1/2022
Louisville	KY	Louisville International - Standiford Field	SDF	S	$3.00	$106,278,940	8y10m	5/1/1997	3/1/2006
Louisville	KY	Louisville International - Standiford Field	SDF	S	$4.50	**	7m	3/1/2006	10/1/2006
Louisville	KY	Louisville International - Standiford Field	SDF	S	$3.00	**	11y4m	10/1/2006	2/1/2018
Louisville	KY	Louisville International - Standiford Field	SDF	S	$3.00	$1,267,315	3m	2/1/2018	5/1/2018
Paducah	KY	Barkley Regional	PAH	N	$3.00	$1,696,178	20y	3/1/1994	3/1/2014
Alexandria	LA	Alexandria International	AEX	N	$3.00	$10,284,927	2y8m	5/1/1999	1/1/2002
Alexandria	LA	Alexandria International	AEX	N	$4.50	**	20y11m	1/1/2002	12/1/2022
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$3.00	$40,580,060	12y10m	12/1/1992	10/1/2005
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	**	14y	10/1/2005	10/1/2019
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	$14,349,672	6y5m	10/1/2019	3/1/2026
Lafayette	LA	Lafayette Regional	LFT	N	$3.00	$1,083,024	3y	9/1/1995	9/1/1998
Lafayette	LA	Lafayette Regional	LFT	N	$3.00	$2,273,692	1y	4/1/2001	4/1/2002
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	**	2y8m	4/1/2002	1/1/2005
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	$2,762,250	3y	5/1/2005	5/1/2008
Lake Charles	LA	Lake Charles Regional	LCH	N	$3.00	$1,177,234	4y2m	3/1/2001	5/1/2005
Lake Charles	LA	Lake Charles Regional	LCH	N	$4.50	**	4y2m	5/1/2005	7/1/2009
Monroe	LA	Monroe Regional	MLU	N	$4.50	$1,854,672	4y5m	4/1/2003	9/1/2007
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$3.00	$133,503,363	8y10m	6/1/1993	4/1/2002
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$4.50	**	1y4m	4/1/2002	8/1/2003
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$4.50	$332,143,033	15y2m	8/1/2003	10/1/2018
Shreveport	LA	Shreveport Regional	SHV	N	$3.00	$29,841,353	8y9m	2/1/1994	11/1/2002
Shreveport	LA	Shreveport Regional	SHV	N	$4.50	**	11y10m	11/1/2002	9/1/2014
Bangor	ME	Bangor International	BGR	S	$3.00	$8,961,006	15y3m	6/1/1995	9/1/2010
Portland	ME	Portland International Jetport	PWM	S	$3.00	$35,581,764	18y7m	2/1/1994	9/1/2012
Presque Isle	ME	Northern Maine Regional Airport at Presque Isle	PQI	N	$4.50	$245,853	4y9m	9/1/2004	6/1/2009
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$3.00	$241,627,775	9y8m	10/1/1992	6/1/2002
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$4.50	**	5m	6/1/2002	11/1/2002
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$4.50	$618,019,115	13y2m	11/1/2002	1/1/2016
Cumberland	MD	Greater Cumberland Reg	CBE		$3.00	$150,000	5y	7/1/1994	7/1/1999
Cumberland	MD	Greater Cumberland Reg	CBE		$3.00	*	6y8m	10/1/1999	6/1/2006
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$3.00	$308,817	2y7m	8/1/1999	3/1/2002
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$4.50	**	1y10m	3/1/2002	1/1/2004
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$4.50	$108,124	3y7m	1/1/2004	8/1/2007
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$3.00	$2,352,042	12y5m	2/1/2002	7/1/2014
Boston	MA	General Edward Lawrence Logan International	BOS	L	$3.00	$702,015,217	11y11m	11/1/1993	10/1/2005
Boston	MA	General Edward Lawrence Logan International	BOS	L	$4.50	**	5y4m	10/1/2005	2/1/2011
Boston	MA	General Edward Lawrence Logan International	BOS	L	$4.50	$293,018,000	5y	2/1/2011	2/1/2016

Worcester	MA	Worcester Regional	ORH	N	$3.00	$614,336	5y	10/1/1992	10/1/1997
Worcester	MA	Worcester Regional	ORH	N	$3.00	$1,021,417	10y3m	9/1/1999	12/1/2009
Alpena	MI	Alpena County Regional	APN	CS	$3.00	$268,480	4y4m	8/1/2001	12/1/2005
Alpena	MI	Alpena County Regional	APN	CS	$4.50	**	2y8m	12/1/2005	8/1/2008
Alpena	MI	Alpena County Regional	APN	CS	$4.50	$193,959	4y5m	8/1/2008	1/1/2013
Detroit	MI	Detroit City	DET		$3.00	$1,250,000	4y2m	1/1/2000	3/1/2004
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$3.00	$2,198,215,360	8y9m	1/1/1993	10/1/2001
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$4.50	**	24y7m	10/1/2001	5/1/2026
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$4.50	$709,097,156	6y5m	5/1/2026	10/1/2032
Escanaba	MI	Delta County	ESC	N	$3.00	$150,721	5y2m	2/1/1993	11/1/1997
Escanaba	MI	Delta County	ESC	N	$3.00	$197,877	1y11m	8/1/1998	7/1/2000
Escanaba	MI	Delta County	ESC	N	$3.00	$114,900	2y5m	10/1/2001	3/1/2004
Escanaba	MI	Delta County	ESC	N	$4.50	$40,000	1y10m	3/1/2004	1/1/2006
Escanaba	MI	Delta County	ESC	N	$4.50	$322,158	6y9m	4/1/2006	1/1/2013
Flint	MI	Bishop International	FNT	S	$3.00	$31,865,870	8y1m	9/1/1993	10/1/2001
Flint	MI	Bishop International	FNT	S	$4.50	**	16y3m	10/1/2001	1/1/2018
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$3.00	$94,359,802	12y11m	12/1/1992	11/1/2005
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$4.50	**	10y11m	11/1/2005	10/1/2016
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$4.50	$7,654,985	2y4m	10/1/2016	2/1/2019
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$164,920	2y8m	7/1/1993	3/1/1996
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$149,326	3y	7/1/1996	7/1/1999
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$485,846	5y9m	10/1/1999	7/1/2005
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	**	1y4m	7/1/2005	11/1/2006
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	$595,111	6y3m	11/1/2006	2/1/2013
Iron Mountain Kingsford	MI	Ford	IMT	CS	$3.00	$204,029	8y9m	9/1/1995	6/1/2004
Ironwood	MI	Gogebic-Iron County	IWD	CS	$3.00	$74,690	13y2m	8/1/1993	10/1/2006
Ironwood	MI	Gogebic-Iron County	IWD	CS	$4.50	$133,060	9y8m	6/1/2007	2/1/2017
Kalamazoo	MI	Kalamazoo/Battle Creek Internaitonal	AZO	N	$3.00	$1,089,716	3y2m	4/1/1997	6/1/2000
Kalamazoo	MI	Kalamazoo/Battle Creek Internaitonal	AZO	N	$3.00	$5,312,429	4y	1/1/2001	1/1/2005
Kalamazoo	MI	Kalamazoo/Battle Creek Internaitonal	AZO	N	$4.50	**	1y7m	1/1/2005	8/1/2006
Kalamazoo	MI	Kalamazoo/Battle Creek Internaitonal	AZO	N	$4.50	$1,500,000	1y6m	10/1/2006	4/1/2008
Lansing	MI	Capital City	LAN	N	$3.00	$6,376,278	8y9m	10/1/1993	7/1/2002
Lansing	MI	Capital City	LAN	N	$4.50	**	6y	7/1/2002	7/1/2008
Lansing	MI	Capital City	LAN	N	$4.50	$32,751,609	13y7m	7/1/2008	2/1/2022
Marquette	MI	Marquette County	MQT	N	$3.00	$62,225	4y	12/1/1992	12/1/1996
Marquette	MI	Sawyer International	MQT/SAW	N	$3.00	$1,077,540	4y3m	4/1/1998	7/1/2002
Marquette	MI	Sawyer International	MQT/SAW	N	$4.50	**	6m	7/1/2002	1/1/2003
Marquette	MI	Sawyer International	MQT/SAW	N	$4.50	$773,078	3y8m	1/1/2003	9/1/2006
Marquette	MI	Sawyer International	MQT/SAW	N	$4.50	$150,711	1y7m	10/1/2006	5/1/2008
Muskegon	MI	Muskegon County	MKG	N	$3.00	$5,013,088	10y1m	5/1/1994	5/1/2004
Muskegon	MI	Muskegon County	MKG	N	$4.50	**	16y6m	5/1/2004	11/1/2020
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$3.00	$156,641	4y6m	3/1/1993	9/1/1997
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$3.00	$842,469	13y7m	12/1/1997	7/1/2011
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$4.50	$280,750	2y	7/1/2011	7/1/2013
Saginaw	MI	MBS International	MBS	N	$3.00	$7,552,127	10y5m	2/1/1997	7/1/2007
Saginaw	MI	MBS International	MBS	N	$4.50	**	9m	7/1/2007	4/1/2008
Sault Ste. Marie	MI	Chippewa County International	CIU	N	$4.50	$1,087,463	17y8m	11/1/2005	7/1/2023
Traverse City	MI	Cherry Capital	TVC	N	$3.00	$4,057,060	5y	1/1/1997	1/1/2002
Traverse City	MI	Cherry Capital	TVC	N	$4.50	**	1y9m	1/1/2002	10/1/2003
Traverse City	MI	Cherry Capital	TVC	N	$4.50	$5,619,279	7y2m	10/1/2003	12/1/2010
Bemidji	MN	Bemidji Regional	BJI	N	$3.00	$362,099	5y3m	11/1/1996	2/1/2002
Bemidji	MN	Bemidji Regional	BJI	N	$4.50	$416,452	3y6m	2/1/2002	8/1/2005
Bemidji	MN	Bemidji Regional	BJI	N	$4.50	$337,711	1y11m	6/1/2006	5/1/2008
Brainerd	MN	Brainerd Lakes Regional	BRD	N	$3.00	$313,455	7y11m	8/1/1993	7/1/2001
Brainerd	MN	Brainerd Lakes Regional	BRD	N	$4.50	$1,845,907	22y3m	7/1/2001	7/1/2024
Duluth	MN	Duluth International	DLH	N	$3.00	$2,341,795	7y6m	10/1/1994	4/1/2002
Duluth	MN	Duluth International	DLH	N	$4.50	$1,278,964	2y7m	4/1/2002	11/1/2004
Duluth	MN	Duluth International	DLH	N	$4.50	$2,745,402	5y1m	4/1/2005	5/1/2010
Grand Rapids	MN	Grand Rapids/Itasca County	GPZ		$3.00	$151,263	3y10m	12/1/1997	10/1/2001
Grand Rapids	MN	Grand Rapids/Itasca County	GPZ		$4.50	**	5y3m	10/1/2001	1/1/2007
Hibbing	MN	Chisholm-Hibbing	HIB	N	$3.00	$338,299	7y1m	6/1/1996	7/1/2003
Hibbing	MN	Chisholm-Hibbing	HIB	N	$4.50	**	3y10m	7/1/2003	5/1/2007
Hibbing	MN	Chisholm-Hibbing	HIB	N	$4.50	$461,737	10y6m	5/1/2007	11/1/2017
International	MN	Falls International	INL	N	$3.00	$597,058	7y6m	12/1/1994	6/1/2002

Falls International	MN	Falls International	INL	N	$4.50	**	3y	6/1/2002	6/1/2005
Falls International	MN	Falls International	INL	N	$4.50	$477,226	5y8m	11/1/2005	7/1/2011
Falls Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$3.00	$448,154,556	8y10m	6/1/1992	4/1/2001
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	**	2y	4/1/2001	4/1/2003
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	$1,360,174,566	15y10m	4/1/2003	2/1/2019
Rochester	MN	Rochester International	RST	N	$3.00	$5,889,069	5y10m	5/1/1996	3/1/2002
Rochester	MN	Rochester International	RST	N	$4.50	**	6y5m	3/1/2002	8/1/2008
St. Cloud	MN	St. Cloud Regional	STC	N	$3.00	$1,147,578	2y5m	2/1/2000	7/1/2002
St. Cloud	MN	St. Cloud Regional	STC	N	$4.50	**	11y6m	7/1/2002	1/1/2014
Thief River Falls	MN	Thief River Falls Regional	TVF	CS	$4.50	$636,828	20y	6/1/2003	6/1/2023
Rota Island	MP	Rota International	GRO/ROP	N	$4.50	$1,797,042	11y8m	1/1/2005	8/1/2016
Saipan Island	MP	Francisco C. Ada/Saipan International	GSN/SPN	S	$4.50	$29,920,680	11y8m	1/1/2005	8/1/2016
Tinian Island	MP	Tinian International	TNI/TIQ	N	$4.50	$1,724,826	11y8m	1/1/2005	8/1/2016
Columbus	MS	Golden Triangle Regional	GTR	N	$3.00	$1,693,211	8y8m	8/1/1992	4/1/2001
Columbus	MS	Golden Triangle Regional	GTR	N	$4.50	**	2y9m	4/1/2001	1/1/2004
Columbus	MS	Golden Triangle Regional	GTR	N	$4.50	$1,792,656	12y2m	1/1/2004	3/1/2016
Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	$148,873	4y4m	10/1/1998	2/1/2003
Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	*	4m	4/1/2003	8/1/2003
Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	$88,495	1y8m	8/1/2003	4/1/2005
Greenville	MS	Mid Delta Regional	GLH	CS	$4.50	**	8m	4/1/2005	12/1/2005
Greenville	MS	Mid Delta Regional	GLH	CS	$4.50	$135,614	2y8m	12/1/2005	8/1/2008
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	$8,247,199	9y1m	7/1/1992	8/1/2001
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	*	6m	12/1/2001	6/1/2002
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	$1,031,474	9m	6/1/2002	5/1/2003
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$4.50	$57,145,388	24y8m	5/1/2003	1/1/2028
Hattiesburg	MS	Hattiesburg-Laurel Regional	PIB	N	$3.00	$237,929	8y11m	7/1/1992	6/1/2001
Hattiesburg	MS	Hattiesburg-Laurel Regional	PIB	N	$4.50	$445,252	7y10m	6/1/2001	4/1/2009
Jackson	MS	Jackson-Evers International	JAN	S	$3.00	$22,296,401	10y5m	5/1/1993	10/1/2003
Jackson	MS	Jackson-Evers International	JAN	S	$4.50	**	2y3m	10/1/2003	1/1/2006
Jackson	MS	Jackson-Evers International	JAN	S	$4.50	$30,175,122	9y2m	1/1/2006	3/1/2015
Meridian	MS	Key Field	MEI	N	$3.00	$293,059	3y9m	11/1/1992	8/1/1996
Meridian	MS	Key Field	MEI	N	$3.00	$665,606	4y9m	3/1/1997	12/1/2001
Meridian	MS	Key Field	MEI	N	$4.50	**	2y5m	12/1/2001	5/1/2004
Meridian	MS	Key Field	MEI	N	$4.50	$700,530	4y	10/1/2005	10/1/2009
Tupelo	MS	Tupelo Regional	TUP	N	$3.00	$457,216	8y5m	11/1/1994	4/1/2003
Tupelo	MS	Tupelo Regional	TUP	N	$4.50	**	8m	4/1/2003	1/1/2004
Tupelo	MS	Tupelo Regional	TUP	N	$4.50	$942,500	10y6m	1/1/2004	7/1/2014
Columbia	MO	Columbia Regional	COU	N	$4.50	$809,302	10y3m	11/1/2002	2/1/2013
Joplin	MO	Joplin Regional	JLN	N	$4.50	$889,664	5y3m	4/1/2003	7/1/2008
Kansas City	MO	Kansas City International	MCI	M	$3.00	$368,055,021	9y5m	3/1/1996	8/1/2005
Kansas City	MO	Kansas City International	MCI	M	$4.50	**	9y3m	8/1/2005	11/1/2014
Kansas City	MO	Kansas City International	MCI	M	$4.50	$56,963,842	2y3m	11/1/2014	2/1/2017
Springfield	MO	Springfield-Branson National	SGF	S	$3.00	$3,110,598	3y9m	11/1/1993	5/1/1997
Springfield	MO	Springfield-Branson National	SGF	S	$3.00	$6,370,614	2y10m	7/1/1998	5/1/2001
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	**	2y7m	5/1/2001	1/1/2004
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$2,168,000	1y3m	5/1/2004	8/1/2005
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$900,000	6m	9/1/2005	3/1/2006
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$83,651,097	29y	1/1/2007	1/1/2036
St Louis	MO	Lambert-St Louis International	STL	M	$3.00	$1,199,564,908	9y	12/1/1992	12/1/2001
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	**	12y1m	12/1/2001	1/1/2014
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	$81,330,000	2y11m	1/1/2014	12/1/2016
St Louis	MO	Lambert-St Louis International	STL	M	$3.00	$13,806,955	6m	12/1/2016	6/1/2017
Billings	MT	Billings Logan International	BIL	S	$3.00	$13,875,440	14y10m	4/1/1994	2/1/2009
Bozeman	MT	Gallatin Field	BZN	N	$3.00	$9,920,096	13y6m	8/1/1993	2/1/2010
Butte	MT	Bert Mooney	BTM	N	$3.00	$1,294,947	11y11m	7/1/1994	6/1/2006
Butte	MT	Bert Mooney	BTM	N	$3.00	$110,883	1y1m	7/1/2006	8/1/2007
Butte	MT	Bert Mooney	BTM	N	$3.00	$146,916	1y6m	11/1/2007	5/1/2009
Great Falls	MT	Great Falls International	GTF	N	$3.00	$3,059,263	9y8m	11/1/1992	7/1/2002
Great Falls	MT	Great Falls International	GTF	N	$4.50	$8,501,340	20y4m	7/1/2002	9/1/2018
Helena	MT	Helena Regional	HLN	N	$3.00	$1,949,098	9y4m	4/1/1993	8/1/2002
Helena	MT	Helena Regional	HLN	N	$4.50	**	1y2m	8/1/2002	10/1/2003

Helena	MT	Helena Regional	HLN	N	$4.50	$2,336,432	6y8m	10/1/2003	6/1/2010
Kalispell	MT	Glacier Park International	GPI/FCA	N	$3.00	$10,997,914	11y5m	12/1/1993	4/1/2005
Kalispell	MT	Glacier Park International	GPI/FCA	N	$4.50	**	11y3m	4/1/2005	7/1/2016
Kalispell	MT	Glacier Park International	GPI/FCA	N	$4.50	$833,138	1y4m	7/1/2016	11/1/2017
Missoula	MT	Missoula International	MSO	N	$3.00	$5,875,780	8y7m	9/1/1992	4/1/2001
Missoula	MT	Missoula International	MSO	N	$4.50	**	1y11m	4/1/2001	3/1/2003
Missoula	MT	Missoula International	MSO	N	$4.50	$6,506,368	7y5m	3/1/2003	8/1/2010
Grand Island	NE	Central Nebraska Regional	GRI	CS	$3.00	$50,370	2y2m	2/1/1999	4/1/2001
Grand Island	NE	Central Nebraska Regional	GRI	CS	$4.50	$545,219	12y6m	5/1/2001	11/1/2013
Kearney	NE	Kearney Regional	EAR	CS	$4.00	$0	1y10m	11/1/2005	9/1/2007
Kearney	NE	Kearney Regional	EAR	CS	$4.50	$153,893	2y1m	9/1/2007	10/1/2009
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	N	$3.00	$0	3y	3/1/2000	3/1/2003
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	N	$4.50	$1,299,534	20y	7/1/2004	7/1/2024
Elko	NV	Elko Regional	EKO	N	$3.00	$6,790,017	5y2m	9/1/1998	11/1/2003
Elko	NV	Elko Regional	EKO	N	$4.50	**	17y3m	11/1/2003	2/1/2021
Las Vegas	NV	McCarran International	LAS	L	$3.00	$849,713,056	12y5m	6/1/1992	11/1/2004
Las Vegas	NV	McCarran International	LAS	L	$4.50	**	1y10m	11/1/2004	9/1/2006
Las Vegas	NV	McCarran International	LAS	L	$3.00	**	4m	9/1/2006	1/1/2007
Las Vegas	NV	McCarran International	LAS	L	$4.00	**	2y6m	1/1/2007	7/1/2009
Las Vegas	NV	McCarran International	LAS	L	$4.50	$1,726,485,906	16y8m	7/1/2009	3/1/2026
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$60,828,215	7y1m	1/1/1994	2/1/2001
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$6,764,380	10m	8/1/2001	6/1/2002
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$6,734,192	8m	6/1/2002	2/1/2003
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$15,556,400	1y8m	2/1/2003	10/1/2004
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	**	2m	10/1/2004	12/1/2004
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$26,712,865	5m	12/1/2004	4/1/2005
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	**	2y4m	4/1/2005	7/1/2007
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$3,400,000	5m	7/1/2007	12/1/2007
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$32,878,000	3y	12/1/2007	12/1/2010
Lebanon	NH	Lebanon Municipal	LEB	N	$3.00	$530,630	7y	8/1/1995	8/1/2002
Lebanon	NH	Lebanon Municipal	LEB	N	$4.50	$63,774	2y6m	11/1/2003	5/1/2006
Lebanon	NH	Lebanon Municipal	LEB	N	$4.50	$140,685	2y6m	10/1/2007	4/1/2010
Manchester	NH	Manchester	MHT	M	$3.00	$163,703,087	15y	1/1/1993	1/1/2008
Manchester	NH	Manchester	MHT	M	$4.50	**	7y7m	1/1/2008	8/1/2015
Manchester	NH	Manchester	MHT	M	$3.00	$71,598,554	5y2m	8/1/2015	10/1/2020
Atlantic City	NJ	Atlantic City International	ACY	S	$3.00	$10,494,427	6y2m	10/1/1999	12/1/2005
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	**	1y5m	12/1/2005	4/1/2007
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	$5,418,189	2y2m	4/1/2007	6/1/2009
Newark	NJ	Newark Liberty International	EWR	L	$3.00	$911,814,555	13y6m	10/1/1992	4/1/2006
Newark	NJ	Newark Liberty International	EWR	L	$4.50	**	4y11m	4/1/2006	3/1/2011
Trenton	NJ	Trenton Mercer	TTN	N	$3.00	$0	3y4m	1/1/2001	5/1/2004
Trenton	NJ	Trenton Mercer	TTN	N	$4.50	$1,061,436	6y10m	5/1/2004	3/1/2011
Albuquerque	NM	Albuquerque International Sunport	ABQ	M	$3.00	$160,323,675	19y1m	7/1/1996	7/1/2015
Farmington	NM	Four Corners Regional	FMN	N	$3.00	$661,102	7y11m	6/1/2003	5/1/2011
Roswell	NM	Roswell International Air Center	ROW	CS	$3.00	$334,477	4y10m	4/1/1999	2/1/2004
Roswell	NM	Roswell International Air Center	ROW	CS	$4.50	**	4m	2/1/2004	6/1/2004
Roswell	NM	Roswell International Air Center	ROW	CS	$3.00	**	1y	6/1/2004	6/1/2005
Roswell	NM	Roswell International Air Center	ROW	CS	$4.50	**	2y8m	6/1/2005	2/1/2008
Albany	NY	Albany International	ALB	S	$3.00	$116,740,338	28y10m	3/1/1994	1/1/2023
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$3.00	$5,244,174	8y10m	11/1/1993	9/1/2002
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	**	3y10m	9/1/2002	7/1/2006
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	$559,849	3y2m	7/1/2006	2/1/2008
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	$1,360,195	1y	9/1/2008	9/1/2009
Buffalo	NY	Buffalo Niagara International	BUF	M	$3.00	$142,638,765	14y11m	8/1/1992	8/1/2007
Buffalo	NY	Buffalo Niagara International	BUF	M	$4.50	**	2y2m	8/1/2007	10/1/2009
Elmira	NY	Elmira/Corning Regional	ELM	N	$3.00	$791,873	3y1m	12/1/2004	1/1/2008
Islip	NY	Long Island Mac Arthur	ISP	S	$3.00	$27,175,578	10y9m	12/1/1994	9/1/2005
Islip	NY	Long Island Mac Arthur	ISP	S	$4.50	$37,133,218	9y8m	9/1/2005	5/1/2015
Ithaca	NY	Ithica Tompkins Regional	ITH	N	$3.00	$6,872,612	20y9m	1/1/1993	10/1/2013
Jamestown	NY	Chautauqua County/Jamestown	JHW	CS	$3.00	$590,896	9y2m	6/1/1993	8/1/2002
Jamestown	NY	Chautauqua County/Jamestown	JHW	CS	$4.50	$200,112	4y10m	9/1/2004	7/1/2009
Massena	NY	Massena International - Richards Field	MSS	CS	$3.00	$163,429	19y7m	4/1/1996	11/1/2015
New York	NY	John F. Kennedy International	JFK	L	$3.00	$965,422,400	13y6m	10/1/1992	4/1/2006
New York	NY	John F. Kennedy International	JFK	L	$4.50	**	4y11m	4/1/2006	3/1/2011

New York	NY	LaGuardia	LGA	L	$3.00	$684,649,104	13y6m	10/1/1992	4/1/2006
New York	NY	LaGuardia	LGA	L	$4.50	**	4y11m	4/1/2006	3/1/2011
Newburgh	NY	Stewart International	SWF	N	$3.00	$8,827,899	6y4m	11/1/1995	3/1/2002
Newburgh	NY	Stewart International	SWF	N	$4.50	**	3y8m	3/1/2002	11/1/2005
Newburgh	NY	Stewart International	SWF	N	$4.50	$254,187	4m	5/1/2007	9/1/2007
Ogdensburg	NY	Ogdensburg Intl	OGS		$3.00	$125,050	23y8m	4/1/1996	12/1/2019
Plattsburgh	NY	Clinton County	PLB		$3.00	$184,658	7y8m	7/1/1993	3/1/2001
Plattsburgh	NY	Clinton County	PLB		$3.00	$46,317	3y10m	6/1/2001	4/1/2003
Rochester	NY	Greater Rochester International	ROC	S	$3.00	$20,828,889	6y8m	12/1/1997	9/1/2004
Rochester	NY	Greater Rochester International	ROC	S	$4.50	$77,242,638	16y9m	9/1/2004	6/1/2021
Saranac Lake	NY	Adirondack Regional	SLK	CS	$3.00	$121,952	13y1m	8/1/1994	9/1/2007
Syracuse	NY	Syracuse Hancock International	SYR	S	$3.00	$18,228,294	6y3m	10/1/1995	1/1/2002
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$12,057,078	2y10m	10/1/2002	8/1/2005
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$6,719,197	1y3m	11/1/2005	2/1/2007
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$96,732,010	19y4m	4/1/2007	8/1/2026
Utica	NY	Oneida County	UCA		$3.00	$1,298,631	12y10m	8/1/1997	6/1/2010
White Plains	NY	Westchester County	HPN	S	$3.00	$15,546,537	8y10m	2/1/1993	12/1/2001
White Plains	NY	Westchester County	HPN	S	$4.50	**	2y5m	12/1/2001	5/1/2004
White Plains	NY	Westchester County	HPN	S	$4.50	$12,300,000	4y7m	5/1/2004	12/1/2008
Asheville	NC	Asheville Regional	AVL	N	$3.00	$5,622,844	7y10m	12/1/1994	10/1/2002
Asheville	NC	Asheville Regional	AVL	N	$4.50	$4,936,653	4y1m	10/1/2002	11/1/2006
Asheville	NC	Asheville Regional	AVL	N	$4.50	$478,051	5m	4/1/2007	9/1/2007
Asheville	NC	Asheville Regional	AVL	N	$4.50	$3,521,375	2y7m	10/1/2007	5/1/2010
Charlotte	NC	Charlotte/Douglas International	CLT	L	$3.00	$794,707,546	16y1m	11/1/2004	12/1/2020
Fayetteville	NC	Fayetteville Regional/Grannis Field	FAY	N	$3.00	$2,069,537	5y3m	11/1/2000	2/1/2006
Greenville	NC	Pitt-Greenville	PGV	N	$3.00	$494,486	3y6m	10/1/1997	4/1/2001
Greenville	NC	Pitt-Greenville	PGV	N	$4.50	**	3m	4/1/2001	7/1/2001
Greenville	NC	Pitt-Greenville	PGV	N	$4.50	$1,480,404	7y10m	7/1/2001	5/1/2009
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$208,878	2y9m	1/1/1996	10/1/1998
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	*	11m	9/1/1999	8/1/2000
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$1,427,284	3y10m	3/1/2005	1/1/2009
New Bern	NC	Craven County Regional	EWN	N	$3.00	$10,681,398	6y9m	2/1/1997	11/1/2003
New Bern	NC	Craven County Regional	EWN	N	$4.50	**	21y	11/1/2003	11/1/2024
Raleigh	NC	Raleigh-Durham International	RDU	M	$3.00	$9,778,473	1y6m	4/1/2003	10/1/2004
Raleigh	NC	Raleigh-Durham International	RDU	M	$4.50	$765,251,376	28y11m	10/1/2004	9/1/2032
Wilmington	NC	Wilmington International	ILM	N	$3.00	$1,526,487	2y7m	2/1/1994	9/1/1996
Wilmington	NC	Wilmington International	ILM	N	$3.00	$7,984,994	4y11m	6/1/1998	5/1/2003
Wilmington	NC	Wilmington International	ILM	N	$4.50	**	3y11m	5/1/2003	4/1/2007
Wilmington	NC	Wilmington International	ILM	N	$4.50	$15,574,579	12y6m	4/1/2007	10/1/2019
Bismarck	ND	Bismarck Municipal	BIS	N	$3.00	$349,092	1y	7/1/1996	7/1/1997
Bismarck	ND	Bismarck Municipal	BIS	N	$3.00	$1,342,095	3y10m	6/1/1998	4/1/2002
Bismarck	ND	Bismarck Municipal	BIS	N	$4.50	$6,572,561	12y5m	4/1/2002	9/1/2014
Fargo	ND	Hector International	FAR	N	$3.00	$4,633,814	5y7m	1/1/1997	8/1/2002
Fargo	ND	Hector International	FAR	N	$4.50	**	1y11m	8/1/2002	7/1/2004
Fargo	ND	Hector International	FAR	N	$4.50	$21,050,526	19y1m	7/1/2004	8/1/2023
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$621,965	3y6m	2/1/1993	8/1/1996
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$1,707,243	3y11m	5/1/1997	4/1/2001
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	**	2y2m	4/1/2001	6/1/2003
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	$1,506,569	4y5m	5/1/2004	10/1/2008
Minot	ND	Minot International	MOT	N	$3.00	$825,445	4y4m	3/1/1994	7/1/1998
Minot	ND	Minot International	MOT	N	$3.00	$990,656	2y11m	3/1/1999	2/1/2002
Minot	ND	Minot International	MOT	N	$4.50	**	1y2m	2/1/2002	4/1/2003
Minot	ND	Minot International	MOT	N	$4.50	$2,432,182	8y3m	4/1/2003	7/1/2011
Akron	OH	Akron-Canton Regional	CAK	S	$3.00	$9,066,039	10y	9/1/1992	9/1/2002
Akron	OH	Akron-Canton Regional	CAK	S	$4.50	$31,034,854	13y8m	9/1/2002	8/1/2016
Cleveland	OH	Cleveland-Hopkins International	CLE	M	$3.00	$199,934,647	9y4m	11/1/1992	3/1/2002
Cleveland	OH	Cleveland-Hopkins International	CLE	M	$4.50	**	2y5m	3/1/2002	8/1/2004
Cleveland	OH	Cleveland-Hopkins International	CLE	M	$4.50	$135,554,000	6y8m	8/1/2004	4/1/2011
Columbus	OH	Port Columbus International	CMH	M	$3.00	$128,445,302	9y6m	10/1/1992	4/1/2002
Columbus	OH	Port Columbus International	CMH	M	$4.50	**	2y6m	4/1/2002	10/1/2004
Columbus	OH	Port Columbus International	CMH	M	$4.50	$77,562,914	5y2m	10/1/2004	12/1/2009
Dayton	OH	James M Cox Dayton International	DAY	S	$3.00	$28,098,728	6y11m	10/1/1994	9/1/2001
Dayton	OH	James M Cox Dayton International	DAY	S	$4.50	**	1y10m	9/1/2001	7/1/2003
Dayton	OH	James M Cox Dayton International	DAY	S	$4.50	$97,523,200	14y7m	7/1/2003	2/1/2018
Toledo	OH	Toledo Express	TOL	N	$3.00	$2,246,374	3y	9/1/1993	9/1/1996
Toledo	OH	Toledo Express	TOL	N	$3.00	$6,442,493	4y	7/1/1997	7/1/2001
Toledo	OH	Toledo Express	TOL	N	$4.50	**	2y6m	7/1/2001	1/1/2004

Toledo	OH	Toledo Express	TOL	N	$4.50	$5,312,436	5y11m	1/1/2004	12/1/2010
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$3.00	$214,384	2y2m	5/1/1994	7/1/1996
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$3.00	$477,044	4y6m	8/1/1997	2/1/2002
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$4.50	$441,000	5y5m	4/1/2007	9/1/2012
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$2.00	$452,189	1y5m	8/1/1992	1/1/1994
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$3.00	**	2y3m	1/1/1994	4/1/1996
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$3.00	$380,745	2y7m	1/1/1998	8/1/2000
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$303,687	1y9m	6/1/2002	3/1/2004
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$253,021	1y1m	9/1/2004	10/1/2005
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$357,888	2y	11/1/2007	11/1/2009
Oklahoma City	OK	Will Rogers World	OKC	S	$3.00	$131,260,905	21y7m	7/1/1997	2/1/2019
Tulsa	OK	Tulsa International	TUL	S	$3.00	$15,986,724	3y7m	8/1/1992	3/1/1996
Tulsa	OK	Tulsa International	TUL	S	$3.00	$59,637,247	14y1m	1/1/1997	2/1/2011
Eugene	OR	Mahlon Sweet Field	EUG	N	$3.00	$6,537,176	7y7m	11/1/1993	6/1/2001
Eugene	OR	Mahlon Sweet Field	EUG	N	$4.50	$14,683,202	10y6m	6/1/2001	12/1/2011
Klamath Falls	OR	Klamath Falls	LMT	N	$3.00	$426,251	1y1m	3/1/2000	4/1/2001
Klamath Falls	OR	Klamath Falls	LMT	N	$4.50	**	3y1m	4/1/2001	5/1/2004
Klamath Falls	OR	Klamath Falls	LMT	N	$4.50	$877,799	7y7m	5/1/2004	12/1/2011
Medford	OR	Rogue Valley International - Medford	MFR	N	$3.00	$5,750,814	7y9m	7/1/1993	4/1/2001
Medford	OR	Rogue Valley International - Medford	MFR	N	$4.50	**	2y	4/1/2001	4/1/2003
Medford	OR	Rogue Valley International - Medford	MFR	N	$4.50	$28,781,931	22y4m	4/1/2003	8/1/2025
North Bend	OR	Southwest Oregon Regional	OTH	N	$3.00	$565,252	7y6m	2/1/1994	8/1/2001
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	**	4y6m	8/1/2001	2/1/2006
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	$1,483,456	8y5m	2/1/2006	7/1/2014
Pendleton	OR	Eastern Oregon Regional at Pendleton	PDT	CS	$3.00	$486,540	16y1m	12/1/1995	1/1/2012
Portland	OR	Portland International	PDX	M	$3.00	$613,687,685	9y3m	7/1/1992	10/1/2001
Portland	OR	Portland International	PDX	M	$4.50	**	14y7m	10/1/2001	5/1/2016
Portland	OR	Portland International	PDX	M	$4.50	$68,207,251	1y10m	5/1/2016	3/1/2018
Redmond	OR	Roberts Field	RDM	N	$3.00	$3,517,536	8y1m	10/1/1993	11/1/2001
Redmond	OR	Roberts Field	RDM	N	$4.50	**	2y1m	11/1/2001	12/1/2003
Redmond	OR	Roberts Field	RDM	N	$4.50	$2,083,546	3y	12/1/2003	12/1/2006
Redmond	OR	Roberts Field	RDM	N	$4.50	$645,420	1y2m	3/1/2007	5/1/2008
Allentown	PA	Lehigh Valley International	ABE	S	$3.00	$11,092,349	8y3m	11/1/1992	2/1/2001
Allentown	PA	Lehigh Valley International	ABE	S	$3.00	$2,807,572	5m	6/1/2001	11/1/2001
Allentown	PA	Lehigh Valley International	ABE	S	$4.50	**	1y2m	11/1/2001	1/1/2003
Allentown	PA	Lehigh Valley International	ABE	S	$4.50	$31,075,601	14y11m	9/1/2003	8/1/2018
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$110,500	2y9m	5/1/1993	2/1/1996
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$116,620	2y9m	1/1/1997	10/1/1999
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$322,410	11y5m	7/1/2000	12/1/2011
Bradford	PA	Bradford Regional	BFD	CS	$3.00	$206,793	7y9m	8/1/1995	5/1/2003
Bradford	PA	Bradford Regional	BFD	CS	$4.50	$446,548	14y6m	5/1/2003	11/1/2017
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$3.00	$386,636	5y10m	6/1/1995	4/1/2001
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$4.50	**	2y7m	4/1/2001	11/1/2003
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$4.50	$325,413	9y6m	4/1/2004	10/1/2013
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$3.00	$2,022,109	4y8m	10/1/1992	6/1/1997
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$3.00	$1,216,914	3y5m	12/1/1997	5/1/2001
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$4.50	$618,885	1y5m	8/1/2003	1/1/2005
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$4.50	$4,038,039	6y11m	7/1/2005	6/1/2012
Harrisburg	PA	Harrisburg International	MDT	S	$3.00	$17,744,614	5y11m	2/1/1997	1/1/2003
Harrisburg	PA	Harrisburg International	MDT	S	$4.50	$118,372,500	31y6m	1/1/2003	7/1/2034
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	N	$3.00	$148,269	3y1m	11/1/1993	12/1/1996
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	N	$3.00	$510,227	5y4m	12/1/1997	5/1/2001
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	N	$4.50	**	5y8m	5/1/2001	1/1/2007
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	N	$4.50	$132,000	2y9m	7/1/2007	4/1/2010
Lancaster	PA	Lancaster	LNS	CS	$3.00	$1,483,000	14y	2/1/1995	2/1/2009
Latrobe	PA	Arnold Palmer Regional	LBE	N	$3.00	$1,397,687	17y2m	3/1/1996	5/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$3.00	$1,141,562,798	8y7m	9/1/1992	4/1/2001
Philadelphia	PA	Philadelphia International	PHL	L	$4.50	**	11y10m	4/1/2001	2/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$3.00	$24,400,000	5m	2/1/2013	7/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$4.50	$198,950,000	4y2m	7/1/2013	9/1/2017
Pittsburgh	PA	Pittsburgh International	PIT	M	$3.00	$100,098,648	3y2m	10/1/2001	12/1/2004
Pittsburgh	PA	Pittsburgh International	PIT	M	$4.50	**	1y9m	12/1/2004	9/1/2006
Pittsburgh	PA	Pittsburgh International	PIT	M	$4.50	$417,566,028	18y3m	9/1/2006	12/1/2024
Reading	PA	Reading Regional/Carl A Spaatz Field	RDG		$3.00	$1,692,031	13y7m	12/1/1994	7/1/2008
State College	PA	University Park	UNV/SCE	N	$3.00	$4,448,552	11y	11/1/1992	11/1/2003
State College	PA	University Park	UNV/SCE	N	$4.50	**	2y8m	11/1/2003	7/1/2006

State College	PA	University Park	UNV/SCE	N	$4.50	$1,420,524	2y7m	7/1/2006	2/1/2009
Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$3.00	$4,588,122	3y6m	12/1/1993	6/1/1997
Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$3.00	*	3y5m	12/1/1997	5/1/2001
Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$4.50	$8,409,402	10y11m	5/1/2001	4/1/2011
Williamsport	PA	Williamsport Regional	IPT	N	$3.00	$215,000	1y6m	5/1/1997	11/1/1998
Aguadilla	PR	Rafael Hernandez	BQN	N	$3.00	$0	3y2m	3/1/1993	5/1/1996
Aguadilla	PR	Rafael Hernandez	BQN	N	$4.50	$9,828,476	16y	12/1/2005	12/1/2021
Ponce	PR	Mercedita	PSE	N	$3.00	$866,000	5y5m	3/1/1993	9/1/1998
San Juan	PR	Luis Munoz Marin International	SJU	M	$3.00	$222,126,971	12y9m	3/1/1993	12/1/2005
San Juan	PR	Luis Munoz Marin International	SJU	M	$4.50	**	2y6m	12/1/2005	6/1/2008
San Juan	PR	Luis Munoz Marin International	SJU	M	$4.50	$339,135,482	18y11m	6/1/2008	5/1/2027
Providence	RI	Theodore Francis Green State	PVD	M	$3.00	$104,029,700	12y7m	2/1/1994	9/1/2006
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	**	1y11m	9/1/2006	8/1/2008
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	$66,396,031	4y8m	8/1/2008	4/1/2013
Columbia	SC	Columbia Metropolitan	CAE	S	$3.00	$70,528,884	8y1m	11/1/1993	12/1/2001
Columbia	SC	Columbia Metropolitan	CAE	S	$4.50	**	9y	12/1/2001	12/1/2010
Florence	SC	Florence Regional	FLO	N	$3.00	$669,334	3y11m	12/1/1995	11/1/1999
Florence	SC	Florence Regional	FLO	N	$3.00	*	2m	12/1/1999	2/1/2000
Hilton Head Island	SC	Hilton Head	HXD/HHH	N	$3.00	$1,542,300	6y4m	2/1/1994	6/1/2000
Hilton Head Island	SC	Hilton Head	HXD/HHH	N	$3.00	$2,076,657	6y10m	12/1/2000	10/1/2007
Myrtle Beach	SC	Myrtle Beach International	MYR	S	$3.00	$27,941,134	5y10m	10/1/1996	8/1/2001
Myrtle Beach	SC	Myrtle Beach International	MYR	S	$4.50	**	6y	8/1/2001	8/1/2007
Aberdeen	SD	Aberdeen Regional	ABR	N	$3.00	$677,809	2y	1/1/2000	1/1/2002
Aberdeen	SD	Aberdeen Regional	ABR	N	$4.50	**	5y5m	1/1/2002	6/1/2007
Aberdeen	SD	Aberdeen Regional	ABR	N	$4.50	$533,588	2y9m	6/1/2007	3/1/2010
Pierre	SD	Pierre Regional	PIR	N	$4.50	$366,239	5y4m	2/1/2003	6/1/2008
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$1,087,206	2y5m	8/1/1997	1/1/2000
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$4,146,262	6y	6/1/2000	6/1/2006
Rapid City	SD	Rapid City Regional	RAP	N	$4.50	**	9m	6/1/2006	5/1/2007
Rapid City	SD	Rapid City Regional	RAP	N	$4.50	$1,401,088	1y4m	5/1/2007	9/1/2008
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$3.00	$10,521,507	10y5m	2/1/1997	7/1/2007
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$4.50	**	4y8m	7/1/2007	3/1/2012
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$4.50	$1,264,140	2y7m	3/1/2012	10/1/2014
Chattanooga	TN	Lovell Field	CHA	N	$3.00	$33,127,444	6y9m	7/1/1994	4/1/2001
Chattanooga	TN	Lovell Field	CHA	N	$4.50	**	3y7m	4/1/2001	11/1/2004
Chattanooga	TN	Lovell Field	CHA	N	$3.00	**	3m	11/1/2004	2/1/2005
Chattanooga	TN	Lovell Field	CHA	N	$4.50	**	10y3m	2/1/2005	5/1/2015
Jackson	TN	McKellar-Sipes Regional	MKL	CS	$4.50	$332,248	7y8m	10/1/2002	6/1/2010
Knoxville	TN	Mc Ghee Tyson	TYS	S	$3.00	$99,080,294	9y9m	1/1/1994	10/1/2003
Knoxville	TN	Mc Ghee Tyson	TYS	S	$4.50	**	18y9m	10/1/2003	7/1/2022
Knoxville	TN	Mc Ghee Tyson	TYS	S	$4.50	$4,691,627	1y2m	7/1/2022	9/1/2023
Memphis	TN	Memphis International	MEM	M	$3.00	$53,700,000	4y5m	8/1/1992	1/1/1997
Nashville	TN	Nashville International	BNA	M	$3.00	$262,379,127	18y10m	1/1/1993	11/1/2011
Abilene	TX	Abilene Regional	ABI	N	$3.00	$2,008,611	4y8m	1/1/1998	9/1/2002
Abilene	TX	Abilene Regional	ABI	N	$4.50	**	5y10m	9/1/2002	7/1/2008
Abilene	TX	Abilene Regional	ABI	N	$4.50	$2,519,008	7y1m	7/1/2008	8/1/2015
Austin	TX	Robert Mueller Municipal	AUS	M	$2.00	$6,189,459	3m	11/1/1993	2/1/1994
Austin	TX	Robert Mueller Municipal	AUS	M	$3.00	**	1y	2/1/1994	2/1/1995
Austin	TX	Austin-Bergstrom International	AUS	M	$3.00	$343,074,546	8y9m	7/1/1995	4/1/2004
Austin	TX	Austin-Bergstrom International	AUS	M	$4.50	**	15y9m	4/1/2004	1/1/2020
Austin	TX	Austin-Bergstrom International	AUS	M	$4.50	$4,125,000	4m	1/1/2020	5/1/2020
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$3.00	$2,767,768	7y6m	9/1/1994	3/1/2002
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$4.50	**	3y	3/1/2002	3/1/2005
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$4.50	$964,833	6y11m	3/1/2005	2/1/2012
Brownsville	TX	Brownsville/South Padre Island International	BRO	N	$3.00	$1,099,404	5y7m	10/1/1997	5/1/2003
Brownsville	TX	Brownsville/South Padre Island International	BRO	N	$4.50	$1,891,541	6y5m	5/1/2003	10/1/2009
College Station	TX	Easterwood Field	CLL	N	$3.00	$2,063,797	4y9m	7/1/1996	4/1/2001
College Station	TX	Easterwood Field	CLL	N	$4.50	**	2y9m	4/1/2001	1/1/2004
College Station	TX	Easterwood Field	CLL	N	$4.50	$1,974,002	7y6m	1/1/2004	3/1/2010
Corpus Christi	TX	Corpus Christi International	CRP	S	$3.00	$49,700,114	9y1m	3/1/1994	3/1/2003
Corpus Christi	TX	Corpus Christi International	CRP	S	$4.50	**	23y10m	3/1/2003	1/1/2027
Dallas	TX	Dallas Love Field	DAL	M	$3.00	$38,994,339	3y8m	2/1/2008	10/1/2011
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$93,687,528	2y1m	5/1/1994	6/1/1996

Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$2,394,925,313	5y5m	2/1/1997	7/1/2002
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$4.50	**	14y8m	7/1/2002	3/1/2017
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$51,900,495	2m	3/1/2017	5/1/2017
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$4.50	$2,988,512,952	17y4m	5/1/2017	9/1/2034
El Paso	TX	El Paso International	ELP	S	$3.00	$52,248,193	11y4m	1/1/1997	5/1/2008
Harlingen	TX	Valley International	HRL	S	$3.00	$9,683,579	9y1m	11/1/1998	12/1/2007
Harlingen	TX	Valley International	HRL	S	$4.50	$7,885,824	3y7m	12/1/2007	7/1/2011
Houston	TX	William P. Hobby	HOU	M	$3.00	$163,415,047	10y11m	11/1/2006	10/1/2017
Killeen	TX	Killeen Municipal	ILE	N	$3.00	$242,051	1y10m	1/1/1993	11/1/1994
Killeen	TX	Killeen Municipal	ILE	N	$3.00	$3,636,168	6y1m	4/1/1995	5/1/2001
Killeen	TX	Killeen Municipal	ILE	N	$4.50	**	2y3m	5/1/2001	8/1/2003
Killeen	TX	Robert Gray AAF	ILE/GRK	N	$4.50	*	2y1m	12/1/2003	1/1/2006
Killeen	TX	Robert Gray AAF	GRK	N	$4.50	$2,713,561	3y9m	6/1/2006	3/1/2010
Laredo	TX	Laredo International	LRD	N	$3.00	$6,303,839	16y9m	10/1/1993	7/1/2010
Longview	TX	East Texas Regional	GGG	N	$3.00	$472,571	5y7m	9/1/1996	4/1/2002
Longview	TX	East Texas Regional	GGG	N	$3.00	$699,232	8y8m	9/1/2002	5/1/2011
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$3.00	$16,178,722	11y4m	10/1/1993	2/1/2005
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$2.00	$5,280,392	2y	2/1/2005	2/1/2007
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$3.00	$9,731,125	6y1m	2/1/2007	3/1/2013
Mc Allen	TX	Mc Allen Miller International	MFE	S	$3.00	$14,921,182	15y6m	4/1/1998	10/1/2013
Midland	TX	Midland International	MAF	S	$3.00	$35,873,495	11y9m	1/1/1993	9/1/2004
Midland	TX	Midland International	MAF	S	$4.50	**	9y4m	9/1/2004	1/1/2014
Midland	TX	Midland International	MAF	S	$3.00	$1,622,298	10m	1/1/2014	11/1/2014
Midland	TX	Midland International	MAF	S	$4.50	$1,553,549	9m	11/1/2014	8/1/2015
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$3.00	$1,659,981	8y11m	5/1/1993	4/1/2002
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$4.50	**	2y4m	4/1/2002	8/1/2004
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$4.50	$2,103,989	8y1m	8/1/2004	9/1/2012
San Antonio	TX	San Antonio International	SAT	M	$3.00	$238,029,391	5y11m	11/1/2001	10/1/2007
San Antonio	TX	San Antonio International	SAT	M	$4.50	**	5y3m	10/1/2007	1/1/2013
San Antonio	TX	San Antonio International	SAT	M	$4.50	$142,929,158	6y2m	1/1/2013	3/1/2019
Tyler	TX	Tyler Pounds Regional	TYR	N	$3.00	$2,911,880	9y6m	3/1/1994	9/1/2003
Tyler	TX	Tyler Pounds Regional	TYR	N	$4.50	**	4y11m	9/1/2003	8/1/2008
Tyler	TX	Tyler Pounds Regional	TYR	N	$4.50	$2,140,662	8y11m	8/1/2008	7/1/2017
Victoria	TX	Victoria Regional	VCT	CS	$3.00	$195,960	3y	12/1/1994	8/1/1998
Victoria	TX	Victoria Regional	VCT	CS	$3.00	$188,872	3y	1/1/1999	1/1/2002
Victoria	TX	Victoria Regional	VCT	CS	$4.50	$444,905	7y	1/1/2002	1/1/2009
Waco	TX	Waco Regional	ACT	N	$3.00	$2,662,658	5y11m	11/1/1995	10/1/2001
Waco	TX	Waco Regional	ACT	N	$4.50	**	6y3m	10/1/2001	1/1/2008
Waco	TX	Waco Regional	ACT	N	$4.50	$668,255	2y1m	1/1/2008	2/1/2010
Cedar City	UT	Cedar City Regional	CDC	CS	$4.50	$229,900	4y8m	2/1/2007	10/1/2011
Salt Lake City	UT	Salt Lake City International	SLC	L	$3.00	$166,173,468	6y4m	12/1/1994	4/1/2001
Salt Lake City	UT	Salt Lake City International	SLC	L	$4.50	**	3m	4/1/2001	7/1/2001
Salt Lake City	UT	Salt Lake City International	SLC	L	$4.50	$298,919,400	8y2m	7/1/2001	9/1/2009
St George	UT	St George Municipal	SGU	N	$3.00	$23,568	4y4m	5/1/1998	9/1/2002
St George	UT	St George Municipal	SGU	N	$4.50	$1,354,902	8y4m	6/1/2003	10/1/2011
Wendover	UT	Wendover	ENV	N	$3.00	$142,300	3y2m	8/1/1996	10/1/1999
Burlington	VT	Burlington International	BTV	S	$3.00	$25,408,285	6y5m	4/1/1997	9/1/2003
Burlington	VT	Burlington International	BTV	S	$4.50	**	6y1m	9/1/2003	10/1/2009
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$3,808,574	2y5m	3/1/1993	8/1/1995
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$7,792,000	7y	12/1/1995	12/1/2002
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$13,500,000	7y9m	8/1/2004	4/1/2012
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$2,280,465	3y1m	3/1/1993	4/1/1996
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$4,408,000	6y7m	12/1/1996	7/1/2003
Arlington	VA	Ronald Reagan Washington National	DCA	L	$3.00	$322,807,356	7y6m	11/1/1993	5/1/2001
Arlington	VA	Ronald Reagan Washington National	DCA	L	$4.50	**	4y1m	5/1/2001	6/1/2005
Arlington	VA	Ronald Reagan Washington National	DCA	L	$4.50	$180,499,457	6y5m	6/1/2005	11/1/2011
Chantilly	VA	Washington Dulles International	IAD	L	$3.00	$274,241,263	7y6m	1/1/1994	5/1/2001
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	**	4y3m	5/1/2001	8/1/2005
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	$761,393,218	11y9m	8/1/2005	5/1/2017
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$2.00	$305,992	1y1m	9/1/1992	10/1/1993
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$3.00	$5,153,400	9y9m	4/1/1995	1/1/2005
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	**	1y1m	1/1/2005	2/1/2006
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	$4,099,484	3y11m	2/1/2006	1/1/2010
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$3.00	$185,940	1y	7/1/1995	7/1/1996
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$3.00	$827,616	1y9m	9/1/2000	6/1/2002
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$4.50	$2,509,770	13y	6/1/2002	6/1/2015

Newport News	VA	Newport News/Williamsburg International	PHF	S	$3.00	$552,500	9m	10/1/2006	7/1/2007
Norfolk	VA	Norfolk International	ORF	M	$3.00	$51,961,000	12y11m	5/1/1997	4/1/2010
Richmond	VA	Richmond International	RIC	S	$3.00	$137,014,261	10y7m	5/1/1994	1/1/2005
Richmond	VA	Richmond International	RIC	S	$4.50	**	14y10m	1/1/2005	10/1/2019
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$3.00	$6,463,183	3y3m	9/1/1998	12/1/2001
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	**	3y2m	12/1/2001	2/1/2005
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$3.00	$8,483,280	9m	2/1/2005	11/1/2005
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	**	6y	11/1/2005	11/1/2011
Staunton	VA	Shenandoah Valley Regional	SHD	CS	$3.00	$207,875	5y	12/1/2001	12/1/2006
Staunton	VA	Shenandoah Valley Regional	SHD	CS	$4.50	$244,811	10y9m	6/1/2007	3/1/2018
Bellingham	WA	Bellingham International	BLI	N	$3.00	$1,594,527	5y1m	7/1/1993	8/1/1998
Bellingham	WA	Bellingham International	BLI	N	$3.00	*	10m	3/1/1999	1/1/2000
Bellingham	WA	Bellingham International	BLI	N	$3.00	$1,400,000	2y6m	1/1/2000	7/1/2002
Bellingham	WA	Bellingham International	BLI	N	$4.50	**	2y11m	7/1/2002	6/1/2005
Bellingham	WA	Bellingham International	BLI	N	$4.50	$2,697,007	4y5m	6/1/2005	11/1/2009
Friday Harbor	WA	Friday Harbor	FRD/FHR	N	$3.00	$517,077	15y5m	2/1/2001	7/1/2016
Moses Lake	WA	Grant County International	MWH	CS	$3.00	$470,000	6y8m	3/1/1999	11/1/2005
Moses Lake	WA	Grant County International	MWH	CS	$4.50	**	10y2m	11/1/2005	1/1/2016
Pasco	WA	Tri-Cities	PSC	N	$3.00	$3,657,898	7y11m	11/1/1993	10/1/2001
Pasco	WA	Tri-Cities	PSC	N	$4.50	**	1y6m	10/1/2001	4/1/2003
Pasco	WA	Tri-Cities	PSC	N	$4.50	$10,404,363	10y7m	4/1/2003	11/1/2013
Port Angeles	WA	William R. Fairchild International	CLM	N	$3.00	$117,556	1y9m	8/1/1993	5/1/1995
Port Angeles	WA	William R. Fairchild International	CLM	N	$3.00	$712,468	11y9m	9/1/1996	6/1/2008
Pullman	WA	Pullman/Moscow Regional	PUW	N	$3.00	$169,288	2y8m	6/1/1994	2/1/1996
Pullman	WA	Pullman/Moscow Regional	PUW	N	$3.00	$706,727	1y11m	2/1/2000	1/1/2002
Pullman	WA	Pullman/Moscow Regional	PUW	N	$4.50	**	3y9m	1/1/2002	10/1/2005
Pullman	WA	Pullman/Moscow Regional	PUW	N	$4.50	$422,187	1y5m	10/1/2005	12/1/2010
Seattle	WA	Seattle-Tacoma International	SEA	L	$3.00	$76,701,322	8y11m	11/1/1992	10/1/2001
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	**	1y5m	10/1/2001	1/1/2003
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	$1,086,205,000	11y5m	1/1/2003	6/1/2014
Spokane	WA	Spokane International	GEG	S	$3.00	$52,372,419	9y10m	6/1/1993	4/1/2003
Spokane	WA	Spokane International	GEG	S	$4.50	**	2y1m	4/1/2003	5/1/2005
Spokane	WA	Spokane International	GEG	S	$4.50	$43,262,293	6y11m	5/1/2005	4/1/2012
Walla Walla	WA	Walla Walla Regional	ALW	N	$3.00	$3,745,775	7y11m	11/1/1993	10/1/2001
Walla Walla	WA	Walla Walla Regional	ALW	N	$4.50	**	18y	10/1/2001	10/1/2019
Wenatchee	WA	Pangborn Memorial	EAT	N	$3.00	$622,488	2y2m	8/1/1993	10/1/1995
Wenatchee	WA	Pangborn Memorial	EAT	N	$3.00	$660,570	4y1m	6/1/1998	7/1/2002
Wenatchee	WA	Pangborn Memorial	EAT	N	$4.50	**	7m	7/1/2002	2/1/2003
Wenatchee	WA	Pangborn Memorial	EAT	N	$4.50	$1,151,290	6y9m	5/1/2003	2/1/2010
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$1,558,823	6y	2/1/1993	2/1/1999
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	*	1y1m	5/1/1999	6/1/2000
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$1,434,678	8y	6/1/2000	6/1/2008
Charleston	WV	Yeager	CRW	N	$3.00	$7,123,395	8y3m	8/1/1993	11/1/2001
Charleston	WV	Yeager	CRW	N	$4.50	**	1y5m	11/1/2001	4/1/2003
Charleston	WV	Yeager	CRW	N	$4.50	$10,911,303	8y5m	4/1/2003	9/1/2011
Clarksburg	WV	North Central West Virginia	CKB	CS	$3.00	$79,103	2y1m	3/1/1994	10/1/1995
Clarksburg	WV	North Central West Virginia	CKB	CS	$4.50	$162,334	1y10m	4/1/2001	8/1/2002
Clarksburg	WV	North Central West Virginia	CKB	CS	$4.50	$2,920,641	50y	5/1/2004	5/1/2054
Huntington	WV	Tri-State/Milton J. Ferguson Field	HTS	N	$3.00	$1,988,309	13y	12/1/1995	12/1/2008
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$2.00	$54,012	1y1m	12/1/1992	1/1/1994
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$2.00	$341,533	7y1m	12/1/1994	1/1/2002
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$4.50	**	2y5m	1/1/2002	6/1/2004
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$4.50	$227,618	3y9m	6/1/2004	3/1/2008
Parkersburg	WV	Mid-Ohio Valley Regional	PKB	CS	$3.00	$305,491	3y3m	5/1/1999	8/1/2002
Parkersburg	WV	Mid-Ohio Valley Regional	PKB	CS	$4.50	$286,543	5y6m	8/1/2003	2/1/2009
Appleton	WI	Outagamie County Regional	ATW	N	$3.00	$10,466,940	11y11m	7/1/1994	6/1/2006
Appleton	WI	Outagamie County Regional	ATW	N	$4.50	**	1y10m	6/1/2006	4/1/2008
Appleton	WI	Outagamie County Regional	ATW	N	$3.00	$318,170	5m	4/1/2008	9/1/2008
Appleton	WI	Outagamie County Regional	ATW	N	$4.50	$4,717,500	4y4m	9/1/2008	1/1/2013
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$3.00	$708,253	5y10m	2/1/1996	12/1/2001
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$4.50	**	4y1m	12/1/2001	1/1/2006
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$4.50	$662,411	7y9m	8/1/2006	5/1/2014
Green Bay	WI	Austin Straubel International	GRB	S	$3.00	$7,530,958	9y	3/1/1993	3/1/2002
Green Bay	WI	Austin Straubel International	GRB	S	$4.50	$38,768,829	18y7m	3/1/2002	10/1/2020

La Crosse	WI	La Crosse Municipal	LSE	N	$3.00	$2,668,694	6y9m	7/1/1994	4/1/2001
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	**	1y9m	4/1/2001	1/1/2003
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	$6,249,707	14y1m	1/1/2003	2/1/2017
Madison	WI	Dane County Regional - Truax Field	MSN	S	$3.00	$12,308,713	8y2m	9/1/1993	11/1/2001
Madison	WI	Dane County Regional - Truax Field	MSN	S	$4.50	$79,902,856	21y11m	11/1/2001	10/1/2023
Milwaukee	WI	General Mitchell International	MKE	M	$3.00	$297,389,378	29y1m	5/1/1995	6/1/2024
Mosinee	WI	Central Wisconsin	CWA	N	$3.00	$7,725,600	13y10m	11/1/1993	9/1/2007
Mosinee	WI	Central Wisconsin	CWA	N	$4.50	**	2y10m	9/1/2007	7/1/2010
Mosinee	WI	Central Wisconsin	CWA	N	$4.50	$3,529,500	5y9m	7/1/2010	4/1/2016
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$3.00	$204,771	2y2m	1/1/1994	4/1/1996
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$3.00	$493,832	5y3m	6/1/1996	9/1/2001
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$4.50	**	2y4m	9/1/2001	1/1/2004
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$4.50	$1,351,274	8y4m	1/1/2004	5/1/2012
Casper	WY	Natrona County International	CPR	N	$3.00	$1,629,582	7y7m	9/1/1993	4/1/2001
Casper	WY	Natrona County International	CPR	N	$4.50	**	2y2m	4/1/2001	6/1/2003
Casper	WY	Natrona County International	CPR	N	$4.50	$2,590,000	8y5m	6/1/2003	11/1/2011
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$3.00	$957,013	7y5m	11/1/1993	4/1/2001
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$4.50	**	5y8m	4/1/2001	1/1/2007
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$4.50	$407,728	5y6m	1/1/2007	7/1/2012
Cody	WY	Yellowstone Regional	COD	N	$3.00	$439,441	3y11m	8/1/1997	7/1/2001
Cody	WY	Yellowstone Regional	COD	N	$4.50	**	8m	7/1/2001	3/1/2002
Cody	WY	Yellowstone Regional	COD	N	$4.50	$76,373	3y1m	3/1/2002	4/1/2005
Cody	WY	Yellowstone Regional	COD	N	$4.50	$618,734	5y5m	9/1/2005	2/1/2011
Gillette	WY	Gillette-Campbell County	GCC	N	$3.00	$369,132	8y3m	9/1/1993	12/1/2001
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	$162,537	2y6m	12/1/2001	6/1/2004
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	*	6m	1/1/2005	7/1/2005
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	$337,238	4y8m	7/1/2005	3/1/2010
Jackson	WY	Jackson Hole	JAC	N	$3.00	$3,799,325	7y8m	8/1/1993	4/1/2001
Jackson	WY	Jackson Hole	JAC	N	$4.50	**	1y4m	4/1/2001	8/1/2002
Jackson	WY	Jackson Hole	JAC	N	$4.50	$5,683,361	6y9m	8/1/2002	5/1/2009
Laramie	WY	Laramie Regional	LAR	N	$3.00	$126,457	4y2m	8/1/1996	10/1/2000
Laramie	WY	Laramie Regional	LAR	N	$3.00	*	9m	12/1/2000	8/1/2001
Laramie	WY	Laramie Regional	LAR	N	$4.50	$252,009	6y4m	12/1/2006	4/1/2013
Riverton	WY	Riverton Regional	RIW	N	$3.00	$1,055,040	5y11m	5/1/1995	4/1/2001
Riverton	WY	Riverton Regional	RIW	N	$4.50	**	22y6m	4/1/2001	10/1/2023
Rock Springs	WY	Rock Springs-Sweetwater County	RKS	N	$3.00	$382,300	11y	4/1/1995	4/1/2006
Rock Springs	WY	Rock Springs-Sweetwater County	RKS	N	$4.50	$226,907	4y6m	4/1/2006	10/1/2010
Sheridan	WY	Sheridan County	SHR	N	$3.00	$218,988	5y10m	3/1/1996	12/1/2001
Sheridan	WY	Sheridan County	SHR	N	$4.50	$433,736	10y	12/1/2001	12/1/2011
Worland	WY	Worland Municipal	WRL	CS	$4.50	$70,500	5y2m	1/1/2003	3/1/2008

NOTES:

Collections at locations noted by * in the amount column were prematurely stopped due to FAA processing errors.

** Amount shown on line immediately above the double asterisk is the total approved collections at this location at both the $3 and $4.50 levels.

Letter of Intent (LOI) Commitments By Fiscal Year

LOI Commitments By Fiscal Year				
State	City	Airport Name	Discretionary 2008	Entitlement 2008
AK	Anchorage	Ted Stevens Anchorage International	7,436,000.00	1,000,000.00
CA	San Jose	Norman Y. Mineta San Jose International	0	1,800,341.00
FL	Miami	Miami International	4,000,000.00	0
FL	Orlando	Orlando International	2,000,000.00	6,200,000.00
FL	Fort Myers	Southwest Florida International	3,500,000.00	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	16,808,300.00	0
IA	Cedar Rapids	The Eastern Iowa	5,000,000.00	3,414,250.00
IL	Chicago	Chicago O'Hare International	20,000,000.00	6,500,000.00
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	7,500,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	9,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	3,500,000.00	0
MA	Boston	General Edward Lawrence Logan International	6,000,000.00	3,690,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	5,850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	14,000,000.00	4,885,975.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	5,000,000.00	0
MO	St. Louis	Lambert-St Louis International	9,000,000.00	2,837,519.00
NC	Charlotte	Charlotte/Douglas International	13,000,000.00	2,386,275.00
NC	Greensboro	Piedmont Triad International	7,000,000.00	5,100,000.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	16,000,000.00	2,975,000.00
OH	Columbus	Port Columbus International	8,300,000.00	0
PA	Harrisburg	Harrisburg International	11,300,000.00	0
SC	Myrtle Beach	Myrtle Beach International	6,000,000.00	0
TN	Memphis	Memphis International	5,805,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	2,552,000.00	0
TX	Houston	George Bush Intercontinental/Houston	7,250,000.00	10,000,000.00
UT	St. George	New	9,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	17,000,000.00	6,662,414.00
WA	Seattle	Seattle-Tacoma International	20,135,000.00	5,498,467.00

LOI Commitments By Fiscal Year				
State	City	Airport Name	Discretionary 2009	Entitlement 2009
AK	Anchorage	Ted Stevens Anchorage International	8,000,000.00	1,470,000.00
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	10,110,000.00	0
FL	Orlando	Orlando International	0	4,780,000.00
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	23,708,300.00	0
IA	Cedar Rapids	The Eastern Iowa	4,300,000.00	3,414,250.00
IL	Chicago	Chicago O'Hare International	20,000,000.00	6,500,000.00
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	5,000,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	6,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	4,000,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	6,000,000.00	3,740,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	3,850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	5,000,000.00	0
MO	St. Louis	Lambert-St Louis International	9,000,000.00	2,837,519.00
NC	Charlotte	Charlotte/Douglas International	11,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	6,000,000.00	5,200,000.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	16,480,000.00	3,036,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	2,170,000.00	0
SC	Myrtle Beach	Myrtle Beach International	9,000,000.00	0
TN	Memphis	Memphis International	5,180,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	5,292,000.00	0
TX	Houston	George Bush Intercontinental/Houston	12,750,000.00	10,000,000.00
UT	St. George	New	9,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	20,000,000.00	6,662,414.00
WA	Seattle	Seattle-Tacoma International	13,700,000.00	5,212,612.00

LOI Commitments By Fiscal Year				
State	City	Airport Name	Discretionary 2010	Entitlement 2010
AK	Anchorage	Ted Stevens Anchorage International	4,000,000.00	1,957,000.00
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	8,540,000.00	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	12,500,000.00	0
IA	Cedar Rapids	The Eastern Iowa	3,500,000.00	3,000,000.00
IL	Chicago	Chicago O'Hare International	20,000,000.00	6,500,000.00
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	3,000,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	2,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	3,500,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	5,900,000.00	3,780,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	5,000,000.00	0
MO	St. Louis	Lambert-St Louis International	5,000,000.00	4,379,916.00
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	6,000,000.00	5,200,000.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	13,170,000.00	3,099,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	9,000,000.00	0
TN	Memphis	Memphis International	4,823,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	6,000,000.00	0
TX	Houston	George Bush Intercontinental/Houston	13,050,000.00	10,024,000.00
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	4,000,000.00	6,662,414.00
WA	Seattle	Seattle-Tacoma International	20,075,000.00	335,205.00

LOI Commitments By Fiscal Year				
State	City	Airport Name	Discretionary 2011	Entitlement 2011
AK	Anchorage	Ted Stevens Anchorage International	7,200,000.00	3,475,750.00
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	10,000,000.00	0
IA	Cedar Rapids	The Eastern Iowa	2,500,000.00	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	5,000,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	6,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	2,500,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	5,900,000.00	3,830,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	0	5,200,000.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,165,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	9,000,000.00	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	15,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	0	6,662,414.00
WA	Seattle	Seattle-Tacoma International	8,200,000.00	5,400,000.00

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary 2012**	**Entitlement 2012**
AK	Anchorage	Ted Stevens Anchorage International	6,280,000.00	3,015,750.00
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	1,500,000.00	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	3,000,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	5,800,000.00	3,870,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	0	5,200,000.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,233,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	20,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,500,000.00

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary 2013**	**Entitlement 2013**
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	0
NC	Greensboro	Piedmont Triad International	0	6,115,513.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,304,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	13,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,600,000.00

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary 2014**	**Entitlement 2014**
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	6,000,000.00	0
NC	Greensboro	Piedmont Triad International	0	0
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,378,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	13,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,700,000.00

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary 2015**	**Entitlement 2015**
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	2,844,597.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,455,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	9,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	14,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	6,206,899.00

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary 2016**	**Entitlement 2016**
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	0	0
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	3,535,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	0	0
VA	Washington	Washington Dulles International	9,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	0

LOI Commitments By Fiscal Year				
State	**City**	**Airport Name**	**Discretionary Beyond**	**Entitlement Beyond**
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	San Jose	Norman Y. Mineta San Jose International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
FL	Fort Myers	Southwest Florida International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	80,000,000.00	0
IN	Gary	Gary/Chicago International	0	0
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MI	Detroit	Detroit Metropolitan Wayne County	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	0	658,991.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	0	0
VA	Washington	Washington Dulles International	0	0
WA	Seattle	Seattle-Tacoma International	0	0

LOI Commitments By Fiscal Year				
State	City	Airport Name	Discretionary Total	Entitlement Total
AK	Anchorage	Ted Stevens Anchorage International	32,916,000.00	10,918,500.00
CA	San Jose	Norman Y. Mineta San Jose International	0	1,800,341.00
FL	Miami	Miami International	22,650,000.00	0
FL	Orlando	Orlando International	2,000,000.00	10,980,000.00
FL	Fort Myers	Southwest Florida International	3,500,000.00	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	63,016,600.00	0
IA	Cedar Rapids	The Eastern Iowa	16,800,000.00	9,828,500.00
IL	Chicago	Chicago O'Hare International	260,000,000.00	19,500,000.00
IN	Gary	Gary/Chicago International	37,844,597.00	8,000,000.00
IN	Indianapolis	Indianapolis International	20,500,000.00	20,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	23,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	16,500,000.00	13,600,000.00
MA	Boston	General Edward Lawrence Logan International	29,600,000.00	18,910,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	13,100,000.00	900,000.00
MI	Detroit	Detroit Metropolitan Wayne County	14,000,000.00	4,885,975.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	15,000,000.00	0
MO	St. Louis	Lambert-St Louis International	23,000,000.00	10,054,954.00
NC	Charlotte	Charlotte/Douglas International	78,000,000.00	36,386,275.00
NC	Greensboro	Piedmont Triad International	19,000,000.00	32,015,513.00
NH	Manchester	Manchester	0	0
OH	Cleveland	Cleveland-Hopkins International	45,650,000.00	29,838,991.00
OH	Columbus	Port Columbus International	8,300,000.00	0
PA	Harrisburg	Harrisburg International	13,470,000.00	0
SC	Myrtle Beach	Myrtle Beach International	33,000,000.00	0
TN	Memphis	Memphis International	15,808,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	13,844,000.00	0
TX	Houston	George Bush Intercontinental/Houston	33,050,000.00	30,024,000.00
UT	St. George	New	82,000,000.00	8,000,000.00
VA	Washington	Washington Dulles International	110,000,000.00	26,649,656.00
WA	Seattle	Seattle-Tacoma International	62,110,000.00	39,453,183.00

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TRUST FUND SHARE OF FAA Activities
(AIRPORT AND AIRWAY TRUST FUND)

Program and Financing
(in millions of dollars)

Identification code: 69-8104-0-7-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
00.01	Payment to operations	5,628	6,397	....
00.02	Payment to Safety and Operations	....	....	759
00.03	Payment to Air Traffic Organization	....	....	8,246
00.04	Payment to Research, Engineering and Development	....	....	156
10.00	Total new obligations	5,628	6,397	9,161
	Budgetary resources available for obligation:			
22.00	New budget authority (gross)	5,628	6,397	9,161
23.95	Total new obligations	-5,628	-6,397	-9,161
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (Trust Fund)	5,628	6,397	9,161
	Change in obligated balances:			
72.40	Obligated balance, start of year	2	2	....
73.10	Total new obligations	5,628	6,397	9,161
73.20	Total outlays (gross)	-5,628	-6,399	-9,161
74.40	Obligated balance, start of year	2	....	....
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	5,628	6,397	9,161
86.93	Outlays from discretionary balances	....	2	....
87.00	Total outlays (gross)	5,628	6,399	9,161
	Net budget authority and outlays:			
89.00	Budget authority	5,628	6,397	9,161
90.00	Outlays	5,628	6,399	9,161

For 2008, the budget proposes $11,893 million for FAA Safety & Operations, Air Traffic Organization, and Research, Engineering & Development, of which $9,161 million would be provided from the Airport and Airway Trust Fund.

Object Classification
(in millions of dollars)

Identification code: 69-8104-0-7-40		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct obligations:			
19.40	Financial Transfers	5,628	6,397	9,161

AIRPORT AND AIRWAY TRUST FUND

Program and Financing (in millions of dollars)

Identification code: 20-8103-0-7-402		FY2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Memorandum (non-add) entries:			
92.01	Total investments, start of year: Federal securities: Par value	7,893	7,931	7,950
92.02	Total investments, end of year: Federal securities: Par value	7,931	7,950	6,427

Section 9502 of Title 26, U.S. Code, provides for amounts equivalent to the funds received in the Treasury for the passenger ticket tax and certain other taxes paid by airport and airway users to be transferred to the Airport and Airway Trust Fund. In turn, appropriations are authorized from this fund to meet obligations for airport improvement grants, FAA staff offices, the Air Traffic Organization, payment to air carriers, and the Bureau of Transportation Statistics Office of Airline Information.

The status of the fund is as follows:

Status of Funds (in millions of dollars)

Identification code: 20-8103-0-7-402		FY2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Unexpended balance, start of year:			
01.00	Balance, start of year..	10,336	10,103	10,181
	Adjustments:			
01.91	Kerosene tax adjustment..	-164	....	....
01.99	Total balance, start of year..	10,172	10,103	10,181
	Cash Income during the year:			
	Current law:			
	Receipts			
12.00	Interest, Airport and airway trust fund [021-00-810320-0] ...	472	493	470
	Offsetting governmental receipts:			
12.60	Excise taxes, Airport and airway trust fund [021-00-810310-0]	11,468	11,871	12,570
	Offsetting collections:			
12.80	Grants-in-aid for airports [021-12-8106-0]..........................	4	1	1
12.82	Facilities and equipment [021-12-8107-0]	224	135	....
12.84	Research, engineering and development (Airport and airway trust fund) [021-12-8108]...	1	16	....
12.99	Income under present law..	12,169	12,516	13,041
32.99	Total cash income	12,169	12,516	13,041
	Cash outgo during year:			
	Current law:			
45.00	Payments to air carriers [021-12-8304-0]	-65	-44	-24
45.01	Grants-in-aid for airports [021-12-8106-0]..........................	-3,878	-2,971	-4,091
45.02	Facilities and equipment (Airport and airway trust fund) [021-12-8107-0]	-2,514	-2,839	-1,628
45.03	Research, engineering and development [021-12-8108-0]....	-153	-185	-84
45.04	Trust Fund share of FAA activities (Airport and airway trust fund) [021-12-8104-0]..	-5,628	-6,399	-9,161
45.99	Outgo under current law (-)	-12,238	-12,438	-14,988
65.99	Total Cash outgo (-)	-12,238	-12,438	-14,988
	Unexpended balance, end of year:			
87.00	Uninvested balance (net), end of year................................	2,172	2,231	1,807
87.01	Airport and Airway Trust Fund	7,931	7,950	6,427
87.99	Total balance, end of year...	10,103	10,181	8,234
	Commitments against unexpended balance, end of year:			
98.01	Obligated balance (-)..	-7,303	-4,199	-1,702
98.02	Unobligated balance (-)...	-1,267	-1,034	-455
98.99	Total commitments (-)	-8,570	-5,233	-2,157
99.00	Uncommitted balance, end of year[1].......................................	1,533	4,948	6,077

[1] Due to the expiration of AIP contract authority in December 2007, the 2009 Budget only includes $17M in new AIP contract authority in 2008. This results in a significant increase in the uncommitted balance of the Airport and Airway Trust Fund in FY 2008 and FY 2009. If Congress were to enact additional contract authority for FY 2008, the estimated year-end uncommitted balance would be lower in FY 2008 and FY 2009.

OPERATIONS

Program and Financing (in millions of dollars)

Identification code: 69-1301-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Air Traffic Organization (ATO)...	6,755	7,048	....
00.04	Regulation and Certification..	1,007	1,082	....
00.05	Commercial Space Transportation......................................	11	13	....
00.06	Staff Offices.	625	680	....
01.00	Direct Program Activities Subtotal	8,398	8,823	....
09.01	Reimbursable program	169	250	....
10.00	Total new obligations	8,567	9,073	....
	Budget resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	96	83	....
22.00	New budget authority (gross)	8,552	8,990	....
22.10	Resources available from recoveries of prior year obligations	6	....	....
22.30	Expired unobligated balance transfer to unexpired account	7	....	....
23.90	Total budgetary resources available for obligation...............	8,661	9,073	....
23.95	Total new obligations	-8,567	-9,073	....
23.98	Unobligated balance expiring or withdrawn	-11	....	....
24.40	Unobligated balance carried forward, end of year	83	....	....
	New budget authority (gross), detail:			
	Discretionary:			
40.00	Appropriation	2,746	2,343	....
	Spending authority from offsetting collections:			
	Discretionary:			
58.00	Offsetting collections (cash)	5,766	6,647	....
58.10	Change in uncollected customer payments from Federal sources (unexpired)	40	....	....
58.90	Spending authority from offsetting collections (total discretionary)	5,806	6,647	....
70.00	Total new budget authority (gross)	8,552	8,990	....
	Change in obligated balances:			
72.40	Obligated balance, start of year	850	1,107	1,093
73.10	Total new obligations	8,567	9,073	....
73.20	Total outlays (gross)	-8,265	-9,087	-1,093
73.40	Adjustments in expired accounts (net)..................................	-24	....	....
73.45	Recoveries of prior year obligations......................................	-6	....	....
74.00	Change in uncollected customer payments from Federal sources (unexpired)	-40	....	....
74.10	Change in uncollected customer payments from Federal sources (expired)	25	....	....
74.40	Obligated balance, end of year	1,107	1,093	....
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	7,316	7,942	....
86.93	Outlays from discretionary balances...................................	949	1,145	1,093
87.00	Total outlays (gross)	8,265	9,087	1,093
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	-5,789	-6,622	....
88.40	Non-Federal sources..	-21	-25	....
88.90	Total, offsetting collections (cash)	-5,810	-6,647	....

	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal sources (unexpired)	40	....	....
88.96	Portion of offsetting collections (cash) credited to expired accounts	-44	....	....
	Net budget authority and outlays:			
89.00	Budget authority	2,746	2,343	....
90.00	Outlays	2,455	2,440	1,093

In 2009, FAA has a new account structure to align FAA's budget account structure with its lines of business. The proposal replaces the Operations and Facilities and Equipment accounts with the Air Traffic Organization and the Safety and Operations accounts. No further budget authority is requested in 2009 in the Operations account and its schedule shows obligation and outlay amounts from prior years. 2009 funding is requested for these activities in the Air Traffic Organization and Safety and Operations accounts.

Object Classification (in millions of dollars)

Identification code: 69-1301-0-1-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	3,993	4,197	....
11.3	Other than full-time permanent	42	44	....
11.5	Other personnel compensation	366	382	....
11.9	Total personnel compensation	4,401	4,623	....
12.1	Civilian personnel benefits	1,318	1,400	....
13.0	Benefits for former personnel	1	1	....
21.0	Travel and transportation of persons	118	124	....
22.0	Transportation of things	23	22	....
23.1	Rental payments to GSA	105	112	....
23.2	Rental payments to others	41	47	....
23.3	Communications, utilities, and miscellaneous charges	374	376	....
24.0	Printing and reproduction	5	5	....
25.1	Advisory and assistance services	394	401	....
25.2	Other services	1,405	1,501	....
26.0	Supplies and materials	124	127	....
31.0	Equipment	79	76	....
32.0	Land and structures	7	5	....
41.0	Grants, subsidies, and contributions	1	1	....
42.0	Insurance claims and indemnities	2	2	....
99.0	Direct obligations	8,398	8,823	....
99.0	Reimbursable obligations	169	250	....
99.9	Total new obligations	8,567	9,073	....

Employment Summary

Identification code: 69-1301-0-1-402		FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
	Direct:			
1001	Total compensable work years: Full-time equivalent employment	39,610	40,442	....
	Reimbursable:			
2001	Total compensable work years: Full-time equivalent employment	133	124	....

AVIATION USER FEES

Special and Trust Fund Receipts
(in millions of dollars)

Identification code: 69-5422-0-2-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Balance, start of year:			
01.00	Balance, start of year	....	....	12
01.99	Balance Start of year	....	....	12
	Receipts:			
02.60	Aviation user fees, over flight fees	49	50	52
04.00	Total balances and collections	49	50	64
	Appropriations:			
05.00	Aviation user fees	-49	-38	-50
07.99	Balance, end of year	....	12	14

Program and Financing
(in millions of dollars)

Identification code: 69-5422-0-2-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Budget resources available for obligation:			
21.40	Un-obligated balance carried forward, start of year	9	12	....
22.00	New budget authority (gross)	3	-12	....
23.90	Total budgetary resources available for obligation	12	....	....
24.40	Un-obligated balance carried forward, end of year	12	....	....
	New budget authority (gross), detail:			
	Mandatory:			
60.20	Appropriations (special fund)	49	38	50
61.00	Transferred to other accounts	-46	-50	-50
62.50	Appropriation (total mandatory)	3	-12	....
	Net budget authority and outlays:			
74.40	Obligated balance, end of year	....	....	....
89.00	Budget authority	3	-12	....
90.00	Outlays	....	....	....

The Federal Aviation Reauthorization Act of 1996 (P.L. 104-264) authorized the collection of user fees for air traffic control and related services provided by the FAA to aircraft that neither take off nor land in the United States, commonly known as over-flight fees. The Budget estimates that $52 million in over-flight fees will be collected in 2009.

AVIATION INSURANCE REVOLVING FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
09.01	Program administration	6	7	7
10.00	Total new obligations(object class 25.2)	6	7	7
	Budget resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	742	939	1,104
22.00	New budget authority (gross)	203	172	45
23.90	Total budgetary resources available for obligation	945	1,111	1,149
23.95	Total new obligations	-6	-7	-7
24.40	Unobligated balance carried forward, end of year	939	1,104	1,142
	New budget authority (gross), detail:			
	Mandatory:			
69.00	Spending authority from offsetting collections: Offsetting collections (cash)	203	172	45
	Change in obligated balances:			
72.40	Obligated balance, start of year	8	9	9
73.10	Total new obligations	6	7	7
73.20	Total outlays (gross)	-5	-7	-7
74.40	Obligated balance, end of year	9	9	9
	Outlays (gross), detail:			
86.97	Outlays from new mandatory authority	5	7	7
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.20	Interest on Federal securities	-33	-53	-44
88.40	Non-Federal sources	-170	-119	-1
88.90	Total, offsetting collections (cash)	-203	-172	-45
	Net budget authority and outlays:			
89.00	Budget authority	....	....	....
90.00	Outlays	-198	-165	-38
	Memorandum (non-add) entries:			
92.01	Total investments, start of year: Federal securities: Par value	698	888	1,068
92.02	Total investments, end of year: Federal securities: Par value	888	1,068	1,096

The fund provides direct support for the aviation insurance program (chapter 443 of title 49, U.S. Code). Income to the fund is derived from premium collections for premium insurance coverage issued, income from authorized investments, and binder fees for non-premium coverage issued. The binders provide aviation insurance coverage for U.S. air carrier aircraft used in connection with certain Government contract operations by the Department of Defense and the Department of State.

The Homeland Security Act of 2002 (P.L. 107-296) required the Secretary to provide additional war risk insurance coverage (Hull Loss and Passenger and Crew Liability) to air carriers insured for Third-Party War Risk Liability as of June 19, 2002, as authorized under existing law. Continuation of this coverage was subsequently directed by several appropriations acts, the last being the Department of Transportation Appropriations Act of 2008, which extended the requirement to provide insurance coverage through August 31, 2008. The Secretary is authorized to limit an air carrier's third party liability to $100 million, when the Secretary certifies that the loss was from an act of terrorism. The FAA insurance policy covers: (i) hull losses at agreed value; (ii) death, injury, or property loss to passengers or crew, the limit being the same as that of the air carrier's commercial coverage before September 11, 2001; and (iii) third party liability, the limit generally being twice that of such coverage.

Object Classification

(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Reimbursable obligations:			
22.52	Other services	6	7	7

Employment Summary

Identification code: 69-4120-0-3-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Direct:			
1001	Civilian Full-time equivalent employment	5	5	5

ADMINISTRATIVE SERVICES FRANCHISE FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Obligations by program activity:			
09.01	Franchise Services	381	386	382
09.99	Total reimbursable program	381	386	382
10.00	Total new obligations	381	386	382
	Budget resources available for obligation:			
21.40	Un-obligated balance carried forward, start of year	159	163	176
22.00	New budget authority (gross)	383	399	391
22.10	Resources available from recoveries of prior year Obligations	2	....	....
23.90	Total budgetary resources available for obligation	544	562	567
23.95	Total new obligations	-381	-386	-382
24.40	Un-obligated balance carried forward, end of year	163	176	185
	New budget authority (gross), detail:			
	Discretionary:			
	Spending authority from offsetting collections:			
58:00	Offsetting collections (cash)	423	399	391
58.10	Change in uncollected customer payments from federal sources (unexpired)	-40	....	....
58:90	Spending authority from offsetting collections (total discretionary)	383	399	391
	Change in obligated balances:			
72.40	Obligated balance, start of year	60	104	80
73.10	Total new obligations	381	386	382
73.20	Total outlays (gross)	-375	-410	-432
73.45	Recoveries of prior year obligations	-2	....	....
74.00	Change in uncollected customer payments from federal sources (unexpired)	40	....	....
74.40	Obligated balance, end of year	104	80	30
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	95	319	313
86.93	Outlays from Discretionary balances	280	91	119
87.00	Total Outlays (gross)	375	410	432
	Offsets:			
	Against gross budget authority and outlays:			
88.00	Offsetting collections (cash) from: Federal Sources	-423	-399	-391
	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal Sources (unexpired)	40	....	....
	Net budget authority and outlays:			
89.00	Budget authority	....	....	....
90.00	Outlays	-48	11	41

In 1997, the Federal Aviation Administration established a franchise fund to finance operations where the costs for goods and services provided are charged to the users on a reimbursable basis. The fund improves organizational efficiency and provides better support to FAA's internal and external customers. The activities included in this franchise fund are: training, accounting, payroll, travel, duplicating services, multi-media services, information technology, material management (logistics), and aircraft maintenance.

Object Classification
(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Reimbursable obligations:			
11.1	Personnel compensation: Full-time permanent	94	102	107
12.1	Civilian personnel benefits	26	28	29
21.0	Travel and transportation of persons	4	5	5
22.0	Transportation of things	5	4	4
23.3	Communications, utilities, and miscellaneous charges	3	6	7
24.0	Printing and reproduction	1	2	1
25.2	Other services	155	153	139
26.0	Supplies and materials	77	77	80
31.0	Equipment	16	9	10
99.0	Reimbursable obligations	381	386	382
99.9	Total new obligations	381	386	382

Employment Summary

Identification code: 69-4562-0-4-402		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate
	Reimbursable:			
2001	Civilian full-time equivalent employment	1,293	1,428	1,428

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Program and Financing
(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2007 Actual	FY 2009 Enacted	FY 2008 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Engineering, development, test and evaluation	204	272	104
00.02	Procurement and modernization of (ATC) facilities and equipment	1,510	1457	368
00.03	Procurement and modernization of non-ATC facilities and equipment .	109	140	73
00.04	Mission support	229	225	29
00.05	Personnel and related expenses	420	460	. . . . .
01.00	Subtotal, direct program	2,472	2,557	574
09.01	Reimbursable program..	86	135	... .
10.00	Total new obligations...	2,558	2,692	574
	Budgetary resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	910	1,038	995
22.00	New budget authority (gross)...	2,687	2,649	. . . . .
22.10	Resources available from recoveries of prior year obligations	13	. . . . .	. . . . .
22.23	Expired unobligated balance transfer to unexpired account.................	4	. . . . .	. . . . .
23.90	Total budgetary resources available for obligation	3,614	3,687	995
23.95	Total new obligations...	-2558	-2692	-574
23.98	Unobligated balance expiring or withdrawn	-18	. . . . .	. . . . .
24.40	Unobligated balance carried forward, end of year	1,038	995	421
24.41	Special and trust fund receipts returned to Schedule N.......................	18	. . . .	
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (trust fund)	2,518	2,514	. . . . .
58.00	Spending authority from offsetting collections: Offsetting collections (cash)..	102	135	. . . . .
58.10	Change in uncollected customer payment for Federal sources (unexpired)...	9	. . . . .	. . . . .
58.90	Spending authority from offsetting collections (total discretionary)	111	135	. . . . .
69.00	Mandatory: Offsetting collections (cash)	58	. . . . .	. . . . .
70.00	Total new budget authority (gross)..	2,687	2,649	. . . . .
	Change in obligated balances:			
72.40	Obligated balance, start of year:	1,690	1,801	1654
73.10	Total new obligations...	2,558	2,692	574
73.20	Total outlays (gross)..	-2,514	-2,839	-1,628
73.40	Adjustments in expired accounts (net)	-44	. . . . .	. . . . .
73.45	Recoveries of prior year obligations	-13	. . . . .	. . . . .
74.00	Change in uncollected customer payment for Federal sources (unexpired)...	-9	. . . . .	. . . . .
74.10	Change in uncollected customer payment for Federal sources (expired)	133	. . . . .	. . . . .
74.40	Obligated balance, end of year..	1,801	1,654	600
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority...	999	1,216	. . . . .
86.93	Outlays from discretionary balances	1,515	1,615	1,604
86.98	Outlays from mandatory balances...	. . . . .	8	24
87.00	Total outlays (gross)..	2,514	2,839	1,628
	Offsets:			

	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	-165	-90	. . . . .
88.40	Non-Federal sources	-59	-45	. . . . .
88.90	Total, offsetting collections (cash)	-224	-135	. . . . .
	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal sources (unexpired)	-9	. . . . .	. . . . .
88.96	Portion of offsetting collections (cash) credited to expired accounts	64	. . . . .	. . . . .
	Net budget authority and outlays			
89.00	Budget authority	2,518	2,514	. . . . .
90.00	Outlays	2,290	2,704	1,628

In 2009, FAA proposes a new account structure to align FAA's budget account structure with its lines of business. The proposal replaces the Operations and Facilities and Equipment accounts with the Air Traffic Organization and Safety and Operations accounts. No further budget authority is requested in 2009 in the Operations account and its schedule shows obligation and outlay amounts from prior years. 2009 funding is requested for these activities in the Air Traffic Organization and Safety and Operations accounts.

Object Classification
(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2006 Actual	FY 2007 Enacted	FY 2008 Estimate
	Direct obligations:			
	Personnel compensation:			
11.11	Full-time permanent	290	317	. . . . .
11.13	Other than full-time permanent	3	3	. . . . .
11.15	Other personnel compensation	7	8	. . . . .
11.19	Total personnel compensation	300	328	. . . . .
11.21	Civilian personnel benefits	70	76	. . . . .
12.10	Travel and transportation of persons	30	37	. . . . .
12.20	Transportation of things	4	4	3
12.32	Rental payments to others	35	36	10
12.33	Communications, utilities, and miscellaneous charges	44	45	15
12.40	Printing and reproduction	1	1	1
12.52	Other services	1,543	1,575	354
12.60	Supplies and materials	34	35	7
13.10	Equipment	179	183	145
13.20	Land and structures	228	233	37
14.10	Grants, subsidies, and contributions	4	4	2
19.90	Subtotal, direct obligations	2,472	2,557	574
29.90	Reimbursable obligations	86	135	. . . . .
99.99	Total new obligations	2,558	2,692	574

Employment Summary

Identification code: 69-8107-0-7-402		FY 2006 Actual	FY 2007 Enacted	FY 2008 Estimate
	Direct			
1001	Civilian full-time equivalent employment	2,738	2,884	. . . . .
	Reimbursable			
2001	Civilian full-time equivalent employment	10	55	. . . . .

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OPERATIONS

ESTIMATES

1999 .... [1,2]5,631,130,000
2000 .... [5]6,039,000,000
2001 .... [8]6,592,235,000

2002 .... [12]6,886,000,000

2003 .... [16,17]7,481,970,000
2004 .... [21]7,590,648,000
2005 .... [24]7,849,000,000
2006 .... [27,28]8,201,000,000
2007 .... [29]8,366,000,000
2008 .... [33]
2009…………………………………………[34]

APPROPRIATIONS

1999 .... [3,4]5,586,071,000
2000 .... [6,7]5,957,590,000
2001 .... [9,10]6,515,837,683
2001 .... [11]123,000,000
2002 .... [13]6,886,000,000
2002 .... [14]200,000,000
2002 Rescission .... [15]-5,681,000
2003 .... [18,19,20]7,019,170,377
2004 .... [22,23]7,479,206,153
2005 .... [25,26]7,706,537,000
2006 .... [30,31]8,104,140,000
2007 .... [32]8,104,140,000
2008 ……………………….. [35]8,740,000,000

[1] Includes mandatory authority of $43,000,000 in user fees
[2] Includes $2,060,000,000 from the Airport and Airway Trust Fund.
[3] Reflects $34,207,000 Y2K supplemental, $4,863,000 TASC reduction per P.L. 105-277, and $5,831,000 rescission per P.L. 106-51.
[4] Includes $4,112,174,000 from the Airport and Airway Trust Fund.
[5] Administration proposed 100 percent funding from the Airport and Airway Trust Fund.
[6] Reflects rescission of $10,800,000 of Y2K balances per P.L. 106-246 and a reduction of $6,610,000 for TASC per P.L. 106-69.
[7] Includes $75,000,000 supplemental per P.L. 106-246.
[8] Administration proposed 100 percent funding from the Airport and Airway Trust Fund.
[9] Reflects administrative rescission of .22 percent per P.L. 106-554 and $14,000,000 transfer to the Essential Air Service.
[10] Includes $4,405,156,288 from the Airport and Airway Trust Fund.
[11] P.L. 107-38, Emergency Supplemental Appropriations Act for Recovery from and Response to Terrorist Attacks on the U.S., FY 2001.
[12] Includes $5,777,219,000 from the Airport and Airway Trust Fund.
[13] Includes $5,773,519,000 from the Airport and Airway Trust Fund.
[14] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[15] Reflects Administrative and Travel Rescission per P.L. 107-206;$5,542,000 from General Fund and $139,000 from Trust.
[16] FY 2003 includes $404,768,000 for CSRS/Health benefit accruals proposed by the Administration.
[17] Includes 3,799,278,000 from Airport and Airway Trust Fund.
[18] Includes $3,774,582,693 from Airport and Airway Trust Fund and $3,248,064,934 from General Fund.
[19] Reflects 0.65 percent across-the-board rescission per P.L. 108-7 and Working Capital Fund cut of $3.9M.
[20] Excludes Midway Island Airfield earmark for $3,500,000—reduced to $3,477,250 by 0.65 rescission.
[21] Administration proposes $6,000,000,000 from Airport and Airway Trust Fund.
[22] Reflects 0.59 percent across-the-board rescission per P.L. 108-199; Working Capital Fund cut by $7.3M.
[23] Includes $4,469,000,000 from Airport Airway Trust Fund.
[24] Includes $6,002,000,000 from Airport and Airway Trust Fund with $2M for Bureau of Transportation Statistics.
[25] Reflects 0.80 percent across-the-board rescission per P.L. 108-447 and Working Capital Fund cut of $6.3M.
[26] Includes $$4,878,728,416 from Airport and Airway Trust Fund.
[27] Includes $6,500,000,000 from the Airport and Airway Trust Fund.
[28] Includes $150,000,000 for Flight Service Station A-76 Competition.
[29] Includes $5,445,000,000 from Airport and Airway Trust Fund.
[30] Reflects 1.0 percent across-the-board rescission per P.L. 109-148.
[31] Includes $5,541,000,000 from Airport and Airway Trust Fund.
[32] Includes $5,485,590,000 from Airport and Airway Trust Fund
[33] Starting in FY 2008, this account will no longer receive appropriations. Funding will go to the new Safety & Operations and Air Traffic Organization accounts.
[34] Starting in FY 2009, this account will no longer receive approprations. Funding will go to the new Safety & Operations and Air Traffic Organization accounts.
[35] Include $6,397,061 from Airport and Airway Trust Fund.

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
1999	2,130,000,000	1999	[36]2,121,255,389
2000	2,319,000,000	2000	[37]2,034,427,000
2001	2,495,000,000	2001	[38]2,650,920,117
2002	2,914,000,000	2002	2,914,000,000
		2002	[39]-15,000,000
		2002	[40]108,500,000
		2002 Rescission	[41]-1,726,000
2003	[42]2,981,022,000	2003	[43]2,961,645,357
		2003 Rescission	[44]-20,000,000
2004	2,916,000,000	2004	[45]2,892,831,000
		2004 Rescission	[46]-30,000,000
2005	2,500,000,000	2005	[47]2,519,680,000
		2005 Supplemental (P.L.108-324)	[48].5,100,000
2006	2,448,000,000	2006	[49]2,514,600,000
		2006	[50]40,600,000
2007	2,503,000,000	2007	[2,480,955],000
2008	[51]	2008	2,513,611,000
2009	[52]		

[36] Includes $122,533,000 for Y2K supplemental per P.L. 105-277, and a rescission of $1,277,611 per P.L. 106-51.
[37] Reflects $30,000,000 rescission of unobligated balances per P.L. 106-69 and a $10,573,000 rescission of Y2K balances per P.L. 106-246.
[38] Includes administrative rescission of .22 percent per P.L. 106-554.
[39] Rescission of unobligated balances per P.L. 107-87.
[40] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[41] Administrative and Travel rescission per P.L. 107-206.
[42] FY 2003 request excludes $18,551,000 for CSRS/Health benefit accruals proposed by the Administration.
[43] Reflects 0.65 percent across-the-board rescission of per P.L. 108-7.
[44] Rescission of unobligated balances.
[45] Reflects 0.59 percent across-the–board rescission per P.L. 108-199.
[46] Rescission of unobligated balances.
[47] Reflects 0.80 percent across-the-board rescission per P.L. 108-447.
[48] Hurricane Supplemental fund per P.L. 108-324.
[49] Reflects 1.0 percent across-the-board rescission.per P. L. 109-148.
[50] Hurricane Supplemental fund per P.L. 109-148
[51] Starting in FY 2008, this account will no longer receive appropriations. Funding will go to the new Safety & Operations and Air Traffic Organization accounts.
[52] Starting in FY 2009, this account will no longer receive appropriations. Funding will go to the new Safety & Operations and Air Traffic Organization accounts.

SAFETY & OPERATIONS

ESTIMATES		APPROPRIATIONS	
2008	[53][54] 1,879,453,000	2008	[57]
2009	[55][56] 2,052,094,000		

[53] New account starting in FY 2008. Includes both traditional Operations and Facilities & Equipment funds.
[54] Includes $671,594,000 from Airport and Airway Trust Fund.
[55] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment funds.
[56] Includes $758,561,000 from Airport and Airway Trust Fund.
[57] FAA funds in FY 08 for the Safety & Ops account were appropriated as the traditional Operations and Facilities & Equipment funds.

AIR TRAFFIC ORGANIZATION

ESTIMATES		APPROPRIATIONS	
2008	[58] [59] 9,307,896,000	2008	[61]
2009	[60] 9,669,878,000		

[58] New account starting in FY 2008. Includes both traditional Operations and Facilities & Equipment funds.
[59] Includes $7,914,433,000 from Airport and Airway Trust Fund.
[60] New account starting in FY 2009. Includes both traditional Operations and Facilities & Equipment.
[61] FAA funds in FY 08 for the Air Traffic Organization account were appropriated as the traditional Operations and Facilities & Equipment funds.

Research, Engineering, and Development

ESTIMATES		APPROPRIATIONS	
1999	290,000,000	1999	[62] 150,275,000
2000	173,000,000	2000	156,495,000
2001	184,366,000	2001	[63] 186,588,600
2002	187,781,000	2002	195,000,000
		2002	[64] 50,000,000
		2002 Rescission	[65] -161,000
2003	126,744,000	2003	[66] 147,485,075
2004	100,000,000	2004	[67] 118,734,310
2005	117,000,000	2005	[68] 129,879,584
2006	130,000,000	2006	[69] 136,620,000
2007	130,000,000	2007	131,297,000
2008	[70,71] 140,000,000	2008	146,828,000
2009	[72,73] 171,000,000		

[62] Includes $367,000 for Y2K supplemental per P.L. 105-277 and a rescission of $92,000 per P.L. 106-51.
[63] Includes rescission of .22 percent per P.L. 106-554.
[64] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[65] Administrative and Travel rescission per P.L. 107-206.
[66] Reflects a 0.65 percent across-the-board rescission per P.L. 108-7.
[67] Reflects a 0.59 percent across-the-board rescission per P.L. 108-199.
[68] Reflects a 0.80 percent across-the-board rescission per P.L. 108-447.
[69] Reflects a 1.0 percent across-the-board rescission of 1.0 percent per P.L. 109-148.
[70] Research, Engineering, & Development account changes from being funded by the Airport and Airway Trust Fund to the Airport and Airway Trust Fund & General Fund in FY 2008.
[71] Includes $122,867,000 from Airport and Airway Trust Fund.
[72] In FY 2009, the Research, Engineering, & Development account will be funded by the Airport and Airway Trust Fund and the General Fund.
[73] Includes $155,025,000 from Airport and Airway Trust Fund.

GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES

1999	1,600,000,000
2000	1,750,000,000
2001	1,960,000,000
2002	1,800,000,000
2002 Rescission	-331,000,000
2003	3,100,000,000
2004	3,400,000,000
2005	2,800,000,000
2006	3,300,000,000
2007	4,000,000,000
2008	4,000,000,000
2009	3,600,000,000

APPROPRIATIONS

1999	1,600,000,000
2000	1,750,000,000
2001	3,200,000,000
2001 Rescission	-579,000,000
2002	1,800,000,000
2002 Rescission	[74]-301,720,000
2002	[75]175,000,000
2003	3,100,000,000
2004	3,400,000,000
2005	2,800,000,000
2006	3,399,000,000
2007	4,399,000,000
2008	4,399,000,000

[74] Rescission of Contract Authority per P.L. 107-87.
[75] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.

GRANTS-IN-AID FOR AIRPORTS
LIMITATION ON OBLIGATIONS
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
1999	(1,700,000,000)	1999	(1,950,000,000)
2000	(1,600,000,000)	2000	[76](1,895,638,000)
2001	(1,950,000,000)	2001	[77][78](3,195,454,500)
2001 (Proposed Supp.)	(-50,000,000)		
2002	(3,300,000,000)	2002	[79](3,474,944,000)
2003	(3,400,000,000)	2003	[80](3,377,900,000)
2004	(3,400,000,000)	2004	[81] (3,379,940,000)
		2004	[82](1,988,200)
2005	(3,500,000,000)	2005	[83](3,497,000,000)
2006	(3,000,000,000)	2006	(3,514,500,000)
2007	(2,750,000,000)	2007	(3,514,500,000)
2008	(2,750,000,000)	2008	[84](3,514,500,000)
2009	(2,750,000,000)		

[76] Reflects reduction of $54,362,000 per P.L. 106-113.
[77] Reflects administrative rescission of .22 percent per P.L. 106-554.
[78] Includes direct appropriation of $2,494,500 for Huntsville, Alabama, and reflect a .22 percent rescission pursuant to P.L. 106-554.
[79] Includes direct appropriation, DOD supplemental of $175,000,000 per P.L. 107-117 and reflects admin. rescission of $-56,000 per P.L. 107-206.
[80] Reflects 0.65 percent across-the-board rescission per P.L. 108-7.
[81] Reflects 0.59 percent across-the-board rescission per P.L. 108-199.
[82] Direct appropriation from General Fund for Ft. Worth Alliance Airport, pursuant to Division H, Section 167, P.L. 108-199.
[83] Includes 0.80 percent across-the-board rescission per P.L. 108-447 and includes a $25,000,000 Hurricane supplemental per P.L. 108-324.
[84] In FY 2008, the Airport Grants program has an obligation limitation of $3,514,500,000, but only $17 million in new contract authority. The program cannot award new grants until sufficient contract authority is provided for FY 2008.

NATIONAL CIVIL AVIATION REVIEW COMMISSION

ESTIMATES	APPROPRIATIONS
1999 0	1999 Rescission .... -849,072

FACILITIES, ENGINEERING AND DEVELOPMENT

ESTIMATES	APPROPRIATIONS
1999 0	1999 (Supp.) Rescission .... -72,389

PERFORMANCE OVERVIEW

Annual Performance Results and Targets

The Federal Aviation Administration (FAA) integrates performance results into its budget request to ensure alignment with the Department of Transportation's Strategic Plan. The FAA tracks the following DOT level performance measures to demonstrate program results:

Strategic Goal: Safety

Reducing Commercial Air Carrier Fatalities[1]: U.S. Fatalities per 100 Million Persons On Board					
	2005	**2006**	**2007**	**2008**	**2009**
Target	N/A	N/A	N/A	8.88	8.62
Actual	N/A	N/A	N/A	N/A	N/A
Previous Measure: U.S. commercial air carrier fatal aviation accidents per 100,000 departures (last 3 years' average)					
	2005	**2006**	**2007**	**2008**	**2009**
Target	0.023	0.018	0.010	≤0.010	≤0.010
Actual	0.017	0.020[2]	0.022[3]	N/A	N/A

1 New metric replaces Fatal Accident Rate beginning in FY 2008. Through FY 2009, targets and results for both measures will be reported.
2 Preliminary estimate. Final data expected by March 2008. It is unlikely that these results will be changed significantly.
3 Preliminary estimate. Final data expected by March 2009.

General Aviation Fatal Accident Rate[1]: Reduce the rate of fatal general aviation accidents					
	2005	**2006**	**2007**	**2008**	**2009**
Target	N/A	N/A	N/A	N/A	TBD
Actual	N/A	N/A	N/A	N/A	N/A
Previous Measure: Reduce the number of fatal general aviation accidents					
	2005	**2006**	**2007**	**2008**	**2009**
Target	343	337	331	325	319
Actual	354[2]	300[3]	314[4]	N/A	N/A

1 In FY 2009, metric changed to General Aviation Fatal Accident Rate.
2 Final result revised from original estimate of 350 in March 2007.
3 Preliminary estimate. Final data expected by March 2008 for the FY 2006 results. It is unlikely that these results will be changed significantly.
4 Preliminary estimate. Final data expected by March 2009.

Serious Hazardous Materials Incidents[1]: Number of serious hazardous materials transportation incidents (CY)					
	2005	**2006[2]**	**2007**	**2008**	**2009**
Target	503	470	466	462	458
Actual	525	491	455[3]	N/A	N/A

1 Targets and results are for DOT as a whole, to which FAA contributes. The FAA's contribution is discussed in Section 4 of this submission.
2 Measure rebaselined – new targets set for FY 2006 and FY 2007.
3 Preliminary estimate.

Commercial Space Launch Accidents[1]: Number of accidents resulting in fatalities, injuries, or significant property damage to uninvolved public					
	2005	**2006**	**2007**	**2008**	**2009**
Target	0	0	0	0	0
Actual	0	0	0	N/A	N/A

[1] FAA *Flight Plan* target. Although not designated a DOT-level measure, Commercial Space Launch Accidents is included here and in Exhibits III-2 and IV-1 to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry.

Strategic Goal: Reduced Congestion

NAS On-Time Arrivals[1]: Percent of all flights arriving within 15 minutes of schedule at the 35 Operational Evolution Plan airports due to National Air Space (NAS) related delays					
	2005	**2006**	**2007**	**2008**	**2009**
Target	87.40%	87.40%	87.67%	88.00%	88.22%
Actual	88.44%	88.36%	86.96%[2]	N/A	N/A

[1] Measure redefined in FY 2005 to exclude delays unrelated to the NAS, such as severe weather.
[2] Final result revised from original preliminary estimate of 86.32%.

Average Daily Airport Capacity[1]: Average daily arrival and departure rates					
	2005	**2006**	**2007**	**2008**	**2009**
Target	99,892	101,191	101,562	101,868	103,328
Actual	101,463	101,932	102,545	N/A	N/A

[1] New strategic goal for DOT in FY 2008. FAA has included this goal in its *Flight Plan* since FY 2004.

Strategic Goal: Global Connectivity

Bilateral Safety Agreements[1]: Number of new or expanded bilateral aviation safety agreements implemented					
	2005	**2006**	**2007**	**2008**	**2009**
Target	2	2	3	2	1
Actual	2	4	3	N/A	N/A

[1] Measures number of agreements signed each year.

External Funding[1]: Yearly increase in international aviation development funding from the U.S. and international governmental organizations, multilateral banks, and industry					
	2005	**2006**	**2007**	**2008**	**2009**
Target	$14.36M	$23.41M	$12.00M	$15.00M	$18.00M
Actual	$19.51M	$33.04M	$13.36M	N/A	N/A

[1] New measure in FY 2006 – 2011 DOT Strategic Plan, reported in FY 2009 budget for the first time. Included in FAA Flight Plan, but targets revised in FY 2007. Original target was 20% increase over previous year's funding total. In FY 2007, target was reset at $12.00 million, with increases of $3 million per year over that baseline from FY 2008 – FY 2011. Original targets are shown for FY 2005 and FY 2006.

NextGen Technologies[1]: Total number of countries taking a significant step, as a result of FAA assistance and collaboration, to implement the operational use of NextGen technologies, procedures, or concepts					
	2005	**2006**	**2007**	**2008**	**2009**
Target	1	1	1	1	1
Actual	1	1	1	N/A	N/A

[1] New measure in FY 2006 – 2011 DOT Strategic Plan, reported in FY 2009 budget for the first time. Measures expansion of NextGen technologies into priority countries – target is one country per year. Similar measure included in FAA Flight Plan, originally called NAS Technologies. Redefined in FY 2006 to restrict measure to GPS-based technologies only, then refocused in FY 2007 to include all NextGen-related projects. Targets shown for FY 2005 and FY 2006 are for original measures.

Strategic Goal: Environmental Stewardship

Noise Exposure: Percent reduction in the number of people in the U.S. who are exposed to significant aircraft noise levels (Revised in FY 2005)					
	2005	**2006**	**2007[1]**	**2008[1]**	**2009[1]**
Target	- 3%	- 4%	- 8%	- 12%	- 16%
Actual	- 29%[2]	-26%[3]	-27%[4]	N/A	N/A

[1] Target revised in FY 2007 to reflect change in short-term growth projections.
[2] Actual result revised from projection.
[3] Revised in Spring 2007.
[4] Projection from trends, to be revised in May 2008.

Streamline Environmental Assessments[1]: Median time to complete Environmental Assessments (EA) for DOT-funded projects					
	2005	**2006**	**2007**	**2008**	**2009**
Target	N/A	N/A	N/A	12	12
Actual	N/A	N/A	N/A	N/A	N/A

[1] New performance goal – no prior data available. Measures the reduction in median time (months) to complete Environmental Impact Statements (EIS) and Environmental Assessments (EA) for DOT funded infrastructure projects. Targets and results are for DOT as a whole, to which FAA contributes. FAA's contribution is discussed in Sections 4 of this submission.

Streamline Environmental Impact Statements[1]: Median time to complete Environmental Impact Statements (EIS) for DOT-funded projects					
	2005	**2006**	**2007**	**2008**	**2009**
Target	N/A	N/A	N/A	30	30
Actual	N/A	N/A	N/A	N/A	N/A

[1] New performance goal – no prior data available. Measures the reduction in median time (months) to complete Environmental Impact Statements (EIS) and Environmental Assessments (EA) for DOT funded infrastructure projects. Targets and results are for DOT as a whole, to which FAA contributes. FAA's contribution is discussed in Sections 4 of this submission.

DOT Facility Cleanup[1]: Percent of DOT facilities characterized as 'No Further Remedial Action Planned' under the Superfund Amendments Reauthorization Act					
	2005	**2006**	**2007**	**2008**	**2009**
Target	93%	93%	93%	93%	93%
Actual	92%	92%	93%	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes. Measures percentage of DOT facilities categorized as No Further Remedial Action Planned under the Superfund Amendments and Reauthorization Act.

Strategic Goal: Organizational Excellence

Acquisition Schedule[1]: For major DOT aviation systems, percent of scheduled milestones established in the acquisition project baselines that are met					
	2005	**2006**	**2007**	**2008**	**2009**
Target	80.0%	85.0%	87.5%	90.0%	90.0%
Actual	92.0%	97.4%	97.0%	N/A	N/A

[1] This is designated as a DOT-level target, but only FAA results are measured. Measures percentage of schedule goals met.

Acquisition Cost[1]: For major DOT aviation systems, percent of cost goals established in the acquisition project baselines that are met					
	2005	**2006**	**2007**	**2008**	**2009**
Target	80.0%	85.0%	87.5%	90.0%	90.0%
Actual	97.0%	100.0%	100%	N/A	N/A

[1] This is designated as a DOT-level target, but only FAA results are measured. Measures percentage of baseline cost goals met.

Infrastructure Projects Schedule[1]: Percent of major Federally funded transportation infrastructure projects with less than 2 percent annual growth in the project completion milestone as reported in the finance plan					
	2005	**2006**	**2007**	**2008**[2]	**2009**
Target	N/A	N/A	N/A	90.0%	90.0%
Actual	N/A	N/A	N/A	N/A	N/A
Previous Measure: For major Federally funded infrastructure projects, percent that meet schedule milestones established in project or contract agreements, or miss them by less than 10 percent					
	2005	**2006**	**2007**	**2008**[2]	**2009**
Target	95.0%	95.0%	95.0%	90.0%	90.0%
Actual	95.0%	91.0%	88.0%	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes.
[2] Measure redefined in DOT Strategic Plan FYs 2006 – 2011.

Infrastructure Projects Cost [1]: Percent of finance plan cost estimates for Federally funded transportation infrastructure projects with less than 2 percent annual growth					
	2005	**2006**	**2007**	**2008[2]**	**2009**
Target	N/A	N/A	N/A	90.0%	90.0%
Actual	N/A	N/A	N/A	N/A	N/A
Previous Measure: For major Federally funded infrastructure projects, percent that meet cost estimates established in project or contract agreements, or miss them by less than 10 percent					
	2005	**2006**	**2007**	**2008[2]**	**2009**
Target	95.0%	95.0%	95.0%	90.0%	90.0%
Actual	79.0%	82.0%	84.0%	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes.
[2] Measure redefined in DOT Strategic Plan FY 2006 – FY 2011.

Detailed performance budget information can be found in Section 4 of the budget submission.

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PERFORMANCE OVERVIEW

Program Assessment Rating Tool (PART) Assessment

PART was developed by the Office of Management and Budget (OMB) to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of PART provides a means through which programs can assess their activities differently than through traditional reviews. The following FAA programs have been assessed via the PART:

Program	PART Cycle	Score	OMB Assessment
Grants-in-Aid for Airports (Airport Improvement Program)	FY 2004	76	Moderately Effective
Research, Engineering & Development	FY 2005	93	Effective
Air Traffic Services (now ATO)	FY 2005	65	Adequate
Facilities and Equipment	FY 2006	55	Adequate
Regulation and Certification (now Aviation Safety)	FY 2006	84	Moderately Effective
ATO – Terminal	FY 2007	74	Moderately Effective

Grants-in-Aid for Airports (AIP) Analysis: AIP provides funding to airports for infrastructure improvements such as safety, security and capacity projects. AIP was reauthorized in FAA's authorization bill, VISION 100, P.L. 108-176.

- The program demonstrates overall cost effectiveness and efficiency. Program is using greater delegation to the regions and use of automation to improve efficiency.
- Program structure, combined with the statute, can, infrequently, limit the programs' ability to quickly respond to new situations and events. For example, statute provides specific criteria on eligibility and use of funds that may limit FAA's ability to respond to hurricane damage.
- The program has good measures and targets and a number of long and short-term goals that are intricately linked together. The Department's 2004 budget proposal aligned spending with goals to drive improved performance within the program.

We are taking the following actions to improve the performance of the program:

- A team reviewed FY 2005 Cost Accounting System/Labor Distribution Reporting information to establish short-term and long-term improvement strategies based on identified Best Practices among FAA Regions. In FY 2007, efficiency measures were tracked against the FY 2006 baseline. The Airports organization will make use of efficiency measures as a standard management practice.
- Supporting safety, security and major capacity projects at airports that provide the greatest benefits to the national system.

Research, Engineering & Development (R,E&D) Analysis: The R,E&D program conducts aviation research to ensure a safe, efficient, and environmentally compatible air transportation system. Research is conducted on safety, human factors, aviation weather, and environment. The high score achieved by this program places it in the top tier category of Effective.

- The program is well-managed and results oriented. The R,E&D program has specific long-term measures tied to multi-year objectives that support the agency's strategic plan. The program's goals are developed in conjunction with sponsors and partners from industry, universities, other agencies, users, and associations.
- The program gains tremendous cost efficiencies through its Centers of Excellence program. This program provides matching funds from non-federal sources enabling the program to leverage industry resources to help finance critical safety research.
- The program's performance plan does not include efficiency measures and targets.

We are taking the following actions to improve the performance of the program:

- Developed an efficiency measure to evaluate overhead costs in the program's budget. Another efficiency measure is to maintain the R,E&D management workforce to no more than ten percent of the overall R,E&D workforce. Financial plans are reviewed at various reporting levels to better manage overhead cost to ensure as many dollars as possible go directly to research projects.
- Use of Delphi financial reports enabled management to effectively control overhead costs and resulted in over $1 million in cost savings, which was made available for research projects.
- FAA works with National Aeronautics and Space Administration (NASA) to ensure no duplication of effort takes place. In coordination with NASA, FAA will develop a follow-on plan to the National Aeronautics Research and Development Policy and will work to identify challenges and R&D solutions to safety, environment, and human factors issues affecting NexGen.

Air Traffic Services (Air Traffic Organization) Analysis: The Air Traffic Services program has been reorganized and is now known as the Air Traffic Organization (ATO). ATO provides guidance and control to air traffic and has implemented many changes to enhance safety and efficiency. Commercial and private aircraft as well as military aircraft receive control instructions, ensuring the safe operation of the national airspace.

- The program lacks efficiency measures and targets. Program also lacks cost effectiveness in program execution.
- Program is aware of management challenges but is working to resolve them too slowly. Program hopes to achieve controller staff savings of ten percent by 2010 through productivity improvements.

We are taking the following actions to improve the performance of the program:

- Improving performance and containing costs. Since FY 2005, program has improved management of workers compensation program to ensure that new claims are minimized and employees are returned to duty.
- ATO hopes to achieve controller staff savings of ten percent by 2010 through productivity improvements. In FY 2005, ATO achieved the first three percent of the goal. In FY 2006, ATO increased controller productivity by two percent and accomplished the same incremental objective in FY 2007.
- Initiatives to support the improvement of performance and containment of cost are included in the FAA Flight Plan.
- A 10-year Strategy for the Air Traffic Control Workforce was published in December 2004 and updated in August 2006 and March 2007. Annual updates will be conducted.

Facilities and Equipment (F&E) Analysis: The program develops and acquires the products and services that enable FAA to enhance the safety of the national airspace system and satisfy current and future operational needs of the system for national and international operations.

- The program has good long-term outcome measures that focus on increasing aviation safety, creating greater capacity, and ensuring organizational excellence. Managers are held accountable for achieving cost, schedule, and performance targets through the agency's Performance Management System, which is evaluated semi-annually.
- Projects consistently experience large cost and schedule overruns and the relative benefits are unclear. Capital funding processes have driven management priorities towards discrete priorities rather than comprehensive, integrated, and on-going refresh of operating capabilities.
- The program provides the necessary equipment and facilities for FAA to fulfill its mission for a safe, secure, and efficient national airspace system. The program uses a collaborative decision making tool to support resource allocations.

We are taking the following actions to improve the performance of the program:

- Developing better internal financial management standards and controls to validate the basis for estimating capital program costs and benefits.

Regulation and Certification (Aviation Safety) Analysis: Aviation Safety (AVS) program provides safety and regulatory oversight of the aviation industry by issuing regulations and safety directives and licensing aircraft. This organization is moderately effective, achieves results and has well defined short and long-term goals.

- AVS has specific long-term performance measures that are tied to multi-year objectives that are linked to FAA's strategic plan.
- There is a lack of efficiency measures and targets within the program, but AVS is in the process of implementing such measures.
- Appropriate financial and management oversight of the program is maintained. Program utilizes a systems approach to safety by using risk management to focus resources efficiently.
- Aviation Safety program issues only those appropriate rules and regulations that are required to meet the goals of the program.

We are taking the following actions to improve the performance of the program:

- AVS developed a cost per rule metric but it did not provide meaningful data for AVS management. An alternative metric on reducing technical corrections in rules by 20 percent in FY07 was approved. AVS has identified "Average Cost of Designee Management per Designee," among others, as broader scope measures that would be more representative of the organization's operations.
- Continue to monitor performance measures which include reductions in the number of fatal air carrier accidents, general aviation and Part 135 accidents and reduction of accidents in Alaska.
- AVS has conducted look-back studies to see if regulations have created the maximum net benefit.
- The aircraft certification office has improved efficiency for inspecting the manufacturing process.
- AVS received ISO 9001 certification in FY 2006, further showcasing FAA's efforts to improve efficiency and deliver quality services.
- Air Transport Oversight System increases effectiveness of oversight by identifying risk before problems occur. The program better utilizes the aviation safety inspector work force by focusing their efforts on known risk areas.

Air Traffic Organization (ATO) - Terminal Programs Analysis: ATO-Terminal directs air traffic flows and assists with take-offs and landings of aircraft in and around airports and airport control towers. The program is moderately effective.

- The Air Traffic Organization-Terminal program has a clear purpose and resources are used directly and effectively to meet the program's purpose.
- The program has ambitious and meaningful long-term goals for increasing safety and capacity. The program has achieved most of its long-term and annual performance targets for FY2006, but needs to demonstrate improved efficiencies and cost effectiveness.
- The program needs to improve its management of major capital acquisition and construction projects by better use of financial management standards and earned value management.

We are taking the following actions to improve the performance of the program:

- Ensuring all major capital acquisition programs achieve compliance with American National Standards Institute standards.
- Developing a plan for improving the management of major capital construction projects, including business case analysis and more systematic use of earned value management.
- Supporting the development of common measures to compare performance between International Air Traffic Service Providers.

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Performance Overview

The FAA is Actively Addressing Management Challenges Identified in the FY 2008 Inspector General's Report.

On November 15, 2007 the Department of Transportation's Office of Inspector General (OIG) reported on the Department's Top Management Challenges for FY 2008. The FAA and its stakeholders are addressing these challenges. In fact, policies to address many of these challenges have already been implemented. This section describes FAA's specific plans to address the Management Challenges applicable to the Department-wide report.

Management Challenge: Addressing Long- and Short-Term Challenges for Operating, Maintaining, and Modernizing the National Airspace System

- *Hiring and Training Nearly 15,000 Controllers Over the Next 10 Years*

The FAA developed the 2007 Controller Workforce Plan to guide its activities as the agency plans to hire an estimated 15,000 Air Traffic Controllers through the year 2016. After reviewing the 2007 plan, the OIG expressed concern that further progress is still needed in completing the validation of accurate facility-level staffing standards, establishing baseline metrics to measure the effectiveness of controller productivity initiatives, and in continuing efforts to reduce the time and costs associated with on-the-job training.

The FAA continues to make significant progress in the validation of accurate facility-level staffing standards. As part of the *2008 Controller Workforce Plan*, the FAA will include new staffing standard models at the facility level for Enroute and Tower Cab facilities. A contract for new Tower Cab simulation capacity was awarded in December 2007 for additional field and Academy systems. We are in the process of installing Enroute training simulators to add additional training capacity at six centers and the FAA Academy. In addition, the FAA has started the TRACON model update and anticipates completion of the model development during the spring of 2008. At TRACON facilities we have also added a new training course for controllers.

As part of the *2008 Controller Workforce Plan*, the FAA will incorporate a productivity chart that shows the historical operations per controller to establish baseline metrics of productivity initiatives.

The OIG has stated interest in FAA's progress in reducing time and costs associated with air traffic controller hiring. Our new hires largely come from three sources: 1) experienced military controllers, 2) Collegiate Training Initiative (CTI) partner schools, and, 3) the general public. We recently took action in all three areas to greatly increase our qualified applicant pool. We currently offer a recruitment bonus of $20,000 to previous military controllers. This past summer, we revised the CTI evaluation process and added nine new schools; thus bringing the new total to 23. Doing so will allow us to attract a large pool of qualified candidates with aviation-related college degrees. During 2007, numerous public sector job announcements were issued throughout the country, resulting in about 25,000 applicants. Those applicants are currently being tested. Another round of nationwide job announcements was issued in January 2008.

The FAA has centralized the selection process, and established processing centers that provide "one-stop-shopping" (e.g., interview, medical, security, etc.) to bring employees on board more expeditiously and efficiently.

All initial training courses at the FAA Academy are currently under review to incorporate a new competency model that describes on-the-job behaviors of successful controllers. Establishing behavioral expectations early in the training process will ultimately reduce overall training time instead of solely relying on repetition and experience as in the past. Because many of our experienced controllers are retiring, these courses will allow FAA to train newly certified controllers quicker more quickly.

To streamline and improve training, controller competencies are being incorporated into our facility training efforts. As existing courses are revised and updated, we are building in the competencies as well as modernizing teaching methods and utilizing technology resources to improve learning and reduce training time. A new Initial Terminal Radar course has been developed, and revisions are currently underway for AT Basics and En Route Stage One which will be completed in 2008. The Initial Terminal Course is the only one not currently in process. Effort to incorporate competencies into field training will commence in FY 2009. In addition, we will begin the process of linking the competencies for Air Traffic Controller training through eLMS.

- *Keeping Existing Modernization Projects on Track*

The FAA has created and implemented mitigation strategies to comprehensively address "this challenge." Implementation of executive and management reviews and wide-ranging processes have resulted in positive, measurable, and dramatic changes in how FAA monitors modernization projects.

We have developed and implemented the use of sound metrics to measure performance related to the costs and scheduling of major acquisitions. Many projects require the approval of top-level management and all projects go through a more effective review process.

Thorough reviews of acquisition proposals by executives and officials at the FAA are signaling the importance of making smart, well-informed acquisition decisions. As expected, proposals are better planned, justified, and contemplated.

In addition to the executive-level reviews, the agency has implemented acquisition management controls through the Joint Resource Council (JRC) the ATO Executive Council, and the Capital Investment Team (CIT).

The JRC reviews and approves all major investments and the Facilities and Equipment, F&E, budget. It delegates to subordinate boards the authority to approve non-major investments in accordance with the Acquisition Management System (AMS). It also conducts service level reviews (SLR) which provide a FAA-wide overview of operations and investments by service organization.

The ATO Executive Council meets monthly to approve mission need statements of programs beginning the investment process. They review major investments prior to submitting these to the JRC for further reviews and approvals. They also provide review and approval of non-major investments to begin acquisitions. For the Executive Council to approve a program, the program must first successfully complete the ATO-Finance Capital Investment Team review process.

The CIT reviews both the benefits and costs of each ATO investment program and validates the methodology to determine if benefits are calculated properly and recipient benefits are correctly identified. They also validate the development costs, whether a proper alternatives analysis was conducted, and whether ATO can afford to operate the system once it is developed.

In addition, a major earned value management (EVM) effort has been initiated across the agency. For all newly approved IT investments that have current year development, maintenance and enhancement funding equal to or greater than $10 million we apply the EVM project management tool. These programs are also required to track and measure program performance in accordance with Earned Value Management Systems (ANS/EIA STD-78 EVMS) guidelines.

By applying this project management tool we are able to ensure optimum project planning and control by effectively integrating the project scope of work with cost, schedule, and performance elements. The FAA efforts in this area have resulted in improved senior level oversight and earlier awareness of problems requiring management intervention. The FAA is one of the first civilian agencies to embark on a comprehensive EVM effort throughout the acquisition life cycle of the effort — from project planning, through contract negotiation, and through the monitoring of cost and schedule performance. The FAA is more than fifty percent of the way to full EVM implementation. Positive reviews have been earned from GAO for our advanced review of all of our systems in preparation for EVM. Further, OMB, GAO, and other agencies recognize FAA as a government leader in EVM and seek our advice and guidance.

In conjunction with EVM processes we have implemented a series of 21 program reporting metrics. A comprehensive Red/Yellow/Green assessment of program performance will be available through a combination of Financial, Schedule, Technical, Resources, External Interest metrics and the Program Managers overall assessment.

We are also developing standard operating procedures that address Program Planning, Baseline Management, and Program Performance Reporting. These processes and procedures will ensure continuity, discipline, and consistency in the way programs are planned, managed, and reviewed at all levels within the FAA.

For FY 2008 the FAA will complete the assessment of 19 programs reaching a 100% GREEN status in complying with all elements of the EVM ANS/EIA STD-748 EVMS guidelines. In addition, the FAA has committed to implementing a number of processes and procedures in response to being removed from the GAO High Risk list for major procurements. These include:

1. Implementing new Verification Validation processes in ERAM, ADS-B, SWIM, and DataCom

2. Complete implementation of seven Best Practices (Risk Management, Requirements, Contract Management, Quality Assurance, Program Management, Measurement & AnalysDevelop Standard Operating Procedures and post for ATO Program

3. Develop Standard Operating Procedures for ATO Program Control and Baseline Management that address Program Planning, Baseline Management, Program Performance Reporting, and Variance Analysis

4. Develop and implement an EVM Surveillance and Certification processes.

- *Reducing Cost, Schedule, and Technical Risk With NextGen*

The FAA has created the Operational Evolution Partnership Integration and Implementation (OEP I&I) office, part of the ATO Operations Planning. This organization, along with the cross-agency OEP Associates Team and its supporting OEP Review Board, will be charged with reducing cost, schedule and technical risk for NextGen.

The OEP I&I office will facilitate the integration of the portfolio of transformational programs and other key agency activities needed for the new mid-term capabilities defined in OEP Version 1. These mid-term capabilities were derived from the NextGen concept of operations, and, when implemented, represent major steps in transitioning from today's NAS to the NextGen system. The OEP I&I office works closely with FAA's research and development programs that are addressing NextGen concepts of use analyses and demonstrations as well as workforce impacts of new NextGen concepts, stakeholder roles and responsibilities, automation technologies, network-enabled operations, policies and procedures. The FAA Research & Technology Development Office contributes to the formulation of NextGen research and engineering requirements in JPDO guidance documents; FAA research and engineering organizations formulate and execute programs that enable near-term and mid-term NextGen capabilities as articulated in the OEP plan, including cross-cutting human factors issues required to meet mid-term NextGen challenges. In FY 2007, FAA established an office that specifically monitors the financial and programmatic performance of these NextGen activities.

Ultimately, the individual NextGen initiatives will be implemented by the FAA organizations with the appropriate experience and expertise. Toward this end, the OEP I&I office has already established a series of service level agreements with other FAA organizations that began work in FY 2008.

FAA's NextGen implementation is overseen by the OEP Associates Team. Comprised of FAA's most senior leaders, including the Deputy Administrator and ATO Chief Operating Officer, the Associates Team ensure the agency takes an "enterprise approach" to planning and executing the NextGen investments. As part of the portfolio management process, the Associates are responsible for:

- Selection of the initiatives included in the annual portfolio of investments;
- Prioritization of the application of resources, when required;
- Authorization of investments at the program level to support NextGen;
- Portfolio tracking, performance assessment and optimization; and
- NAS Enterprise Architecture implementation progress

The Associates continue to monitor progress on near-term commitments that will improve capacity today while laying the foundation for NextGen. These include new airport infrastructure, performance-based navigation procedures and airspace redesign, among other projects, focused on the OEP 35 airports and 15 key metropolitan areas. The Associates have the authority to force immediate mid-course corrections, as needed.

Supporting the Associates is the OEP Review Board. This Director-level working group provides a more detailed assessment of the initiatives before the portfolio is presented to the Associates. At this level, the executives responsible for annual resource planning and execution will balance the needs of today with the plans to meet the needs in the future. This phase of the portfolio management process provides an assessment of individual activities, availability of resources, performance review of previous investments, as well as near and far-term benefits of the entire portfolio. To date, this group has developed FAA's comprehensive FY 2009 budget request that – if started now and continued with predictable funding through the near future – will allow the agency to truly transform the NAS. This year the Review Board will focus on developing the content of OEP Version 2, to be published in June 2008, as well as developing the budget request for FY 2010.

As we move forward on NextGen, FAA continues to strengthen its bonds with JPDO. JPDO's director is a member of the OEP Associates Team; the JPDO portfolio management director and chief architect serve on the OEP Review Board, which the JPDO director co-chairs with the ATO Operations Planning Vice President. Members of JPDO working groups are populated by personnel from FAA in partnership with other participating agencies. These work groups are engaged in the development of the OEP plan, especially in the areas of safety management, airport development, and avionics planning. FAA's Vice President of Operations Planning, who oversees the agency's research and development, serves on JPDO's Integration Council, along with FAA leads on global harmonization and environmental performance.

- *Maintaining FAA's Aging Air Traffic Control Facilities*

Today there are over 500 terminal and enroute air traffic control systems and facilities located throughout the country. Both the number and locations of the ATC systems and facilities currently in use were driven by the technology at the time of their installation. In preparation for the transition to the NextGen Air Transportation System it is estimated that 400 of these legacy systems and facilities will need to be replaced or modernized.

In the interim, annual funding for the continued maintenance and repair of these legacy enroute and terminal air traffic control systems and facilities is critical to ensure the continued reliability of the National Airspace System. Indeed, it is an agency priority to sustain all systems and facilities that could potentially compromise the safety of the flying public or the occupational safety and health of FAA employees.

In addition to continuing NAS sustainment activities, requested funding for infrastructure modernization programs for both terminal and enroute air traffic control systems and facilities have averaged about 10 percent of the $2.5 billion annual facilities and equipment budget in recent years. The Administration has requested higher capital funding levels for FY 2009-2012 in the reauthorization bill to support required technologies integral to NextGen development. Even with new capital investment in NextGen technologies leading to eventual transition, it remains critical for FAA to budget for sustainment of current NAS infrastructure. FAA will ensure that continued sustainment of existing NAS infrastructure remains a priority for FY 2008 and beyond contingent upon the agency receiving sufficient budget authority.

A key element of the FAA's transformation into NextGen is moving to new operational paradigms. Significant improvements in technology have removed many past constraints allowing new approaches to operations concepts and facility development. By taking full advantage of new technologies, NextGen facilities will improve safety, flight efficiency and productivity and reduce overall infrastructure cost. This means fewer air traffic delays and lower costs for both aircraft operators and travelers.

In FY 2008, FAA will continue ongoing analysis of requirements for NextGen facilities. As part of the analysis, the FAA is evaluating several aspects related to future operations and facilities, including the transition of new operational requirements, physical security, and workforce impact. The analysis includes consideration of existing enroute and terminal facilities and how operational changes and technology advancements will change airspace assignment and facility requirements.

FAA anticipates determining its approach to NextGen facilities by the second quarter of FY 2009.

Some FY 2008 Initiatives related to this challenge:

1) Improve employee safety and reduce air traffic control operations risks through the implementation of major asbestos abatement projects at five Air Route Traffic Control Centers (ARTCCs).
2) Focus sustainment funding on mitigating operations risks associated with mission critical physical plant infrastructure failure modes at all ARTCCs.
3) Annual workplace safety inspections now include a check for moisture intrusion and mold growth. If problems are found, mitigation efforts will be initiated.

- *Properly Accounting for Capital Investments*

Following extensive corrective actions undertaken during FY 2007, FAA restated its FY 2006 construction-in-progress (CIP) balances, and the independent auditors lifted their qualified opinion and reissued an unqualified opinion on FAA's FY 2006 financial statements. The FAA also received an unqualified opinion on its FY 2007 financial statements. The FAA has already started a series of initiatives to address the weaknesses and deficiencies in the capitalization business processes that led to the FY 2006 qualified audit opinion. Those initiatives include reviewing and adjusting where necessary, remaining CIP records not already addressed, and improving processes for future capitalization activities. These initiatives are described in a Capitalization Program Management Plan (PMP), which will be used to guide the Capitalization Program. The PMP was approved on January 15, 2008. Highlights of the planned actions include the following:

- Complete the remaining clean-up activities of records not already addressed during the extensive FY 2007 cleanup process. Remaining cleanup includes, for example, accounts payable mass additions, asset retirements, and reconciliation of project accounting.

- Perform routine capitalization processing including asset retirement processing; and, expand the use of quality control indicators as measures of the health of the program, including monitoring the CIP account and tracking asset deployments and dates placed in service. (During the first quarter of FY 2008, FAA capitalized/expensed $303 million; the CIP balance is being held to $2.8 billion.)

- Identify and implement process improvements to existing policy, procedures, business processes, and systems. The process improvement activities will address the auditors' Notification of Findings and Recommendations as well as the lessons learned from the intensive clean-up activities undertaken during FY 2007.

Also, we will expand staffing in a phased approach during FY 2008 and FY 2009 to sustain the capitalization processes, ensure positive future audit results in the CIP area, and to backfill for FAA personnel that had been temporarily reassigned to work the capitalization cleanup issues. In FY 2008 and FY 2009, we plan to add 31 and 68 permanent full-time equivalents, respectively, to the capitalization process, across FAA.

Management Challenge: Reducing Congestion in America's Transportation System

- *Reducing Delays, Improving Airline Customer Service, and Meeting the Anticipated Demand for Air Travel in the Near Term*

  The FAA continues to work at reducing delays and meeting the anticipated demand for air travel. Implementation of the Next Generation Air Transportation System (NextGen) is the long term solution to increasing capacity of the National Airspace. In the meantime, FAA and the Department of Transportation have implemented a number of initiatives to reduce delays in the near term. The top actions for FY 2008 include:

  - **New York Aviation Rulemaking Committee (ARC)**. The ARC was formed in September 2007 to explore operational improvements, market-based mechanisms, and other options for addressing airspace congestion and flight delays in the New York metro-area. The ARC provided its recommendations to the Secretary of Transportation on December 17, 2007.

    Based on our work with the ARC and other efforts, this Administration is implementing the following objectives:

    - Give priority treatment to operational and capacity improvements at LaGuardia Airport, John F. Kennedy International Airport and Newark Liberty International Airport;
    - Establish and implement new take-off patterns at Newark and Philadelphia International Airport allowing for more efficient aircraft movement, and new satellite-based navigation procedures providing more options for aircraft routing during thunderstorms which will be in place by the end of 2008;
    - Establish an executive-level Director for the newly created New York Integration Office to coordinate regional airspace issues and all projects and initiatives addressing problems of delays and congestion in the area;
    - Form a new Federal advisory task force to suggest ways for airports and airlines to handle lengthy tarmac delays and protect stranded passengers.

  - **John F. Kennedy (JFK) Scheduling Reduction Meeting**. The FAA convened a scheduling reduction meeting for JFK Airport on October 23-24 to address the problem of severe congestion and delays. The FAA met with air carriers operating at the airport to discuss possible flight schedule reductions and the re-timing of peak period flights.

    The FAA issued an order on January 15, 2008 to cap operations at the airport at 82-83 per hour. The order is effective from March 30, 2008 through October 24, 2009.

  - **Newark Liberty International Airport.** FAA is negotiating schedules with airlines serving Newark so that airlines will reduce their schedules during peak periods and shift to off-peak periods. These and other measures adopted at Newark will prevent carriers from moving their JFK flights to Newark, thus avoiding merely shifting the congestion.

  - **New York Area Operational Improvements.**
    Besides FAA's participation in the NY ARC and the Scheduling Reduction Meeting at JFK, FAA has additional activities to relieve congestion in the New York area. The FAA's Air Traffic Organization (ATO) is working to implement several operational initiatives that will provide for increased efficiencies and reduce delays at the Port-Authority run airports. The most noted initiatives include New York, New Jersey, and Philadelphia Airspace Redesign, the Short-Term Initiatives Workgroup, and the implementation of ASD-X at JFK airport.

The U.S. military worked with FAA to make some of its airspace available for civilian airliners over the Thanksgiving and Christmas holidays in 2007. The military opened up airspace off the east coast, which helped relieve congestion in the most congested regions – from Maine to Florida.

- **LaGuardia Airport – Congestion Management Rulemaking**. The FAA issued a Notice of Proposed Rulemaking (NPRM) in August 2006 that anticipates the use of market-based mechanisms at LaGuardia in the future, if Congress approves the Administration's legislative proposal to implement such measures at LaGuardia.

  The FAA will continue to work in FY 2008 on a final rule for LaGuardia airport. The final rule may incorporate recommendations by the NY ARC. The agency will also continue to lead a public outreach campaign to educate stakeholders on pricing strategies, such as congestion pricing and auctions, since market-based mechanisms may be incorporated in the final rule at LaGuardia airport.

- **O'Hare International Airport Congestion Management Rule**. The congestion management rule in place at Chicago's O'Hare Airport is set to expire in October 2008, when the first runway associated with the O'Hare Modernization Program (OMP) is scheduled to come on-line. The FAA will continue to monitor delay statistics at the airport as well as the progress of the OMP.

- *Keeping Planned Infrastructure and Airspace Projects on Schedule To Relieve Congestion and Delays*

New runways and runway extensions provide significant capacity increases. Since fiscal year 2000, 13 new runways have opened at the 35 OEP airports, providing these airports with the potential to accommodate 1.6 million more annual operations. Currently, eight OEP airports have ten airfield projects (three new runways, two airfield reconfigurations, one runway extension, two taxiways) under construction. These ten projects will be commissioned through 2012. End around taxiways are new to the OEP and provide another means to improve safety and decrease delays at a busy airport by providing an alternative to having aircraft cross an active runway. Atlanta's end-around was commissioned in April 2007, and one is under construction at Dallas-Ft. Worth.

A regional horizontal integration team comprised of representatives from key FAA organizations and outside stakeholders monitors the progress of each OEP runway project and/or taxiway project. The team is responsible for ensuring that the runway and/or taxiway project is commissioned on schedule with all necessary equipment and airspace procedures in place to achieve the full operational capability of the airfield project. The team provides quarterly updates to the OEP Associates Team, which is chaired by the FAA Deputy Administrator. Any issues relating to the runway project are discussed, assigned to an executive to resolve, and tracked by the integration team to ensure resolution. Because four new runways are scheduled for commissioning in November 2008, the Associates are especially engaged in this process.

One new runway that opened in FY 2007 at Boston Logan reduced delays, on average, by 2.8 minutes per operation at the airport as a result of this process. The runway opened on schedule with the equipment, airspace procedures, and modifications needed to provide the expected benefits.

In OEP Version 1, published in June 2007, FAA expanded its view into airport infrastructure planning, reporting on a number of projects that are under consideration for OEP airports in future years. FAA also defined 15 metropolitan areas that will be significantly capacity constrained in 2025 if improvements are not started today. Within these metro areas are 21 OEP airports -- the nation's busiest -- and 86 secondary and reliever airports. Ongoing assessments of the existing and potential infrastructure and air traffic operations in these metro areas will provide FAA with locations for analyzing potential operational capabilities. For the traveling public, this will ultimately result in improved access and reduced delay in the nation's busiest markets. More information can be found at www.faa.gov/programs/oep.

In support of the O'Hare Modernization effort, FAA has implemented Phase 1 of the Chicago Airspace Project, which consists of new eastbound departure routes and supporting sectors. The agency also completed design, safety analysis and procedural work for the southbound departure routes, part of Phase 2, in late 2007. Training and final implementation actions for the southbound routes, associated airspace realignment, and new supporting sectors are underway with expected completion in April 2008.

Implementation planning meetings for the New York/New Jersey /Philadelphia Metropolitan Area Airspace Redesign started in October 2007, and the first elements of Stage 1 of the implementation plan, dispersal heading, were implemented in December 2007**.** These and other airspace projects in Washington D.C. and Houston are also monitored by the OEP Associates.

Airport & Project		**Total Est. Cost ($ M)**	**Current Estimated Completion Date**
Los Angeles International Airfield Reconfiguration (Southside) New Center Taxiway		$111	June 2008
Philadelphia International Runway 17/35 extension (1,040')		$65	January 2009
Chicago O'Hare Airfield Reconfiguration (Phase 1: 3 projects)	9L/27R	$455	November 2008
	10L/28R runway extension (2,856' ext)	$240	November 2008
	10C/28C	$1,265	2011
Seattle-Tacoma International 16R/34L		$1,129	November 2008
Washington-Dulles 1L/19R		$356	November 2008
Charlotte 17/35		$300	February 2010
Dallas-Ft. Worth End-around Taxiway		$49	2009
Boston Logan Centerfield Taxiway			2010

Management Challenge: Continuing to Make a Safe Aviation System Safer

- *Taking Proactive Steps To Improve Runway Safety in Light of Recent Serious Incidents*

Reducing the potential for runway incursions and runway collisions is a top priority for the FAA. Achieving a significant reduction in the severity and frequency of runway incursions

requires a strategy encompassing a vision, a mission, and a set of goals and objectives that provide guideposts and milestones. In FY 2008, FAA will continue its efforts to identify and respond to risks on the runway by analyzing runway incursion trends and the errors that lead to runway incursions. Strategies that will be employed in FY 2008:

Human Error Risk Reduction

Improve training, procedures, evaluation, analysis, testing, and certification to reduce the risk of runway incursions resulting from errors by pilots, air traffic controllers, pedestrians, vehicle operators, tug operators and non-pilots conducting aircraft taxi operations.

Runway Incursion Risk Reduction

Conduct a minimum of 50 Runway Safety Action Team (RSAT) meetings. RSAT reports will be issued, recommendations entered into the ATO-S's RSAT Recommendation Database and tracked on a continual basis for timely implementation and/or disposition. We will also provide support and a template for the Safety Reviews at the 20 identified airports where wrong runway departures and runway incursions are the greatest concern.

Safety Promotion, Outreach, and Awareness

The FAA will also conduct aviation industry outreach through participation in aviation events such as "Sun N' Fun", Oshkosh Fly-In Air Show and other aviation safety conventions and conferences. The FAA will also continue implementation of the FAA-National Association of State Aviation Officials, NASAO, Safety Partnership by conducting at least one FAA-NASAO co-sponsored initiative and event.

We will manage efforts of the Headquarters' Runway Safety Program Staff and the field offices to continue to improve and provide educational training and awareness tools to commercial and non-commercial pilots, airport vehicle operators, and controllers by conducting and participating in at least 20 of the following activities:

- Pilot Seminars that complement the WINGS program
- Flight Instructor Refresher Courses (FIRC)
- Commercial Flight Instructor (CFI)/Designated Pilot Examiner (DPE) refresher courses
- Airport Safety Meetings (ASM) and/or ATC Safety Awareness Initiatives

If a runway incursion occurs in the respective Regional Runway Safety Program Manager's, RRSPM, region, the RRSPM will collect and analyze the data for casual factors, develop solutions to address the identified casual factors, and communicate "lessons learned" to applicable parties and key ATO Safety Management in a timely fashion. The RRSPMs will also provide a synopsis of the "Lessons Learned" in their respective regions at quarterly performance reviews. We will continue to address runway safety issues as they pertain to runway incursions, operational errors, or other requests related to field activities. Seventy-one of the seventy-five airports have already complied with the National Plan for Runway Safety's mandate for improving signage. The FAA has committed to revising and republishing the National Plan for Runway Safety.

The FAA will also continue: 1) its advancement in technology for improving runway safety; 2) continue developing, testing, evaluating, and deploying technology such as Runway Status Lights (RWSLs) at AMASS and ASDE-X airports (the ASDE-X Program continues to thoroughly test every system enhancement before it is implemented at an operational site); 3) to test low cost ground surveillance solutions – a radar-based low cost alternative to ADSE-X; and, 4) sponsor other proof of concept designs in mitigating runway incursions.

Below you will find the airports referenced for the RWSL at AMASS and ASDE-X airports.

RWSL will be installed at 21 ASDE-X airports with 2 support systems located at Oklahoma City, OK (PSF) and the Academy

ID	Region	Airport
ATL	ASO	Hartsfield-Jackson Atlanta International Airport
ORD	AGL	Chicago O'Hare International Airport
LAX	AWP	Los Angeles International Airport
MSP	AGL	Minneapolis-St. Paul International Airport
IAH	ASW	George Bush Intercontinental Airport
IAD	AEA	Washington Dulles International Airport
DTW	AGL	Detroit Metro Wayne County Airport
PHL	AEA	Philadelphia International Airport
JFK	AEA	John F. Kennedy International Airport
DFW	ASW	Dallas/Ft. Worth International Airport
EWR	AEA	Newark International Airport
LAS	AWP	Las Vegas McCarran International Airport
DEN	ANM	Denver International Airport
BWI	AEA	Baltimore-Washington International Airport
PHX	AWP	Phoenix Sky Harbor International Airport
SEA	ANM	Seattle-Tacoma International Airport
BOS	ANE	Boston Logan International Airport
FLL	ASO	Ft. Lauderdale/Hollywood Airport
MCO	ASO	Orlando International Airport
CLT	ASO	Charlotte Douglas International Airport
SAN	AWP	San Diego International Airport

- *Ensuring Consistency and Accuracy in Reporting and Addressing Controller Operational Errors*

To address this challenge, FAA will continue to focus on the development and implementation of an automated software prototype that will depict Air Traffic Control separation conformance in the Terminal environment nationwide. The Traffic Analysis and Review Program (TARP) will apply separation logic to targets; identify where applicable separation standards are not being maintained; and highlight incidents for further investigation. The TARP Program Management Plan, which details the implementation schedule, resources and budget, was coordinated and signed by ATO Safety, Terminal, and Acquisition and Business Services. All Terminal sites for calendar year 2007 have been selected and deployment is on track to meet FAA's *Flight Plan* objective to enhance the safety of FAA's air traffic systems. Software development to allow TARP to use National Offload Program, NOP, data in the En Route environment has begun.

By the end of December 2007, the FAA had completed TARP audit tool implementation at the first five terminals sites and had begun TARP audit tool implementation at the next five terminal sites. TARP training, software installation and configuration file approval had been completed at Indianapolis, South Bend, Yankee, El Paso and Portland, Oregon TRACONS. Memos authorizing and requiring these facilities to utilize TARP to satisfy their monthly audit requirement had been issued. TARP training and software installation had been completed at Salt Lake, Raleigh/Durham, Cincinnati, Daytona Beach and Tucson TRACONS.

By September 30, 2008, the FAA will begin TARP audit tool implementation at 15 percent of all applicable sites. The FAA will also begin development of TARP pre-planned product improvements to support enhancements such as an automated interface with quality assurance databases by April 30, 2008. The operational concept and requirements development of the TARP interface with air traffic quality assurance began in November 2007.

The En Route and Oceanic Services Unit will continue to remain focused on reducing risk in the National Airspace System through effective performance management. For FY 2008, En Route and Oceanic facilities will develop and implement strategies which address the primary critical points (causal factors) found in their operational errors, creating a safety culture within the facility, ensuring the quality of on-the-job training, and ensuring that weather information is properly disseminated.

In addition to these initiatives En Route and Oceanic Services will continue daily monitoring of performance, and will pursue procedural development to enhance the safety of NAS operations. En Route and Oceanic Services will also continue their communication and awareness strategies, which includes bi-weekly quality assurance and training telcons, a weekly quality assurance newsletter, and an annual quality assurance and training conference.

To ensure consistency and accuracy in reporting and addressing controller operational errors, in FY 2008 the FAA began providing briefings to operational field air traffic personnel to emphasize the joint goals of the Agency towards safety and efficiency. A significant element of the briefing addresses the need and responsibility for air traffic personnel to fully report all losses of separation for both operational errors and pilot deviations. The briefing includes discussion of the need to accurately capture the casual factors during investigation of every loss of separation. These briefings are scheduled to be presented to most large Terminal facilities and some of their associated En Route facilities by the end of March 2008.

The FAA is also ensuring more complete and accurate reporting of losses of separation through random audits of recorded radar data. Each month, ATO Safety selects approximately 15 terminal radar facilities and directs them to review two hours of radar data for dates and times specified by the Safety office. In addition, FAA requires approximately three of these facilities to forward their radar data for the selected periods to ATO Safety for a second, independent review of separation. En Route and Oceanic Services facilities continue to utilize the audit process in FAA Order 7210.56

In 2008, FAA will continue to develop an index to describe the central tendency and variance of losses of separation. The index will allow FAA to measure performance over a period of time, similar to a stock index. This new measure will provide indicators that reflect both the risk of collision and the degree to which separation standards were maintained.

- *Strengthening Risk-Based Oversight Systems for Air Carriers, External Repair Facilities, and Aircraft Manufacturers*

The FAA continues to effectively oversee manufacturers' compliance with the regulations. In the interest of safety and effective resource allocation, a risk management model is used to identify critical impact indicators that serve to categorize facilities according to their potential for producing nonconforming products and parts. As with any system, continuous improvement is essential, and the Aircraft Certification Service (AIR) has numerous initiatives, both in-process and planned, to strengthen AIR's risk based oversight system.

Overviews of our key initiatives are:

- Revising guidance to manufacturers to include a process that evaluates and selects suppliers based on their capability to perform all manufacturing activities, inspections, and tests necessary to meet the specified requirements. Draft guidance will be created by June 2008 and incorporated in Advisory Circular 21-20 by September 2009.

- On June 2008 will begin developing a risk indicator, to be used by FAA manufacturing inspectors, relative to manufacturers' use of flight-critical parts suppliers. Risk indicators will be incorporated into Risked Based Resource Targeting by September 2008.

- Revising risk indicators, used by FAA manufacturing inspectors, to reduce the level of subjectivity in evaluating manufacturers so that inspectors' risk assessments will be more consistent.

- Revising guidance to require FAA manufacturing inspectors to review a manufacturer's prior audits of suppliers as part of the inspectors' analysis of risk and determination of resource targeting.

- Updating FAA supplier audit requirements, so that the number of audits that FAA manufacturing inspectors are required to conduct more directly correlates with the number of suppliers used by a manufacturer.

- Revising FAA manufacturing inspector training related to auditing, supplier operations, and documentation of audit results. A review of the Aircraft Certification System Evaluation Program (ACSEP) will be completed in September 2008. New directive material will be incorporated in the ACSEP directive by September 2009.

One hundred thirteen certificate management teams are currently using the Air Transportation Oversight System (ATOS), a system-safety, risk-based process, to execute the agency's responsibilities to determine the continuing operational safety of the nation's 14 Code of Federal Regulations part 121 air carriers.

To meet this important milestone in July 2007, FAA executives, assisted by cadres of specially-qualified trainers, began implementing plans to ensure that ATOS certificate management teams are adequately staffed and trained. Certificate management teams range in size from three principal inspectors for very small air carriers to more than 70 inspectors for large ones. Certificate management team members receive training on system safety and the use of ATOS risk management tools in addition to specialized technical training.

New risk management tools include clear definitions of risk indicators and descriptive word pictures to aid principal inspectors in determining quantifiable scores for each area of identified risk. This scoring, coupled with a step-by-step procedure to prioritize inspection tasks, enables FAA managers to ensure that resources are always targeted to inspection areas with the highest potential risk. Six new training courses teach inspectors how to use the redesigned ATOS processes and tools. So far, 1,398 inspectors have taken the training. Approximately 300 more inspectors will take the training by March 31, 2008. The training is required for new hires. No inspector is allowed to perform ATOS work assignments until completing the training.

As suggested in the Office of the Inspector General report of 2003, the FAA developed a sound process for determining where critical aircraft maintenance is performed. In September 2005 the Flight Standards Service launched the enhanced repair station and air carrier oversight system.

- The system is a risk-based system that standardized the approach for surveillance of certificated repair stations and non-certificated facilities contracted to perform maintenance for air carriers. This risk-based oversight system provides for the continuous assessment and prioritization of each repair station and non-certificated repair facility and provides a method of targeting areas of high risk. The Flight Standards Service has released a revised operations specifications D091 paragraph, expanding from only capturing "substantial maintenance providers" to now capturing all outsource maintenance providers (certificated and non- certificated). Separately, a rulemaking effort has been launched for the revision of 14 CFR §121.369 which will require air carriers to file a Quarterly Utilization Report (QUR) with the FAA Certificate Holding District Office. This new requirement will provide information directed at the greatest amount of activity that is "outsourced" to maintenance providers/vendors.

- The FAA developed new inspection guidance and air carrier processes to address the issue of outsourced maintenance, the new guidance is scheduled for release in January 2008. As of December 2007, all 121 air carriers have been moved into the Air Transportation Oversight System (ATOS). This risk-based system is expected to improve the current FAA surveillance system.

- The FAA has improved the oversight of both certificated and non-certificated repair facilities. Additionally, FAA clarified guidance to its field inspectors by issuing 33 new or revised Aviation Safety Inspector handbook chapters, and developed and revised 60 Program Tracking and Reporting Subsystem activity codes to more closely track surveillance events. The FAA also revised the Air Transportation Oversight System (ATOS) Element 1.3.7 (outsource maintenance). All of these efforts were developed to ensure FAA field inspectors are better equipped to accomplish the assigned surveillance tasks in a dynamic environment. The Flight Standards Service is currently completing new guidance and will release new chapters to FAA Order 8900.1 (Flight Standards Information Management System) by June 2008. This new guidance will provide the latest practices and procedures for evaluation and surveillance of air carrier outsources maintenance providers.

- The Flight Standards Service risk-based system now includes new data collection processes for the analysis of existing and newly developed data from the oversight of critical repairs accomplished by certificated repair stations and non-certificated repair facilities.

- *Maintaining a Sufficient Number of Inspectors*

The FAA is developing short and long-term strategies to address safety workforce staffing. In May 2007, FAA's Aviation Safety Organization (AVS) provided to Congress a 10-year *Aviation Safety Workforce Plan*. This plan ensures that an adequate safety staff is maintained to address oversight needs and addresses inspector attrition and anticipated changes in the aviation industry. In addition, this plan also addresses the competencies and skills required within the AVS workforce to stay abreast of new technologies and to meet growing industry demands for service.

In response to the recommendations in the *Aviation Safety Inspector Staffing Standards Study* prepared by the National Research Council of the National Academies, AVS concurred with the recommendation to create a new staffing model, and expand the staffing model to include the entire safety critical workforce. As of the first quarter of FY 2008, the staffing model is in the discovery phase and will include a multiple layered approach for encompassing the entire AVS safety critical workforce. Based on current activities including scheduled requirements gathering, AVS will implement the AIR inspector workforce component by December 2008 and the AFS inspector workforce component by September 2009. AVS will add other workforce components to the staffing model starting in FY 2009 based on the direction of the senior leadership team.

The FAA has also established recruitment plans to fill our most critical occupations. We are working with the agency's Human Resources' Corporate and Recruitment and Marketing office to continue to cultivate the relationships and partnerships with the industry, professional organizations, and the educational communities to ensure positive publicity for FAA and AVS in order to enhance recruiting opportunities. In FY 2008, Human Resources will implement the recently updated Aviation Safety Inspector (ASI) Flight Standards competency qualification standards to be used in the hiring assessment system. The competency qualification/training model planned for implementation in FY 2008 will provide a method for AVS staff and supervisors to plan, develop, and manage business, interpersonal and technical competency levels of the workforce to support the organization's safety mission.

In FY 2007, even though approximately 35 percent of our safety inspector workforce and 14 percent of our engineer workforce were eligible to retire, the AVS attrition rate over the past three years has been approximately six to eight percent annually. The majority of the staff losses are due to retirements. Although we have an older workforce, we anticipate that our attrition rate will remain consistent because 40 percent of our workforce are in their second career and are new to the FAA.

- *Strengthening Oversight of the Airman Medical Certification Program*

Part 67 of the Federal Aviation Regulations prescribes the medical standards and certification procedures for issuing medical certificates for airmen and for remaining eligible for a medical certificate. A person who meets the medical standards prescribed in Part 67, based on medical examination and evaluation of the person's history and condition is entitled to an appropriate medical certificate. The Airman Medical Certification Program is the program the FAA employs to ensure that pilots are medically qualified and fit to pilot an aircraft in the National Airspace System. The Airman Medical Certification Program is a critical safety program.

Each year the FAA processes approximately 460,000 airman medical certificate applications. After completing FAA training, physicians in private practice are designated by the FAA as an Aviation Medical Examiner (AME). AMEs are an essential component of the Airman Medical Certification Program. The FAA currently has approximately 4,700 physicians who are designated to examine and evaluate airmen to determine whether they meet the Part 67 medical standards. To properly discharge the duties associated with their responsibilities, AMEs must have detailed knowledge and understanding of the FAA rules, regulations, policies, and procedures related to the medical standards and the certification process.

Due to increased medical knowledge and experience and also improved diagnoses and treatments, medical cases the FAA must review have become considerably more complex. The increased complexity of medical cases requires more analysis and time to determine whether a pilot should be medically certified. The aging pilot population has also increased the number of complex airmen medical cases. In order to ensure the quality and timeliness of the FAA medical certification process the FAA requested additional resources for processing airmen medical certification cases. Twelve additional positions were requested in the President's FY 2008 budget to handle the increase in workload related to processing complex medical cases.

- Hire additional airmen medical certification analysts – July 15, 2008

To further improve the Medical Certification Program, FAA proposes to increase AME oversight. With the additional (9) positions provided in the final FY 2008 budget, FAA proposes to allocate one position to each of the regions, to increase oversight of AMEs. Under this initiative the FAA would substantially increase the number of site visits made to AMEs to ensure that they have the appropriate equipment and suitable clinical space to conduct FAA medical certification examinations. These resources would also be used to investigate complaints made by airmen.

- Hire senior AME program analyst for national AME program oversight – May 1, 2008
- Hire regional AME oversight personnel – September 1, 2008
- Develop new AME oversight ISO-9001 procedures – October 1, 2008
- Develop training and train new AME oversight personnel – October 1, 2008

To address concerns raised in a recent congressional hearing about FAA handling of falsified pilot medical certificates, the Office of Aerospace Medicine is revising FAA Form 8500-8, Application for Airmen Medical Certificate, to obtain more information from applicants. Applicants will specifically be asked whether they are receiving disability benefits from the federal government or any other sources. If an applicant responds affirmatively to this question our examiners will follow-up with the applicant to ascertain the nature of their disability and determine whether the medical issues related to their disability may disqualify them from being a pilot. We are also modifying our AME training to emphasize the importance of being thorough in their medical examinations, conducting a thorough interview to get a good patient history and of correlating the findings from their medical examinations with the medical history the applicant has provided. We will also be addressing the issue of falsification at future AME seminars and other AME training.

- Modify FAA Form 8500-8, obtain OMB approval, print and distribute new form – September 1, 2008
- Modify AME training – April 1, 2008

The FAA's Chief Counsel is conducting a review of the numerous legal issues which come into play in comparing our airmen medical certification information with medical data from other government sources, such as the Privacy Act issues associated with accessing other government databases that contain medical information about the applicant. At the conclusion of this review FAA may make additional changes to the medical certification application form. The FAA is also prepared to assist other government departments and agencies with matching programs to the extent resources are available and that it will not compromise other safety programs.

Management Challenge: Strengthening the Protection of Information Technology Resources, Including the Critical Air Traffic Control System.

- *Enhancing Air Traffic Control System Security and Continuity Planning*

To control modifications to national system baselines, all major systems used to provide air traffic management services in the National Airspace System (NAS) are subject to rigid configuration management. In response to IG concerns, the FAA agreed in FY 2005 to conduct a review of major ATC systems beginning with En Route and Oceanic/Offshore operational facilities. The purpose of the effort was to determine the prevalence of undocumented system modifications to the national baselines. Teams from the Air Traffic Organization Information Systems Security (ISS) Program conducted site visits and analyses at 24 operational facilities and collected ISS data on 16 major En Route and Oceanic/Offshore NAS systems.

Analysis of over 8,800 ISS data findings determined that there was less than 10 percent deviation from the documented baselines and none of the deviations were of a malicious nature. Considering the resource investment for this effort exceeded $1.2 million, the Return-On-Investment was not deemed adequate to continue beyond the NAS systems already scrutinized.

The FAA is committed to taking necessary and prudent steps to ensure all risks associated with the NAS are effectively managed. We will continue to strictly enforce standing configuration management policies and will enhance those policies as necessary. We are committed to a viable Certification and Accreditation program that complies with all national, departmental and agency requirements and we will continue to improve our risk assessment and testing processes. Some of the activities planned for FY 2008 to support our commitments are:

- Assure Certification and Accreditation of 100 percent of NAS and NAS Mission Support systems by September 2008.
- Assure at least 90 percent of NAS and NAS Mission Support systems requiring recertification are Certified & Accredited by their anniversary date.
- Continue to mature the process implemented in FY 2007 that emphasizes independence of the Risk Assessment and Security Test and Evaluation processes.
- Assure Contingency/Disaster Recovery Plan development and testing goals for systems with FIPS-199 Availability Categorization of High and Moderate are met.
- Conduct pilot activities to incorporate the new requirement to conduct Contingency/Disaster Recovery Plan testing for systems with FIPS-199 Availability Categorization of Low into our established Certification and Accreditation process by the end of FY 2008.
- Conduct a Table-Top exercise with representatives from the Department of Transportation Office of the Inspector General to validate our FIPS-199 Categorization process.
- Conduct at least three Information Systems Security policy Compliance Reviews in collaboration with the Office of Information Security.

The FAA will also continue to implement the En Route Business Continuity Plan, BCP, to transition operations to the William J. Hughes Technical Center in Atlantic City, New Jersey, should the FAA lose an en route facility due to a natural disaster or other catastrophic event. In 2008, the Spare Air Route Traffic Control Center, SPARTCC, will be outfitted with the equipment and connectivity necessary to deliver air traffic services for any of the contiguous United States ARTCCs. The SPARTCC will provide up to 40 operational sectors and all the mission critical systems and services necessary to recover a minimum of 80 percent previous capacity of any ARTCC in approximately three weeks from activation. Additional capacity and services may be available depending on the nature of the outage and the size of the impacted facility.

The FAA position of record is to focus on providing a robust technical and operational approach to recovering the service for all en route centers via a single common solution. Natural and man made hazards vary with facility location and so do the associated risks. Clearly, the service impacts vary with the shear volume of traffic and the national and seasonal flows. In order to mitigate these service impacts, FAA has committed to roll out a communications infrastructure from each ARTCC to the SPARTCC to maximize services. In 2008 FAA will begin to roll out and install a Federal Telecommunications Infrastructure (FTI) backbone to provide pre-positioned customer premise equipment and requisite bandwidth commensurate with the services that are being reconstituted for BCP operations.

The multi-disciplinary integration team that is implementing the Business Continuity Plan (BCP) strategy will, to the extent practical and technically feasible, attempt to prioritize the FTI communications backbone from each ARTCC to the SPARTCC in New Jersey. The intent is to roll out communication services based on the number of air traffic operations while ensuring the integrity of the FTI service network, thereby, mitigating the service risk and meeting near-term objectives for business continuity.

Engineers at the William J. Hughes Technical Center will conduct a detailed impact analysis with stakeholders and customers to determine effective mitigation strategies for Technical Center services affected by SPARTCC activation. The report is due September 2008

- *Continuing to Enhance Oversight of Information Technology Investments*

The FAA has made significant progress in implementing Earned Value Management. We are recognized by OMB, GAO and the civilian agency program management community as one of the leaders in implementing and using this important program management technique. The OIG report referenced above also indicated that the FAA had made "modest progress" towards implementing and using EVM. We also acknowledge that there is still more progress to be made and have incorporated implementing EVM as one of the critical milestones in our plan to get our NAS Modernization Program off the GAO's High Risk List in 2009. GAO has launched an audit of our EVM efforts and expects to report out their findings this fiscal year.

In August 2005, FAA performed an initial compliance assessment each of our major acquisition programs against the industry standard for Earned Value Management Systems (ANSI/EIA-748). The results of our internal evaluation were sent to OMB along with a set of plan of actions and milestones that set a goal of implementing EVM by the end of 2007. Working towards this goal, FAA implemented an active surveillance program to ensure that our major programs continue to work towards and become compliant with the 32 ANSI/EIA-748 EVMS guidelines. The results are tracked monthly using our EVM "Flag" dashboard. As of January 2008, all but one legacy major program is non-compliant; however, it is on track to be compliant in early 2008.

In addition, FAA formed the EVM Council as a cooperative effort of various Air Traffic Organization (ATO) offices, and other Line of Business and Staff organizations, to provide guidance and oversee implementation of Earned Value Management. The Council has been meeting biweekly since January 2006. The Council has recommended many changes in our acquisition policy and tracks the progress of EVM implementation in the FAA. Extensive training has been offered to all program teams and all senior acquisition executives have received EVM awareness training.

Our contractors are important partner in improving program performance in the FAA. We are reaching out to our contractors in a variety of ways. We have held three industry days with our prime and support contractor communities. These forums have led to close cooperation and information sharing of best practices. We have developed program performance metrics, which include EVM metrics, for executive boards to help them track our major acquisition programs. In addition, most program managers and executive boards are using EVM in program management and investment decision-making.

The progress in the past year has been significant, and we have a clear path forward. In FY 2008, we plan on accomplishing the following: set up a process to ensure that all proposed major programs have key elements of an effective EVM system in place before they are approved for implementation; ensure that EVM metrics are tracked by the major investment board for all programs under development; set up EVM acceptance and surveillance processes; continue to extend our partnerships with industry to ensure that we are adopting the proven program management practices found within both the public and private sector today; and continue to advance towards the institutionalization of EVM. Our goal is that we will not only be "green" in implementing full EVM in the agency, but also that we become a "center of excellence" in managing major programs using EVM and other program management best practices.

Management Challenge: Managing Acquisition and Contract Operations More Effectively To Obtain Quality Goods and Services at Reasonable Prices

- *Increasing Incurred-Cost Audits of Procurement Contracts to Reduce Unallowable Charges*

  The FAA plans to continue emphasizing incurred cost audits through the centralized audit program. For FY 2008, the agency is providing $1.7 million to fund a central Interagency Agreement with the Defense Contract Audit Agency (DCAA) to order incurred cost type and other required audits for procurement contracts. Award of the Interagency Agreement and initiation of audits is planned by March 2008, or when funding is received. Additionally, the agency has established a FY 2008 Flight Plan Goal activity to require audits of cost-reimbursable contracts of $100 million or more in value.

  The Contracting Oversight Team, under the Acquisition Policy and Contracting Office, manages the central DCAA audit process and issues audit requests, maintains the audit database, and acts as a liaison with DCAA Headquarters and Branch offices. The Oversight Team issued a Standard Operating Procedure (SOP) in 2003 outlining the process for requesting audits and requiring that any findings of unallowable and/or un-allocable costs identified in an audit must be addressed by the Contracting Officer in the contract file. The SOP was updated in FY 2007.

- *Developing Strategies for the Future Acquisition Workforce*

The FAA recognizes the criticality and challenge to develop its future acquisition workforce. We will need a high level of technical, financial, procurement, and program management expertise to design, develop, integrate, and successfully deploy the complex systems of the Next Generation Air Transportation System (NextGen). The FAA has identified its core acquisition workforce to include researchers; business and financial management specialists, including investment analysts and cost estimators; acquisition program managers; systems engineers; human factors engineers; and contracting officers and specialists. We are engaging in workforce planning with key officials and subject matter experts across our acquisition community to identify and implement recruitment, selection, training, and certification strategies for all of our core acquisition disciplines. In FY 2007 the Air Traffic Organization (ATO) contracted with the National Academy of Public Administration (NAPA) to form a panel of external experts and conduct an independent, impartial assessment of the skill sets required, and strategies to obtain the expertise needed, to manage, integrate, and implement NextGen. This work is currently underway. We are also exploring ways to establish a system identifier for key acquisition positions, because except for contracting officers/specialists, other key acquisition job roles do not have designated job series, which creates a challenge in tracking and assessing the acquisition workforce.

In developing the acquisition workforce, we already provide training curricula and certification programs in procurement, program management, investment analysis, cost estimating, systems engineering and human factors. For example, in the Air Traffic Organization, all program managers on capital investment programs valued at $50 million and above are required to be Project Manager Professional (PMP) certified which is the internationally recognized standard for project management. For systems engineers, we sponsor a master-level certificate and degree program through one of the country's premier systems engineering schools and encourage International Council on Systems Engineering (INCOSE) certification which is the internationally-recognized standard System Engineering (SE) certification. We also support certifications in human factors engineering and cost estimating and require all contracting officers and specialists to meet or exceed federal standards for training and certification. Our current focus is on: a) assessing workforce needs; b) recruitment and hiring strategies; and c) defining even more structured career path guidance that outlines experience expectations in addition to training and certification for entry, mid, and senior levels. We are utilizing a variety of recruitment and retention flexibilities we have to attract both experienced talent from government and private industry and entry level talent, to develop a pipeline for the future. FY 2008 actions include:

- Establish a system identifier for key acquisition positions (March 2008)
- Undertake a formal assessment of the skill sets required, and strategies to obtain the expertise, to manage, integrate, and implement NextGen
  - Interim assessment of findings from NAPA (December 2008)
  - Interim action plan to address interim findings (May 2008)

  - Finalize action plan and develop implementation schedule to address final report of findings (February 2009)

- Developing and implementing acquisition program manager career development and certification policy, which includes agency strategy for recruiting, selecting, and assigning Project Managers to capital investment projects (in formal coordination for LOB concurrence now)
- Implementing strategies identified in FY 2007 to grow FAA expertise in contracting, including designing and piloting a new structured training and development program for entry-level ATO contracting specialists (design by March 2008)
- Continue to deliver acquisition training, education, and certification programs for key acquisition disciplines, based on competency models and priority skills to develop (e.g., risk management, earned value management, requirements development, enterprise architecture, etc.) (Ongoing)

- *Fostering High Ethical Standards Throughout the Department and Its Contracting Programs To Maintain the Public Trust*

The FAA plans to evolve the existing procurement ethics training into a more holistic yet focused training module that can be offered both by live training and by eLMS (Electronic Learning Management System).

To meet the OIG management challenge, the FAA will develop a training module devoted completely to ethics. The new module will take existing training that looked exclusively at the current laws and regulations and expand it to include specific instances of non-compliance and lessons learned.

This module should be available for electronic release by March 2008. Consistent with the OIG's observation that live training has benefits beyond electronic training, FAA will offer live training to employees at each of its three service centers and Headquarters.

This effort will supplement past training. Between January and March 2006 a total number of 3,346 acquisition related employees were trained FAA-wide. That training included acquisition ethics as well as other acquisition related topics. Approximately 150 procurement and legal personnel received additional ethics training during the annual FAA Procurement Training Conferences during the past year.

EXHIBIT IV-1
FY 2009 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, & Exempt Obligations
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2007 ACTUAL	FY 2008 ENACTED*	FY 2009 REQUEST
1. SAFETY STRATEGIC GOAL			
A. Aviation Safety			
a. Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2007 & FY 2008)	7,837,590	8,213,602	
b. Reduce the Commercial Air Carrier Fatality Rate (FY 2009)			8,465,825
c. Reduce General Aviation Fatal Accidents (FY 2007 & FY 2008)	1,566,547	1,629,194	
d. Reduce the General Aviation Fatal Accident Rate (FY 2009)			1,350,453
e. Other (Maintain Zero Commercial Space Transportation Accidents)	13,043	13,280	15,008
Subtotal Aviation Safety	**9,417,180**	**9,856,076**	**9,831,286**
B. Hazardous Materials Safety			
a. Reduce Serious Hazardous Materials Incidents (FY 2008 - FY 2009)		20,893	23,845
Subtotal Hazardous Materials Safety		**20,893**	**23,845**
Total – Safety Strategic Goal	**9,417,180**	**9,876,968**	**9,855,131**
2a. MOBILITY STRATEGIC OBJECTIVE (FY 2007)			
A. Increase NAS On-Time Arrival Rate at the 35 OEP Airports	4,004,679		
Total Mobility Strategic Objective (FY 2007)	**4,004,679**		
2b. REDUCED CONGESTION STRATEGIC GOAL (FY 2008 & FY 2009)			
A. Meet Air Transportation Demand			
a. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		495,086	460,557
b. Increase Average Daily Airport Capacity for the 35 OEP Airports		3,527,282	3,211,983
Subtotal Meet Air Transportation Demand (FY 2008 & FY 2009)		**4,022,368**	**3,672,540**
Total – Reduced Congestion Strategic Goal		**4,022,368**	**3,672,540**
3a. GLOBAL CONNECTIVITY STRATEGIC OBJECTIVE (FY 2007)			
A. Conclude Bilateral Aviation Safety Agreements	34,833		
Total Global Connectivity Strategic Objective	**34,833**		
3b. GLOBAL CONNECTIVITY STRATEGIC GOAL (FY 2008 & FY 2009)			
A. Sustained International Leadership			
a. Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009)			18,506
Subtotal Sustained International Leadership			**18,506**

EXHIBIT IV-1
FY 2009 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, & Exempt Obligations
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2007 ACTUAL	FY 2008 ENACTED*	FY 2009 REQUEST
B. Harmonized Regulatory and Facilitation Requirements			
a. Conclude Bilateral Aviation Safety Agreements and b. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries		57,777	43,835
Subtotal Regulatory and Facilitation Requirements		**57,777**	**43,835**
C. Expand Business Opportunities			
a. Other (Meet FAA's Procurement Goals for Women-Owned and Small Disadvantaged Businesses)		553	725
Subtotal Expand Business Opportunities		**553**	**725**
Total – Global Connectivity Strategic Goal (FY 2008 & FY 2009)		**58,330**	**63,066**
4a. ENVIRONMENTAL STEWARDSHIP STRATEGIC OBJECTIVE (FY 2007)			
A. Reduce Exposure to Significant Aircraft Noise	445,143		
Total Environmental Stewardship Strategic Objective	**445,143**		
4b. ENVIROMENTAL STEWARDSHIP STRATEGIC GOAL (FY 2008 & FY 2009)			
A. Reduction in Pollution			
a. Reduce Exposure to Significant Aircraft Noise		243,288	276,846
b. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action Planned		39,031	38,823
Subtotal Reduction in Pollution		**282,319**	**315,669**
B. Streamlined Environmental Reviews			
a. Reduce Median Completion Time for all Environmental Impact Statement (EISs) and Environmental Assessments (EAs)		34,874	36,776
Subtotal Streamlined Environmental Reviews		**34,874**	**36,776**
Total – Environmental Stewardship Strategic Goal (FY 2008 & FY 2009)		**317,193**	**352,446**
5. SECURITY, PREPAREDNESS AND RESPONSE STRATEGIC GOAL	**198,775**	**201,403**	**218,574**
6a. ORGANIZATIONAL EXCELLENCE STRATEGIC GOAL (FY 2007 & FY 2008)	**436,319**	**438,677**	
6b. ORGANIZATIONAL EXCELLENCE STRATEGIC GOAL (FY 2009)			
A. President's Management Agenda			
a. Other (FAA Activities Supporting the Achievement of DOT's President's Management Agenda Goals)			413,542
Subtotal President's Management Agenda			**413,542**

EXHIBIT IV-1
FY 2009 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, & Exempt Obligations
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2007 ACTUAL	FY 2008 ENACTED*	FY 2009 REQUEST
B. Financial Stewardship (FY 2009)			
a. Percentage of Major Federally Funded Transportation Infrastructure Projects with less than 2 percent Annual Growth in the Project Completion Milestone as Reported in the Finance Plan			2,000
b. Percentage of Financial Plan Cost Estimates for Major Federally Funded Transportation Infrastructure Projects with Less than 2 percent Annual Growth			2,000
Subtotal Financial Stewardship			**4,000**
C. Acquisition Management			
a. For Major DOT Systems, the Percentage of Scheduled Milestones Established in the Acquisition Project Baselines that are Met			31,850
b. For Major DOT Systems, the Percentage of Cost Goals Established in the Acquisition Project Baselines that are Met			31,850
Subtotal Acquisition Management			**63,700**
Total – Organizational Excellence Strategic Goal (FY 2009)			**481,242**
GRAND TOTAL	**14,536,927**	**14,914,939**	**14,643,000**

* Total includes AIP funding level in the FY 2008 Omnibus (PL 110-161). In FY 2008, the Airport Grants program has an obligation limitation of $3,515 million, but only $17 million in new contract authority. The program cannot award new grants until sufficient contract authority is provided for FY 2008.

SAFETY

The safety of American aviation is unparalleled. Since 2001 there have been over 68 million successful flights on U.S. commercial aircraft. This represents over 4.1 billion passengers who have flown safely. By 2025, there will be added demands on the capacity of the system and FAA must steadily progress its plans and activities to be ready for the additional safety challenges.

As part of Vision 100, Congress chartered the Next Generation Air Transportation System (NextGen) Joint Planning and Development Office (JPDO) to jump-start the aviation system of tomorrow. This office uses the brainpower and resources of six cabinet-level offices to develop a blueprint for the aviation system in 2025 and, more importantly, a plan to get there. The plan for NextGen states that the demands on the system may triple from what they are today. It anticipates the need to handle new types of aircraft, ranging from low-orbit spacecraft such as SpaceShipOne to very light jets being used as air taxis. Also, unmanned pilotless civil aircraft will fly cargo and one day, passengers.

Purpose of this Document

This document provides targeted information about the safety initiatives underway at FAA, and the progress the agency has made in reducing the Commercial Air Carrier Fatal Accident Rate. It also presents FY 2009 programmatic and resource needs to meet the challenges of increasing aviation safety and achieving targets set for the newly established Commercial Air Carrier Fatality Rate, which will replace the Fatal Accident Rate. This budget request supports the course toward the future, preserves existing services, and supports the agency's most important strategic objective of enhancing safety through oversight, operations, and research programs.

Document Organization

The document is structured around the four primary FAA safety performance goals followed by a supplemental section, which provides additional details to support the discretionary increase requests. A brief description of the sections and the contents of each, follow.

1. **Reduce the Fatality Rate for Commercial Air Carriers** outlines the total budget request supporting this measure, presents an overview of commercial aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight — Preparing for Flight, Flight, and Post-Flight. Also, within each phase of flight discretionary increases related to that phase are provided. More detailed information supporting the requested increases is provided in the supplemental discretionary increase section.
2. **Reduce General Aviation (GA) Fatal Accidents** outlines the total budget request, presents an overview of GA safety performance, and provides the budget justification details. The budget justification is also organized in the context of the three phases of flight. More detailed information supporting the requested increases is provided in the supplemental discretionary increase section.
3. **Prevent Fatalities, Injuries, or Damage to the Uninvolved Public from Commercial Space Launches** outlines the total budget request, presents an overview of commercial safety launches performance, and provides the budget justification details. The budget justification is organized to detail programs that affect all phases of flight and related discretionary increases are also outlined.
4. **Reduce the Number of Serious Hazardous Materials Incidents in Transportation** outlines the total budget request, presents an overview of hazardous materials, performance, and specifies programs and related resource needs to support initiatives in FY 2009.
5. **Supplemental Details Discretionary Increase Requests** provides marginal cost of performance and is organized to overview the financial and human resource changes associated with the requested discretionary increases for the commercial aviation, GA, and commercial space launch performance goals. In addition, the section provide details regarding how the specific fund requests support safety goals now and in the future, and the marginal costs and expected performance achievements.

Context of this Document

In the agency's complex, interrelated system all FAA organizations play a role in ensuring aviation safety. However, for the commercial and GA performance outcome goals, Aviation Safety (AVS), Airports (ARP), and the Air Traffic Organization (ATO) lead the way. For the commercial space launch performance outcome goal, the Commercial Space Transportation (AST) organization assumes the lead. And finally, the Security and Hazardous Materials (ASH) organization leads the programs and initiatives for the performance goal – reduce hazardous materials incidents.

All four appropriations – Safety and Operations, Air Traffic Organization (ATO), Grants-In-Aid for Airports (AIP), and Research, Engineering and Development (RE&D) – fund the vital aviation safety activities outlined in this document.

For complete disclosure of information technology funding that supports Department of Transportation (DOT) objectives, please refer to the justifications in Section 3, both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program.

In general, the summaries for activities in each goal section funded by Safety and Operations, ATO Salaries and Expenses and AIP present the total amount assigned to that goal for the organization. For ATO Capital Programs and RE&D the inserts show resources for selected individual projects/programs. The assignment of funds by goal is detailed in Exhibits II-3 and IV-1.

Summary Budget Request

Table 1. Total Safety Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Safety			
Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2007 & FY 2008)			
Operations	6,935,501	7,297,365	
F & E	205,292	184,867	
RE&D	91,622	99,626	
AIP	605,174	631,744	
Subtotal	**7,837,590**	**8,213,602**	
FTE	**32,907**	**34,484**	
Reduce the Commercial Air Carrier Fatality Rate (FY 2009)			
Safety & Operations			1,368,527
Air Traffic Organization			6,525,811
RE&D			94,688
AIP			476,800
Subtotal			**8,465,825**
FTE			**35,155**
Reduce GA Fatal Accidents (FY 2007 & FY 2008)			
Operations	722,229	576,404	
F & E	193,692	172,580	
AIP	650,626	880,210	
Subtotal	**1,566,547**	**1,629,194**	
FTE	**5,294**	**3,922**	
Reduce the GA Fatal Accident Rate (FY 2009)			
Safety & Operations			201,281
Air Traffic Organization			504,647
AIP			644,525
Subtotal			**1,350,453**
FTE			**2,825**
Reduce Serious Hazardous Material Incidents (FY 2008 & FY 2009)			
Operations		20,893	
Safety & Operations			23,845
Subtotal		**20,893**	**23,845**
FTE		**143**	**147**
Zero Commercial Space Accidents			
Operations	13,043	13,280	
Safety & Operations			15,008
Subtotal	**13,043**	**13,280**	**15,008**
FTE	**64**	**65**	**71**
Safety $ Total	**9,417,180**	**9,876,968**	**9,855,131**
Safety FTE Total	**38,265**	**38,614**	**38,198**

This budget request supports *Increased Safety*, DOT and FAA's most important strategic objective. The FAA estimates that almost $10 billion, approximately 67 percent of the agency's budget in FY 2009, will be required to maintain and improve the agency's safety programs. Table 1 summarizes the Safety budget request by allocation. Table 2 provides the discretionary increase budget request.

Table 2. Discretionary Increase Requests

	($000)	FTE
SAFETY AND OPERATIONS		
Aviation Safety		
AOV Safety Oversight Staff	800	10.0
Aviation Safety Total	*800*	*10.0*
Commercial Space Transportation		
Human Space Flight Safety	270	2.0
Commercial Space Transportation Total	*270*	*2.0*
SAFETY AND OPERATIONS TOTAL	***1,070***	***12.0***
AIR TRAFFIC ORGANIZATION		
Salaries and Expenses		
206 Air Traffic Controllers	11,263	153.0
AIR TRAFFIC ORGANIZATION TOTAL	***11,263***	***153.0***
GRANTS-IN-AID FOR AIRPORTS (AIP)		
Airport Geographic Information System	74	0.5
Airport Geographic Information System Equipment	500	0.0
Airport Safety Management System	74	0.5
Airport Safety Certification Inspectors	148	1.0
Airport Technology Research	74	0.5
Airport Obstruction Evaluation	500	0.0
AIP TOTAL	***1,370***	***2.5***
TOTAL	***13,703***	***167.5***

Aviation Safety Overview

America continues to set the world standard for aviation, and safety is the hallmark of FAA. As the stewards of aviation safety in the United States, the agency and its industry partners have built a system that has reduced the risks of flying to all-time lows. In FY 2009 and beyond, FAA will continue to focus its resources—financial, human, and physical—primarily on safety.

The FAA oversees the world's largest, most complex aviation system, and serves millions of people who travel on commercial airlines, hundreds of thousands who make aviation their livelihood, and thousands more who fly for recreation. The level of public confidence in the safety of air travel has a huge impact on the U.S. economy. Today, travel and tourism account for one out of seven jobs in America.

In 1997, the White House Commission on Aviation Safety and Security issued a challenge to FAA and the aviation industry – to reduce the air carrier fatal accident rate by 80 percent in ten years. In response, FAA initiated a joint government-industry analysis of causal factors most frequently involved in aviation accidents. The resulting document, Safer Skies – A Focused Agenda, has formed the basis for joint government-industry efforts to reduce the number of accidents in both the commercial and general aviation areas.

This year marks the end of that ten-year period. By the end of FY 2007, FAA achieved a rate of 0.022 fatal accidents per 100,000 departures – a 57 percent drop. Although we did not achieve the target set ten years ago, FAA's safety achievements have been significant. In the three years prior to setting this goal, the U.S. averaged about six commercial fatal accidents per year. The average loss of life each year was 266 deaths.

Today, thanks to new technology, revised rules and procedures, and increased training, not only are there fewer commercial fatal accidents each year, but the chances of survival have increased significantly. In the past three years the U.S. averaged approximately two fatal accidents per year, with an average loss of life of 28. In addition, FAA's efforts during the past ten years have resulted in reduced general aviation fatal accidents and Alaska fatal accidents. Both measures are at their lowest recorded levels in history.

Through the continuing effort and cooperation of all the participants in the aviation industry and FAA, the aviation industry has achieved the safest period in history. For this reason, FAA is introducing a new performance metric for commercial air carrier safety – Fatalities per 100 Million Persons On Board. This new metric is more relevant to the flying public, as it better measures the individual risk, as low as it is, to fly. And the long-term target is no less challenging than the previous goal – the agency aims to cut this risk in half by 2025. To make this vision a reality, FAA will continue to work in partnership with industry.

Partnership is the lynchpin of FAA's safety efforts. The agency constantly works with groups such as the Aircraft Owners and Pilots Association, Air Safety Foundation, Airline Pilots Association, Air Transport Association, Experimental Aircraft Association, GA Manufacturers Association, National Business Aviation Association, Allied Pilots Association, Association of Flight Attendants, airline and airport officials, manufacturers, and safety experts. Each group contributes to the safety of the NAS with technology, communications, and its unique expertise.

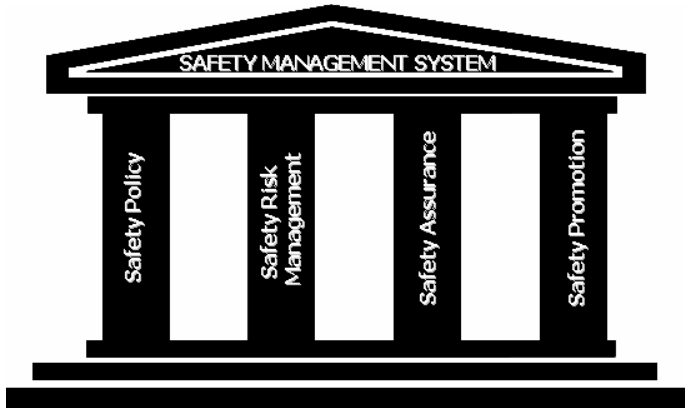
While maintaining its regulatory and enforcement role, FAA and the aviation community have embraced three basic long-term strategies: 1) prevent accidents by addressing recurrent causes; 2) improve certification and surveillance; and 3) share safety data and information with aviation partners. These strategies are at the heart of most of FAA's long-term safety programs.

Safety Management Approach

As the aviation environment and industry changes, FAA must keep pace. The current processes and systems have served the agency well and have helped to create the safest aviation system in the world. To achieve the next level of safety, the traditional methods of analyzing the causes of an accident or incident, after the fact, are not enough. A more forward thinking approach is required to analyze trends, data, and systems to manage issues before they become incidents or accidents.

The FAA, along with other federal agencies and operators in the NAS, are adopting a system safety approach to safety management. This approach, called a Safety Management System (SMS), relies on developing standardized language, processes, and tools to manage safety risk. SMS relies on four pillars to manage risk:

- ➔ Safety Policy – Aligning procedures and processes in an organization to establish and meet safety objectives;
- ➔ Safety Risk Management (SRM) – Assessing risk in the system to identify and mitigate hazards;
- ➔ Safety Assurance – Continuously monitoring and updating the policies and activities to ensure that the processes work as intended; and
- ➔ Safety Promotion – Creating a safety culture that permeates every area of our work at all levels of the organization.



The foundation of FAA's SMS is the Quality Management Systems (QMS) designed to manage organizational quality and to install precision in FAA's safety processes. The SMS is a system designed to integrate safety into FAA's quality processes. The FAA's Aviation Safety Organization (AVS) registered its QMS through the International Standards Organization (ISO) 9000 in FY2006.

Further, the SMS closes the gap between the International Civil Aviation Organization's (ICAO) safety management requirements and current FAA capabilities. ICAO is a United Nations organization that is dedicated to increasing the safety and security of international civil aviation. The organization addresses fundamental issues ranging from air navigation and capacity to emerging environmental concerns such as engine noise and emissions. The FAA, in concert with other U.S. Government bodies, coordinates a harmonious U.S. position that will be represented in the technical work conducted by ICAO panel and study groups.

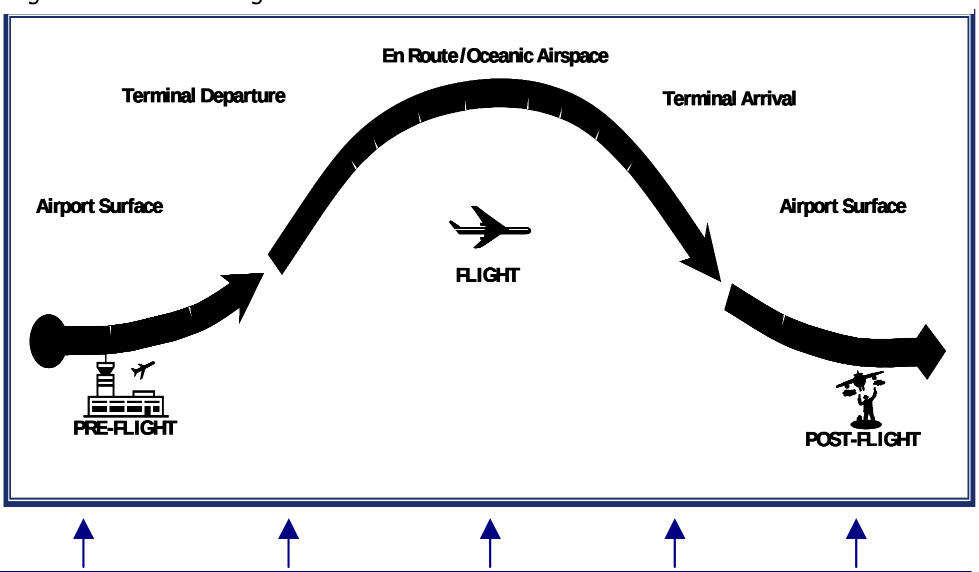
Performance Measure

Reduce Air Carrier Fatality Rate for Commercial and Scheduled Carriers

Section Organization

This section outlines the total budget request associated with this performance measure, presents an overview of commercial and scheduled air carrier aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight — Preparing for Flight, Flight, and Post-Flight. Also, within each phase of flight, discretionary increases related to that phase are provided. More detailed information supporting the requested increases is provided in the supplemental discretionary increase section. Figure 1 below illustrates the phases of flight and the associated air traffic control system responsible for providing services through all phases of flight.

Figure 1. Phases of Flight and the Associated Air Traffic Control Roles and Facilities



Air Traffic Control Tower (ATCT)	Terminal Radar Approach Control (TRACON)	Air Route Traffic Control Center (ARTCC)	Terminal Radar Approach Control (TRACON)	Airport Traffic Control Tower (ATCT)
- Ground Control - Local Control	- Departure Controller	- Radar Controller - Radar Associate - Assistant Controller	- Arrival Controller	- Tower Controller - Ground Controller

Budget Request

This funding request supports the DOT Safety strategic goal and FAA's Reduce Commercial Air Carrier Fatality Rate performance outcome goal. The FAA requests about $8.5 billion for programs contributing to the strategic objective to reduce the Commercial Air Carrier Fatality Rate.

Specifically, the budget request facilitates continued reductions in the fatality rate for passenger and cargo carriers. The FAA performance target is to reduce the number of air carrier fatalities per 100 million persons on board to 8.62 in FY 2009.

Table 3-A summarizes FAA's progress since 2005 in meeting the Fatal Accident Rate performance targets and provides the agency's future targets. The rate includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (Part 121) and scheduled flights of commuter airlines (Part 135). Table 3-B

provides the performance target for the new FY 2009 Commercial Air Carrier Fatality Rate per 100 million persons on-board measure. Table 4 summarizes the resources needed to achieve this goal.

Table 3-A. Commercial Air Carrier Fatal Accident Rate[1]

	2005	2006	2007	2008	2009
Target:	0.023	0.018	0.010	≤0.010	≤0.010
Actual:	0.017	0.020[2]	0.022[3]	N/A	N/A

Table 3-B. Commercial Air Carrier Fatalities Per 100 Million Persons On Board[4]

	2005	2006	2007	2008	2009
Target:	N/A	N/A	N/A	8.88	8.62
Actual:	N/A	N/A	N/A	N/A	N/A

[1] Measures three year rolling average of accidents per 100,000 departures.
[2] Preliminary estimate. The National Transportation Safety Board (NTSB) will make final data available in March 2008. It is unlikely that this result will be changed significantly.
[3] Preliminary estimate. Final data expected March 2009.
[4] New metric to replace Fatal Accident Rate beginning in FY 2008. Through FY 2009, targets and results for both measures will be reported.

Table 4. Budget Request for Reducing Commercial Air Carrier Fatality Rate Goal

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Safety			
Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2007 & FY 2008)			
Operations	6,935,501	7,297,365	
F & E	205,292	184,867	
RE&D	91,622	99,626	
AIP	605,174	631,744	
Total	**7,837,590**	**8,213,602**	
FTE	**32,907**	**34,484**	
Reduce the Commercial Air Carrier Fatality Rate (FY 2007 & FY 2008)			
Safety & Operations			1,368,527
Air Traffic Organization			6,525,811
RE&D			94,688
AIP			476,800
Total			**8,465,825**
FTE			**35,155**

Performance Overview

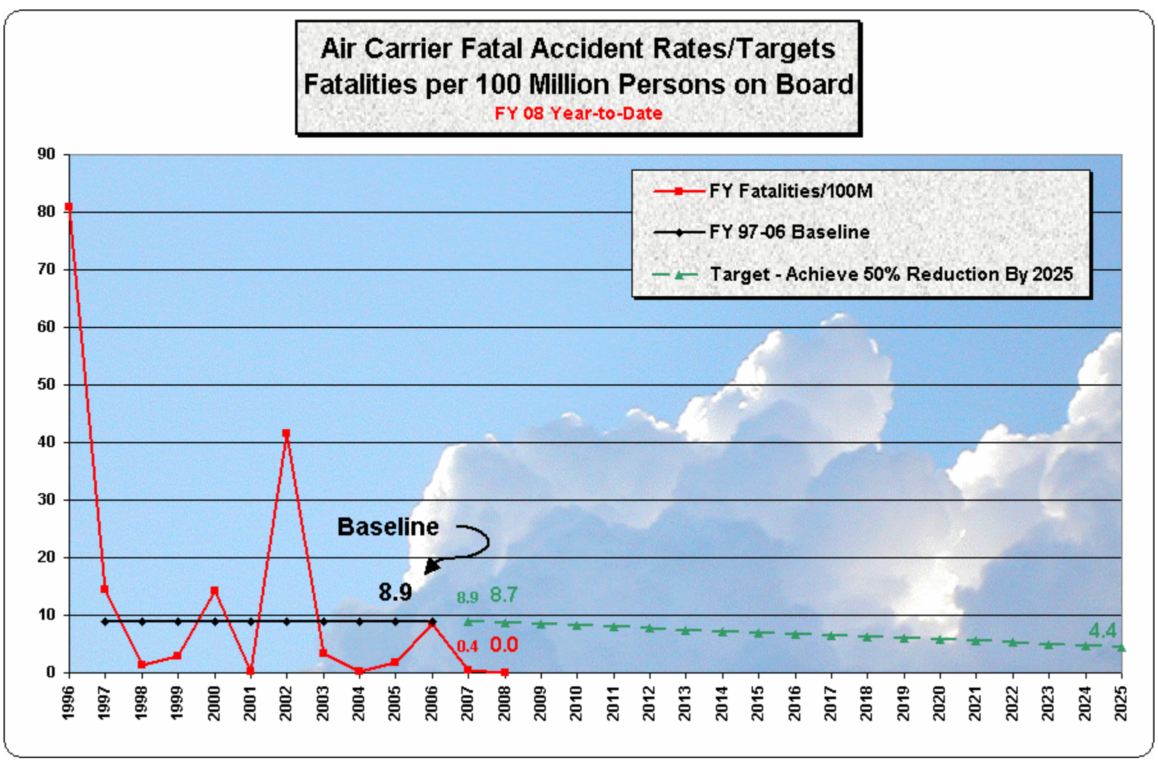
This remains one of the safest periods in aviation history for both commercial and general aviation. Over the last five years, nearly three billion airline passengers have safely reached their destinations. The NAS operates 32,000 scheduled commercial flights daily.

The FAA will not make its FYs 2006 – 2008 targets to reduce the Commercial Air Carrier Fatal Accident Rate. The agency continues to work toward achieving the long-term goal of reducing the rate to a three-year rolling average of 0.010 per 100,000 departures. The FY 2007 rate for fatal accidents per 100,000 departures was 0.022. For FY 2008, FAA anticipates a rate of no better than 0.016. This still represents a remarkable decrease from the 1996 goal to reduce the Commercial Air Carrier Fatal Accident Rate by 80 percent in ten years. By the end of FY 2007, FAA achieved an impressive 57 percent of that goal. Few other government agencies have so seriously pursued achieving such an ambitious, long-term goal and achieved as significant an accomplishment as FAA.

The current fatal accident measure is expressed in terms of fatal accidents per 100,000 departures. However, with this measure all fatal accidents, as defined by National Transportation Safety Board (NTSB), are weighted equally. The result is that an accident with a single fatality is viewed in the same way as an accident involving hundreds of passengers. This metric fails to discriminate between events. Fatal accidents such as Kirksville (13 fatal), Lexington (49 fatal), and AA587 (Belle Harbor – 265 fatal) are treated and weighted the same as an individual ramp agent involved in a fatal accident.

Therefore, to more accurately measure commercial air carrier safety, FAA is introducing a new metric which will count fatalities per 100 million persons on board rather than total fatal accidents. The new metric more accurately reflects the actual personal risk to each member of the flying public. All fatalities, including passengers, crewmembers, ramp workers, and ground fatalities are counted equally, mirroring NHTSA's treatment of pedestrian and cyclist fatalities. The proposed new target is a 50 percent reduction in fatalities per 100 million persons on board by 2025.[1] Figure 2 below provides the new Commercial Air Carrier Fatality Rate, with prior year results and past and future FAA targets.

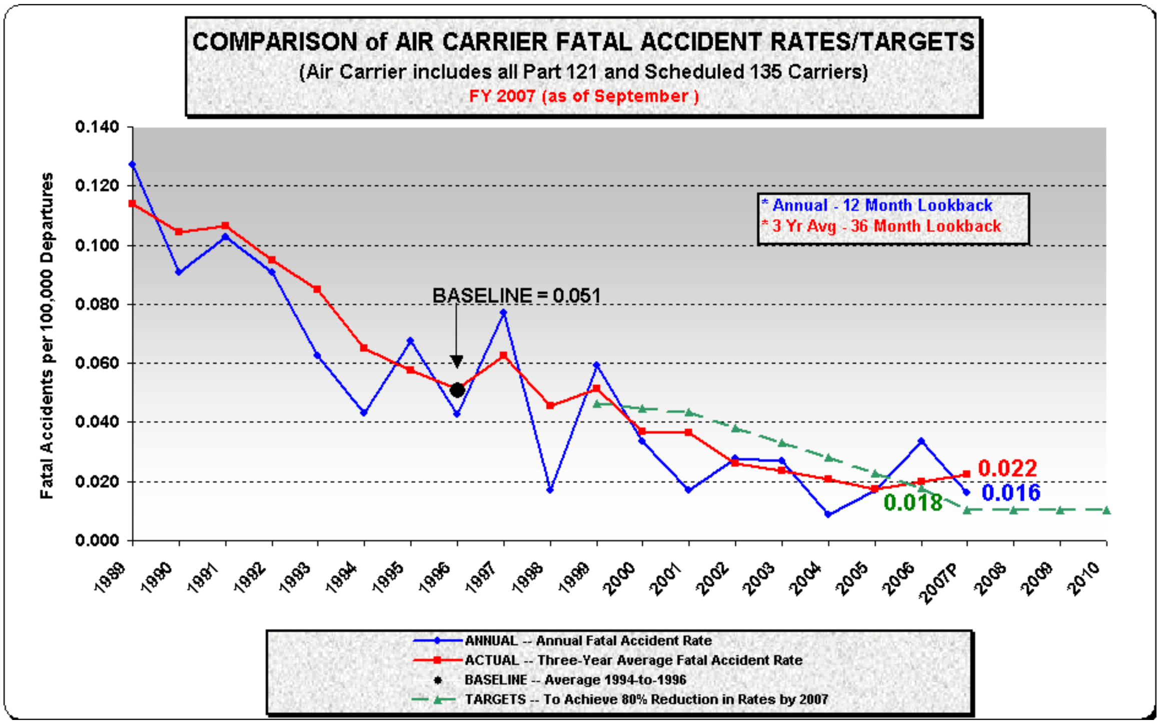
Figure 2. Historical Fatal Accident Rate (FY 1996 - 2025) and FAA's Targets (FY 1999 - 2009)



[1] Proposed target is subject to approval by the Commercial Aviation Safety Team (CAST).

Figure 3 below provides the historical Commercial Air Carrier Fatal Accident Rate and past and future FAA targets. It illustrates FAA's steady progress to further reduce the accident rate to 80 percent below the 1994–1996 baseline by FY 2007 and to maintain a rate below 0.010 thereafter. The rate includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (Part 121) and scheduled flights of commuter airlines (Part 135). This budget request supports the agency's core activities and provides for focused increases to improve performance.

Figure 3. Historical Fatal Accident Rate (FY 1989 - 2007) and FAA's Targets



All four FAA appropriations fund vital flight preparation activities and AVS, ARP, and the ATO lead the way.

Aviation Safety Organization. AVS has a singular mission — to promote aviation safety in the interest of the American public and the millions of people who rely on the aviation industry for business, commerce, and pleasure. To fulfill this mission, AVS directs and manages safety programs that fall into three primary areas, certification and licensing, standards and policy, and continued operational safety oversight and surveillance.

Office of Airports. As an organization, ARP provides leadership to the airport and aviation community to ensure that the National Plan of Integrated Airport Systems (NPIAS) is developed to meet the Nation's airport needs. ARP has a continuing stake in the safety, security, capacity, financial, and environmental aspects of airports. The organization's major business challenge is to improve the safety, capacity, and condition of U.S. airports and to maintain a level of investment for airport infrastructure projects that benefits the NAS.

Air Traffic Organization. The mission of the ATO is to identify aircraft collision risk and mitigate aircraft collision risks during the delivery of air traffic separation services. The separation of aircraft at appropriate distances is critical to maintaining safe air transportation. More than 15,000 air traffic controllers play a central role in separating aircraft from other aircraft, adverse weather, and obstacles through all phases of flight.

Budget Request Justification

PREPARING FOR FLIGHT
Aviation Safety Organization
Airports
Air Traffic Control Organization

Commercial Aviation Safety

The FAA focuses a substantial portion of its resources on safety prior to flight. The agency prepares each flight for takeoff by setting standards and providing oversight of all aviation related personnel and entities. In support of flight preparations AVS provides regulation and certification services; ARP establishes and maintains airport infrastructure and standards; and ATO delivers air traffic separation services.

The following table provides a guide to the contents of the Preparing for Flight section of this document.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	**Office of Airports (ARP)**	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment & Personnel - Certify and License - Regulate and Inspect **Discretionary Increases** - AOV Safety Oversight Staff	**Establish and Maintain Airport Standards and Infrastructure** - Airport Safety, Standards, and Infrastructure - Establish and Maintain Airport Infrastructure **Discretionary Increases** - Airport Geographic Information System (GIS) - Airport GIS Equipment - Airport Safety Management System (SMS) - Airport Technology Research - Airport Certification and Safety Inspectors - Airport Obstruction Evaluation	**Establish and Maintain, Facilities, Processes & Systems Technology** - Establish Air Traffic Control - Establish Integrated Safety Management System

Aviation Safety Services – Air Carrier, Equipment, and Personnel

(Safety and Operations, Aviation Safety, $917.2 million, 5,278 FTE)

This funding request supports the continued establishment of the highest safety standards for U.S. aviation standards. The regulatory foundation and vigilant oversight provided by FAA have a direct impact on reducing air carrier accidents. It is important to recognize that these high standards ultimately influence regulations set in many other countries.

The FAA, in its efforts to set aviation standards and provide aviation oversight, performs two key functions – it certifies and licenses people, equipment, and air carriers and it establishes strict regulatory standards and conducts inspections to ensure compliance with those standards. This section provides details on the activities associated with these functions and outlines discretionary increase needs to continue these efforts now and into the future.

Certify and License

The FAA certifies airlines, pilots, and planes before they are permitted to fly in the U.S. The agency oversees safety standards for airlines, commuter, on-demand operators, and other commercial operators. Airline pilots must meet agency standards for flight skills and medical fitness before they can fly commercial aircraft. The FAA also certificates non-pilot personnel essential to safe flight.

The agency is also responsible for licensing and certifying all new aircraft types and major components, such as engines and propellers. Aircraft and components manufactured in the United States and abroad are developed in concert with the agency to assure airworthiness. This is an enormous undertaking – each aircraft carrying commercial airline passengers receives multiple certifications from FAA. These certifications ensure that each and every aircraft meets the highest safety standards. FY 2009 funding for this core business activity is needed to oversee current and new certificates.

Regulate and Inspect

More than 5,900 FAA inspectors, engineers, medical personnel, and other critical safety staff oversee air carriers, manufacturers, repair stations, training schools, and pilots to ensure certificate holders continue to meet safety standards. The standards maintained by FAA's employees provide the basic framework of aviation safety. Each year, FAA conducts hundreds of thousands of inspections, including a growing number of international suppliers to major U.S. companies. If the agency discovers a violation of federal regulations, it brings an enforcement action. The FY 2009 funding request ensures consistently high standards and contributes directly to further reductions in the commercial accident rates and fatality rates.

Because the workforce is small in comparison to the industry and public served by FAA, resources are leveraged through the designee system. The designee program authorizes private persons and organizations to perform many routine activities on behalf of FAA, allowing the agency to concentrate on the most critical safety areas. Designees also expand FAA access to technical expertise. The program enables more timely certification of individuals and companies. The FAA currently uses over 11,100 designees, plus another 27,000 people who are authorized to do specific work on behalf of the Administrator.

Aviation Safety Services - Discretionary Increase Requests

(Safety and Operations, Aviation Safety, $800 thousand, 10 FTE)

The FAA requests a discretionary increase for AOV Safety Staff to support regulation and certification activities and initiatives. The specific resource needs for this discretionary increase request are outlined below. The increase request responds to exponential growth in the demands for regulation and certification services.

In support of this commercial aviation discretionary increase request, the agency conducted a marginal cost analysis. This analysis demonstrates that the requested increases are necessary to meet the public's expectation for continued safety leadership and for declines in the Commercial Air Carrier Fatality Rate and General Aviation Fatal Accident Rate. Output measures for this program are delineated in the final section of this chapter, Supplemental Details, Marginal Cost of Performance Analysis.

AOV Safety Oversight Staff

(Safety and Operations, Aviation Safety, $800 thousand, 10 FTE)

Aviation Safety requests additional resources for Air Traffic Safety Oversight (AOV) to conduct risk based modeling, simulation, and analysis of changes necessary to meet increased capacity demands as well as the actions required for implementation of NextGen. The positions will provide oversight of the SMS process within ATO for the integrated collection of processes, procedures, and programs that ensures a formalized and proactive approach to system safety through risk management.

DISCRETIONARY INCREASE REQUEST

AVIATION SAFETY SERVICES

AOV Safety Oversight Staff
(Safety and Operations, Aviation Safety, $800 thousand, 10 FTE)

Purpose:		**Benefit:**	**Resource Requirements:**
Increase Air Traffic Safety Oversight Staffing	➔	Achieve regulatory responsibilities required under FAA Order 1100.161 (procedures used within FAA to conduct oversight of ATO)	$800,000 10 FTE
	➔	Increase number of facility and system audits	
	➔	Full implementation of recently established safety processes and compliance monitoring to include ISO-9000 compliance and enforcement processes and an ATO SMS	

PREPARING FOR FLIGHT
Aviation Safety Organization
Airports
Air Traffic Control Organization

Commercial Aviation Safety
(Continued)

The following table provides a guide to the contents of this section of the Commercial Aviation Performance Goal and focuses on the activities of the Office of Airports in preparing for flight.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	Office of Airports (ARP)	Air Traffic Organization (ATO)
Aviation Safety Services – Air Carrier, Equipment & Personnel - Certify and License - Regulate and Inspect **Discretionary Increases** - AOV Safety Oversight Staff	**Establish and Maintain Airport Standards and Infrastructure** - Airport Safety, Standards, and Infrastructure - Establish and Maintain Airport Infrastructure **Discretionary Increases** - Airport Geographic Information System (GIS) - Airport GIS Equipment - Airport Safety Management System (SMS) - Airport Technology Research - Airport Certification and Safety Inspectors - Airport Obstruction Evaluation[2]	**Establish and Maintain Facilities, Processes & Systems Technology** - Establish Air Traffic Control - Establish Integrated Safety Management System

Establish and Maintain Airport Standards and Infrastructure

(Grants-in-Aid for Airports, Office of Airports, **$**476.8 million, 95 FTE)

Airport Safety, Standards, and Infrastructure

ARP is responsible for certifying commercial service airports to meet minimum safety requirements under Part 139. To support airport safety, we develop advisory circulars (AC) and equipment specifications, conduct research, and provide policy guidance.

Safety programs supported include:

Airport Certification and Inspection. ARP certifies commercial service airports under Part 139, which establishes minimum safety standards for airports. Certified airports are inspected periodically by FAA's Airport Certification and Safety Inspectors to ensure airports are meeting Part 139 requirements.

Implementation of Safety Management Systems (SMS) at Airports. In FY 2009, FAA will continue the implementation process for SMS at airports. The implementation of SMS at airports will be particularly useful to help mitigate the risk associated with the large amount of construction activity at airports. SMS moves from the traditional reactive approach of determining cause by analyzing accidents after they occur to a proactive approach where airports analyze accident statistics and other data to determine trends and identify risks. SMS improves safety by instituting a formalized process for airports to proactively identify risks and to develop mitigation strategies to reduce those risks. FAA's airport SMS efforts will also harmonize the U.S with the ICAO requirements for airports SMS.

Airport Technology Research. The Airport Technology Research Program at FAA's William J. Hughes Technical Center, Atlantic City, New Jersey provides the technical basis to keep the agency's Advisory Circulars (AC) up-to-date. These technical documents provide airports guidance on how to comply with airport safety regulations. FAA's engineering and technical support staff develop AC and technical specifications. Regional engineers also review proposed airport safety and development projects. Airport safety research is conducted in the areas of airport design, aircraft rescue and firefighting, airport lighting and marking, and wildlife hazard mitigation.

Airport Cooperative Research Program (ACRP). The ACRP, administered by the Transportation Research Board (TRB) under an agreement with FAA, also conducts research on airport issues. The ACRP conducts research on problems identified by airports and other members from the aviation community. Research topics are solicited and a Board of Governors consisting of executives from airports, universities, consultants, airport associations, and FAA and other federal agencies selects the most promising topics for funding.

[2] One time funding request

Airport Safety Data. The FAA gathers information on all public-use airports for dissemination to pilots through the Airport Safety Data Program. This information is gathered by airport certification safety inspectors and by state inspectors funded by the agency. Information is entered into the National Flight Data Center database, published in the Airport Facility Directory, and incorporated on aeronautical charts. There are approximately 35 FAA airport certification safety inspectors who inspect about 600 civilian airports.

Airport Geographic Information (GIS) System. ARP is developing the Airports Surveying-GIS Program. This program is an end-to-end process for the collection, validation, and central warehousing of airport data in a seamless digital stream from the point and time of collection, through validation and delivery to a centrally managed data warehouse.

Establish and Maintain Airport Infrastructure

The FAA funds a range of activities to ensure the safety of U.S. airports through grants and administrative support. This funding request directly supports efforts to reduce runway incursions, which reduces the risk of airline accidents. Requested FY 2009 funding will maintain the integrity of airport surfaces and structures nationwide and, where needed, will improve their condition.

Safety-related development receives priority consideration for AIP funding. The FY 2009 request continues support of initiatives to improve runway safety areas at airports to meet standards or to the extent practical, implement SMS at airports, reduce runway incursions, and improve infrastructure conditions.

Improvements to Runway Safety Areas. The agency's long-term goal to improve runway safety areas (RSA) will minimize damage to aircraft and injuries to those on board, once the aircraft leaves the runway surface. A plan for completing improvements at all RSAs has been developed. RSA improvements are frequently multi-year projects. Preliminary planning indicates that 87 percent of RSA improvements will be completed by 2010 and all-practicable improvements at RSAs will be completed by 2015.

Runway Incursion Reduction. The FAA places a high priority on initiatives to reduce runway incursions. ARP will continue to implement recommendations that reduce their occurrence.

Infrastructure Conditions. The agency recognizes the safety benefits of ensuring that pavements at airports identified in the NPIAS are in good or fair condition and meet current safety and design standards. AIP will continue to support this goal. Also, AIP will continue to use its flexibility to maximize the funding to establish navigation aids (NAVAIDs) for eligible projects. The AIP and ATO, Capital Programs share the same eligibility for funding NAVAID projects.

Establish and Maintain Airport Standards and Infrastructure - Discretionary Increase Requests (Grants-in-Aid for Airports, Office of Airports, $1.4 million 2.5 FTE)

ARP requests discretionary increases to support Establishment and Maintenance of Airport Standards and Infrastructure activities and initiatives. The discretionary increase request will provide Airport GIS, Airport SMS, Airport Technology Research, Airport Certification and Safety Inspectors and Airport Obstruction Evaluation. The specific resource needs for each discretionary increase request are outlined below.

Airport Geographic Information Systems (GIS). One position (0.5 FTE) is requested to enable an effective transition in FY 2009 to an electronic system for maintaining airport data on more than 5,100 public use airports. The electronic GIS system will provide the capability of generating electronic airport layout plans and electronic airport obstruction charts. The additional personnel will be responsible for the implementation of the Airports-GIS program to approximately 5,100 public use airports. It includes program management of the National Geodectic Survey Memorandum of Understanding directing approximately 20-30 million survey dollars through the program annually with a large portion from the airport grants program. The personnel will also be used to develop and administer the electronic Airport Layout Plan (ALP) portion of the program as well as the Airport Obstruction Chart (AOC) implementation. Since this is an agency-wide program, all the lines of business will be looking to ARP to provide oversight and support. ARP will also be responsible for the technical accuracy of the data and will monitor the website input and output.

Airport Geographic Information Systems Equipment[3]. $500,000 is requested for computer aided drafting and design (CADD) computers and equipment to evaluate electronic Airport Layout Plans (ALPs), and

[3] One time funding request.

support all current airport planning and engineering functions utilizing electronic data. The funds will procure computer hardware, plotters, and software for each of our 9 regional and 22 field offices. The equipment will be used under the Airport-GIS program being implemented in FYs 2008 – 2009. All future planning documents submitted by an airport will need to be in electronic format. Without the hardware to review and edit these submissions, the process will be severely crippled or negated by still relying on a paper process.

<u>Airport Safety Management System (SMS)</u>. One Airport SMS position (0.5 FTE) is requested to implement SMS at more than 500 certificated airports. In November 2005, ICAO amended Annex 14, Volume I (Airport Design and Operations) to require member States to have certificated international airports establish an SMS. The FAA supports harmonization of international standards, and has worked to make U.S. aviation safety regulations consistent with ICAO standards and recommended practices. The SMS position will also coordinate SMS activities with the other lines of business and be the contact for providing SMS information to airports.

The forecasted growth in air transportation will require new measures and a greater effort from all aviation product producers, including airport operators, to achieve a continuing improvement in the level of aviation safety. The use of SMS at airports can contribute to this effort by increasing the likelihood that airport operators will detect and correct safety problems before those problems result in an aircraft accident or incident.

<u>Airport Technology Research</u>. ARP requests an additional one position (0.5 FTE) in FY 2009 to support research and development (R&D) projects. Each R&D project requires engineering support to develop proposals and plans, write statement of works, develop government cost estimates, review contractor proposals, monitor contractor performance and prepare R&D reports. Adequate staffing is needed to ensure quality research is conducted on time and within budget. The combination of increased requirements over the past several fiscal years and the complexity of the research projects require additional engineering staff to effectively manage the work and to ensure timely, high quality research products. Current airport research underway includes research in airport design, airport pavement construction and maintenance, airport lighting and marking, aircraft rescue and firefighting, and wildlife hazard mitigation. This funding request brings the total staffing in the Airport Technology Research Program to 22 positions and 21.5 FTE.

<u>Airport Certification and Safety Inspectors</u>. Two Airport Safety and Certification Inspectors (1.0 FTE) are requested to augment the current cadre of 35 airport safety and certification inspectors whose workload has steadily increased. The amended Part 139 has expanded the requirement for airport certification to include smaller airports. This includes airports with commercial service aircraft of more than 9 seats. As a result, the current 35 inspectors are responsible for inspecting 572 certificated airports, limiting FAA's ability to inspect all airports once a year. In addition to more airports to inspect, FAA is implementing an airport SMS at Part 139 airports to bring the U.S. in harmonization with the ICAO standard. Each airport will need to develop an SMS system and manual. The FAA safety and certification inspectors will be responsible for reviewing the airport's SMS program to determine its compliance with FAA requirements. Airport safety and certification specialists provide technical assistance to foreign countries to improve world-wide aviation safety. This technical assistance is usually in the form of seminars and on-the-job training in airport safety.

<u>Airport Obstruction Evaluation</u>. This one-time request for additional funding of $500,000 is requested for contract support to develop improvements to the Airport Obstruction Evaluation Program. Every 28 days updated NAS data is published. Obstruction Evaluation and Airport Airspace Analysis (OEAAA) is the primary mechanism for the collection of airport/runway data and the coordination of airport projects. With the reorganization of the ATO it is imperative for ARP to undertake a complete review of its responsibilities and guidance under the OEAAA program.

For ARP to meet its responsibilities in the maintenance of the NAS, a viable and vital OEAAA program is required. This analysis will yield the critical obstruction evaluation and non-rulemaking airport enhancements to the OEAAA software used by all FAA lines of business. Secondly, the analysis will clearly define the current and future manpower requirements of ARP to meet airspace obligations. The analysis will further the process of integrating all airport data for obstruction evaluation, airport safety data, geographic information systems, and electronic airport layout plans under single leadership, eliminating duplication of effort and improving the integrity and availability of the data.

The software improvements and training will enable ARP regional and district offices to effectively enter new airport data and proposed construction projects into the system, and conduct the required airspace and obstruction analyses. ARP will prepare the necessary revisions to FAA Order 7400.2 "Procedure for Handling Airspace Matters", Part 3 "Airport Airspace Analysis". The changes to the directives and software will provide the opportunity to prepare and deliver basic obstruction analysis computer program training to our field personnel, increasing their efficiency while reducing their workload.

The following table provides a brief synopsis of the costs and benefits associated with the requested discretionary budget increases.

DISCRETIONARY INCREASE REQUEST

Establish and Maintain Airport Standards and Infrastructure			
Airport Safety, Standards, and Infrastructure (Grants-in-Aid for Airports, Office of Airports, $1.4 million, 2.5 FTE)			
Purpose:	**Benefit:**	**Resource Requirements:**	
Airport Geographic Information System (GIS)	➔ Implement and maintain an electronic airport GIS ➔ Coordinate collection, validation, and input of airport survey data. ➔ Oversee and coordinate system for developing electronic airport obstruction charts ➔ Coordinate and manage system for implementing use of electronic airport layout plans	$74,000	0.5 FTE
Airport GIS Equipment	➔ Ability for regional and field offices to review and edit airport planning and engineering documents that are submitted in electronic format.	$500,000	0.0 FTE
Airport Technology Research	➔ Increased monitoring of projects associated with Innovative Pavement Research Foundation (IPRF), Center of Excellence in Airport Technology (CEAT) ➔ Inter-organizational collaboration and FAA leadership in airport technology research	$74,000	0.5 FTE
Airport Safety Management System (SMS)	➔ Implement airport SMS at certificated airports in U.S. ➔ Reduce accidents and runway incursions by applying proactive analysis to identify and mitigate risk on the airport surface.	$74,000	0.5 FTE
Airport Certification Safety Inspectors	➔ Additional 2 inspectors are required to keep up with workload increases generated by expansion of Part 139 to smaller airports and implementation of safety management systems (SMS) at airports.	$148,000	1.0 FTE
Airport Obstruction Evaluation	➔ Update software to improve airspace and airport obstruction evaluation. ➔ Develop training courses for airspace and airport obstruction analysis.	$500,000	0 FTE

Commercial Aviation Safety
(Continued)

PREPARING FOR FLIGHT
Aviation Safety Organization
Airports
Air Traffic Control Organization

The following chart provides a guide to the framework of this section focused on the Commercial Air Carrier Fatality Rate performance measure and the activities of the AVS and ATO in support of safety in pre-flight preparations.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	**Office of Airports (ARP)**	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment, & Personnel - Certify and License - Regulate and Inspect **Discretionary Increases** - AOV Safety Oversight Staff	**Establish and Maintain Airport Standards and Infrastructure** - Airport Safety, Standards, and Infrastructure - Establish and Maintain Airport Infrastructure **Discretionary Increases** - Airport Geographic Information System (GIS) - Airport GIS Equipment - Airport Safety Management System (SMS) - Airport Technology Research - Airport Certification and Safety Inspectors - Airport Obstruction Evaluation	**Establish and Maintain Facilities, Processes & Systems Technology** - Establish Air Traffic Control - Establish Integrated Safety Management System

Establish and Maintain Facilities, Processes, and Systems Technology
(ATO, Salaries and Expenses, $6.3 billion, 27,818 FTE)

During pre-flight, the ground controller monitors the runways and taxiways using ground radar to ensure aircraft do not cross active runways or interfere with movement. The local controller clears the flight for take-off. About five miles out of the airport, flights are handed off to the departure controller located at a nearby TRACON facility. From there, most of a commercial aircraft's flight passes under the direction of a controller at one of FAA's 21 ARTCCs.

Establish Air Traffic Control

Air traffic controllers are responsible for directing the movements of aircraft prior to takeoff, on the ground, and in the air. Air traffic control depends on the combined efforts of pilots, air traffic controllers, and maintenance technicians. The Air Traffic Control System Command Center in Reston, Virginia, concurrently monitors all air traffic and the operational status of the NAS. The Command Center's traffic management units address systemic problems and ensure that revised flight routes do not overload controllers' sectors.

The FAA funds contract towers staffed by non-federal air traffic controllers. The FY 2009 budget request includes $117.8 million for the contract tower program to provide safe, cost-effective services to smaller airports across the country. The average cost per tower has been increasing and contract tower costs are expected to average $471,000 in FY 2009, as compared to $455,000 in FY 2008.

The FAA forecasts commercial aircraft operations at contract-tower airports to grow an average of 1.4 percent annually during the 14-year forecast period, from 1.9 million to 2.3 million operations annually, an overall increase of 22 percent. Non-commercial activity is expected to slow, increasing only an average of 1.1 percent annually, from 14.9 million operations in FY 2007 to 18.3 million operations in FY 2025.

Establish Integrated Safety Management System (SMS)

The FAA's SMS is an integrated collection of processes, procedures, policies, and programs that address all aspects of air traffic control and navigation services, including airspace changes, air traffic procedures and standards, airport procedures and standards, and new and modified hardware and software. SMS is in use in ATO and AVS with processes and procedures designed specifically to the organization's activities.

In FY 2009 and beyond, SMS implementation will expand as ATO further develops and implements the Safety Risk Management (SRM) safety assessment methodology. The methodology is based on the estimation of risk (technical and/or operational) using an internationally applied mathematical model and associated statistical procedures. The SMS helps reduce the number of isolated safety decisions which at times, result in wasted time and resources. It includes processes to collect and analyze safety data, conduct reviews and evaluations, and continuously monitor data to ensure safe operations. In addition, safety culture surveys will be conducted within ATO to benchmark the current safety climate and support subsequent safety promotion activities.

A five-year training plan has been developed that includes training on SRM processes for operational practitioners and acquisition engineering practitioners. In FY 2009, SRM practitioner training courses will continue at the Center for Management and Executive Leadership. The training will provide practitioners with the knowledge, skills, and tools necessary for ensuring the successful application of the SRM process to operational changes in the NAS. The course also provides participants with an understanding of the SMS and how SRM is integrated within SMS. Additionally, the course provides in-depth information on SRM tools, documentation requirements, and the development of mechanisms to monitor controls and risk mitigation strategies developed during safety risk assessments. The course is tailored for operational employees, using examples and exercises relevant to their work.

The ATO's implementation of SMS will expand the collection, consolidation, and analysis of safety data to enhance reporting and assessment. The SMS Order, SMS Implementation Plan, and SMS Manual form the basic tenets of ATO's SMS. The overall policy and requirements for SMS are prescribed in the SMS Order. The SMS Implementation Plan details the timeline of and resources for implementation activities. The SMS Manual provides a systematic, explicit, and comprehensive approach for managing safety risks – mitigating the severity and likelihood of a hazard at all levels, throughout the entire scope of an operation and lifecycle of a system. Further, SRM will be fully integrated into safety significant changes and planning activities. The Flight Plan performance target for FY 2009 is to apply SRM to a minimum of seven significant changes in the NAS.

Commercial Aviation Safety

(Continued)

FLIGHT
Aviation Safety Organization
Air Traffic Organization

Once a flight takes off, FAA employees and systems ensure its safe arrival at its destination by providing comprehensive oversight and air traffic control services. U.S. airlines operate about 35,000 daily departures and carry about 1.8 million passengers. All four appropriations contribute to this work. Likewise, in FAA's complex, interrelated system, all FAA organizations play a role in ensuring flight safety. The ATO, AVS, and ASH take the lead. The major responsibilities of ATO and AVS are described below. Those of ASH are outlined later in this chapter in the Reduce Serious Hazardous Materials Incidents Section. The following table provides a guide to this section's contents.

COMMERCIAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Aviation Safety Services - Aviation Safety Analysis System	**Establish and Maintain Flight Operations Systems** **Discretionary Increase** - Air Traffic Controller Hiring Program **ATO Capital Programs** - Terminal Doppler Weather Radar - Airport Surface Detection System - Runway Incursion Reduction Program - Runway Status Lights (RWSL)

Aviation Safety Services

(Safety and Operations, Aviation Safety, $917.2 million, 5,278 FTE)

Capital programs funded by the Safety and Operations appropriations support FAA's flight operations. This section highlights one of these capital programs – Aviation Safety Analysis System.

Aviation Safety Analysis System (Safety and Operations – Capital Program, Aviation Safety, $18.9 million)

This capital program provides automation hardware, software, and communications updates to support aviation safety information databases. For FY 2009, the request will enable this program to continue consolidating all previous Information Technology (IT) infrastructure programs that support AVS' safety workforce. Regulation and Certification Infrastructure for System Safety (RCISS) will expand and enhance the current AVS infrastructure while leveraging components across AVS services. The safety workforce uses these databases to certify and regulate aircrews, airlines, and other licensed companies in aviation. FAA safety inspectors use the information to determine if an airline is in compliance with good safety practices. ASAS will automate paper-based data repositories for such functions as determining medical fitness of FAA air traffic controllers, pilots, and other employees; examining the compliance history of aviation entities; reporting on investigations; and assessing facility security.

COMMERCIAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Aviation Safety Services - Aviation Safety Analysis System	**Establish and Maintain Flight Operations Systems** **Discretionary Increase** - Air Traffic Controller Hiring Program **ATO Capital Programs** - Terminal Doppler Weather Radar - Airport Surface Detection System - Runway Incursion Reduction Program - Runway Status Lights (RWSL)

Establish and Maintain Flight Operations Systems

(ATO, Salaries and Expenses, $6.3 billion, 27,818 FTE)

This budget request provides the necessary resources to ensure the safe separation between the thousands of aircraft in U.S. airspace at any given moment. These resources are critical to maintaining a safe system.

Control Air Traffic

During flight, most of a commercial aircraft's flight passes under the direction of a controller at one of FAA's 21 ARTCCs. The airspace monitored by each ARTCC covers thousands of square miles, divided into as many as eighty sectors. A team of up to four controllers is assigned to each sector, responsible for guiding the movement of aircraft through the Center's airspace, while separating them both horizontally and vertically. A flight can be handed off between several ARTCCs along its route. As it nears its destination, it is lined up with other approaching flights. As the flight nears completion, it is handed off to the approach controller at the TRACON serving the airport, and finally to the tower controller, who clears it for landing.

Establish and Maintain Air Traffic Controller Hiring Program - Discretionary Increase Request (ATO, Salaries and Expenses, $11.3 million, 153 FTE, 306 EOY)

To support the following request for increased air traffic controller staff and training, ATO has conducted a marginal cost of performance analysis, which is presented at the end of this safety section. This analysis demonstrates that with this funding, FAA's on-board target for controllers will be met in FY 2009 and training program for new recruits will be shortened by two to three years.

The following table provides a brief outline of the costs and benefits of the discretionary funding request. More detailed information can be found in the Supplementary Details Section of this chapter.

DISCRETIONARY INCREASE REQUEST

Establish and Maintain Processes, Systems, and Technology			
Air Traffic Controller Hiring (ATO, Salaries and Expenses, $11.3 million, 153 FTE, 306 EOY)			
Purpose:	**Benefit:**	**Resource Requirements:**	
Air Traffic Controller Hiring	➔ Provides for a net increase of306 in the controller workforce in FY 2009 ➔ Pro-actively recruit, hire, and train some 17,000 controller positions through 2017	$11.3 million	153 FTE (306 EOY)

Over the next ten years, 63 percent of the agency's controllers will become eligible to retire. Total losses over the next 10 years are expected to be over 15,000. The FY 2009 budget request funds the updated hiring goal and is consistent with the numbers requested in this budget. Controller staffing levels will need to increase each year through 2017 to ensure the number of controllers in the system stays ahead of expected retirements.

Since FY 2005, FAA has submitted to Congress "A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce". The reports outline the agency's plan to hire, staff, and train controllers and details cost savings from productivity improvements.

Bringing aboard new controllers is a complex process and requires several years to fully train a controller. Therefore, the recruit and trainee pipeline must be filled in a deliberate, continuous fashion. Filling the job of a controller who retires today is the culmination of a three-five year process. While FAA expects to compress the hiring process to two-three years, the agency must continue to prepare for a continuing increase in the number of retiring controllers.

Air Traffic Organization – Capital Programs

The ATO has many capital programs that provide support to FAA's safety mission and safe flight operations. Four of these Capital Programs are highlighted in the following table – Terminal Doppler Weather Radar (TDWR), Airport Surface Detection Equipment, the Runway Incursion Reduction Program, and Runway Status Lights (RWSLs).

Air Traffic Organization – Capital Programs Highlights		
Program	**Funding**	**Program Summary**
Terminal Doppler Weather Radar (TDWR) – Service Life Extension Program	$6.1 million	TDWR enhances the safety of air travel through timely detection and reporting of hazardous wind shear in and near an airport's terminal approach and departure zone by detecting microburst and gust fronts. The service life extension activity replaces existing components with more reliable components to help continue the TDWR operation until 2020. FY 2009 funding will be used to complete the acquisition of a retrofit modification, to buy production antenna drive motor systems and begin their installation, to acquire and install a replacement computer and its uninterruptible power system, and to replace the air conditioners at about half of the TDWR sites
Airport Surface Detection Equipment - Model X (ASDE-X)	$32.7 million	The ASDE-X system provides air traffic controllers with a visual representation of the traffic situation on the airport surface movement area and arrival corridors. This increased awareness on the airport surface movement area is essential to reduce runway collision risks and critical Category A & B runway incursions. There are a total of 35 operational systems and three support systems planned. FY 2009 funding will go toward continuing implementation activities including construction, site preparation, equipment installation and system optimization at 22 airports. Twelve ASDE-X systems will be delivered.

Air Traffic Organization – Capital Programs Highlights		
Runway Incursion Reduction Program	$10.0 million	The funding requested for the Runway Incursion Reduction Program will support FAA *Flight Plan* initiatives and provide for continued research, development, and operational evaluation of technologies to increase runway safety. Research emphasis will remain on technologies that can be applied cost effectively at small to medium airports. Additionally, the program will continue to explore alternative small airport surface detection technology and the application of these technologies and human factors principles toward developing pilot, controller, and vehicle operator situational awareness tools. When appropriate, solutions will be prototyped and tested in an operational setting to validate their technical performance and operational effectiveness.
Runway Status Lights (RWSLs)	$26.96 million	RWSLs act as stoplights on runways and taxiways, signaling when it is safe to enter, cross or begin takeoff on a runway. Located along the centerline of a runway or taxiway, Runway Entrance Lights and/or Takeoff Hold Lights will illuminate red when a runway is in use, notifying the pilot of a taxiing aircraft to either stop prior to crossing the runway, or yield to the aircraft landing or taking off. Since most runway incursions are caused by pilot deviations, RWSLs are a vital layer of redundancy in runway safety and provide a back-up and reinforcement of controller guidance. In addition, this program helps establish an international standard that incorporates human factors principles for this type of safety technology. For FY 2009, the requested funding will be used to award a contract for software design, development, testing, and implementation activities at the key site as well as to acquire the equipment for and begin installation at the support sites.

POST FLIGHT
Aviation Safety Organization
Air Traffic Organization

Commercial Aviation Safety

Once a flight lands, the agency is responsible for its safe arrival at the gate. The FAA learns from each flight by gathering and analyzing data to incrementally improve safety throughout its complex system. With appropriate funding to support post-flight evaluation activities, the agency will be able to gather information to identify and address vulnerabilities in the system. The following table provides a guide to the post-flight portion of this section.

COMMERCIAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Set Standards and Provide Oversight	**Control Air Traffic** **Ensure Future Air Traffic Control Safety** - Research, Engineering, & Development Programs

Set Standards and Provide Oversight

(Safety and Operations, Aviation Safety, $917.2 million, 5,278 FTE)

Aviation safety is a continuous loop — establishing safety standards and policies; ensuring all aviation personnel, organizations, and equipment meet these standards; performing ongoing risk analyses and evaluations; and implementing improvements — all in an effort to avoid the causes of accidents before they occur. However, when accidents or incidents do occur, the agency ensures that it learns from them. The agency participates in every aviation accident investigation conducted by the NTSB.

The FAA gains additional information about risks and greater understanding about mitigating them through voluntary safety programs and data analysis. Two major voluntary programs for air carriers are the Aviation

Safety Action Program (ASAP) and Flight Operational Quality Assurance (FOQA). ASAP encourages air carrier employees to voluntarily report critical safety information. FOQA collects and analyzes digital flight data generated during normal operations.

FAA is also developing the Aviation Safety Information Analysis and Sharing (ASIAS) system. The ASIAS system enables users to perform data analysis across multiple databases, search an extensive warehouse of safety data, and display the data in an array of useful formats. This system is part of the effort to transform aviation oversight from reactive and diagnostic surveillance to a risk-based approach (i.e., proactive and prognostic).

The agency also periodically issues airworthiness directives (AD), the agency's most stringent measure aimed at increasing aviation safety. An AD is a mandatory regulatory action designed to bring an aircraft to a prescribed level of safety. The agency also undertakes rigorous analysis of all new technologies before they are implemented to assure their safety.

COMMERCIAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Set Standards and Provide Oversight	**Control Air Traffic** **Ensure Future Air Traffic Control Safety** - Research Engineering and Development Programs

Control Air Traffic

(ATO, Salaries and Expenses, $6.3 billion, 27,818 FTE)

As an aircraft approaches its destination, it is handed off to the approach controller at the TRACON serving the airport. The tower controller then updates pilots with the latest weather conditions, ensures proper spacing between aircraft, and clears the flight for landing. The ground controller monitors the runways and taxiways using ground radar information to ensure that taxiing aircraft do not cross active runways or interfere with movement on the ground. As before takeoff, an airport's ground controller directs aircraft to keep it apart from other aircraft and on the right path to the terminal once it lands. Ground controllers are often responsible for coordinating dozens of vehicles, from aircraft to baggage carts to passenger transports.

Ensure Future Air Traffic Control Safety

(Research, Engineering, & Development, $94.7 million, 259 FTE)

The following are samples of the many research programs, funded by the R,E&D appropriation, which progress the body of knowledge related to critical safety challenges and support the mitigation or elimination of risks. As aviation technology and operating environments evolve, so must the tools and processes that ensure safety. This resource request is vital for FAA to look beyond the immediate environment and to ensure that products are delivered without increased risk, in a timely manner, and with benefit to the public. The programs support increased safety and capacity and reduce the environmental impacts of aviation.

Research, Engineering, & Development – Sample Programs Ensure Future Air Traffic Control Safety		
Program	**Funding**	**Program Summary**
Fire Research and Safety	$6.7 million	The Fire Research and Safety program develops technologies, procedures, test methods, and criteria to prevent accidents caused by in-flight fires and fuel tank explosions and improve survivability during a post-crash fire. FY 2009 funding will examine fire behavior of structural composites such as those used in the new Boeing 787, the first large transport aircraft with a composite fuselage and wings. Fire safety concerns involve the replacement of aluminum with a combustible composite material that can burn and is a poor conductor of heat. Longer term applied research on fire-proof cabins will continue to develop enabling technology for ultra-fire resistant interior materials and facilitate the transfer of that technology to the private sector.

Research, Engineering, & Development – Sample Programs Ensure Future Air Traffic Control Safety		
Advanced Materials/ Structural Safety Program	$2.9 million	The Advanced Materials/Structural Safety Program aims to ensure the safety of civil aircraft constructed of advanced materials and increase accident survivability by improving crash characteristics of aircraft structures and systems.
Atmospheric Hazards/Digital Systems Safety	$4.8 million	The Atmospheric Hazards/Digital System Safety program develops and validates technologies and procedures that increase flight safety in adverse atmospheric conditions, including icing conditions and electrical interference.
Aging Aircraft/Continued Airworthiness Program	$14.6 million	The Aging Aircraft/Continued Airworthiness Program develops technologies and practices to help ensure the continued airworthiness of aircraft structures and systems in the civil transport fleet. One research and development goal for this program is to develop new inspection tools to assure the long term safety of metallic and composite structures.
Aviation Safety Risk Analysis/System Safety Management	$12.5 million	The Aviation Safety Risk Analysis/System Safety Management program develops risk management methodologies, prototype tools, technical information, and safety management system procedures and practices that will improve aviation safety. In addition, the program aims to develop an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner. It also conducts research to evaluate proposed new technologies and procedures, which will improve safety by making relevant information available to the pilot during terminal operations.
Aeromedical Research	$8.4 million	The Aeromedical Research program focuses on enhancement of the safety, security, and health of humans in the NAS. The program investigates injury and death patterns in civilian flight accidents to determine causes and develop prevention strategies. Advanced molecular biological methods are being developed to objectively define and track pilot and crew fatigue. Equipment and procedures are developed to improve egress from aircraft and the strength of aircraft passenger seats. The program also analyzes pilot medical certification standards, as well as medical, toxicological, and physiological aspects of accidents. In FY 2009, researchers will evaluate sensor systems that provide real time warning and support actions that mitigate the effects of intentional or unintentional chemical or biological aircraft contaminants. The program will recommend methods to reduce head, neck, torso, and extremity injuries in aircraft crash environments to improve evacuation capability and improve certification procedures.
Weather Program - Safety	$17 million	The FAA Weather Research Program conducts applied research to develop weather products that provide more accurate warnings and forecasts. National laboratories, government agencies, and universities perform the research. Products are deployed into NAS components and National Weather Service systems to support safety and efficiency. By FY 2009 the weather program will implement probabilistic and mountain-wave turbulence forecast capabilities for experimental use. The program will provide knowledge that can be used by FAA to support design approvals for weather data link systems and to issue appropriate operational approvals for weather products for use in the cockpit.
Flightdeck/ Maintenance/ System Integration Human Factors	$7.5 million	The Flightdeck/Maintenance/System Integration Human Factors program provides technical information and advice to improve pilot, inspector, maintenance technician, and aviation system performance. The program focuses on the development of guidelines, tools, and training to enhance error capturing and mitigation capabilities in the flight deck and maintenance environments. It also develops human performance information that the agency provides to the aviation industry for use in designing and operating aircraft and training pilots and maintenance personnel. In FY 2009 assessment of human factors risks related to transitioning to NextGen will include identifying new sources of human error and how pilot performance may change with delegation of responsibility for self-separation.

Continued next page

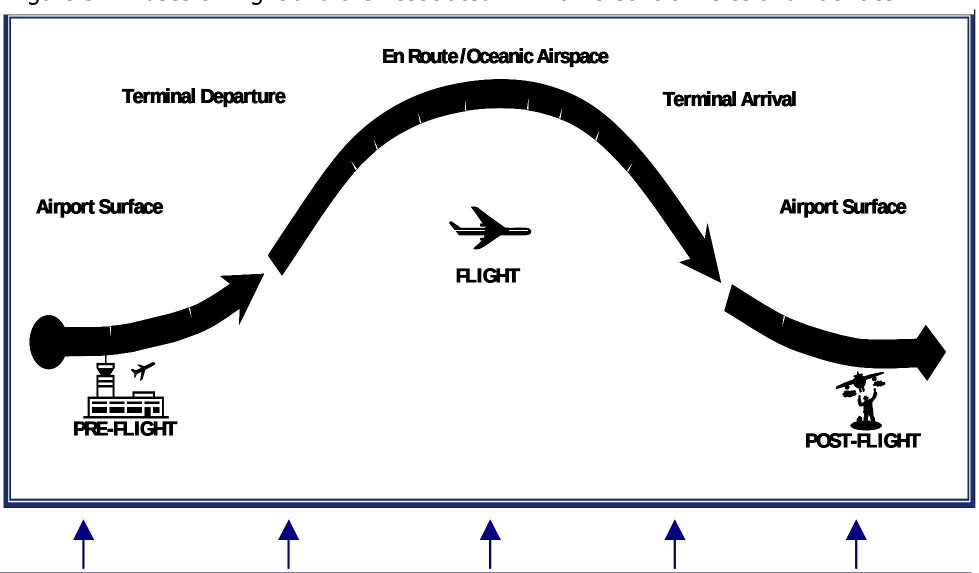
Research, Engineering, & Development – Sample Programs Ensure Future Air Traffic Control Safety		
Air Traffic Control/ Technical Operations Human Factors	$10.5 million	This Air Traffic Control/Technical Operations Human Factors program develops the human factors elements that enable air traffic control systems of the future and provides better methods to address human error in operations and maintenance. Tests and criteria for the selection of operational personnel hold promise to identification of the best job candidates and to reduce costs associated with attrition and training failures. FY 2009 funding supports NextGen Flexible Terminals and Airports by developing an advanced terminal workstation concept including simulations to determine display of surveillance and flight data information. Human errors and safety hazards will be examined regarding a shift from clearance-based control to trajectory-based control.

Performance Measure
Reduce the Number of General Aviation Fatal Accidents

Section Organization

This section outlines the total budget request, presents an overview of general aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight. More detailed information supporting the increase is provided in the supplemental discretionary increase section. Figure 3, below depicts the phases of flight and the associated air traffic roles and facilities that support GA safety.

Figure 3. Phases of Flight and the Associated Air Traffic Control Roles and Facilities



Air Traffic Control Tower (ATCT)	Terminal Radar Approach Control (TRACON)	Air Route Traffic Control Center (ARTCC)	Terminal Radar Approach Control (TRACON)	Airport Traffic Control Tower (ATCT)
- Ground Control - Local Control	- Departure Controller	- Radar Controller - Radar Associate - Assistant Controller	- Arrival Controller	- Tower Controller - Ground Controller

Budget Request

This funding request contributes to the DOT Safety strategic goal and to the General Aviation Fatal Accident Rate performance measure. This resource request for just under $1.4 billion supports FAA efforts to incrementally reduce general aviation fatal accidents, including accidents in Alaska.

The performance history and targets are displayed in Table 5-A and Table 5-B provides the performance target for the newly defined FY 2009 General Aviation Fatal Accident Rate measure. There is two year transition period as we phase into the new rate-based measure. The resources needed to achieve this goal are provided in Table 6.

Table 5-A. Number of general aviation fatal accidents

	2005	2006	2007	2008	2009
Target:	343	337	331	325	319
Actual:	354[1]	300[2]	314[3]	N/A	N/A

Table 5-B. General aviation fatal accident rate[4]

	2005	2006	2007	2008	2009
Target:	N/A	N/A	N/A	N/A	TBD[2]
Actual:	N/A	N/A	N/A	N/A	N/A

[1] Final result revised from original estimate of 350 in March 2007.
[2] Preliminary estimate. Final data expected by March 2008. It is unlikely that these results will change significantly.
[3] Preliminary estimate. Final data expected March 2009.
[4] Beginning in FY 2009, metric changes to General Aviation Fatal Accident Rate. There is a two year transition period as we phase into the new measure.

Table 6. Budget Request for Reducing General Aviation Accidents

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Safety			
Reduce GA Fatal Accidents (FY 2007 & FY 2008)			
Operations	722,229	576,404	
F & E	193,692	172,580	
AIP	650,626	880,210	
Total	**1,566,547**	**1,629,194**	
FTE	**5,294**	**3,922**	
Reduce the GA Fatal Accident Rate (FY 2009)			
Safety & Operations			201,281
Air Traffic Organization			504,647
AIP			644,525
Total			**1,350,453**
FTE			**2,825**

General Aviation Overview

General Aviation (GA) is a catalyst for economic growth. It's an integral part of the U.S. economy, supporting 1.3 million jobs and over $102 billion of total economic activity. Businesses that use GA gain competitive advantage, while communities gain jobs and access to the nation's air transportation system.

Although most people are familiar with FAA's role in commercial aviation, they may not be aware that it also oversees the safety of almost 300,000 GA aircraft in the United States. GA aircraft and activities subject to FAA oversight are outlined in the table that follows.

FAA GENERAL AVIATION OVERSIGHT	
Aircraft	**Activities**
- Single-seat home-built airplanes - Rotorcraft - Balloons - Extended-range turbojets - Unmanned aerial vehicles - Micro-jets	- Student training - Crop dusting - Fire fighting - Law enforcement - News coverage - Sightseeing - Industrial work - On-demand air taxi service - Corporate transportation - Personal use /recreational flying

There are approximately 250,000 private pilots in the U.S. and some 220,000 active GA aircraft. Each year, GA aircraft transport only about one-fourth the number of people who fly on U.S. commercial airlines, but in most years more people perish from GA accidents. Therefore, reducing the number of fatal GA accidents is a top priority for FAA. The average number of fatal GA accidents for FAA's 1996-1998 baseline period was 385. The FAA's goal is to reduce this number to no more than 319 per year by FY 2009.

Performance Overview

The FAA met the target in FY 2007 for reducing general aviation fatal accidents with fatal accidents involving rotorcraft showing especially sharp improvements. When looking at the trend line of the last ten years, FAA has continued to trend in the right direction. However, since GA accidents tend to fluctuate from year to year, the downward trend is not smooth. It is also important to note that since the agency began using General Aviation Fatal Accidents as a performance target six years ago, the ceiling has been exceeded only once.

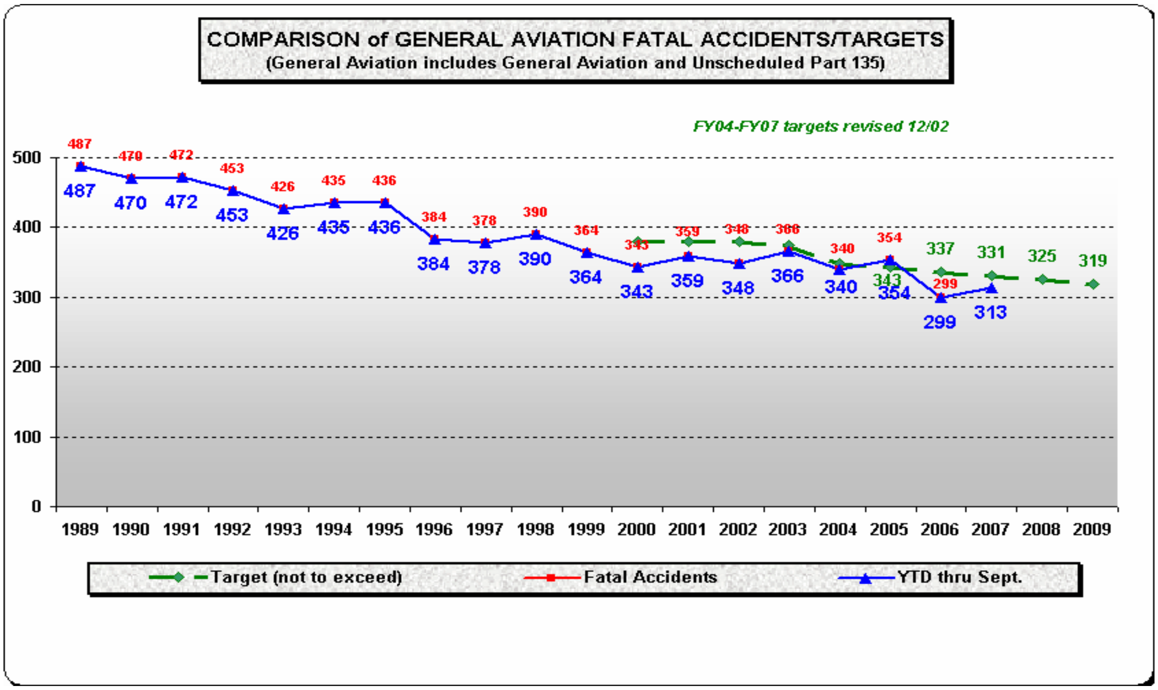
In FY 2008, FAA will redefine the measure from the number of general aviation fatal accidents to a fatal accident rate. To set the target for the new rate, in FY 2007 the agency completed the annual survey of GA aircraft owners. Using the results of this and previous surveys, the agency developed statistically accurate rates based on actual activity throughout the United States.

Further, approximately 60 percent of runway incursions are due to pilot error and about 80 percent of pilot deviations occur in GA. The FAA's close regulatory relationship with commercial passenger and cargo operators has been successful in mitigating the risk and in the reduction of runway incursions. Efforts are currently underway to expand the education outreach for GA operations.

In recent years, FAA has focused on reducing aviation risks in Alaska, particularly those associated with GA. Aviation plays a vital role in Alaska, but the state's topography and weather present unique safety challenges to pilots. Reducing accidents in Alaska to no more than 99 per year by 2009 is the third objective listed under FAA's *Flight Plan* goal for increased safety.

FAA works with various members of the GA community, including aeromedical evacuation, charter services, and other members of the community to promote education and training on night landings, weather, and other areas of concern.

Since 1989, there has been a significant improvement in the number of general aviation accidents. The FAA began measuring general aviation fatal accidents as a performance target in FY 2000. Since then the agency has met or exceeded the target every year with the exception of FY 2005. The graph below shows the result of industry-wide efforts to continuously improve the safety of general aviation.



The steady improvement of general aviation's safety record is the result of dozens of programs within all areas of GA, from pilot education and training, to better technology, to improved operating methods and practices, to a more complete body of knowledge learned during more than 100 years of flying.

Budget Request Justification

In the same way it supports commercial aviation, FAA creates a strong regulatory and oversight environment to support general aviation. All four appropriations: Safety and Operations, ATO Capital Programs, AIP, and R,E&D, fund vital parts of this work. Since the majority of aviation fatalities are related to general aviation, reducing their number is a top priority for FAA.

In FAA's complex, interrelated system, all FAA organizations play a role in preparing general aviation aircraft for safe takeoffs, with AVS, ARP, and ATO taking the lead. Their major responsibilities are described on page 10 in the Commercial Safety Section.

General Aviation Safety

PREPARING FOR FLIGHT
Aviation Safety Organization
Office of Airports
Air Traffic Organization

GA in the United States is one of the world's safest forms of public transportation. Part of that outstanding track record comes from the steady improvements in technology and certification standards that have made GA safe for those flying and those on the ground. The following table outlines the contents of the Preparing for Flight segment of the GA section.

GENERAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	Office of Airports (ARP)	Air Traffic Organization (ATO
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Establish and Maintain Airport Infrastructure	Provide Pilot Services

Aviation Safety Services – Air Carrier, Equipment and Personnel

(Safety and Operations, Aviation Safety, $168.6 million, 1,020 FTE)

General aviation flying is the gateway to commercial aviation. Just as in commercial aviation, GA pilots, aircraft, and organizations must be given an FAA approved and certificated in order to fly. The agency oversees more than 650 U.S. pilot training schools and centers. Instructors must be recertified every other year to renew their flight instructor certificate. Pilots are also required to obtain a medical certificate from an authorized FAA aviation medical examiner.

As is the case with commercial aircraft, new GA aircraft must receive FAA certification. There is an even greater variety in the GA class of aircraft than in commercial aviation; over 850 different types of GA airplanes and helicopters hold FAA certificates, as well as 179 other GA aircraft categorized as airships, balloons, and gliders. For new-generation GA aircraft, the agency has partnered with industry to develop new FAA-Industry Training Standards (FITS) that assure pilots are trained to fly technically advanced aircraft.

General Aviation Safety

(Continued)

GENERAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	**Office of Airports (ARP)**	**Air Traffic Organization (ATO**
Aviation Safety Services – Air Carrier, Equipment, & Personnel	**Establish and Maintain Airport Infrastructure**	**Provide Pilot Services**

Establish and Maintain Airport Infrastructure

(Grants-in-Aid for Airports, Office of Airports, $644.5 million, 63 FTE)

The agency places special emphasis on AIP investments aimed at reducing accidents in Alaska for GA and all Part 135 operations. This funding will support the continued improvement of rural airports by targeting up to 20 substandard airports through 2010, requiring infrastructure development to permit access by essential medical emergency aircraft. In addition to this program, many of the airport activities described previously in the Commercial Air Carrier Fatality Rate section also support GA in Alaska and in other regions throughout the country.

Provide Pilot Services

(ATO, Salaries and Expenses, $325.4 million, 1,431 FTE)

Many pilots of general aviation aircraft fly by visual flight rules (VFR). These pilots are not required to file flight plans and are only provided services by ARTCCs as time and workload permit. Flight Service Stations (FSS) and Automated Flight Service Stations (AFSS) are the agency's primary air traffic facilities that provide flight services to VFR pilots. AFSS are a network of facilities across the U.S. operated by the FAA. These stations are part of FAA's air traffic system and are staffed by uniquely trained air traffic control specialists. The primary role of an AFSS is to provide weather briefings and flight planning services to pilots. AFSS also coordinate VFR search and rescue services, provide orientation services to lost aircraft, maintain continuous weather broadcasts on selected navigational aids (NAVAIDs), and issue and cancel Notices to Airmen (NOTAMs).

There are various methods to obtain a required preflight pilot weather briefing. Pilots may call an FSS, use the Telephone Information Briefing System, or use the Direct User Access Terminal System (DUATS) all provided and funded by FAA. DUATS allows the pilot automated access to weather and aeronautical information through a personal computer at home, at the office, or at a fixed-based operator. Pilots may also pay a weather vendor to provide weather and aeronautical information for the preflight weather briefing.

Since October 4, 2006, flight services in the continental U.S. (CONUS), Hawaii and Puerto Rico have been provided by Lockheed Martin and funded by FAA through an A-76 performance-based contract. Alaska flight services were not a part of the A-76 contract process – three AFSS and 14 non-automated FSS remain government operated. The FAA plans to implement the Alaska Flight Service Modernization (AFSM) program to ensure Alaska's unique aviation needs are satisfied by providing service on par with the service available in the CONUS, Hawaii, and Puerto Rico; to expand and enhance flight services throughout Alaska through innovative use of remote airport advisory cameras and the delivery of information via Internet website hosted on kiosks located at rural airports; and to provide productivity increases and reduce operational costs. Enhanced automation has been implemented in Alaska to resolve information security and data integrity issues.

The urgency to modernize flight service in Alaska is warranted because Alaska's skyways are equivalent to the highway and road infrastructure found throughout the CONUS, making the use of general aviation aircraft essential to everyday life. This includes, but is not limited to, enabling children to attend school, traveling to medical appointments, and supplying communities with groceries, fuel, and mail.

Using existing human resources, Flight Services in Alaska has developed and implemented a pilot safety initiative aimed at reducing general aviation accidents in the State. This initiative uses the knowledgeable and experienced controller workforce of Alaska's Flight Services to interact directly with pilots to communicate tips and best practices on the use of the FSS to improve the safety of the flight.

General Aviation Safety

FLIGHT
Aviation Safety Organization
Air Traffic Organization

The table below provides a brief outline of the following information focused on GA, Flight.

GENERAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Provide Pilot Services

Aviation Safety Services – Air Carrier, Equipment, and Personnel

(Safety and Operations, Aviation Safety, $168.6 million, 1,020 FTE)

As with commercial aviation, continued operational safety oversight is the most critical part of the agency's safety responsibility for GA. The FAA must maintain the safety of the current system and its users—people, equipment, and organizations—before the agency can allow new users to enter the system.

Many FAA personnel are assigned to work in both the commercial and GA arenas. Similar to commercial aviation, the agency issues Airworthiness Directives (AD) and uses the Aircraft Certification Systems Evaluation Program to help oversee the GA community. In addition, the same group of designees enhances FAA oversight resources.

Many general aviation aircraft never enter FAA-controlled airspace. These pilots can experience greater freedom and greater challenges and therefore carry greater responsibility than their commercial aviation counterparts. Many pilots fly solo and lack the access to resources for training, emergency procedures, equipment, and corporate policy available to their commercial aviation counterparts. These factors, as well as the use of smaller aircraft, help contribute to general aviation fatal accidents. The agency continues to work with the GA community to drive down the number of fatal accidents.

Weather is one of the primary causes of GA fatalities. A pilot operating under VFR may take off in clear skies, but weather or visibility can turn bad unexpectedly during flight. For this reason, providing pilots with accurate and current weather information through pre-flight weather briefings, as well as through technology in the cockpit, is a high priority.

In addition, the agency has implemented the System Safety Approach for GA initiative. Begun in 2000, this initiative is a risk-management approach to enhanced safety. The FAA also draws on the benefits of satellite technology, which helps pilots navigate more precisely and safely.

General Aviation Safety

(Continued)

FLIGHT
Aviation Safety Organization
Air Traffic Organization

GENERAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment, & Personnel	**Provide Pilot Services**

Provide Pilot Services

(ATO, Salaries and Expenses, $325.4 million, 1,431 FTE)

During flight, a pilot can request weather updates or other support from the FSS. If the pilot becomes disoriented or lost during a flight, he can contact a FSS controller by radio for assistance. Further, if a pilot is in an emergency situation and needs to make an unscheduled landing, the controller in the FSS can either assist the aircraft or contact the controlling ATC facility for assistance.

Upon nearing the landing airport, the pilot contacts the control tower by radio and requests landing instructions. The tower controller provides the pilot with information regarding other airplanes in the area and with approach, landing, and taxi instructions. At non-towered airports or during hours when the control tower is closed, a pilot can request advisory services from select FSS.

The Alaska Flight Service Modernization (AFSM) program is currently working through the AMS program to ensure parity of flight services in Alaska with the level of service available in the CONUS, Hawaii, and Puerto Rico; to expand flight service accessibility throughout Alaska; and to provide productivity increases and reduce operational costs.

General Aviation Safety

POST FLIGHT
Aviation Safety Organization

This last phase of general aviation flight is focused on the activities of AVS and ATO in support of post-flight safety. The table below provides a snapshot of the content.

GENERAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment, Personnel	Provide Pilot Services - WAAS for GPS

Aviation Safety Services – Air Carrier, Equipment and Personnel

(Safety and Operations, Aviation Safety, $168.6 million, 1,020 FTE)

Like commercial aviation, GA safety is a continuous loop — establishing safety standards and policies; ensuring all aviation personnel, organizations, and equipment meet these standards; performing ongoing risk analyses and evaluations; and putting improvements in place — all in an effort to avoid the causes of accidents before they occur.

However, when accidents or incidents do occur, the agency ensures that it learns from them. The agency investigates almost every GA accident. FAA also collaborates with the GA community on the GA Joint Steering Committee to target resources where they can bring the greatest benefit. The group is focusing on the biggest accident causes — weather, controlled flight into terrain, and aeronautical decision-making. For all of these, pilot education is essential, which is why the agency is stepping up its pilot education efforts through a revitalized Aviation Safety Program. In addition, dedicated websites generate e-mail update notices to pilots and provide information on temporary flight restrictions and other notices.

Among the biggest challenges for the agency are upcoming changes in the GA environment. New equipment such as the WAAS and Global Positioning System (GPS) will likely be introduced and airspace restrictions may increase. Both of these will require improved coordination and collaboration with the GA community. The agency must also oversee the safety of the current aviation system as it plans for the safe introduction of new personal air transport vehicles and unmanned aerial vehicles.

Provide Pilot Services - WAAS for GPS

(Air Traffic Organization, ATO Capital Programs, $99.0 million)

The WAAS program for GPS is the first navigation aid capable of providing vertical guidance, or three dimensional guided instrument approaches, to pilots during all phases of flight, in all weather conditions at all locations throughout the NAS. The FAA has identified WAAS as a "Contributor" program for NextGen providing Broad-Area Precision Navigation. In addition to the overall safety gains, WAAS enables feeder airports to have reliable landing capability in all weather conditions. This capability is an important contributor to NextGen as it enables scheduled transport operations for regional carriers from feeder airports to major hub airports.

WAAS, a satellite-based navigation technology allows any qualifying airport in the NAS to have vertical and horizontal guidance without expensive legacy navigation hardware installed at each runway. WAAS continuously broadcasts a GPS-like signal from space for horizontal and vertical navigation across the NAS. The WAAS messages are broadcast to users' receivers via leased navigation transponders on two commercial geostationary (GEO) satellites. For FY 2009, the requested funds will be used for technology refresh which includes subsystem replacement, GEO development specific to the deployment of the 5^{th} GEO satellite, leasing two Lockheed Martin geostationary satellites, avionics development, and customer acceptance and benefit.

Performance Measure
Prevent Fatalities, Injuries, or Damage to the Uninvolved Public from Commercial Space Launches

Section Organization

This section outlines the total budget request, presents an overview of commercial launch safety performance, and provides budget justification details. Unlike the previous two sections, this budget justification is organized to detail activities and programs that support all phases of flight. Related discretionary increases are also outlined.

Budget Request

This funding request contributes to the DOT Safety strategic goal. This resource request for $15.0 million will allow DOT to continue funding to maintain FAA's record of zero fatalities during commercial space launches.

It supports maintaining FAA's *Flight Plan* target of Zero Commercial Space Launches involving fatalities, serious injuries, or significant property damage to the uninvolved public. While this is not a DOT-level performance outcome goal, it is included here to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry. Table 9 displays performance history and targets. Table 10 shows the resources required to maintain this record.

Table 9. Number of commercial space launches causing a fatality, serious injury, or significant damage to the uninvolved public

	2005	2006	2007	2008	2009
Target:	0	0	0	0	0
Actual:	0	0	N/A	N/A	N/A

Table 10. Budget Request for Commercial Space Safety Goal

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Safety			
Zero Commercial Space Accidents			
Operations	13,043	13,280	
Safety & Operations			15,008
Total	**13,043**	**13,280**	**15,008**
FTE	**64**	**65**	**71**

Performance Overview

The FAA's Associate Administrator for Commercial Space Transportation (AST) conducts a variety of activities to ensure the protection of the public during commercial space transportation activities and to encourage, facilitate, and promote the development of U.S. commercial space launch and reentry vehicles and commercial launch and reentry sites. This is accomplished by guiding the commercial space transportation industry through the regulatory process; evaluating license and/or permit applications; inspecting launch and/or site operations; providing contacts within the insurance industry and with parts and fuel suppliers; evaluating proposed operational plans; supporting environmental reviews; and conducting studies and public events.

The FAA has licensed 184 launches through December 2007 and has maintained a safety record that includes no third party casualties or property damage. Licensed commercial launches decreased from seven in 2006 to four launches in 2007. This was a result of factors such as a Sea Launch failure, damage to the Delta IV launch pad and satellite delays. AST estimates revenues of $725 million to launch operators in FY 2007.

The licensing process is a major reason for FAA's sterling commercial space transportation safety record. The agency currently has 15 active licenses: 10 for expendable launch vehicles (ELV) and 5 for launch site operators, which includes 2 inland launch sites.

The Commercial Space Launch Act provides the agency authority to license both launch operations and launch site operations. In addition, the Commercial Space Launch Amendments Act (CSLAA) of 2004 authorizes the issuance of experimental permits for suborbital RLV and provides for human space flight on commercial launches. The CSLAA promotes entrepreneurial and technological growth and development. It facilitates market entry and provides an opportunity for smaller companies with less experience and fewer resources than the major industry players, to first develop and test without having to meet the rigorous standards of the licensing process.

AST recognizes the multitude of airspace management challenges brought on by space operations and is leading an initiative to safely integrate increasingly complex space launch operations into the NAS. This initiative is the Space and Air Traffic Management System (SATMS), which in part requires that licensed and permitted launch operators, especially those at non-federal launch sites, coordinate their activities with the air traffic region responsible for managing the launch or reentry airspace.

The agency works closely with the Commercial Space Transportation Advisory Committee (COMSTAC) on issues of importance to the launch industry. The agency also conducts activities in partnership with various space organizations and state associations, including the Aerospace States Association (ASA), the Aerospace Industries Association (AIA), and the Satellite Industry Association (SIA). The ASA has taken a lead role not only in coordinating with states that are operating and developing new launch sites, but in fulfilling the need for a broad national vision for commercial space transportation. The AIA has made revitalizing the aerospace workforce and industrial base among its top priorities.

In August 2006, NASA awarded Space Act Agreements, referred to as the COTS (Commercial Orbital Transportation Services) program which provide funding over a four year period to selected developers to develop and demonstrate the vehicles, systems, and operations needed to re-supply, return cargo from, and transport crew to and from a human space facility, represented by the International Space Station. Because the COTS demonstrations are conducted by participants, not NASA/U.S. Government, the participants need to obtain either licenses or permits from FAA.

Since the beginning of the program in FY 2006, FAA has been participating in COTS activities to facilitate the licensing process. Such participation has included systems requirements reviews, preliminary design reviews, critical design reviews, and discussions around launch/landing site issues. The COTS program has provided AST with its first opportunity to exercise the reentry regulations promulgated in September 2000, and to make a reentry determination. The FAA is anticipating the initial launches and reentries for this program to commence early in 2009.

In addition, FAA provides publications, data, and events to industry that focus attention on the commercial space sector and the business opportunities it affords. Most recently, FAA's Commercial Space Transportation organization co-hosted with the U.S. Air Force (USAF) the second annual summit attended by RLV entrepreneurs. The summit provided a forum at which the USAF presented its space transportation needs and the RLV entrepreneurs communicated their capabilities. AST also conducts an annual forecast conference for the benefit of the industry.

Budget Request Justification

This funding request will allow FAA to further promote safety in the rapidly developing commercial space industry.

License, Permit, Inspect, and Support Industry Development

(Safety and Operations, Commercial Space Transportation, $14.1 million, 68 FTE)

The commercial space transportation industry continues to evolve and advance technologies in a business climate that offers unprecedented challenges. Companies developing RLVs are committed to the goals of safely operating their vehicles, reducing the cost of access to space, and providing new opportunities for space travel by paying passengers. Further, the CSLAA provides a stepping-stone to enhance both research and development and human space flight. The emerging human space flight segment also joins the ELV and evolved expendable launch vehicle (EELV) markets.

Casualties to the uninvolved public and damage to uninvolved property during commercial space transportation activities are prevented and risk is reduced through the agency's continual development and enforcement of commercial space transportation regulations, safety evaluations of proposed licensed or permitted activities, and monitoring and inspection of launch safety related activities. A launch or reentry accident involving the public could be catastrophic to this evolving industry. Given adequate resources to support licensing, permitting, and inspection programs, FAA can promote safety and encourage growth in commercial space. Reducing resources that support the commercial space workforce has the potential to adversely impact safety, long-term customer support, and industry development.

License and Permit Determinations

AST issues licenses to established launch services providers as well as new entrants to the market, and to operators of launch and reentry sites. AST also issues permits to new launch vehicle developers to provide industry with a mechanism to perform a flight test program to gain the technical data needed to meet the requirements for a license.

The licensing and permitting processes for vehicle developers are accomplished in phases. The phases include initial discussions with potential applicants; determining the level of environmental review needed; pre-application consultations, including systems engineering assessments to assist the applicant in preparing the application package; evaluations of the application; and the issuance of license or permit determinations.

Since the enactment of the CSLAA, interest in experimental permits has increased significantly. The purpose of experimental permits is to allow developers to test new design concepts, new equipment, or new operating techniques; show compliance with requirements as part of the process for obtaining a license; or conduct crew training using the planned launch or reentry vehicle rocket design, prior to obtaining a license.

The CSLAA regulations governing experimental permits and human space flight were completed in FY 2007. Experimental permits will be issued for periods of one year and allow for an unlimited number of flights. Depending on the launch operator's plans, an experimental permit may be an interim step to a full license. While the legislation recognizes the inherent risk in space flight and provides that participants assume some risk engaging in it, the agency's regulatory regime for permitted operations continues to provide for the safety of the uninvolved public.

Human space flight adds a complicating dimension to permit and license evaluations. Pilots and some crew members are part of a vehicle's flight safety system. Unlike mechanical or automated systems, human reactions during flight present unique challenges during the safety evaluation process. The issuance of an experimental permit does not require a quantitative risk analysis. However, for a launch license, risk analyses are required as part of the license determination – creating a new challenge since the introduction of humans as part of the flight safety system is not easily quantifiable. Human space flight also adds other factors to consider in the determination, such as the level of training required and the physical condition of the crew to ensure safety to the uninvolved public. While the only licensed flights to date involving humans were conducted in Scaled Composite's SpaceShipOne, several companies have conducted test flights under the experimental permit regime and have announced plans to conduct passenger flights under a license in 2009.

The launch site operator or reentry site operator license application process includes an interagency review to ensure foreign policy, national security, and international obligations are addressed. The safety evaluation focuses on launch and reentry site suitability, security, scheduling, notifications of local agencies, record keeping, lightning protection, the storage and handling of propellants and explosives, and an environmental review.

Safety Inspections

Safety inspections contribute significantly to AST's ability to verify licensees and permitees remain in regulatory compliance and continue to operate safely and to the attainment of FAA's safety goal. AST performs safety inspections of licensed and permitted operators that include activities at launch and reentry sites, and even at manufacturing facilities where activities occur that could affect the safety of a launch or reentry operation. The purpose of safety inspections is to ensure that the licensee or permittee is conducting activities in accordance with 1) the regulations, 2) the representation made in the application materials presented to AST, and 3) the terms and conditions of the license or permit.

With greater oversight responsibilities at federal launch ranges and increased vehicle complexity, FAA anticipates more than one inspection will be performed for each licensed operator. Some inspections will occur during preflight activities leading up to launch and could also include activities during the launch itself and at manufacturing facilities. The FAA expects to conduct 44 inspections of licensed and permitted launch operations during FY 2009. The agency currently conducts one annual inspection of launch site operations per year and anticipates conducting six site inspections in FY 2009.

Support Industry Development

The commercial dimension of U.S. space activity is evident in the growing list of existing non-federal launch sites as well as in the number of proposed inland commercial launch sites. Organizations in several states see the potential of spaceports to accommodate future launch vehicles and are actively working to turn their spaceport visions into reality. Site operators are also seeking new opportunities such as payload processing and space research facility development. These conditions require the agency to embrace the operational and technical complexities of the U.S. commercial space transportation industry and to facilitate greater recognition of the industry in the U.S. economy and to manage resources to optimize results.

Another direct result of the 2004 legislation has been a surge in planning for human space flight. Several companies are implementing plans to provide the public with the means to get to space within the 2009 or 2010 time frame. In October 2007, the X-Prize Foundation will sponsor its third X-Prize Cup competition. The annual event gathers many companies and/or teams to compete in space-related events, several of which require vehicle flights. The conditions of many of those competitions require the competitors to have licenses or experimental permits for their vehicle operations. In addition to working with the foundation to coordinate safety for the event, the competition creates a recurring permit evaluation and subsequent safety inspection workload for AST.

The recognition that the commercial space transportation industry is on the cusp of an increase in growth has several states and transportation authorities seeking information about the establishment of launch and reentry sites. They recognize the future economic benefits for a locality with these assets. While several communities have publicly made pronouncements of intentions to establish spaceports, three locations, including one inland site, are currently in discussions with AST.

Human Space Flight Safety Requirements - Discretionary Increase Request

(Safety and Operations, Commercial Space Transportation, $270,000, 2 FTE)

The FAA requests resources to conduct safety evaluations that include human space flight elements in FY 2009. Since the passage of the CSLAA and the surge of interest in experimental permits, entrepreneurs have focused attention on business operations designed to generate income and space tourism. The steps to full paid passenger flight operations are likely to include R&D, testing, and training under experimental permits, followed by license applications and preliminary flights. The human aspects of these activities present the agency with challenges in the technical evaluation of safety issues heretofore not presented.

Safety related activities associated with this expectation result in new work responsibilities for FAA's AST organization. Resources required for the added human space flight workload are not available within the base budget.

The legislation authorizing the issuance of licenses and experimental permits required that determinations be made within 180 and 120 days, respectively. Adhering to those legislative mandates and conducting the additional evaluations as a result of the addition of humans on board, both in flight crew capacities and as space flight participants, requires AST to apply additional resources to the evaluation process. To date the operation of Scaled Composite's SpaceShipOne is the only license determination AST has made that included a crew member as part of the flight safety system and conducted flights under those conditions. Based on the SpaceShipOne experience and companies that plan human space flight operations, AST estimates an increase of 30 to 40 percent in evaluation efforts.

In addition, if the licensed, permitted, or approved activity results in a mishap, an investigation is required to determine the need for changes to prevent its reoccurrence. The investigation will also determine the need to either change a regulation or promulgate a new one, if enforcement proceedings are warranted.

Further, safety approval final rules, issued in FY 2006, are voluntary on the part of the applicant and will be issued to manufacturing firms and systems operators. The FAA anticipates applicants may undertake voluntary safety approvals as a way to simplify both their application and evaluation processes. The agency anticipates issuing safety approvals applicable to safety systems, processes, services, or personnel that may be used in licensed commercial launch or reentry activities.

The funding request also supports the agency in the development of appropriate safety regulations and standards to keep pace with the developing space industry. Each year the agency and the COMSTAC RLV Working Group identify new research projects and evaluate them to determine if they support the agency safety and promotion goals.

The agency and the USAF continue to work together and share resources to ensure safe launch operations and to develop common safety standards. The FAA and the Air Force have institutionalized their safety partnership through various agreements, including the January 2002 Memorandum of Agreement between FAA and the Air Force on Safety and Range Activities. The FAA operates a Commercial Space Transportation Safety Office located at Patrick Air Force Base, Florida and the USAF stations a liaison officer at AST. Through strengthening the coordination between the agency and the Air Force on day-to-day activities public safety is ensured.

To support this discretionary increase request, the agency has conducted a marginal cost of performance analysis. The presentation of this analysis appears in the Supplemental Details chapter. This analysis demonstrates the requested increase is necessary to prevent fatalities, injuries, or damage to the uninvolved public from commercial space launches involving human space flight and to promote safety in the rapidly developing commercial space industry. An output measure for the program is delineated in the marginal cost of performance analysis in the final section of this document.

Performance Measure
Reduce the Number of Serious Hazardous Materials Incidents in Transportation

Chapter Organization

This chapter outlines the total budget request, presents an overview of hazardous materials and performance and specifies programs and related resource needs to support safety initiatives in FY 2008.

Budget Request

This funding request for approximately $23.8 million contributes to the DOT Safety strategic goal and to the Reduce Serious Hazardous Materials Incidents performance measure. The hazardous materials goal is a DOT target. The FAA shares responsibility with the Pipeline and Hazardous Materials Safety Administration (PHMSA), the Federal Motor Carriers Safety Administration (FMCSA), and the Federal Railroad Administration (FRA) for decreasing the number of serious hazardous materials incidents in transportation. Table 7 displays performance history and targets. Table 8 shows the resources required to maintain this record.

Table 7. Number of serious hazardous materials incidents [1]

	2005	2006[2]	2007	2008	2009
Target:	503	470	466	462	458
Actual:	525	491	455[3]	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes. The FAA's contribution is discussed in Section 4 of this submission.
[2] Measure rebaselined – new targets set for FY 2006 and FY 2007.
[3] Preliminary estimate.

Table 8. Budget Request for Serious Hazardous Materials Incidents in Transportation Goal

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Safety			
Reduce Hazardous Material Incidents (FY 2008 & FY 2009)			
Operations		20,893	
Safety & Operations			23,845
Total		**20,893**	**23,845**
FTE		**143**	**147**

DOT is creating a risk-based performance goal to measure the effectiveness of its hazardous materials program. This new goal will examine the effectiveness of DOT's regulations, inspections, and outreach in changing practices and lowering risk in the hazardous materials industry.

Performance Overview

Hazardous materials pose a serious accident risk for aircraft. Hazardous materials incidents, the unintended release of hazardous materials, occur most frequently in commercially shipped cargo. The best-known case of an accident related to hazardous materials was the 1996 ValuJet crash. In that case, improperly handled oxygen containers ignited, causing the airplane to crash, killing all passengers and crew aboard. Since that time, the agency has reemphasized vigilance in the prevention of hazardous materials incidents.

The FAA's Assistant Administrator for Security and Hazardous Materials (ASH) is responsible for the safe transportation of hazardous materials in air commerce. ASH develops and implements national policy on hazardous materials through inspections, training, and outreach to those involved in the production and transportation of hazardous materials worldwide.

Aviation-specific program performance targets are currently being met. In recent months, the air transport of batteries has been identified as a serious accident risk for aircraft. Since 1999 there have been approximately 70 reports of various types of batteries in air cargo or passenger baggage that have caused fires. During 2006 the U.S. Consumer Products Safety Commission announced the recall of over 10 million lithium batteries which have been found to ignite when heated during simple use. To reduce this risk FAA has been working with the Pipeline and Hazardous Materials Safety Administration to strengthen the hazardous materials regulations that apply to battery shipments.

Budget Request Justification

The following section describes the major activities supported by this budget request. The flight structure used in other sections has not been continued here, as this program affects all phases of flight.

Manage Hazardous Materials

(Safety and Operations, Security and Hazardous Materials, $22.4 million, 140 FTE)

Since 1977, the Secretary of Transportation has delegated the enforcement of regulations governing transportation of hazardous materials by air and the investigation of hazardous materials incidents to FAA. Approximately $6 million is collected each year in hazardous materials civil penalties. The FAA expects to complete over 9,000 inspections in FY 2009. The agency also expects to open 3,000 hazardous materials investigations in FY 2009.

A significant portion of the hazardous materials program's success depends on legal services provided by regional and headquarters attorneys. Approximately $51 million worth of civil penalties for hazardous materials violations have not yet been issued to violators for collection. Currently, the regional program offices are reviewing $3.9 million worth of civil penalties.

Technical training for hazardous materials inspectors is another key component of the program's success. ASH conducts an annual analysis of training needs for this function. Courses are currently offered for new inspectors, and refresher and advanced training opportunities are provided to seasoned hazardous materials inspectors.

In March 2006, GAO issued an audit report entitled Undeclared Hazardous Materials, New DOT Efforts May Provide Additional Information on Undeclared Shipments (GAO-06-471). The results of this report indicate that while DOT and DHS play complementary roles in efforts to discover undeclared hazardous material, neither can provide data about the amount of undeclared hazardous materials entering or discovered entering the country, even though their subordinate agencies maintain inspection databases.

Two new DOT efforts will enhance the current approach for discovering undeclared hazardous materials entering the U.S. First, the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provides DOT inspectors enhanced authority to open and inspect cargo when they have, "an objectively reasonable and articulable belief that the package may contain a hazardous material."

Further, individuals who discover undeclared hazardous materials in transportation are now required to self-report the discovery.

Secondly, core hazardous materials responsibilities have changed as the result of Congressional and Administration direction. DOT's PHMSA and the Research and Innovative Technology Administration (RITA) issued a new interpretation that makes airline passengers subject to hazardous materials regulations while being screened by security personnel. The requirement to screen one hundred percent of checked baggage continues to greatly increase the workload of the TSA screening agent and FAA's hazardous materials organization. When screeners suspect hidden hazardous materials in checked luggage, they notify the air carrier. If it actually is unauthorized hazardous materials the air carrier must notify the agency. The FAA receives some 2,000 to 3,000-baggage reports each month.

Reported hazardous materials discrepancies increased from approximately 1,000 in 1998 to over 15,000 in 2006. In response, the agency is deploying new automation tools to process many of these findings. For example, FAA has deployed a web-based data entry tool to support inspectors in documenting air carrier reports of hazardous materials discrepancies. The agency has also developed a computerized system that generates educational awareness letters to passengers found to be carrying less serious hazardous materials. For commercial shippers, the agency will continue to develop and use the DOT-wide hazardous materials information-sharing database to score shipping companies for level of risk. This risk information assists the agency in targeting companies to visit and is used to prioritize inspections to ensure efficient use of limited resources.

However, the more serious hazardous materials in checked and carry-on baggage will be individually investigated. In addition, while commercial shipper incidents are declining, passenger incidents are increasing. Based on those factors, the agency plans to increase its outreach efforts to better educate the public during FY 2009. Significant Congressional and Administration focus on the hazardous materials program will continue into FY 2009.

SUPPLEMENTAL DETAILS
DISCRETIONARY INCREASE REQUESTS

Discretionary increases requested to support safety are based in part on the agency's desire to maintain its outstanding performance record as evidenced in FY 2004's Program Assessment Rating Tool (PART) score for Aviation Safety. The program earned the second highest score available, Moderately Effective. The PART findings included recognition of the program's long-term performance measures tied to multi-year objectives linked to FAA's strategic plan. More details on PART reviews of FAA programs can be found in the Performance Overview located in Section 3.

Commercial Aviation Safety

(Safety and Operations)

Commercial aviation is the safest form of transportation, and FAA is committed to making air travel even safer. These discretionary increases will allow the agency to better serve an evolving industry. Emerging low cost carriers, growing business jet use, and changing business models for legacy carriers have imposed new demands on Aviation Safety's regulation and certification activities. These requests respond to the challenges of this dynamic environment and promise continued declines in the Commercial Air Carrier Fatality Rate.

The table below outlines the requested program changes from the FY 2009 baseline associated with the Commercial Air Carrier Fatality Rate performance measure. The requests are summarized in the Commercial sections of this document and are discussed in further detail in Section 3 under Operations for AVS.

COMMERCIAL AVIATION SAFETY
DISCRETIONARY INCREASE REQUESTS

FY 2008 REQUESTED PROGRAM CHANGES					
AVS – Safety and Operations Funding Supporting Safety Goal					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$1,006,473	6,075	$800	10.0	$1,007,273	6,085

Aviation Safety Services - Discretionary Increase Requests

The discretionary increase request is targeted at Aviation Safety Services for commercial aviation. Specifically the resources are requested to support regulation and certification activities and initiatives. These funds are specifically requested for AOV Safety Oversight Staff. Output and/or outcome measures are delineated below.

AOV Safety Oversight Staff (Commercial Aviation)
(Safety and Operations, Aviation Safety, $800 thousand, 10 FTE)

Aviation Safety requests additional resources for Air Traffic Safety Oversight (AOV) to conduct risk based modeling, simulation, and analysis of changes necessary to meet increased capacity demands as well as the actions required for implementation of the Next Generation Air Transportation System (NextGen). The positions will provide oversight of the SMS process within ATO for the integrated collection of processes, procedures, and programs that ensures a formalized and proactive approach to system safety through risk management.

Increase Safety Oversight of the Air Traffic Organization. ATO directly or contractually operates more than 600 air traffic facilities and thousands of facilities that provide navigational, surveillance and communications services within the NAS.

Additional resources will allow FAA to conduct more on-site investigations of Air Traffic Controller Operational Errors. Current resources only allow for on-site reviews of events where accidents were narrowly avoided. During FY 2008, the agency will conduct on-site investigations of less than 20 percent of these incidents. As additional inspectors are hired and trained, this number will increase to approximately 25 percent of serious incidents in the FYs 2009 - 2010 timeframe.

The additional resources will also allow the agency to:

- Achieve regulatory responsibilities required under FAA Order 1100.161 (procedures used within FAA to conduct oversight of ATO).
- Increase number of facility and system audits.
- Fully implement recently established safety processes and compliance monitoring to include ISO-9000 compliance and enforcement processes and an ATO SMS.
- Perform an increasing number of facility and system safety audits to ensure the existing NAS operations are conducted in compliance with approved standards. With current resource levels, only an estimated five percent of facilities directly operated by the ATO can be audited. Specifically, this means ATO operated facilities would undergo compliance audits about every 15 years. The requested increase allows audits at approximately 20 percent of facilities, reducing the average time between audits to 5 years.

MARGINAL COST ANALYSIS

AOV SAFETY OVERSIGHT STAFF					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTE	($000)	FTE	($000)	FTE	($000)
93	$12,100	10	$800	103	$12,900

Output Measure	Without Increase	With Increase	Change
Percentage of facilities audited annually	10%	15%	5%
Percentage of on site incident investigations conducted annually	15%	20%	5%

Airport Safety - Discretionary Increase Requests

(Grants-in-Aid for Airports, Office of Airports, $1.4 million, 2.5 FTE)

The discretionary increase requests are targeted to improve Airport Safety for commercial aviation. Specifically the resources are requested for:

1. Airport Geographic Information System (GIS)
2. Airport Safety Management System (SMS)
3. Airport Technology Research
4. Airport Certification and Safety Inspectors

FY 2009 REQUESTED PROGRAM CHANGES					
Establish and Maintain Airport Standards and Infrastructure					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$475,430	92	$1,370	2.5	$476,800	94.5

Airport Geographic Information System (GIS). Over the last several years, ARP developed and continues to refine the Airports Surveying-GIS Program. This program is an end-to-end process for the collection, validation, and central warehousing of airport data in a seamless digital stream from the point and time of collection, through validation and delivery to a centrally managed data warehouse. This process requires the flight safety critical data collected during an airport survey (both ground observations and photogrammetrics) be subjected to a rigorous government independent verification and validation (IV&V)

process before being released. Concurrently, completion of this program will result in migrating away from a traditional paper airport obstruction charts (AOC) to an electronic AOC.

One position (0.5 FTE) is requested to support the significant increase in workload this program is going to impose on ARP. The additional personnel will be responsible for the Airports-GIS program and the approximately 5100 public use airports affected by the GIS program. It includes program management of the National Geodectic Survey Memorandum of Understanding directing approximately 20-30 million survey dollars through the program annually with a large portion from the airport grants program. The personnel will also be used to develop and administer the electronic Airport Layout Plan portion of the program as well as the AOC implementation. Since this is an agency-wide program, all FAA lines of business will be looking to ARP to provide this oversight and support. ARP will also be responsible for the technical accuracy of the data and will need to monitor the web site input and output.

The additional position will enable an effective transition to an electronic system for maintaining airport data on more than 5100 public use airports and will provide the capability of generating electronic airport layout plans and electronic airport obstruction charts. This will increase the accuracy and timeliness of generating these important documents. About $20 million to $30 million is spent annually on conducting airport surveys. The additional funding will ensure that the data from these surveys is quickly validated and put in a format that is readily accessible by the airport, FAA, and the aeronautical charting community.

Airport Geographic Information System (GIS)					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTEs	($000)	FTEs	($000)	FTEs	($000)
0.0	$500	0.5	$74	0.5	$574

Output Measures	Without Increase	With Increase	Change
Implementation of electronic airport obstruction charts and airport layout plans at 5100 public use airports	Full implementation by 2012	Full implementation by 2009	3-year gain

<u>Airport Safety Management System (SMS)</u>. One Airport Safety Management System (SMS) position (0.5 FTE) is requested to implement SMS at certificated airports. The application of SMS, a systematic, proactive, and well-defined safety program, allows an organization producing a product or service to strike a realistic and efficient balance between safety and production. The forecasted growth in air transportation will require new measures and a greater effort from all aviation producers—including airport operators—in order to achieve a continuous improvement in the level of aviation safety. The use of SMS at airports can contribute to this effort by increasing the likelihood that airport operators will detect and correct safety problems before those problems result in an aircraft accident or incident.

In November 2005, ICAO amended Annex 14, Volume I (Airport Design and Operations) to require member States to have certificated international airports establish an SMS. The FAA supports harmonization of international standards, and has worked to make U.S. aviation safety regulations consistent with ICAO standards and recommended practices. In FY 2009 ARP requires one position (0.5 FTE) to manage and implement an airport SMS for the more than 500 certificated airports.

The SMS position will coordinate SMS activities with the other lines of business and be the contact for providing SMS information to airports.

The responsibilities of this position vary and have multiple responsibilities. These include the following:

- Develop and maintain Advisory Circulars and FAA Orders
- Liaison with the ACRP to develop SMS related guidebooks and safety manuals
- Serve as a SMS representative to the JPDO
- Support data mining projects in collaboration with AVS
- Conduct SMS Pilot Studies in coordination with regional inspectors
- Deliver SMS presentations to industry and to FAA personnel
- Support International SMS information sharing and training initiatives

MARGINAL COST ANALYSIS

Airport Safety Management System (SMS)					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTEs	($000)	FTEs	($000)	FTEs	($000)
0	0	0.5	$74	0.5	$74

Output Measures	Without Increase	With Increase	Change
Implement airport SMS at certificated airports	Coordinated SMS implementation plans at 572 airports by 2012	Coordinated SMS implementation plans at 572 airports by 2010	2 year gain

Airport Technology Research. ARP requests an additional one position (0.5 FTE) in FY 2009. This brings the total staffing in the Airport Technology Research Program to 22 positions and 21.5 FTE. The combination of increased funding over the past several fiscal years and the complexity of research projects require additional engineering staff to effectively manage the work and to ensure timely and high quality research products.

Program funding has dramatically increased from $5 million in FY 2003 to over $19 million in FY 2009. Approximately half the research funding is directed to airport safety projects. The additional position will help close the gap between onboard staffing and the staffing requirement. With eight engineers, staffing for safety research is at 69 percent of the required level of 13. This new position requested will increase this level to 77 percent of the requirement. This will result in more engineering time available per project and result in improved project planning, better on time performance, and improved project oversight. The benefits of this request can be defined by two related performance measures, the percentage of the required staffing level met, and the percentage increase in overall engineering time available.

MARGINAL COST ANALYSIS

Airport Technology Research					
FY 2008 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTEs	($000)	FTEs	($000)	FTEs	($000)
21	18,712	0.5	74	21.5	18,786

Output Measures	Without Increase	With Increase	Change
Percentage of staffing requirement met.	69 % (9 engineers vs. requirement of 13)	77 % (10 engineers vs. requirement of 13)	8 % increase
Increase in Engineering Time Available	0 %	11 %	11% increase

Airport Certification and Safety Inspectors. Two Airport Safety and Certification Inspectors (1.0 FTE) are requested to augment the small cadre (35) of airport safety and certification inspectors whose workload has steadily increased. Part 139 has been amended to expand the requirement for airport certification to smaller airports including those with commercial service with aircraft of more than nine seats. In addition to more airports to inspect, FAA is implementing an airport safety management program (SMS) at Part 139 airports to bring the U.S. in harmonization with the ICAO standard. Each airport will need to develop an SMS system and manual.

The FAA safety and certification inspector will be responsible for reviewing the airport's SMS program to determine its compliance with FAA requirements. In addition, airport safety and certification specialists provide technical assistance to foreign countries to improve world-wide aviation safety. This technical assistance is usually in the form of seminars and on-the-job training in airport safety and certification. The two additional airport safety and certification inspectors requested in FY 2009 are essential for the workforce to keep up with the expanding workload.

The two additional Airport Safety and Certification Specialists will increase the total number of inspectors from 35 to 37 to inspect 572 certificated airports. As each inspector can inspect about 15 airports per year, the additional two inspectors will enable FAA to conduct about 30 additional airports per year.

MARGINAL COST ANALYSIS

Airport Safety and Certification Specialists					
FY 2008 Base		**FY 2009 Increase Request**		**FY 2009 Total Request**	
FTEs	($000)	FTEs	($000)	FTEs	($000)
35	$5,180	1.0	$148	36	$5,328

Output Measures	Without Increase	With Increase	Change
Inspections of 572 certified airports	525 airport inspections/year	555 airport inspections/year	30 additional airport inspections/year

Establish and Maintain Air Traffic Controller Hiring Program - Discretionary Increase Request

(ATO, Salaries and Expenses, $11.263 million, 153 FTE, 306 EOY)

The Vision 100 reauthorization directs FAA to develop a plan to ensure adequate staffing for air traffic control. From 1982 through 1991, the agency hired an average of 2,655 new controllers per year. This hiring surge created the potential for a large portion of the controller work force to reach retirement age at roughly the same time.

In December 2004 and March 2007, ATO presented a report to Congress on strategies for dealing with this surge of retirements, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce.* The report laid out a plan with staffing standards and training strategies to achieve maximum safety and efficiency for the NAS. The FY 2009 budget request funds the updated hiring goal and is consistent with the numbers requested in this budget.

A well-trained and fully-staffed air traffic control workforce is essential to the FAA's ability to provide the safest air traffic services in the world. Every decision we make is done to ensure both the safety and the future viability of the NAS. Having enough controllers in place when and where we need them is critical.

The total number of controllers projected to be hired through FY 2017 is approximately 17,000. The ATC Workforce Plan maintains a trainee-to-total controller ratio at a manageable level. For example, a ratio of 25 percent would mean an average of one trainee out of every four controllers.

The table below provides details on the requested program changes from FY 2009 baseline associated with this goal:

FY 2009 REQUESTED PROGRAM CHANGES					
ATO Salaries and Expenses Supporting Commercial Aviation Safety					
FY 2009 Baseline Estimates		**FY 2009 Program Changes**		**FY 2009 Total Request**	
($000)	FTE	($000)	FTE	($000)	FTE
$6,313,526	27,665	$11,263	153	$6,324,789	27,818

Commercial aviation is among the safest forms of transportation. These discretionary increases are required to implement FAA's workforce plan for hiring and training air traffic controllers (ATC) in FY 2009. They will support continued declines in the Commercial Air Carrier Fatality Rate, along with significant reductions in GA fatalities. Output measures for hiring and training are delineated below.

Marginal Cost

AIR TRAFFIC CONTROLLER HIRING (PC&B)					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTE	($000)	FTE	($000)	FTE	($000)
20,192	$3,333,201	153	$11,263	20,345	$3,344,464

Output Measures	Without Increase	With Increase	Change
Controllers on Board (after replacing projected attrition)	15,130	15,436	306

The FY 2009 Workforce Plan target for actual on-board controllers is 15,436. To meet its target, the request provides for a net increase of 306 in the controller workforce in FY 2009. These new hires will be added to the training pipeline to ensure that growth in the number of controllers remains ahead of the expected surge of retirements and to account for a 3.3 percent washout rate at the FAA Academy.

Space Launch Safety Requirements - Discretionary Increase Request

(Safety and Operations, Commercial Space Transportation, $270,000, 2 FTE)

As of April 2007, the U.S. commercial space transportation industry had 181 licensed launches over the past 21 years without a fatality, serious injury, or significant damage to the uninvolved public. Similarly, since October 2006, there have been nine launches under experimental permits also without a fatality, serious injury, or significant property damage to the uninvolved public. The FAA is committed to maintaining that perfect safety record. This discretionary increase will allow the agency to better serve the evolving commercial industry.

In an evolving regulatory environment that reduces the barriers to market entry, new entrepreneurs are bringing fresh ideas and employing new technologies to create business opportunities that heretofore had not existed. These entrepreneurs have imposed new demands on AST's inspection activities. This budget request responds to the challenge of this changing environment and seeks to assure the continued prevention of fatalities, serious injuries, and significant property damage to the uninvolved public.

The Commercial Space Launch Amendments Act (CSLAA), which authorizes the issuance of experimental permits and provides for human space flight on commercial launch, is dramatically changing the landscape of AST's business practices and processes. The CSLAA promotes entrepreneurial and technological growth and development. It facilitates market entry and provides an opportunity for smaller companies with less background, experience, and resources than the major industry players, to develop and test without having to meet the rigorous standards of the licensing process.

The human space flight surge anticipated after Scaled Composites won the Ansari X-Prize has begun. Several companies have announced plans to begin test flights in 2007 and 2008, with passenger flights starting in the 2009 timeframe and occurring as frequently as weekly by 2010. Others have indicated plans to request safety approvals for various equipment or operations associated with space flight or human space flight. AST is currently working with 13 entrepreneurial companies that are in various stages of development. The human space flight element of the surge radically changes the safety evaluations performed and impacts the resource requirements needed to assure safety.

The table below provides details on the requested program changes from the FY 2008 baseline associated with this goal.

FY 2008 REQUESTED PROGRAM CHANGES					
AST Safety and Operations Funding Supporting Safety Goal					
FY 2008 Baseline Estimates		FY 2008 Program Changes		FY 2008 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$13,830	67.0	$270	2.0	$14,100	69.0

Human Space Flight Safety

Since the passage of the CSLAA and the surge of interest in experimental permits, entrepreneurs have indicated intentions to significantly increase the number of launches. Safety related activities associated with this expectation result in new work responsibilities for AST. Resources required for the human space flight safety evaluations are not available within the base budget.

Safety evaluations in the license and permit determination processes have been the central elements in ensuring vehicle operation safety. Thus far, AST has been able to address the safety issues presented by the wide variety of new technology and designs introduced by new entrepreneurs entering the market. The introduction of humans into the flight safety systems is a substantial departure from past evaluations and adds a new dimension to safety evaluations.

Thus far, safety evaluations have been oriented to the hard sciences such as engineering and physics – software can be tested for performance; conditions can be simulated and recreated; vehicle performance can be determined with a high degree of certainty; and outcomes are based on physical laws. However, human performance as a part of the vehicle's safety system poses a new challenge in predicting its operation.

Humans in the flight safety system add uncertainty to operations. Factors such as physical conditioning and training must now be included in the evaluation. The safety evaluation process must now include methods to address performance by human pilots and crew members that allow AST to determine that a vehicle can or can not be operated safely.

Additionally, several companies have approached AST with plans to develop businesses to train space vehicle pilots and crews. Their intent is to obtain safety approvals for their training programs. AST must develop the criteria to evaluate those training plans and have the resources to conduct the safety evaluations for the safety approval determinations.

The legislation authorizing the issuance of licenses and experimental permits included that determinations be made within 180 and 120 days, respectively. Adhering to those legislative mandates and conducting the additional evaluations as a result of human space flight, require AST to apply additional resources to the evaluation process. To date, the operation of Scaled Composite's SpaceShipOne is the only license determination AST has made that included human space flight participants as part of the flight safety system and conducted flights. While none of the companies with which AST is working currently has space flight participants in their plans, they will be forthcoming. Based on the SpaceShipOne experience and companies that will plan human space flight operations, AST estimates an increase of 30 to 40 percent in its evaluation efforts. AST currently expends over 11 FTEs for license and permit determinations, none of which currently conducts human space flight evaluation. An additional four end-of-year FTEs will be needed to address human space flight in FY 2009.

MARGINAL COST

SPACE LAUNCH SAFETY REQUIREMENTS					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
FTE	($000)	FTE	($000)	FTE	($000)
0.0	$0	2.0	$270	2.0	$270

Output Measures	Without Increase	With Increase	Change
Experimental Permitted Launch Operation Inspections	0	11	11

The procedure for processing and evaluating applications for licenses, permits, and safety approvals includes a safety evaluation. Safety evaluations to this point, with the exception of SpaceShipOne in FY 2004, have not included humans as part of the flight safety system. The added responsibility for the evaluation of humans in the flight safety system during the determination decision process will require a greater number of engineering staff. The additional engineering staff will conduct evaluations within the mandated requirements of the authorizing legislation.

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REDUCED CONGESTION

Introduction

With the air traffic control system at capacity, the Next Generation Air Transportation System (NextGen) is the only way to continue to address today's constraints and comprehensively modernize and transform the air transportation system. The FAA is committed to increasing capacity and reducing congestion in order to better accommodate traffic growth and to support the economic viability of those who use the system, now and in the future.

The complexity of the future operating environment – with evolving fleet mixes, new aircraft, technology, and environmental constraints – must be approached in partnership with our stakeholders. The multi-agency Joint Planning and Development Office (JPDO) is charged with developing the vision for the air transportation system's transformation with the active participation of the DOT, FAA, NASA, DoD, DHS, and Commerce along with numerous non-governmental stakeholders.

Over the past year, the FAA has positioned itself to lead the implementation of much of the NextGen infrastructure. The challenge has been to find a way to ensure that the FAA's integration and implementation planning can realize JPDO's vision for NextGen. In FY 2007, FAA established the new OEP, or Operational Evolution Partnership. The OEP serves as the key decision-making venue for ensuring that FAA's NextGen commitments can lead to NextGen transformation. The OEP enables collaboration and coordination across the aviation community, including the airlines, cargo carriers, general aviation, airports, local communities, manufacturers, and other government agencies.

The OEP is organized around three domains and their respective solution sets: air traffic operations, airport development, and aircraft and operator requirements. All three domains are critical to achieving the strategic goal of reduced congestion and must be approached interdependently considering the strategic research and development opportunities; safety, policy, and certification requirements; and development of key enabling programs and technologies. The greatest benefits will be realized through balanced progress on the airport surface, in the aircraft, and throughout the air traffic management system. The FY 2009 budget request supports those activities across the domains to achieve near-term deployment of mature technologies, develop moderately mature concepts for operational viability, and perform research to better define long-term capabilities.

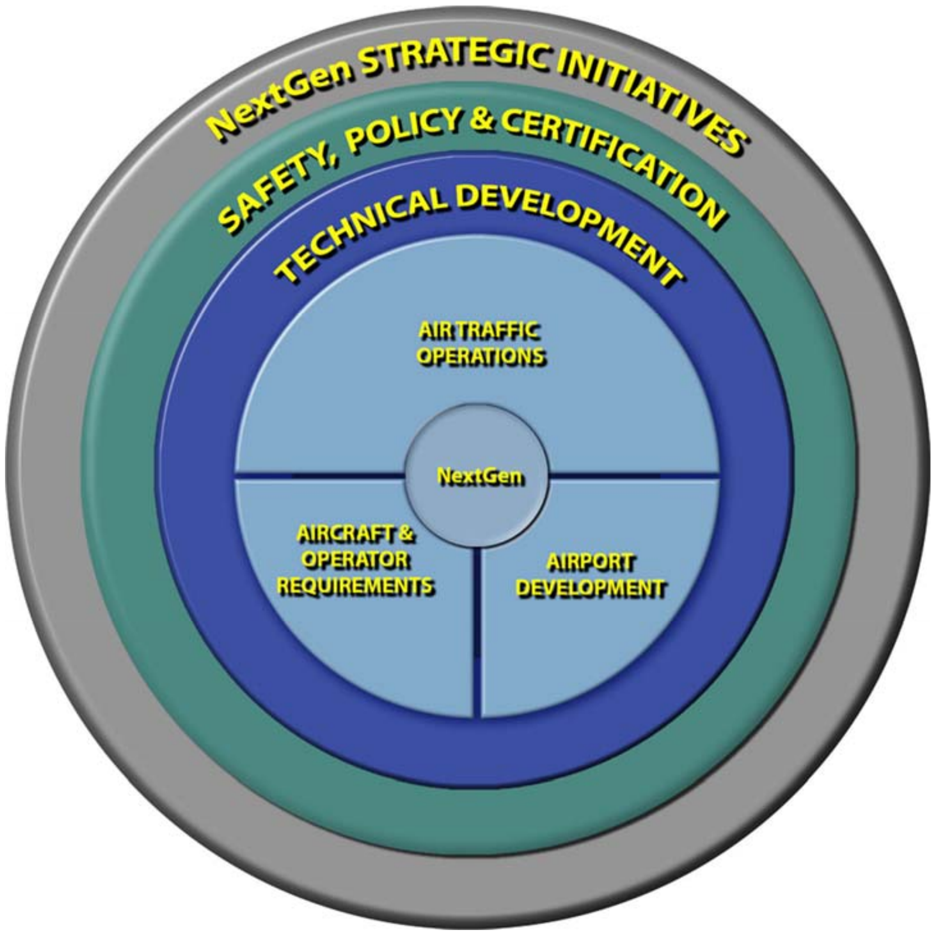
The request is performance-based and performance-driven. In the airport domain, if the airport system remains the same as it is today, 18 airports and seven metropolitan areas around the country will need additional capacity by 2015. Achieving reduced congestion and meeting the future capacity needs of the nation's airports will require innovative approaches, as well as continued emphasis on airport expansion infrastructure, and technological improvements.

With NextGen, aircraft are expected to have a wider range of capabilities and support varying levels of total system performance via onboard capabilities and associated crew training. Many aircraft will have the ability to perform airborne self-separation, spacing, and merging tasks and precisely navigate and execute four-dimensional trajectories. Along with navigation accuracy, aircraft will have varying levels of cooperative surveillance performance via transmission and receipt of cooperative surveillance information. Aircraft without an onboard pilot (e.g., unmanned aircraft systems) will operate among regular aircraft. These aircraft capabilities represent a significant change in the aircraft's role and are critical to achieving reduced congestion.

In the air traffic operations domain, the seven solutions sets are aimed at enabling a broad range of NextGen capabilities. In the near term, our investments will address increasing throughput at the nation's busiest airport terminal areas; initiating separation management efforts to enable shifting from clearance-based control to trajectory-based; and providing the capability to dynamically change airspace and airports for greater capacity through flexible terminals and airports.

While these are only some of the many capabilities that will be enabled through NextGen, it goes without saying that all elements of the air transportation system – air traffic, aircraft, and airports alike – must transform in order to achieve the NextGen vision. The FY 2009 budget submission is a critical step towards ensuring that our near-term portfolio of investments support achieving critical mid-term capabilities.

Figure 1. The Operational Evolution Partnership Plan



Focus of OEP Domains and Transition Rings

Three core domains focus on FAA's implementation commitments:

- **Airport Development** targets capacity and delay reduction at both the 35 busiest airports and 15 metropolitan areas forecasted to experience significant population gains and economic growth over the next 20 years. With regard to the 35 OEP airports, the focus is on reducing delays and increasing capacity through building new runways and taxiways, major runway extensions, and airfield reconfigurations. Vis-à-vis the 15 metropolitan airports, the focus is on reducing delays and increasing capacity through airport expansion as well as regional and multi-modal planning efforts.
- **Aircraft & Operator Requirements** focuses on developing standards for an avionics equipage package that provides the new capabilities required by NextGen.
- **Air Traffic Operations** describes new operational capabilities centered on fundamental NextGen concepts.

Three transition rings represent the evolution of proposed initiatives, showing stakeholders our progress toward fully committing agency resources to implementing new operational capabilities.

Organization

This budget request focuses on DOT's two aviation performance measures under its Reduced Congestion strategic goal – reliable and on-time performance of scheduled air carriers and increased capacity for the 35 OEP airports to meet projected demand and reduce congestion. Narratives for both performance measures appear in the Performance Overview and Budget Request Justification sections. The Budget Request Justification section is organized by the activities of Preparing for Flight, Flight, and Post-Flight.

Narrative sections contain parenthetical inserts that summarize resource requests. In this section, most inserts summarize the total resources for an organization or appropriation that are mapped to Reduced Congestion. For ATO Capital and Research, Engineering, and Development (RE&D) the inserts show resources for selected individual programs.

For complete disclosure of IT funding directly supporting DOT objectives, please refer to the technology investments justifications in Section 3.

Table 1 summarizes the Reduced Congestion budget request. Exhibits IV-1 in Section 4 and II-3 in Section 2 provide additional details.

Summary Budget Request

The FAA requests $3.7 billion, or about 25 percent of the total FY 2009 request, to implement the OEP plan by expanding capacity and reducing congestion within the nation's aviation system. The request supports expansion of capacity on the ground, in the form of new runways, and the continued deployment of new technologies that allow more efficient use of existing system capacity.

Table 1. Total Reduced Congestion Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Mobility (FY 2007)			
Operations	482,291		
F & E	1,732,939		
RE&D	21,979		
AIP	1,767,469		
Subtotal Mobility	**4,004,679**		
Subtotal FTE	**3,069**		
Reduced Congestion (FY 2008 & FY 2009)			
Increase NAS On-Time Arrival Rate at the 35 OEP Airports			
Operations		137,444	
F & E		326,434	
Safety & Operations			22,479
Air Traffic Organization			393,754
RE&D		31,208	44,324
Subtotal On-Time Arrivals		**495,086**	**460,557**
Subtotal FTE		**720**	**929**
Increase Average Daily Airport Capacity for the 35 OEP Airports			
Operations		370,436	
F & E		1,482,287	
Safety & Operations			18,735
Air Traffic Organization			1,912,528
AIP		1,674,558	1,280,720
Subtotal Avg Daily Airport Capacity		**3,527,282**	**3,211,983**
Subtotal FTE		**2,736**	**3,311**
Reduced Congestion $ Total	**4,004,679**	**4,022,368**	**3,672,540**
Reduced Congestion FTE Total	**3,069**	**3,456**	**4,240**

The DOT's Strategic Plan for Fiscal Years 2006–2011 lays the foundation for a new transportation model that will be needed to support America's economy in future years. Among other things, the plan sets out an innovative *National Strategy to Reduce Congestion on America's Transportation Network*; and, for the first time in DOT's history, congestion reduction is identified as a strategic goal. Congestion reduction will be integrated as a priority throughout all DOT programs.

Specific to FAA, the National Strategy targets the improvement and provision of a future funding framework by designing and deploying the Next Generation Air Transportation System – a modernized aviation system with greater capacity and less congestion.

Further, the Strategic Plan identifies as an outcome the ability to meet new and growing demands for air transportation services through 2025 and beyond. The plan continues to emphasize the importance of NAS on-time arrivals with an added focus on reliability. It also identifies a new goal focused on average daily airport capacity at the 35 OEP airports. The FY 2009 funding request supports the achievement of these two capacity goals.

Performance Measure: Increase Reliability and On-Time Performance of Scheduled Air Carriers

This funding request contributes to the DOT Reduced Congestion strategic goal for the increase the NAS On-Time Arrivals performance outcome measure. In FY 2005, FAA calculated NAS On-Time Arrivals as the percentage of all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late, based on the carrier flight plan filed with FAA, excluding minutes of delay attributed by air carriers to extreme weather, carrier action, and security delay. Table 3 shows targets and results for NAS On-Time Arrivals. Table 4, on the following page, provides the budget request for Reduced Congestion and Figure 2 shows the percentage of on-time arrivals for the period FY 2005 through FY 2009.

Table 3. Percentage of all flights arriving at the 35 OEP airports no more than 15 minutes late due to NAS-related delays. [1]

	2005	2006	2007	2008	2009
Target:	87.40%	87.40%	87.67%	88.00%	88.22%
Actual:	88.44%	88.36%	86.96%	NA	NA

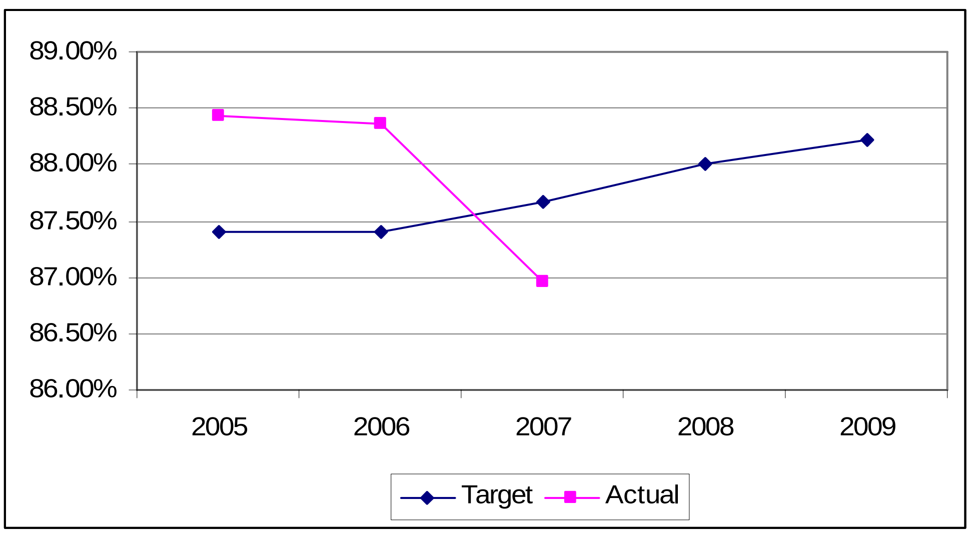
[1] For FY 2005, FAA modified this measure to adjust for delays beyond its control, i.e. those not resulting from NAS-related factors. Previously, delays attributed to severe weather, the air carrier, and security were counted.

Table 4. Budget Request for NAS On-Time Arrivals

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Reduced Congestion			
Increase NAS On-Time Arrival Rate at the 35 OEP Airports (FY 2008 & FY 2009)			
Operations		137,444	
F & E		326,434	
Safety & Operations			22,479
Air Traffic Organization			393,754
RE&D		31,208	44,324
Total		**495,086**	**460,557**
FTE		**720**	**929**

Figure 2. NAS On-Time Arrivals at the 35 busiest airports identified by the OEP.



Performance Measure: Increase Capacity for the 35 OEP Airports to Meet Projected Demand and Reduce Congestion.

This funding request also contributes to the DOT Reduced Congestion strategic goal and to the increase capacity at the 35 OEP airports to meet demand and reduce congestion performance outcome measure. FAA calculates the performance outcome through the Average Daily Airport Capacity measure and seeks to achieve an average daily airport capacity of 103,328 arrivals and departures per day by FY 2009 and maintain through FY 2011 at the 35 OEP airports. Average Daily Airport Capacity is the sum of the daily hourly-called arrival and departure rates at the relevant airports per month, divided by the number of days in the month. This is a dynamic measure, which changes daily based on factors such as weather and runway availability. The annual capacity level is the weighted sum of the monthly capacity levels.

While this is a new strategic goal for the DOT, FAA has focused attention on this goal area in the FAA *Flight Plan* since FY 2005.[2] Therefore, historic data are available and are presented below. Table 5 shows targets and results for Average Daily Airport Capacity at the 35 OEP airports and Table 6 provides the total budget request for this goal. Figure 3 shows the capacity trends for the period FY 2005 through FY 2009.

Table 5. Average Daily Airport Capacity Targets and Results at 35 OEP Airports

	2005	2006	2007	2008	2009
Target:	99,892	101,191	101,562	101,868	103,328
Actual:	101,463	101,932	102,545	NA	NA

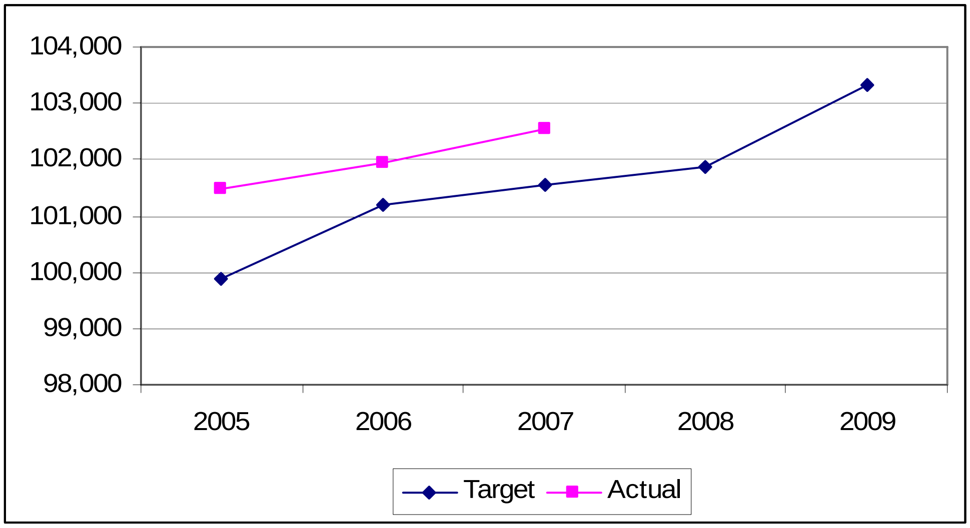
Table 6. Budget Request for Average Daily Airport Capacity at 35 OEP Airports

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Reduced Congestion			
Increase Average Daily Airport Capacity for the 35 OEP Airports (FY 2008 & FY 2009)			
Operations		370,436	
F & E		1,482,287	
Safety & Operations			18,735
Air Traffic Organization			1,912,528
AIP		1,674,558	1,280,720
Total		**1,674,558**	**3,211,983**
FTE		**2,736**	**3,311**

[2] In FY 2005, the agency's capacity measure was modified to include both arrival and departure capacity (replacing the daily arrival capacity measure and arrival efficiency rate used previously).

Figure 3. Capacity trends at the 35 OEP Airports



Performance Overview

Aviation system delays occur when the demand for air transport services exceeds the capacity of the system. The ability of the system to respond to demand is a function of airport runway capacity, airspace capacity, the status of air traffic control equipment, and weather conditions.

Commercial aviation delays are estimated to cost airlines over $3.0 billion per year. Missed flight connections, missed meetings, and loss of personal time directly affect passengers and our national system capacity to meet air demands. Air traffic volume and adverse weather conditions are the major causes of aviation delays. However, other factors such as runway closures, air carrier decisions, rapid population growth, changes in consumer demand, and environmental considerations can also affect performance.

In the late 1990s, Operational Performance System Network (OPSNET) delays increased steadily, peaking in FY 2000 and FY 2005. Decreased traffic levels in FY 2002 led to a corresponding decline in delays. Meanwhile, recent forecasts indicate that commercial aviation has rebounded. By FY 2011, air carrier, commuter, and air taxi operations are anticipated to increase approximately 10.7 percent from FY 2006. In order to accommodate this growth, the capacity of the NAS must be used more efficiently without compromising the safety of flight.

To address these issues, traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) maintain constant communication with all facets of the aviation community to collaboratively develop and implement solutions to system constraints. By planning throughout the day, FAA and aviation stakeholders work together to adjust traffic demands to meet available capacity. The FAA programs and initiatives outlined in the OEP, such as airspace redesign, revised air traffic control procedures, and the introduction of new technology, are expected to further increase the efficiency of the NAS.

Increased funding requests support Reduced Congestion and are based in part on the agency's desire to not only maintain but also to improve the performance record it demonstrated in the FY 2006 Program Assessment Rating Tool (PART) score for Facilities and Equipment. At that time, the program was rated Adequate. The PART findings included recognition of the program's use of a collaborative decision making tool to support resource allocations. More details on PART reviews of FAA programs can be found in the Performance Overview located in Section 3.

Budget Request Justification

The following sections describe the major activities supported by this budget request and highlight the role of each activity and its importance in expanding capacity by using the context of the flight pattern – *Preparing for Fight, Flight, and Post-Flight*. While most organizations in the agency support capacity and reduced congestion improvements, ATO takes the lead in reducing delays and improving on-time performance. In FY 2009, ATO plans to spend $398.2 million of its Salaries and Expenses funding and $1.9 billion of its Capital programs funding on capacity initiatives, several of which are highlighted below.

Preparing for Flight

Proactively Managing Traffic Flow
(ATO, Salaries and Expenses, $398.2 million, 1,751 FTE)

When weather conditions, unexpected demand, equipment outages, or other system constraints impact an airport or portion of airspace, traffic management specialists at the ATCSCC develop a plan to minimize delays and congestion and maximize system capacity. To accomplish this, they proactively plan with numerous aviation stakeholders, and with traffic management specialists at affected air traffic control facilities. ATCSCC specialists evaluate the projected flow of traffic and then implement the least restrictive corrective action necessary to ensure demand does not exceed system capacity.

Air Traffic Management (ATM) (ATO, Capital Programs, $90.2 million): The FAA's Traffic Flow Management (TFM) system is the Nation's single source for capturing and disseminating air traffic information and is the key product for coordinating air traffic across the aviation community. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system uniquely provides timely information to all aviation stakeholders in order to minimize NAS system delays.

The automation and communication mechanisms provided by the TFM system support the decision-making process that ultimately impacts flight schedules. The TFM system enables FAA Traffic Management Supervisors/Coordinators (TMS/TMC) and flight Airline Operations Centers (AOC) in industry to use common data and automation tools to collaborate and generate daily air traffic flow strategies that balance FAA responsibilities, while preserving the economic flexibility for the customer. FY 2009 funding will support TFM Modernization, related Collaborative Air Traffic Management Technologies (C-ATM-T) software development activities and the Route Availability Planning Tool (RAPT).

The ATM systems, which include Traffic Flow Management Modernization (TFM-M) and C-ATM-T, provide direct mission support to FAA by ensuring efficient flow of air traffic through the NAS. The TFM-M program has recently replaced obsolete hardware and is in the process of modernizing the software of the current infrastructure. This will reduce the cost of ownership and ensure that FAA can meet future aviation needs. TFM-M will provide a hardware and software infrastructure to enable continued development of products and services to more effectively manage the flow of air traffic.

The TFM system is used to balance air traffic demand with capacity to ensure optimum utilization of the NAS. The TFM system also provides infrastructure integration of Collaborative Decision Making products and Collaborative Routing Coordination Tool functionality, technology products developed under the auspices of the previous Free Flight Phases 1 and 2 programs.

C-ATM-T will continue to improve the efficient usage of existing NAS capacity through collaborative, operational, and procedural changes, and will improve bad weather departure and landing capacity through new technologies and procedures. C-ATM-T will also improve automation tools and procedures to make air traffic flow more efficiently during degraded conditions due to adverse weather or excessive volume. Additionally, it will promote the use of automated systems that provide more accurate and timely information to all users, and implement tools and processes that promote collaborative decisions regarding best routing and scheduling alternatives.

The RAPT addresses an urgent need to increase the airport departure capacity during convective weather. In busy, complex metropolitan areas such as New York, airways are tightly clustered and the proximity of adjacent arrival flows means that deviations around thunderstorms by departures cause serious disruptions to arrivals. As a result, the departure flows are often shut down. RAPT is a Weather-Assimilated Decision Support Tool (DST) that supports the development and execution of departure management plans that more fully utilize the available departure capacity during Severe Weather Avoidance Plans (SWAP). RAPT integrates 3D convective weather forecasts from the Corridor Integrated Weather System (CIWS) with the

NAS airspace structure information (including aircraft trajectory information) to predict the availability of the filed departure route and specifically designated coded alternative departure routes for an aircraft. The demonstration system currently operates as a prototype in the New York area, with program plans to conduct evaluations of the capability through FY 2009 which include other major metropolitan areas.

Corridor Integrated Weather System (ATO, Capital Programs, $5.9 million): The Corridor Integrated Weather System (CIWS) project provides advanced weather product generation to help air traffic users reduce convective weather delays. For FY 2009, the funding will be used to – secure CIWS facilities and associated resources at the William J. Hughes Technical Center (WJHTC); procure hardware; engineer and implement input data sources at the WJHTC; continue development of the Technical Transfer Package; train program development and program support; and conduct Independent Operation Test and Evaluation.

CIWS provides national, en route, and terminal air traffic flow managers and airline system operation centers personnel with accurate, automated, rapidly updated weather information as well as products for integrated weather-Air Traffic Management system to support decision making envisioned for NextGen. These weather-related products include storm locations, radar measured storm tops, and 2-hour forecasts including storm growth and decay.

The CIWS project is currently conducting business case/investment analysis to gain final approval from the Joint Resource Council for deployment in the NAS. CIWS requirements are derived from the "Mission Needs Statement for Aviation Weather," which identifies gaps for thunderstorms detection, forecasting, and impact assessment for congested air corridors.

The CIWS project operates a demonstration platform providing advanced weather products to the ATCSCC, eight ARTCCs, and six TRACONS in the northeast quadrant of the country. CIWS coverage of the most heavily traveled areas of southern Canada provides an indication of route availability for the Canadian Playbook routes as well.

The CIWS demonstration has shown that fully automated high resolution 3D weather information coupled with zero to two hour forecasts of storm locations can significantly improve the ability of ATC users to safely use available capacity during severe convective activity. Air routes can be kept open longer before being impacted by weather and can be reopened earlier. Similarly, better knowledge of future storms position allows more efficient rerouting around storms. Better information on current and predicted storm heights allows users to identify opportunities to safely fly over storm areas. This translates into substantial user fuel savings, enhances user safety, and well organized reroutes for weather avoidance. The CIWS has been shown to improve ATC productivity in terms of the time required to develop and execute effective convective weather mitigation plans.

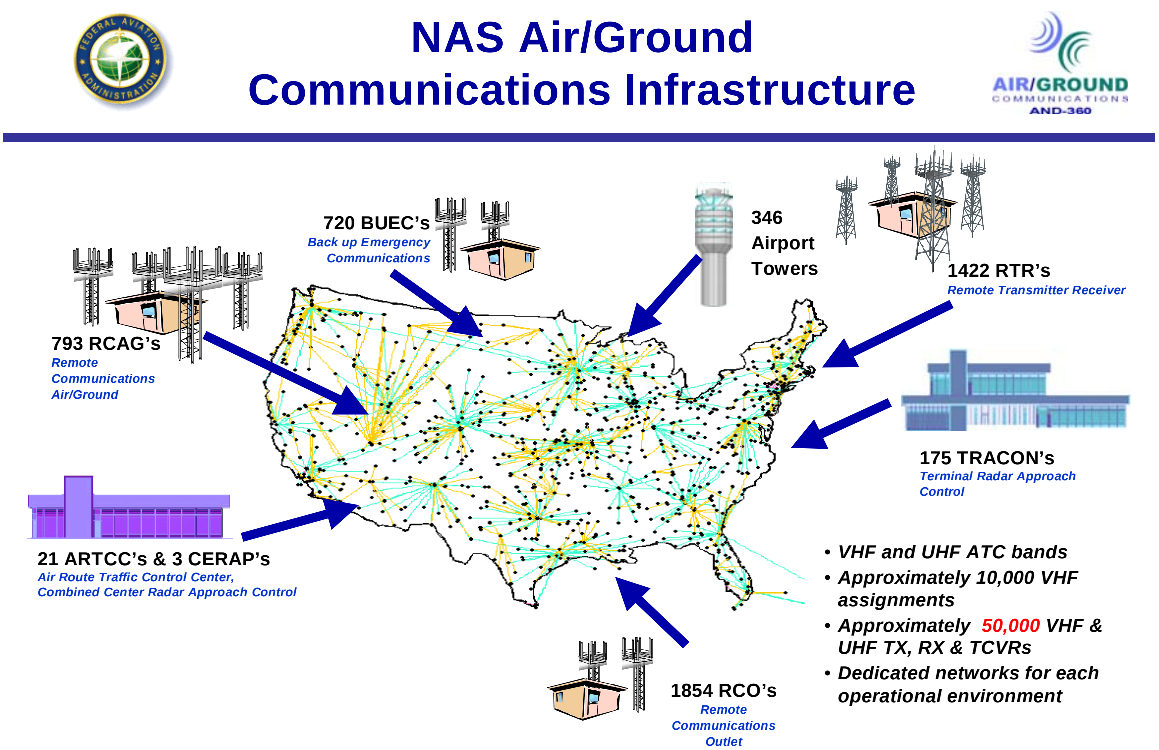
Replacing Obsolete Communications Equipment

Airport Cable Loop Systems – Sustained Support (ATO, Capital Programs, $7.0 million): This program will replace on-airport, copper-based, signal/control cable lines that have deteriorated with fibre optic transmission systems. The obsolete underground telecommunications cable infrastructure systems are vulnerable to failure and could cause outages. In FY 2009, $7.0 million is requested to provide funding for LaGuardia, Portland, Denver, Newark, Charlotte Douglas, Cincinnati Northern Kentucky, Washington National, and Boston-Logan Phase 2 airports. The funding will also provide for upgrade and retrofit support, engineering testing, and configuration management.

Air-to-Ground Communications Infrastructure (AGCI) Program (ATO, Capital Programs, $7.5 million): AGCI improves air traffic operational efficiency and effectiveness by modernizing the current communications infrastructure through all NAS environments (both en route and terminal). This program replaces old and increasingly antiquated technology and establishes new facilities intended to broaden communications coverage. AGCI encompasses several programs including the following three programs:

Air Ground Communications Infrastructure (AGCI) Program (ATO Capital Programs, $7.5 million)		
Program		**Purpose**
Communications Facilities Expansion Program	➔	Provides for new radio control facilities and/or modifies existing facilities to enhance the air-to-ground communications between air traffic control and aircraft.
Radio Control Equipment Program	➔	Total replacement program for all Air Route Traffic Control Centers (ARTCC), Remote Communication Air/Ground, Terminal Radar Approach Control (TRACON)/Air Traffic Control Towers (ATCT), remote transmitter/receivers, Automated Flight Service Stations, and remote communications outlet facilities.

Figure 4 illustrates the Air-to-Ground Communications Infrastructure system.



Laying the Foundation for the Next Generation Air Transportation System

Aviation is a driving force in America's economic growth. The current infrastructure of the nation's air transportation system is, however, inherently limited in its ability to grow and adapt. The current air traffic system has served the nation well since the 1950s and it continues to be the basis of the world's largest and safest air transportation system. If FAA is to respond to increasing demand and to create a scalable and adaptable system, it must do so in a way that also improves safety and reduces adverse impacts on the environment. This means FAA will need to completely change its approach to the way the system will function in the twenty-first century.

In 2003, Congress enacted VISION 100 – Century of Aviation Reauthorization Act which chartered the JPDO to begin work on the planning and implementation of NextGen. What Congress envisioned, and what has developed since, is an unprecedented initiative. It involves the DOT, DHS, DoD, DOC, NASA, and the White House Office of Science and Technology Policy. The vision encompasses all areas of the aviation community, including general aviation, commercial and public safety helicopter operators, and traditional commercial and business flight operations. NextGen is our nation's response to the challenges faced by the aviation community.

In the near-term, the NextGen portfolio of investments focuses on the development and implementation of key NextGen foundational technologies and capabilities. These include: Automatic Dependent Surveillance-Broadcast (ADS-B), System Wide Information Management (SWIM); Data Communications, and NextGen Network-Enabled Weather (NNEW). These capabilities represent a shift of decision-making from the ground to the cockpit. In the future, flight crews will have increased control over their flight trajectories and ground controllers will become traffic flow managers.

NextGen is designed to address many of the most significant limitations to growth in the current air transportation system. These include runway capabilities and the inherent limitations of ground-based control of en route and terminal area airspace and the vulnerability of the system to weather. FAA's implementation commitments that contribute to NextGen will be further detailed in the Operational Evolution Partnership, or OEP, which was described at the beginning of this section.

Joint Planning and Development Office (Research, Engineering & Development, $14.5 million): The JPDO is responsible for defining and facilitating the implementation of NextGen. The next generation system requires a highly deliberate and integrated planning process that, in the near-term, results in products that inform the architectural design, policy, and investment decision-making required to launch and fuel its implementation. To this end, the JPDO has made marked progress to develop and mature foundational products with the cooperation of partner agencies. These products include the NextGen Concept of Operations (ConOps), Enterprise Architecture, and Integrated Work Plan (IWP). The NextGen ConOps and Enterprise Architecture set the context for the NextGen requirements and inform investment analysis and decision-making, as laid out in the NextGen business case. In their current version, the products represent preliminary transformational products. They will need to be matured in FY 2009 in order to ensure continued collaborative planning, investment decision-making, and integrated NextGen design and implementation.

The FY 2009 budget request of $14.5 million will be used to:

Joint Planning and Development Office
(Research, Engineering & Development, $14.5 million)

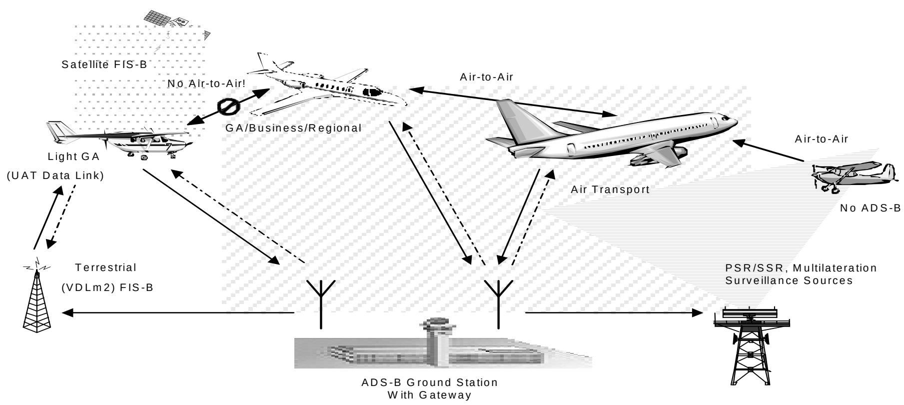
NextGen Support

- ➔ Refine NextGen Concept of Operations, Enterprise Architecture, and Integrated Work Plan.
- ➔ Continue to work with partner agencies to facilitate multi-agency alignment to the NextGen Integrated Work Plan and Enterprise Architecture.
- ➔ Develop FY 2011 Formulation Package to support NextGen resource planning and development of the NextGen business case.
- ➔ Develop FY 2011 NextGen business case.
- ➔ Update NextGen risk management plan.
- ➔ Conduct system-wide modeling and analysis to support refinement of the NextGen Concept of Operations, Enterprise Architecture, Integrated Work Plan, and development of the FY 2011 NextGen business case.
- ➔ Continue development of NextGen portfolio management and decision-support tools.
- ➔ Continue to coordinate with aviation and aeronautics research programs to ensure that research results in decisions that influence the most effective investment and implementation decision-making.
- ➔ Continue to coordinate and conduct demonstrations that will test operational concepts, address operational challenges, and provide alternatives for architectural trade-offs.
- ➔ Facilitate the transfer of technologies from research programs that are ready for implementation to the federal agencies with operational responsibilities and to the private sector, as appropriate.
- ➔ Monitor and measure NextGen performance and progress towards achieving the operational improvements and capabilities as identified in the Integrated Work Plan.

Automatic Dependent Surveillance Broadcast (ADS-B) NAS Wide Implementation (ATO, Capital Programs, $300.0 million) NextGen envisions the creation of seamless surveillance and shared situational awareness for both air and ground communications systems. Using a broadcast of the aircraft's position as the basis for providing surveillance, ADS-B will provide the cockpit with a more complete situational awareness picture. Planes will be able to "see" other planes, surveillance will be available to areas that currently do not have coverage, and pilots will receive real time aeronautical information, such as weather, flight restrictions, and special use airspace.

The new technology will result in productivity gains for FAA and opportunities to operate the NAS at reduced cost. FY 2009 will witness the continuance of activities started in FY 2007 and FY 2008 for ADS-B NAS Wide Implementation. These deliverables include In-Service Decision (ISD) of Broadcast Services; Louisville separation standards approval; GOMEX separation standards approval; GOMEX communications and weather IOC; Juneau and Philadelphia separation standards approval; and continuing NAS-Wide deployment of ground infrastructure. Figure 5 which follows, illustrates the new surveillance system ADS-B will make possible.

Figure 5. Automatic Dependent Surveillance Broadcast (ADS-B) System Overview



System-Wide Information Management (SWIM) (ATO, Capital Programs, $41.0 million): Point-to-point operations characterize today's NAS. In contrast, networks can enable multiple parties to share information by linking individual systems together. To support the NextGen long-term vision of shared common knowledge of situations, SWIM uses an Internet-like network to make information accessible, securable, and usable in real-time for all users. For example, shared networks would enable FAA to share information with the international aviation community, other government agencies, and the aviation industry.

SWIM will help transition the NAS to network-centric operations by providing the infrastructure and associated policies and instructions to enable NAS-wide information sharing. Underlying this transition is a scalable, standards-based network architecture – to be developed through this project – that seamlessly and securely connects users with the NAS information they need. SWIM provides advanced information distribution and sharing capabilities to support a wide range of air traffic control activities, such as negotiating and tracking flight plans, tracking aircraft movement via surveillance, and sharing weather information with NAS service providers and users. The following table provides a brief synopsis of the initiatives to be funded by this request.

SYSTEM-WIDE INFORMATION MANAGEMENT (SWIM)	
	Segment 1 Development **(ATO, Capital Programs, $41.0 million)**
Purpose:	**Initiatives:**
Systems Engineering Analysis and Development, Infrastructure Transition, Software Procurement, Financial Analysis, and Documentation.	➔ Provide standards/guidance to SWIM implementing programs on SWIM Segment 1 core capabilities ➔ Procure service container software and provide to implementing programs ➔ Code and test of initial Segment 1 capabilities ➔ Prepare for JRC to baseline FY 2011-2013 funding ➔ Conduct analyses and prepare documentation for Final Investment Decision (JRC 2b) for Segment 2.

NextGen Network Enabled Weather (NNEW) (ATO, Capital Programs, $20.0 million): This funding supports NextGen network-enabled weather (NNEW) capability. NNEW will assimilate weather information into the NextGen decision-making process and will provide common, complete, authoritative weather information to all users and automated decision support systems.

The FY 2009 request for $20 million will enable the NNEW requirements and architecture to be developed. It will enable the point-to-multipoint, networked access by all NextGen users, service providers, military planners, security personnel, and the flying public of observational and forecast weather information from the distributed 4-dimensional data cube. NNEW is responsible for establishing the information management capabilities necessary for the operations of the network enabled 4D data cube. The 4D data cube will be developed to be the authoritative weather data repository and will provide net-centric access by system users to consistent tactical and strategic-level weather information. Changes to weather information will be rapidly disseminated and all weather users will have improved access to timely and accurate flight information at their homes, businesses, airports, and in the air to support improved decision making for increased capacity and enhanced safety. There will also be an interoperability/demonstration effort to resolve key technical questions and reduce implementation risk of a network-enabled weather environment to FAA and external system users.

NextGen Technology Demonstration (ATO, Capital Programs, $28.0 million): Funding will support four technology demonstration initiatives, which are designed to provide advanced solutions to meet air traffic demand and increase capacity of the NAS.

The funding request will support the following initiatives and yield the outlined benefits:

NEXTGEN TECHNOLOGY DEMONSTRATION (ATO, Capital Programs, $28.0 million)	
Purpose:	**Benefit:**
International Air Traffic Interoperability	➔ Proof-of-concept and working prototypes for an operational environment with flight profile predictability and efficiency on long-duration international flights, where fuel burn optimization is a prime concern. ➔ Demonstrate exchange of operational data between aircraft operators and air traffic service providers for informed decision making in near real-time to increase productivity. ➔ Demonstrate efficient transition from the oceanic/en route phase of flight to the domestic/en route and offshore/descent phases of flight to increase transition area efficiency and productivity.
High Density Airport (HDA) Capacity and Efficiency Improvement Project	➔ Show enhanced airspace use to accommodate the expected demand. ➔ Test whether or not the FAA can increase capacity without additional staffing.
Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration	➔ Allow for early implementation of trajectory management flight planning capabilities for all aircraft operating in the NAS. ➔ Significant benefits can be realized in airspace designated for high performance aircraft through problem identification and resolution earlier in the process, workload spread more evenly, and more effective management of airspace.
Tower Services (Augmented Visual Operations, Remotely Staffed Towers, Automated Tower Services)	➔ Near-term goal and expected benefits are a proof-of-concept and working prototype for augmenting visual tower operations at staffed towers. ➔ Longer-term goals will be the remotely staffed tower and providing Automated Tower Services. ➔ Such systems will support the projected growth in air traffic by providing additional options for providing ATCT services at airports not currently served, and potentially lower man-power costs. ➔ These systems offer a potential reduction in the higher cost of building, maintaining, and replacing ATCTs throughout the NAS.

Improving Efficiency, Building and Maintaining Runways
(Grants-in-aid for Airports, Office of Airports, $1.3 billion, 282 FTE)

Currently, eight OEP airports have airfield projects under construction which are to be commissioned by FY 2012. These airfield projects include three new runways, two airfield reconfigurations, one runway extension, one center taxiway and one end-around taxiway. End-around taxiways are new to the OEP and provide another means to improve safety and decrease delays at busy airports by providing an alternative to having aircraft cross active runways. With the opening of the end-around taxiway at Atlanta in April 2007, approximately 617 runway crossings per day were eliminated. In addition, there are currently ten other projects at OEP airports in various stages of the planning and environmental processes – three airfield reconfigurations, three runway extensions, and four new runways.

The FAA also works with local and regional authorities to examine regional solutions to improve capacity and reduce delays. The agency provides vital technical and financial assistance for planning, environmental analysis, and construction/rehabilitation of runways, taxiways, and aprons. The FAA also actively participates in developing and maintaining the Runway Template Action Plan, which supports the timely commissioning of the runways. Further, AIP funding is directed to ensure that 93 percent of runways at airports in the National Plan of Integrated Airport Systems (NPIAS) are maintained in good or fair condition, ensure support of the Military Airport Program, develop reliever airports, and support research of airfield pavements to carry existing and new generation aircraft. The AIP funding plan will reflect a special emphasis on increasing capacity.

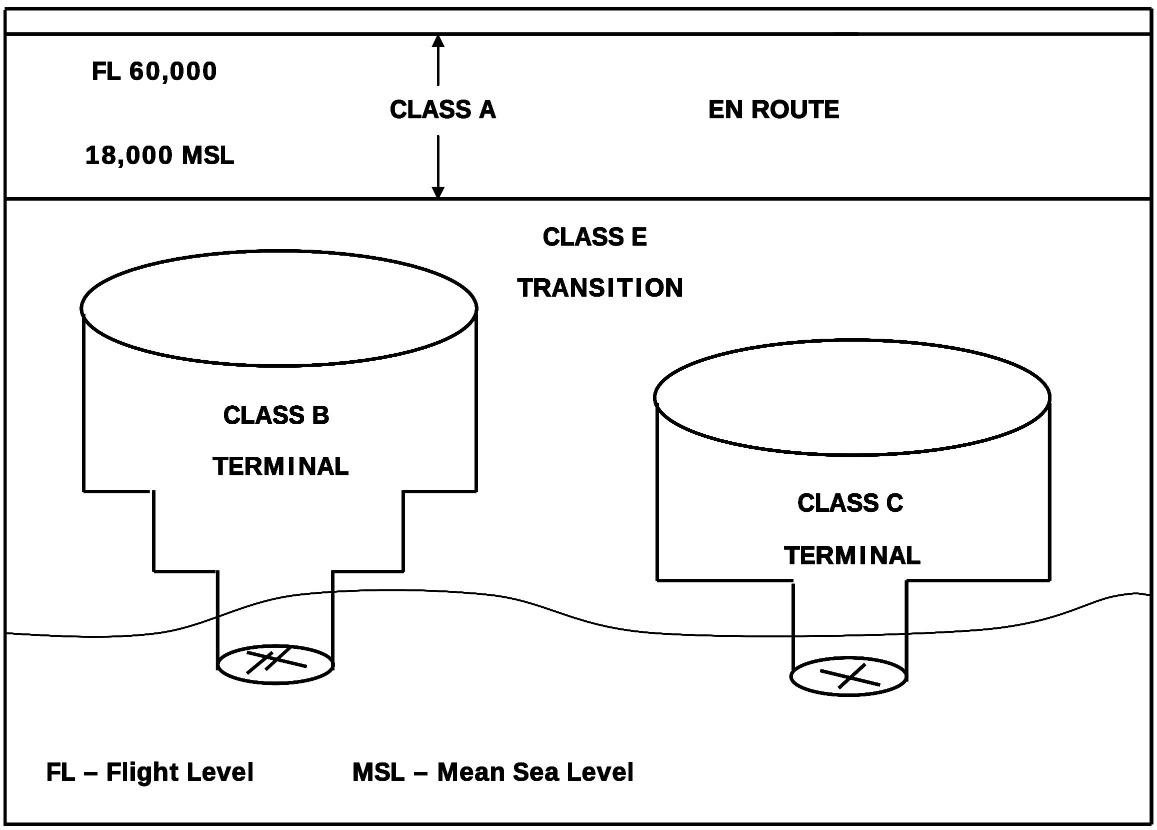
Flight

Improving Traffic Flow Near Terminal Areas

(ATO, Salaries and Expenses, $398.2 million, 1,751 FTE)

Terminal airspace is a critical lynch pin in the efficient use of airport capacity. Congestion, complexity, and limited departure points in the current airspace can result in restrictions, limiting airport departure throughput. Likewise, inefficient holding and arrival routes can limit airport arrival throughput. Terminal airspace redesign focuses on enhancing available resources to make transition to and from the airport more efficient by adding routes and applying appropriate area navigation (RNAV) or Required Navigation Performance (RNP) procedures. Figure 4 below illustrates U.S. airspace classes, which include terminal and en route airspace. Terminal airspace includes classes B, C (shown), and D (not shown). Class A encompasses en route airspace and is physically above all the other classes.

Figure 6. Distinction between Terminal and En route Airspace



Terminal airspace redesign also is essential in the delivery of increased capacity associated with the implementation of new runways. Without airspace redesign, these new runways will not be able to deliver the proposed capacity changes. Studies have shown that 40 percent to 60 percent of projected capacity from new concrete will be lost without the necessary changes to terminal (and en route) airspace. These changes include new fixes, routes, and sector structure to allow aircraft to use the new runways.

Terminal airspace optimization (mid-term) and redesign (long-term) projects are ongoing across the United States. Efforts are planned for all major metropolitan areas and congested terminal areas servicing key airports, focusing on the airspace associated with the 35 OEP airports. When completed, these projects will reduce complexity, balance controller workload, and reduce en route flow constraints. The operational outcome will be fewer restrictions and reduced flight delays.

Automated Surface Observing System - ASOS (ATO, Capital Programs, $8.5 million): Accurate, reliable weather information is critical to the efficient use of the Nation's airspace. Automated weather observing equipment improves the quality, frequency, and timeliness of weather observations and reduces costs and the time air traffic controllers spend on weather observation duties. Benefits will include continued and expanded capability for Instrument Flight Rules flight operations, improved continuous observation capability at a significantly reduced cost from manual observations, and high quality, real-time weather data communication. FY 2009 funding will procure 223 ceilometers and spares as part of the ASOS Pre-Planned Product Improvement project.

Improving En Route Efficiency
(ATO, Salaries and Expenses, $398.2 million, 1,751 FTE)

Congestion in transition and en route airspace often limits the ability to get departing aircraft off the ground and can also limit arrivals—even if runway capacity is available. Increased flexibility is needed to address the challenges caused by traffic volume and severe weather in en route airspace. Restrictions often are put in place to manage demand for access to en route airspace when levels exceed what can be safely handled. Transition and en route airspace congestion often limits the ability to get departing aircraft off the ground and limits arrivals, even if runway capacity is available. In response, restrictions often are put in place to manage demand for access to en route airspace when levels exceed what can be safely handled. Increased flexibility is needed to address the challenges caused by traffic volume and severe weather in en route airspace.

High Altitude Airspace Management (HAAM) is the Airspace Management Program effort to renovate the high altitude en route environment. The goal is to move from the constrained, ground-based route structure to an area navigation (RNAV) environment focused on user flexibility, efficiency, and predictability. RNAV procedures and routes are used to develop new air traffic paths that reduce flow complexity by permitting aircraft to fly optimum routes with little controller intervention. RNAV-equipped aircraft offer improved access and flexibility for point-to-point operations

Air Traffic Control Beacon Interrogator Replacement (ATO, Capital Programs, $13 million): The FAA's existing surveillance Air Traffic Control Beacon Interrogator (ATCBI-4/5) systems have reached the end of their life cycles and many of the parts are already obsolete. The inability to replenish spares is putting the availability of Secondary Surveillance Service at risk. Furthermore, the existing analog beacons are incompatible with new digital automation systems. The replacement system, known as ATCBI-6, significantly enhances en route air traffic controllers' ability to separate aircraft, while reducing their workload and improving the accuracy of aircraft position and altitude data. For FY 2009, $10.0 million will support the delivery of 1 remaining ATCBI-6 system to the site and have 17 sites at initial operating capabilities. An additional $3.0 million is requested for Beacon Only Facility Establishments in order to complete construction activities at Yakutat, AK.

En Route Automation Modernization (ERAM), (ATO, Capital Programs, $203.05 million): ERAM replaces the Host computer system and Direct Access Radar Channel (DARC) software; hardware and associated interfaces; and communications and support infrastructure. ERAM will provide existing functionality and new capabilities to support the NAS architecture evolution, Air Traffic Services operational requirements, and information security requirements. ERAM will improve the efficiency of the air traffic control system by allowing varying standards of separation, enabling flexible routing around congestion and weather restrictions, and providing automated hand-offs.

ERAM development and deployment is being conducted incrementally in order to reduce risk, provide early benefits, address equipment sustainment issues, and to ensure a stable system during the transition from the Host computer system.

The FY 2009 budget request includes $203.05 million to support the main phases of the ERAM program including ERAM Releases 1, 2, and 3. The requested funding level will enable the complex transition from the current system to a modernized, en route automation system without impacting critical service delivery.

EN ROUTE AUTOMATION MODERNIZATION (ERAM)	
(ATO, Capital Programs, $203.05 million)	
Purpose:	**Steps:**
Complete transition from current system to modernized, En Route system architecture while maintaining critical services.	➔ Replacement of the Direct Access Radar Channel and the addition of safety alerts through the Enhanced Back-up Surveillance (EBUS) effort. ➔ National deployment of the En Route Information Display System (ERIDS), an important tool for providing the early benefits of improved productivity and efficiency that distributes important information to air traffic controllers electronically. ➔ ERAM Release 1 is the replacement of the Host Computer System with new software and hardware and the integration of these elements within evolving En Route system architecture in coordination with the other elements of the En Route Automation Program ➔ ERAM Releases 2/3 will contain software maintenance updates and further functional enhancements.

Voice Switching and Control System (VSCS), (ATO, Capital Programs, $23.3 million): The VSCS Upgrade and Tech Refresh are ongoing programs to replace and upgrade the obsolete, non-supportable VSCS hardware and software in all 21 Air Route Traffic Control Centers (ARTCC), the Mike Monroney Aeronautical Center, and the William J. Hughes Technical Center. These upgrades will ensure that the air-to-ground and ground-to-ground communications capabilities are reliable and available for separating aircraft, coordinating flight plans, and transferring information. In FY 2009, $22.8 million will fund the retrofit of VSCS power supplies, the development of depot test equipment of repeater/LAN efforts, PLM to C++ code conversion activities, and engineering analysis. An additional $500,000 is requested for in service engineering activities.

ARTCC Building Improvements / Plant Improvements (ATO, Capital Programs, $56.5 million): The ARTCC Improvements program supports en route air traffic operations and service-level availability through facility lifecycle program management of the 20 ARTCCs, two Center Radar Approach Control (CERAP) facilities at San Juan and Guam, the Honolulu Control Facility, and the Air Traffic Control System Command Center. Most of the buildings and systems are over 40 years old and pose risks of system failure that can adversely affect air traffic operations. For example, in June 2001 a fire in a 22-year old kitchen at the Cleveland ARTCC resulted in an evacuation of the control room and the loss of ATC capability for 16 minutes over 65,000 square miles. As a result, 50 flights were delayed and all en route traffic was routed around the Cleveland airspace. In FY 2005 alone there were eight catastrophic occurrences of pipe ruptures which could have similarly affected operations. At the Washington ARTCC, plastic sheeting had to be draped over air traffic control positions to maintain operations.

For FY 2009, $55,500,000 is requested to continue ARTCC modernization and sustainment projects. Major construction projects will replace obsolete support equipment in operations and training areas. These projects will include asbestos abatement, mechanical and electrical system replacements, fire detection and protection upgrades as well as interior architectural construction. An additional $1,000,000 will also fund in-service engineering activities.

Next Generation VHF Air-to-Ground Communication System (NEXCOM), (ATO, Capital Programs, $46.4 million): The continuous growth in air traffic, along with the introduction of new services such as the broadcast and transmission of new weather products, has driven a proportional demand for new Air-to-Ground (A/G) communication frequency channels. This approximately four percent annual growth in frequency demand can no longer be satisfied with the available spectrum in high-density areas. The lack of available spectrum for new radio channels will prohibit the addition of new ATC sectors and other Air-to-Ground services needed to maintain the efficiency and effectiveness of the NAS. This inability to enlarge and adjust NAS communications to accommodate air traffic growth will result in unacceptable delays for system users. For FY 2009, $33.4 million is requested to deploy multimode digital radios at 160 sites, conduct investment analysis, and begin the radio procurement for terminal and flight service radio replacement. $10.0 million is requested for the UHF Radio Replacement Program. The UHF Replacement program replaces UHF radios at remote communications facilities. In addition, $3.0 million is requested for NEXCOM Segment 2. This funding will enable the agency to conduct an Investment Analysis and begin radio procurement for the terminal and flight service radio replacement in time to support NextGen.

Improving Oceanic Airspace Efficiency

(ATO, Salaries and Expenses, $398.2 million, 1,751 FTE)

Oceanic air traffic is projected to continue to grow at a higher rate than domestic air traffic, primarily in the highest density areas. In addition, the market demands expanded capacity through improved operational and fuel efficiency. With the present oceanic airspace structure, users are constrained in choice of routes and do not receive timely granting of requests for clearance changes. This results in increased operating costs due to less than ideal routes.

Allowing properly equipped aircraft and qualified aircrews to operate under reduced oceanic separation enables more aircraft to fly optimal routes. This enhances aircraft flight time as well as fuel and payload efficiency, and may provide more opportunities to add flights without delays. Fuel savings are estimated to be nearly $2.4 billion during the period from 1996 to 2015.[3] With substantial increases in jet fuel prices, fuel savings are expected to be much higher.

While much of oceanic airspace has not reached capacity limitations yet, increased efficiency through procedural and other operational improvements can provide benefits to controllers and airspace users. Because all oceanic airspace is also international airspace, changes in the oceanic airspace environment require coordination and collaboration with international colleagues to ensure a seamless operational environment. With potential changes in operational responsibilities for oceanic airspace users and air traffic service providers, it is important that FAA continue its global leadership.

Oceanic Automation System (ATO, Capital Programs, $20.7 million): The Advanced Technologies and Oceanic Procedures program (ATOP) will replace existing oceanic air traffic control systems and procedures with a single integrated system, modernizing facilities responsible for managing over 24 million square miles of airspace over the Atlantic and Pacific Oceans, including the Oakland, New York, and Anchorage ARTCCs. ATOP will provide a fully modernized oceanic air traffic control automation system including, installation, testing, training, common procedures, and lifecycle system maintenance. ATOP also allows FAA to meet international commitments to reduce aircraft separation standards, thereby dramatically increasing capacity and efficiency for the agency's customers. In fact, controllers are able to reduce aircraft separation with ATOP from 100 nautical miles to 30 nautical miles.

For FY 2009, $20,700,000 is requested to complete the ATOP technical refresh at the William J. Hughes Technical Center (WJHTC) and the three oceanic sites, continue ATOP Preplanned Product Improvements for enhancements to ATOP software for procedural and radar operations, provide for information security and logistics support, provide for the required level of program and engineering support, and provide tech refresh for DOTS Plus software.

Eliminating Capacity Constraints

The systems discussed below allow FAA and its employees to eliminate capacity constraints in NAS where possible, whether they are due to the physical constraints of its facilities or due to outdated and overloaded automation systems.

Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1) (ATO, Capital Programs, $28.2 million): STARS replaces the 47 oldest and most operationally critical Automated Radar Terminal System (ARTS) IIIA's (43) and Common ARTS IIE's (4) sites. STARS assists controllers in separating air traffic during arrivals, departures, and over flights at airports by providing new air traffic control workstations with state-of-the-art computers, displays, and commercially based software. STARS provides a digital system to meet expanding air traffic control needs through 2031.

In FY 2009, the $28.2 million funding request is for technical refresh and terminal enhancements activities. Technical refresh funds will be used to continue installation of a new operating system, continue the second phase of the system processor and peripheral equipment purchase and replacement, initiate procurement activities associated with tower controller monitor replacement, eliminating costly inter-dependency of system processors and operating systems, provide technical support for program and system engineering. As STARS enters the operational phase of its life cycle, terminal enhancement software changes are required to the baseline software to improve system performance, efficiency, ease of use and support, and incorporate safety and security modifications.

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[3] Source: *Strategic Plan for Oceanic Airspace Enhancements and Separation Reductions*, January 2002, Table 4-1 Approximate Fuel Savings.

Terminal Air Traffic Control Facilities – Replace (ATO, Capital Programs, $134.3 million): The FAA provides air traffic control services from more than 270 ATCT and TRACON facilities and must continually replace these buildings to ensure acceptable service levels and to meet evolving operational requirements. The average age of a control tower is 25 years, and some have been in service for 50 years. Control towers built 20 years ago do not meet today's operational requirements or current building codes and design standards.

Terminal facility replacement projects are funded in five phases to provide sound financial management of projects. The table below provides an overview of the phases of ATCT and TRACON replacement efforts.

TERMINAL AIR TRAFFIC CONTROL FACILITIES – REPLACEMENT (ATO, Capital Programs, $134.3 million)				
Phases of Terminal Facility Projects				
Phase I	**Phase II**	**Phase III**	**Phase IV**	**Phase V**
Site Selection	Facility Design	Facility Construction	Equipment and Utilities Installation	Asset Disposition: Decommissioning, Demolition, or Refurbishing of the old facility
Advance Engineering	Electronic Equipment Design			
	Electronic Equipment Procurement			

For FY 2009, FAA is requesting funding to span five phases to continue replacing aging facilities. This includes: Phase I/II funding for three sites; Phase III construction funding for five sites; and, Phase IV construction funding for seven sites. Also included in this request is funding for other direct program costs.

Air Traffic Control Tower (ATCT)/Terminal Radar Approach Control (TRACON) Facilities – Improve (ATO, Capital Programs, $37.9 million): The FAA must continually upgrade and improve aging terminal facilities and equipment to provide an acceptable level of service and to meet current and future operational requirements. Since their initial construction, almost all ATCT and TRACON facilities have had to address additional operational and safety requirements in the areas of accessibility, hazardous materials, seismic events, and security. Facility improvements must incorporate these new requirements and ensure an orderly transition to the new configuration for relocated/replaced equipment with minimal impact on existing operations. FY 2009 funding will be used to improve, repair, and sustain facilities that are not candidates for replacement; seismic modifications to facilities that are not candidates for replacement; support system engineering, configuration management, risk management, facility planning and other program support service; facility condition assessments; and in-service engineering.

Terminal Digital Radar (ATO, Capital Programs, $17.1 million): In the Terminal Digital Radar Program, new digital Airport Surveillance Radar Model 11 (ASR-11) radar systems will replace existing ASR Models 7/8 primary radar systems and associated Air Traffic Control Beacon Interrogator Models 4/5 (ATCBI 4/5) secondary radar systems. This will ensure continuation of surveillance service with improved air detection and expanded six-level weather detection/display capability.

In FY 2009, a total of $17.1 million is requested at the target level to procure 11 demolition/restorations and purchase the final set of depot spares. In addition, the program is conducting a business case analysis to support the request to begin technology refresh for purchase of the initial 20 kits to commence deployment. The funding would be used to replace the obsolete commercial off-the shelf (COTS) hardware cards within the signal data processing card rack with the Advanced Signal Data Processor (ASDP). The ASDP reduces the number of processing cards from 14 to 3.

Precision Runway Monitors (PRM) (ATO, Capital Programs, $1.0 million): The PRM system aims to maintain optimum runway use at airports with closely spaced parallel runways. PRM is a highly accurate electronic scan (e-scan) radar that tracks and processes aircraft targets at a one-second update rate (as opposed to 4.8 seconds with conventional radars). The PRM system enables pilots to fly simultaneous independent approaches to parallel runways spaced less than 4,300 feet apart. The ability of pilots to conduct simultaneous approaches during adverse weather will increase throughput and decrease delays.

For FY 2009, $1 million is requested to conduct an investment and economic analysis of replacing legacy PRM E-Scan systems with the Multilateration PRM-A system, and determining other candidate sites with closely-spaced parallel runways that may benefit from this technology.

Terminal Voice Switch Replacement (TVSR) / Enhanced Terminal Voice Switch (ETVS) (ATO, Capital Programs, $8.4 million): The ongoing TVSR/ETVS program involves replacing the aging, obsolete voice switches in the ATCTs and TRACON facilities. Voice switches enable air traffic controllers to communicate with aircraft as well as with other air traffic control facilities. To date, this program has replaced 447 of 497 terminal switches throughout the NAS. The program also provides the contract vehicles for the FAA to procure voice switch equipment for new and modernized terminal facilities. For FY 2009, $7.9 million is requested to procure, test, deliver, and install ten terminal voice switches. An additional $500,000 is requested for in-service engineering.

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GLOBAL CONNECTIVITY

Introduction

On the leading edge of international cooperation is commercial aviation, which has grown 70-fold since the first jet airliner flew five decades ago. Aviation systems within and among nations are lifelines to the future, freer trade, accelerated economic growth, and to greater cultural exchange. Seamless global aviation is critical to an increasingly global economy that hinges on efficient supply chains and just-in-time manufacturing.

The FAA is uniquely positioned to provide leadership in the global aviation community through expanded technical assistance to other civil aviation authorities, and continued emphasis on bilateral agreements to help harmonize aviation safety and environmental quality around the world. Today, FAA has operational responsibility for about half of the world's air traffic, has certified more than two-thirds of the world's large jet aircraft, and has provided assistance to more than 130 countries to improve their aviation systems.

The FAA, however, must become even more globally focused to strengthen America's aviation leadership role in both safety and air traffic control and to ensure that U.S. citizens can travel as safely and efficiently around the world as they do at home.

In FY 2009, to help improve safety, FAA will expand its training and technical assistance programs that help civil aviation authorities meet international safety standards. The FAA will also continue its work with global partners to promote wider adoption of safety technologies.

In addition, for greater connectivity, FAA is targeting efforts to promote seamless global operations in cooperation with international partners and the International Civil Aviation Organization (ICAO).

Organization

This budget request is organized by the following DOT performance measures: 1) conclude eight bilateral agreements with key countries or regional authorities between FYs 2007-2011, 2) provide technical assistance to foreign countries, 3) increase external funding for global safety initiatives, 4) expand the use of NextGen performance-based systems, and 5) increase contracts awarded to disadvantaged and women-owned businesses.

Narrative sections contain parenthetical inserts that summarize resource requests. For Safety and Operations, ATO Salaries and Expenses, and Grants-in-Aid for Airports, the inserts show the total resources for that appropriation that support the Global Connectivity Goal. For ATO Capital Programs, the funding requested for the individual program is provided.

For complete disclosure of IT funding directly supporting DOT objectives, please refer to the technology investments justifications in Section 3, both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program section.

Table 1 on the following page summarizes the Global Connectivity budget request. Exhibits II-3 and IV-1 provide additional details.

Summary Budget Request

The FAA's request for $63.1 million to support Global Connectivity activities allows the agency to maintain its leadership role in global aviation. The request supports expanded global presence, training and technical assistance to foreign aviation authorities, and maintenance of aircraft certification work. Table 1 provides the Summary Budget Request and Table 2 outlines the discretionary increase request for Global Connectivity.

Table 1. Total Global Connectivity Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Global Connectivity (FY 2007)			
Operations	30,964		
F & E	3,630		
AIP	239		
Subtotal	**34,833**		
FTE	**136**		
Global Connectivity (FY 2008 & FY 2009)			
Conclude Bilateral Aviation Safety Agreements and Expand the Use of NextGen Systems or Concepts in Priority Countries			
Operations		57,587	
Safety & Operations			38,991
Air Traffic Organization			4,644
AIP		190	200
Subtotal		**57,777**	**43,835**
FTE		**310**	**244**
Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009)			
Safety & Operations			18,506
Subtotal			**18,506**
FTE			**66**
FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses			
Operations		553	
Air Traffic Organization			680
Safety & Operations			45
Subtotal		**553**	**725**
FTE		**4**	**3**
Global Connectivity $ Total	**34,833**	**58,330**	**63,066**
Global Connectivity FTE Total	**136**	**314**	**313**

Table 2. Discretionary Increase Request

	($000)	FTE
SAFETY AND OPERATIONS		
International Aviation		
FAA Offices in Latin America	386	2.0
SAFETY AND OPERATIONS TOTAL	***386***	***2.0***
TOTAL	***386***	***2.0***

Performance Overview

To support U.S. aviation safety leadership, FAA expanded its international presence by establishing an office in Brasilia, Brazil in FY 2008. Furthermore, the FAA is planning to increase its international presence by establishing and staffing a second office in Latin America in FY 2009.

The agency plans to focus resources to provide training and technical assistance to help foreign civil aviation authorities comply with international aviation safety standards. Specifically, FAA plans to continue technical assistance and training to key partner countries; administer programs that continue and increase external funding for international aviation projects; and maintain FAA's ability to rely on the safety oversight and certification activities performed by other aviation authorities by concluding or expanding additional bilateral aviation safety agreements.

Another focus of FAA's technical assistance effort is to support an interoperable and seamless global aviation system based on common use of the latest technologies. Such a system will not only be safer, but also more efficient.

Performance Measure: Conclude Eight Bilateral Agreements with Key Countries or Regional Authorities between FY 2007 and FY 2011

This funding request contributes to DOT's Global Connectivity strategic goal. Bilateral Aviation Safety Agreements (BASAs) promote aviation safety and environmental quality, enhance international cooperation, and increase efficiency in matters related to civil aviation worldwide.

Table 3. Number of bilateral agreements completed per year, beginning in FY 2005

	2005	2006	2007	2008	2009
Target:	2	2	3	2	1
Actual:	2	4	3	N/A	N/A

Performance Measure: Expand the Use of NextGen Performance-Based Systems or Concepts to Priority Countries

This funding request contributes to the DOT global connectivity strategic goal and promotes seamless operations around the globe in cooperation with bilateral, regional, and multilateral aviation partners.

The FAA computes the performance outcome through a count of the countries involved with FAA on technical assistance or general cooperation that have achieved significant implementation milestones on NextGen technologies, procedures, or concepts.

Table 4. Number of priority countries taking a significant step, as a result of FAA assistance and collaboration, to implement the operational use of NextGen technologies, procedures, or concepts.

	2005	2006	2007	2008	2009
Target:	1	1	1	1	1
Actual:	1	1	1	N/A	N/A

Note: New measure in FY 2006 – 2011 DOT Strategic Plan, reported in FY 2009 budget for the first time. Measures expansion of NextGen technologies into priority countries – target is one country per year. Similar measure included in *FAA Flight Plan*, originally called NAS Technologies. Redefined in FY 2006 to restrict measure to GPS-based technologies only, refocused in FY 2007 to include all NextGen-related projects. Targets shown for FY 2005 and FY 2006 are for original measures.

Table 5. Budget request for supporting Bilateral Aviation Safety Agreements and Expand NextGen Technologies performance measures.

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Global Connectivity			
Conclude Bilateral Aviation Safety Agreements and Expand the Use of NextGen Systems or Concepts in Priority Countries (FY 2008 & FY 2009)			
Operations		57,587	
Safety & Operations			38,991
Air Traffic Organization			4,644
AIP		190	200
Total		**57,777**	**43,835**
FTE		**310**	**244**

Performance Overview

Bilateral Aviation Safety Agreements

A BASA is a government-to-government commitment intended to promote aviation safety and environmental quality and to enhance cooperation and increase the safety and efficiency of respective aviation systems. By helping to build a network of competent civil aviation authorities and concluding agreements with additional countries or regional authorities, FAA can have a significant impact on improving global understanding of U.S. safety regulations, leading to more consistent international oversight.

With the increasing globalization of aircraft manufacturing and air carrier operations, the interdependency between the U.S. and the foreign aviation sector is outpacing the agency's ability to conduct oversight throughout the globe. Since BASAs are based on the recognition of comparability between U.S. and foreign oversight systems, they allow FAA to rely on the safety oversight capabilities and technical expertise of other civil aviation authorities, thereby minimizing duplication of efforts as well as freeing resources to support U.S. safety priorities.

The FAA's goal is to conclude eight new or expanded bilateral agreements recognizing safety certification and approval systems of other countries between FYs 2007-2011. Each bilateral agreement will be executed with a key country or regional authority. The U.S. government currently plans to sign BASAs in FY 2008, with both Korea and Japan. Other countries are being considered for the out-years.

Expand NextGen Technologies

By working with international civil aviation authorities, organizations and other countries, FAA can continue to enhance its international leadership role and ensure harmonization of NextGen technologies, procedures, and concepts with global, regional and national air traffic management (ATM) modernization efforts. BASAs will be one of the vehicles for formalizing other countries' adoption of NextGen technologies. These same NextGen technologies, procedures, and concepts are currently being explored and implemented in the National Airspace System (NAS) and are critical to the success of NextGen to handle projected future demands. Global harmonization of NextGen with existing and proposed international ATM modernization initiatives is imperative to realizing all potential safety, capacity and efficiency benefits for U.S. carriers flying globally and for U.S. citizens traveling abroad on foreign flag carriers.

Proper and timely coordination of NextGen planning, development, and implementation activities with key global partners, users, and stakeholders is imperative if the United States is to create a truly seamless future air transportation system that will be able to safely and efficiently handle the expected increase in air traffic operations in the next 5, 10, and even 20 years. Aviation, by its nature, crosses regional boundaries and can spearhead global interoperability of disparate systems and products.

The FAA is committed to promoting the adoption of U.S. NextGen technologies, systems and concepts amongst our global partners. Funding of NextGen international coordination and harmonization activities, as defined in FAA's *Flight Plan's* NextGen Technologies performance target, is key to allowing the agency to succeed in this role of bringing the world aviation community together to collectively use NextGen as the foundation to handle future requirements. This funding will promote technologies such as GPS, as well as procedures such as Required Navigation Performance.

Budget Request Justification

Negotiating Bilateral Safety Agreements
(Safety & Operations, International Aviation, $526 thousand, 2 FTE)

The FAA coordinates the negotiation of BASAs with the Department of State, which leads the negotiation of the BASA with the foreign government or its civil aviation authority. These agreements have two components: executive agreements and implementation procedures. The executive agreement is signed by the U.S. Department of State and the target country's Ministry of Foreign Affairs. It lays the essential groundwork for cooperation between the two governments and their respective aviation authorities. Once the executive agreement is concluded, FAA negotiates implementation procedures (IPs) with the partner civil aviation authority. The IPs provide detailed operational safety and certification arrangements between FAA and the foreign civil aviation authority. The IPs are the operational portion of the bilateral agreement that allow for acceptance of aviation goods and services between the two countries.

Supporting Bilateral Safety Agreements
(Safety & Operations, Aviation Safety, $33.7 million, 204 FTE)

The FAA conducts certification activities in accordance with the terms of final bilateral agreements. This includes validations of design approvals, certification of repair stations on behalf of other countries and the preparatory work leading to the acceptance of another country's regulatory oversight system (bilateral technical evaluations).

Performance Measure: Secure a Yearly Increase in External Funding for Global Safety Initiatives

This funding request contributes to DOT's Global Connectivity strategic goal and promotes improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners. The success of these efforts is measured in terms of the amount of new funding which the agency secures for international aviation infrastructure and capacity projects. The metric used to measure success is the amount of external funding that FAA identifies and directs toward critical aviation infrastructure projects.

Table 6. Yearly increase in international aviation development funding from the U.S. and international governmental organizations, multilateral banks, and industry

	2005	2006	2007	2008	2009
Target:	$14.36M	$23.41M	$12.00M	$15.00M	$18.00M
Actual:	$19.51M	$33.04M	$13.36M	N/A	N/A

Note: New measure in FY 2006 – 2011 DOT Strategic Plan, reported in FY 2009 budget for the first time. Included in *FAA Flight Plan*, but targets revised in FY 2007. Original target was 20% increase over previous year's funding total. In FY 2007, target was reset at $12.00 million, with increases of $3 million per year over that baseline from FY 2008 – FY 2011. Original targets are shown for FY 2005 and FY 2006.

Table 7. Budget request for supporting External Funding.

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Global Connectivity			
Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009)			
Safety & Operations			18,506
Total			**18,506**
FTE			**66**

Performance Overview

Often countries that could benefit the most from aviation technical assistance are the least able to afford it. While the FAA has no grant program to finance international safety and capacity efforts, it seeks to leverage the limited resources the agency is able to contribute by implementing a methodology to increase intellectual and financial assistance from U.S. Government organizations, multilateral banks, and industry. New sources of external funding are critical in supporting FAA's efforts to maintain its role as a global leader in aviation safety standards and procedures.

Budget Request Justification

Technical assistance and training improve aviation safety abroad and are at the very core of FAA's international programs. A primary focus of this effort is to transfer knowledge and skills to help developing countries comply with international aviation safety standards. FAA's external funding program contributes supplemental resources to its technical assistance efforts. The FAA's *Flight Plan* performance target is to secure a yearly increase in international aviation funding to strengthen the global aviation infrastructure. The agency plans to achieve a 100 percent increase of the FY 2007 baseline target of $12 million in $3 million annual increments for an FY 2012 target of $27 million.

Securing External Funding
(Safety & Operations, International Aviation, $17.4 million, 63 FTE)

The Office of International Aviation (API) has responsibility for achieving the *Flight Plan* Performance Target for external funding. More specifically, the International Policy staff is responsible for overall management of the external funding program, including developing plans, coordinating the efforts of all participants, promoting good working relationships with donor organizations, developing agreements with donor organizations, tracking progress toward the *Flight Plan* Performance Target, identifying projects for Afghanistan and Iraq, and developing reports for presentation to senior management. API regional offices are responsible for identifying external funding projects, working with other FAA organizations and host countries to develop project proposals, and then presenting those proposals to donor organizations. API's International Operations staff is responsible for facilitating the transfer of funds from donor organizations to FAA, if project implementation requires FAA to take control of funds.

Establishing Technical Assistance Agreements
(Safety & Operations, International Aviation, $17.4 million, 63 FTE)

The agency plans to focus additional resources to provide training and technical assistance to help foreign civil aviation authorities meet international standards. Specifically, FAA plans to expand technical assistance and training to key partner countries; and maintain FAA's ability to rely on the aircraft certification work performed by other civil aviation authorities around the world.

Discretionary Increase Request: FAA Offices in Latin America
(Safety & Operations, International Aviation, $386 thousand, 2 FTE)

This submission requests two additional FTEs to staff offices in Latin America, as well as funding for the increased cost of positioning staff in foreign locations. These individuals will provide support to several key agency initiatives – international aviation agreements, technical assistance to U.S. allies, encouraging the adoption of safety policies and procedures that are in sync with U.S. practices, and promoting U.S. aviation technologies and services. The FAA representatives will also promote U.S. safety practices and standards. This will help to improve the safety of air travel for American citizens traveling in and out of the region.

NextGen and Air Traffic Technical Assistance Programs
(Air Traffic Organization, Salaries and Expenses, $4.6 million, 20 FTE)

ATO provides leadership, technical assistance, and support to the global civil aviation community, its air navigation service providers, civil aviation authorities, and airspace users in an effort to increase the overall safety, capacity and efficiency of global air operations. This assistance is based on the current technologies, systems, procedures, and concepts that are either in operational use today in the U.S. National Airspace System (NAS) or are in the planning and development stages in support of the transition to the NextGen vision.

Further, the leadership, technical assistance, and support is focused on support to the International Civil Aviation Organization (ICAO) and its regional planning and implementation groups and members States, as well as key regional and multilateral aviation coordination groups. In this way FAA provides expertise on the implementation of communication, navigation and surveillance, and air traffic management technologies to harmonize and standardize regional implementations with FAA's current and planned operations for the U.S. Specific bilateral assistance is also provided to strategic countries or entities that have major influence on the aviation landscape within their regions. Examples of this include the established assistance, coordination and harmonization relationships with Europe (Eurocontrol), Civil Air Navigation Service Organization (CANSO), Japan, Brazil, China, India and North America (Canada and Mexico).

Aviation Safety Leadership
(Safety and Operations, Aviation Safety, $33.7 million, 204 FTE)

The FAA continues to focus efforts on its partnership with China. In FY 2007, China implemented 10 of 27 Commercial Aviation Safety Team (CAST) Safety Enhancements. These Safety Enhancements are designed to mitigate major known causal factors of accidents, focusing on the most disastrous accidents: Controlled Flight Into Terrain (CFIT) and mid-air collisions. China may decide during summer 2007 to add an additional ten CAST enhancements by FY 2012. These safety enhancements have proven effective in the U.S. in reducing commercial air carrier accidents. They will help China maintain its excellent safety record as it expands its aviation system in the future.

Airport Technical Assistance
(Grants-in-Aid for Airports, Office of Airports, $200,000, 3 FTE)

Under the Grants-in-Aid for Airports account, FAA provides technical assistance when requested to help countries improve airport safety. Assistance is provided to develop airport certification and inspection programs and implement airport safety management systems to meet ICAO requirements. The ICAO requirements for states to develop airport certification systems and airport safety management systems are relatively new. The ICAO airport certification requirements are based in large measure on FAA's Part 139 Airport Certification Program. Technical assistance is also provided to help countries reduce the hazard from bird strikes near airports. This funding also covers time and travel for technical experts to participate in ICAO panels and work groups.

FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses

Table 8: Budget Request for supporting FAA's Procurement Goals

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Global Connectivity			
FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses (FY 2008 & FY 2009)			
Operations		553	
Air Traffic Organization			680
Safety & Operations			45
Total		**553**	**725**
FTE		**4**	**3**

While FAA does not contribute directly to DOT's Disadvantaged and Women-Owned Businesses performance goal, the agency does have its own related targets. The Office of Civil Rights manages DOT's Disadvantaged Business Enterprise (DBE) program for FAA. The DBE program requires recipients of federal financial assistance to establish goals for the participation of disadvantaged entrepreneurs and certification of the eligibility of DBE firms to participate in DOT contracts and airport concessions.

The FAA's DBE program requires approximately 300 primary and 560 non-primary airports to set contracting goals for socially and economically disadvantaged firms. Approximately 300 primary airports must set concession goals as well. In FY 2006, DBE prime and sub-contractors grossed $382.3 million, which equates to 15.3 percent of all Airport Improvement Program contract projects. DBE concessionaires (ex car rental) grossed $1.8 billion in revenue, which equates to 13.09 percent of all concession gross receipts; while car rental DBE concessionaires' gross receipts were $195.5 million.

The FAA's Major Procurement Program Goal (MPPG), i.e. FAA's Small Business Development Program is managed by the agency's acquisition executive. In FY 2008, FAA anticipates awarding $2 billion in Direct Procurements. The FAA's FY 2008 MPPG for Contracts Awarded to Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals (which includes 8-A) is 10 percent of total direct procurement dollars, though the actual accomplishment will not be known until the first quarter of FY 2009. This goal will remain at 10 percent until the fourth quarter of FY 2009 when goals for FY 2010 will be determined.

The FAA's MPPG for women-owned small businesses is also managed by the agency's acquisition executive. In FY 2008, the goal is five percent of total direct procurement dollars. The Women-Owned Businesses direct procurement goals for FY 2009 and 2010 will remain at five percent.

Other International Aviation Budget Requests

Capital Security Cost Sharing Program Contribution
(Safety & Operations, International Aviation, $1 million)

The FAA is requesting an increase for the Department of State's Capital Security Cost Sharing Program. Under this program, all agencies with overseas staff are charged on a per capita basis for the erection of new or modification of existing embassy compounds to meet more stringent physical security requirements. Charges to all federal agencies are being phased in over a five–year period. The increase in FAA's share is $1 million for FY 2009, which represents the fifth installment of the five-year phase-in period. The entire effort is a 14-year, $17.5 billion dollar, government-wide program authorized under the 2005 Foreign Relations Authorization bill.

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ENVIRONMENTAL STEWARDSHIP

Introduction

The adverse environmental by-products of aviation, primarily noise and emissions, are the major potential constraints to the continued growth of aviation. Public concerns over the environmental impact of aviation operations, as well as requirements embodied in laws and regulations, can severely constrain the ability of the aviation system to meet the nation's needs. Preliminary analysis by the Joint Planning Development Office (JPDO) of the NextGen Plan shows that noise and emissions could increase between 140-200 percent over the next 20 years, becoming a significant constraint on planned capacity increases. Further, energy issues have gained significantly more attention in the last few years due to sustained price increases and renewed interest in alternative fuels. The FAA is committed to managing aviation's growth in an environmentally sound manner and has an aggressive plan to accomplish this objective through mitigation, operational measures, measurements and standards, and research and development.

If FAA is to effectively tackle these environmental challenges, the agency must maintain its investments in Research, Engineering, and Development (R,E&D), Safety and Operations, and Grants-in-Aid for Airports (AIP). The agency expects environmental issues to become increasingly difficult over the time period of the *Flight Plan* (2007-2011), but continuing efforts to reduce aircraft noise exposure and to mitigate all types of aviation emissions will be critical to ensuring the necessary capacity growth in the NAS. In particular, aviation greenhouse gas emissions could become an increasingly important issue, especially on the international stage.

Organization

The FAA's *Flight Plan* does not include a distinct environmental strategic goal. Environmental performance targets in the *Flight Plan* are linked to the Capacity goal (the equivalent to DOT's Reduced Congestion strategic goal), reflecting FAA's commitment to increasing the capacity of the NAS in an environmentally sound manner. For purposes of this performance budget, FAA programs that contribute to the DOT-level Environmental Stewardship goal are presented in this section. These programs are organized by the performance targets they support.

Narrative sections begin with a resource request summary for the organization involved. The summaries for activities in each goal section funded by Safety and Operations, Grants-in-Aid for Airports (AIP) and ATO Salaries and Expenses present the total amount assigned to that goal for the organization. For ATO Capital Programs the inserts show resources for selected individual programs. The resources shown for R,E&D include both the Reduce Environmental Impacts program and a share of Mission Support funding.

For complete disclosure of information technology (IT) funding directly supporting DOT strategic goals, please refer to the technology investment justifications in Section 3 in the Office of Information Services/Chief Information Officer detailed justification and under ATO Capital Programs in the Air Traffic Organization section.

Table 1 summarizes the Environmental Stewardship budget request. Exhibits II-3 and IV-1 provide additional details.

Summary Budget Request

Table 1. Total Environmental Stewardship Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Environmental Stewardship (FY 2007)			
Reduce Exposure to Aircraft Noise			
Operations	5,138		
F&E	31,215		
RE&D	16,633		
AIP	392,156		
Subtotal	**445,143**		
FTE	**182**		
Environmental Stewardship (FY 2008 & FY 2009)			
Reduce Exposure to Aircraft Noise			
Operations		16,745	
F&E		50	
Safety & Operations			17,850
RE&D		15,994	32,016
AIP		210,498	226,980
Subtotal		**243,288**	**276,846**
FTE		**160**	**162**
Streamline the Completion of Environmental Reviews			
AIP		34,874	36,776
Subtotal		**34,874**	**36,776**
FTE		**46**	**46**
Increase the Percentage of Facilities Categorized as No Further Remedial Action Planned			
Operations		9,583	
F&E		29,448	
Safety & Operations			662
Air Traffic Organization			38,162
Subtotal		**39,031**	**38,823**
FTE		**34**	**74**
Environmental Stewardship $ Total	**445,143**	**317,193**	**352,446**
Environmental Stewardship FTE Total	**182**	**240**	**282**

This request seeks a total of $352.4 million to support FAA's contributions to DOT's Environmental Stewardship strategic goal, and the performance measures for reduced aviation noise exposure, DOT facilities cleanup and streamlined environmental reviews. Funding will also support the FAA Flight Plan performance target to improve aviation fuel efficiency.

Table 2. Discretionary Increase Requests

	($000)	FTE
SAFETY AND OPERATIONS		
Policy, Planning and Environment		
Integration of Environmental Performance into NextGen	521	0.0
National Resource Specialist for Parks	183	0.0
SAFETY AND OPERATIONS TOTAL	***704***	***0.0***
GRANTS-IN-AID FOR AIRPORTS (AIP)		
Expanded Environmental Research in ACRP	5,000	0.0
Environmental Review Evaluation	100	0.0
AIP TOTAL	***5,100***	***0.0***
TOTAL	***5,804***	***0.0***

Performance Measure: Reduce the Number of People Exposed to Significant Aircraft Noise

This funding request for $276.8 million will contribute to DOT's Environmental Stewardship strategic goal and to the Reduced Aircraft Noise Exposure performance measure. The performance history and targets are displayed in Table 3. Table 4 summarizes the budget resources requested.

Table 3. Cumulative percent reduction in number of people exposed to significant aircraft noise levels

	2005	2006	2007[1]	2008[1]	2009
Target:	- 3.0%	- 4.0%	- 8.0%	- 12.0%	- 16.0%
Actual:	- 29.0%[2]	- 26.0%[3]	- 27.0%[4]		

[1] Targets revised in FY 2007 to reflect changes in short-term growth projections.
[2] Actual Result revised from projection.
[3] Revised in Spring 2007.
[4] Projection from trends, to be revised in May 2008.

Table 4. Budget Request for Reducing Exposure to Aircraft Noise

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Environmental Stewardship			
Reduce Exposure to Aircraft Noise (FY 2008 & FY 2009)			
Operations		16,745	
F&E		50	
Safety & Operations			17,850
RE&D		15,994	32,016
AIP		210,498	226,980
Total		**243,288**	**276,846**
FTE		**160**	**162**

Performance Overview

Public concern and sensitivity to aircraft noise around airports is high. In recent years, noise complaints have increased even while quieter aircraft technology has been introduced. Aircraft noise is an undesired by-product of mobility, and the government acts to reduce the public's exposure to unreasonable noise levels.

The phase-out of noisier commercial aircraft was principally responsible for the reduction in the number of people exposed to high levels of aircraft noise between 1990 and 2000, although these efforts were complemented by noise compatibility projects funded under AIP. While the new international aircraft noise standard now being established will encourage the introduction of quieter aircraft into operations, AIP-funded noise compatibility projects will be a principal means employed by the government to mitigate significant aircraft noise exposure in the near future.

These projects identify airport-specific noise impacted areas and noise mitigation measures. Mitigation measures normally include residential and educational building soundproofing, land-use planning strategies and relocation of residences and buildings used primarily for educational or medical purposes. In addition, passage of FAA's reauthorization proposal, the NextGen Financing Reform Act of 2007, will further advance research to develop additional approaches to noise mitigation such as new air traffic procedures that take advantage of the advanced avionics capabilities of modern aircraft to reduce noise in both approach and departure procedures.

A significant reduction in noise exposure began in 2002, driven by air carrier fleet and operational changes that took place in the aftermath of September 11. It was expected that a return to more typical fleet compositions and a return to air traffic growth would narrow the positive gap. However, the return of fleet composition and air traffic to pre-September 11 levels has not occurred at the pace expected. Consequently, the actual number of residents exposed to significant noise remains well below the current target.

The continued gap between actual and target noise exposure initiated a re-examination of the current noise exposure target and an examination of the long-term trends in noise exposure. The earliest noise exposure level estimate dates back to 1975. At that point about 7 million persons where exposed to 65 DNL. Since then, the rate of decline in the number of residents exposed to significant aircraft noise has fluctuated due to various factors affecting air traffic and fleet composition. On average, the number of residents exposed to significant noise has declined by at least five percent per year since 1975.

In assessing the target going forward, several factors were considered. There have been two phase-outs of aircraft in the last 15 years – the legally required phase-out of Stage 2 aircraft by 2000 and the market-driven retirement of older, less fuel efficient Stage 3 aircraft after September 11. This has pushed forward lower levels of noise reduction earlier than projected, but such reductions are unlikely to be repeated unless either a government-mandated phase-out is imposed in the next few years, or further market-driven retirements occur. The imposition of mandated phase-outs is not currently under consideration.

Initial analysis by JPDO of environmental trends based on expansion of the NAS indicates that noise exposure is likely to move upwards over the next 10 years as traffic growth continues, even taking into account forecasted fleet changes and some limited implementation of new air traffic procedures. This analysis shows it could prove problematic to even meet the one percent reduction goal, much less the historic five percent rate, over time. At this point it is unclear whether the Administration's proposal to provide authority and funding to FAA to accelerate the implementation of new air traffic procedures and new aircraft emissions and noise technology will be approved. Without these programs, there is little prospect for the type of fleet and performance change required to meet either the current target or historic experience.

Finally, as FAA takes a more integrated approach to environmental regulation – assessing the relative cost-benefit tradeoffs of reductions in noise, local air quality, and greenhouse gas emissions – it remains unclear at this point what the relative importance of noise vs. emissions will be in the future. While aviation noise continues to be the primary environmental focus of airport communities, air quality and climate impacts are becoming increasing concerns.

Stricter ozone and particulate matter standards under the Clean Air Act have resulted in local authorities and environmental groups calling for action from federal agencies and air carriers to mitigate nitrogen dioxide emissions (that contribute to ozone production) and other pollutants. If state and local initiatives to mitigate pollutant emissions are taken, particularly in areas that are not in attainment, the NAS could face a proliferation of such air quality schemes reminiscent of the local noise measures that undermined its efficiency in the late 1980s. Local worries about the environmental impact of these emissions can impede capacity growth. Airports located in air quality nonattainment or maintenance areas increasingly find that air emissions add to the complexity, length, and uncertainty of the environmental review and approval of expansion projects.

Added to worries about regional and local air quality, concern is growing about the impact of aviation emissions on global climate change. Taken as a whole, aviation emissions could succeed noise as the major impediment to aviation's future growth and development.

Having accounted for all these factors, FAA will increase its noise exposure target beginning in FY 2007 from a one percent to a four percent reduction per year in the number of people exposed to significant noise. Performance will continue to be measured using a three-year moving average from the base average years, 2000 to 2002. This is closer to the historical rate of change and incorporates the experience of the last few years. The FAA will continue to monitor the trends in noise exposure and will review this target after its reauthorization proposal has been acted on and its work on environmental trends in the NextGen system has been further refined.

AIP and RE&D investment must be continued in FY 2009 if these improvements are to be sustained. These resources are essential if FAA is to further understand and reduce noise exposure. The agency will continue to provide AIP funding for soundproofing of residences and buildings intended primarily for educational or medical purposes in noise impacted areas surrounding airports, as well as for land acquisition and relocation. The FAA must also continue RE&D investment to refine assessment methodologies and develop new metrics and better procedures for dealing with environmental issues. The FAA will also initiate new efforts to develop and mature technology and operational approaches to mitigate aviation's environmental impact at the source. Finally, the pilot program to fund low emission projects under the AIP noise set-aside has evolved into a permanent national program, the Voluntary Airport Low Emission Program (VALE) for airport low emission technologies. As a result, both noise and emissions projects are eligible for AIP funding.

To ensure continued progress, FAA will:

- Continue to provide AIP funding for Noise Compatibility Program recommendations such as the soundproofing, the purchase of buffer zones around airports, residential acquisition/relocation, and land use planning;
- Continue to develop noise and emissions research and assessment technologies;
- Increase its efforts to leverage greater academic, industry, and research organization resources and efforts through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence, and
- Implement operational flight control measures to help reduce exposure to noise.

Further, passage of the NextGen reauthorization proposal and associated RE&D funding will expand FAA's environmental research programs and allow the agency to:

- Implement a research consortium to accelerate the maturing of lower energy, emissions, and noise technology and alternative fuels for aircraft;
- Identify and demonstrate how advances in Communication, Navigation and Surveillance technology can be leveraged to optimize airport and airspace throughput and reduce noise, fuel burn and emissions;[1]
- Determine the appropriate metrics to manage aviation environmental impacts that are needed to allow a three-fold growth in capacity;
- Reduce uncertainties in climate impact estimated levels that will enable establishment of appropriate mitigation actions;
- Determine and develop NAS infrastructure adaptation necessary to adopt new environmental technologies and alternative aviation fuels, and[1]
- Develop airspace analytical tools for aviation noise and emissions impacts, and analysis of costs/benefits of mitigation techniques.[1]

Environmental Research and Airport Development

The Airport Cooperative Research Program (ACRP) within the Office of Airports (ARP) conducts airport-related research, including research on environmental issues. The ACRP was authorized at $10 million per year in Vision 100. The agency works with aviation associations and the Transportation Research Board to implement the program. For FY 2009, the agency's reauthorization proposal recommends adding $5 million to fund the expansion of ACRP's environmental research studies. Environmental issues impact every aspect of airport operations, and additional research is needed in order to plan for, study, and mitigate the impact future environmental requirements will place on airports.

[1] These efforts are subcomponents of the $41.4 million NextGen System Development budget line item in ATO Capital, all the resources for which are attributed to the Safety goal.

Budget Request Justification

Setting Standards and Providing Oversight
(Safety and Operations, Office of Policy, Planning and Environment, $5.5 million, 36 FTE)

The FAA develops national aviation environmental and energy policy. This policy addresses the full spectrum of environmental aspects of FAA actions, including aircraft noise and exhaust emissions and energy conservation. The agency develops regulations and standards as appropriate to meet statutory requirements or DOT and agency policy. The FAA also collaborates with other federal agencies to develop policies and coordinates community, state, local, and general public participation in the resolution of environmental and energy matters.

In FY 2009, the agency will work with local communities and the international aviation community toward balanced approaches that reduce aviation noise and emissions. The agency will ensure timely review of planning and environmental efforts at all thirty-five Operational Evolution Partnership (OEP) airports examining new runway and airfield configurations, and will develop best practices for managing relations with the airport and aviation industry and for informing the public about aviation and the environment. In addition, FAA will continue to ensure that international environmental standards adopted by the International Civil Aviation Organization are globally and uniformly applied, reflect the best available technology, provide real environmental benefits, and are economically sound. Finally, FAA has taken leadership of environmental strategy development and implementation for the NextGen Plan.

Discretionary Increase Request: Integration of Environmental Performance into NextGen
(Safety and Operations, Office of Policy, Planning and Environment, $521,000, 0.0 FTE)

AEP will use these funds to support ATO in managing the effective integration of environmental performance into the NextGen agile air traffic system. This will mitigate and manage the environmental impacts in the terminal and en route airspace environment, which, in turn, will enable removal or reduction of environmental constraints on NextGen capacity growth. There are significant NextGen-driven environmental imperatives. It has become apparent that environmental constraints are likely to impede aviation growth sooner than technical, operational, fiscal, or other factors. Airspace redesign is increasingly limited by environmental factors.

Discretionary Increase Request: National Resource Funding for Parks
(Safety and Operations, Office of Policy, Planning and Environment, $183,000, 0.0 FTE)

The FAA has two statutorily mandated requirements in this area. The National Parks Overflights Act of 1987 requires FAA and the National Parks Service (NPS) to take joint actions to establish an overflights plan to make Grand Canyon National Park quieter. It involves unprecedented policy issues and is technically challenging, requiring new noise methodologies. The National Parks Air Tour Management Act of 2000 requires FAA and NPS to establish air tour management plans for every national park that has commercial air tours. This Act intends to ensure that commercial air tours do not significantly impact national parks. At issue are questions of science and policy.

AEP will use these funds to strengthen the management of FAA's engagement under these Acts. The increase will allow the agency to examine questions around policy development and resolution of scientific and technical issues more closely. Environmental methodologies and determinations developed by FAA under its statutory authority will also impact FAA actions on airport development and airspace redesign, where national parks are overflown. Because of the extent of national parks, particularly in the western United States, there are significant impacts for aviation. Airspace restrictions, due to concern about environmental impacts on national parks, would have widespread effects. Airlines and major airports are heavily involved in national park issues.

Developing Methodologies, Models, Metrics and Tools to Assess and Mitigate Environmental Impacts (Research, Engineering & Development, $15.6 million)

Aerospace systems have historically been designed – and regulations for their certification and use have been written – as though aviation noise and various emissions had nothing to do with one another. However, aviation noise and emissions are highly interdependent phenomena. Future environmentally responsible aviation policy and rulemaking must be based on a new, interdisciplinary approach that is as affordable as it is effective.

Existing analytical tools are inadequate to assess interdependencies between noise and emissions or analyze the cost/benefit of proposed actions. Accordingly, in FY 2009 FAA will continue to develop a robust new comprehensive framework of aviation environmental analytical tools and methodologies to perform these functions. The long-term aim is to provide a seamless, comprehensive set of tools to address all aspects of noise and emissions. The elements of this framework include:

- Environmental Design Space (EDS) capability to provide integrated analysis of noise and emissions at the aircraft level;
- Aviation Environmental Design Tool (AEDT) capability to generate interrelationships between noise and emissions and among emissions at the local and global levels, and
- Aviation Portfolio Management Tool (APMT) capability to provide the common, transparent cost/benefit methodology needed to optimize national aviation policy in harmony with environmental policy.

The FAA's development of these tools will allow:

- Government agencies to understand how proposed actions and policy decisions affect aviation noise and emissions;
- Industry to understand how operational decisions affect proposed projects, and
- The public to understand how actions by government and industry affect aviation noise and emissions.

The FAA will also continue activities through the PARTNER Center of Excellence to identify and better measure the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems. Further, the agency will continue its efforts to maintain the currency of regulation and technical guidance materials concerning aircraft noise and engine exhaust emissions certification requirements.

Programs Advancing NextGen Environmental Research

Continuous Low Energy, Emissions, and Noise (CLEEN) Technologies and Metrics and Impacts for NextGen (Research, Engineering & Development, $16.1 million)

Anticipated increases in air transportation demand will place significant environmental pressures on various segments of the NextGen system. The primary environmental constraints on the capacity and flexibility of NextGen could be community noise, local air quality, global climate impacts, and energy production and consumption. Environmental issues have impacted airport and airspace growth over the past decade. To ensure that environmental impacts do not constrain NextGen's growth, FAA must accelerate the introduction of quieter and cleaner technology in our fleets.

Ninety percent of the environmental improvements (noise and emissions reductions) in the aviation system in the last 30 years have come from improved technology. Without a pipeline of near term (5-10 years) technology improvements, we cannot achieve the absolute reduction of significant noise and air quality impacts that we believe are necessary to enable NextGen growth. Robust research and development is needed to enable technology solutions to manage and mitigate environmental constraints. The goal is to have a fleet of quieter, cleaner aircraft that operate more efficiently with less energy.

In FY 2009, FAA will initiate the Continuous Low Emissions, Energy and Noise (CLEEN) Technologies program to help achieve the NextGen goal of increasing capacity threefold while reducing significant environmental impacts in absolute terms. The program is focused on reducing current levels of aircraft noise and greenhouse gas emissions, improving local air quality, and advancing alternative fuels for aviation use.

The NextGen environmental goal is to reduce significant health and welfare impacts of aviation community noise and local air quality in absolute terms, notwithstanding growth. Although there is no quantitative goal for greenhouse gas emissions, the vision does call for reducing uncertainties associated with these emissions to levels that enable appropriate action. Accordingly there is a need to develop a robust science-based understanding of impacts of aviation emissions on earth's climate change and translate these impacts into improved metrics that can be used to better assess and mitigate aviation's contribution.

In FY 2009, FAA will advance efforts to establish and implement metrics to better assess climate impacts from commercial aircraft operations.

Advanced Noise and Emissions Reduction and Validation Modeling

(ATO, Capital Programs, $7.0 million)[2]

The Advanced Noise and Emissions Reduction and Validation Modeling programs will help achieve the NextGen goal of increasing capacity threefold while reducing significant environmental impacts in absolute terms. The program will focus on developing operational procedures to enable absolute reduction of significant aviation environmental impacts, and on establishing their costs and benefits. The program will also advance the NAS infrastructure adaptation required to adopt CLEEN technologies and alternative fuels.

The Advanced Modeling program will also provide sufficient knowledge to enable the development of approaches to mitigating aviation's effects on the environment which will be critical to the enhancement of capacity. To further these goals, the research planned for FY 2009 will:

- Evaluate the potential for NAS environmental benefits of new aircraft technologies and alternative fuels;
- Initiate a comprehensive analysis of the impact on the NAS of new aircraft types [e.g. aircraft featuring Continuous Low Emissions, Energy, and Noise (CLEEN) technologies, Very Light Jet (VLJ), Unmanned Aerial Vehicle (UAV), Supersonic Business Jet (SSBJ)];
- Assess approaches to optimize environmental performance;
- Initiate efforts to identify any NAS adaptation required to adopt new CLEEN technologies and alternative fuels;
- Explore advanced algorithms, automated systems and approaches for en route, surface, and terminal operations, and automated systems to optimize the reduction of significant climate, air quality and aircraft noise impacts;
- Define existing and planned environmental mitigation methods to counter NAS constraints of today and for NextGen;
- Initiate development of the Aviation Environmental Design Tool (AEDT) regional version to enable evaluation of airspace environmental impacts and support EMSs, and
- Apply metrics for health and human welfare and climate impacts to develop a sample NAS EMS and define benefits of mitigation actions.

Supporting Noise Mitigation Efforts

(Grants-in-Aid for Airports, Office of Airports, $226.9 million, 36 FTE)

Much of the unwelcome noise generated by commercial aircraft is produced during takeoff and landing. Consequently, people living and working in proximity to major airports are exposed to the highest levels. Airports built decades ago in outlying rural areas now find themselves surrounded by suburban development. Further reduction in the exposure to excessive aircraft noise levels therefore requires significant investments in soundproofing of residences, businesses, and public facilities.

ARP assesses the environmental impacts of proposed airport projects submitted for AIP funding or other approval, and provides technical and funding support to mitigate impacts. Noise is typically the impact of greatest concern, and the AIP and Passenger Facility Charge (PFC) programs provide funding to assist in abating the impacts of aircraft noise on individuals located around the airport. AIP-funded Noise Compatibility Program Studies and National Environmental Policy Act documents identify recommendations for mitigation such as the purchase and relocation of residences and businesses, soundproofing of residences and buildings used for educational or medical purposes, and the installation of noise barriers or monitoring equipment.

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[2] While these two programs support Environmental Stewardship, they are subcomponents of the $41.4 million NextGen System Development budget line item in ATO Capital, all the resources for which are attributed to the Safety goal. As a result, the $7 million budgeted for the programs is not included in Budget Tables one and four above. The funding is included in the total ATO Capital Programs request supporting the Commercial Air Carrier Fatal Accident Rate under Safety.

Discretionary Increase Request: Expanded Environmental Research in the Airport Cooperative Research Program (ACRP)
(Grants-in-Aid for Airports, Office of Airports, $5.0 million, 0 FTE)

At the beginning of FY 2008, more than 70 ACRP research studies were underway. In FY 2009, FAA is requesting an increase for ACRP of $5.0 million to expand this very successful research program from $10.0 to $15.0 million. Of this total ACRP request the agency intends to allocate up to $5.0 million for airport related environmental research. Potential research areas include, but are not limited to, minimizing the impact of deicing and anti-icing fluids through new formulations and improved runoff management; airport-related particulate matter and hazardous air pollutants emissions; aircraft noise impacts on the local community; climate change implications from airport development and operations; and the evaluation of alternative aviation fuels.

To supplement this increase request, a marginal cost analysis has been prepared which highlights the benefits FAA expects to realize through expanding its environmental research program. Please see the tables at the end of this chapter.

Performance Measure: Streamlined Environmental Review of Transportation Infrastructure Projects

This request for $36.8 million in AIP funding will contribute to FAA's support of DOT's initiative to streamline Environmental Impact Statements (EISs) or Environmental Assessments (EAs) of transportation infrastructure projects, specifically through reduction of the time to complete reviews for airport projects funded by AIP grants. In FY 2006, ARP began developing criteria to measure the effectiveness and timeliness of reviews for airport development projects. The FAA has created a new tracking database that includes EA/EIS data extending back to FY 2002. The agency will begin to report on the status of EAs/EISs in FY 2008. These performance targets support the achievement of DOT's strategic outcome of increased project review efficiency. Performance history and targets are displayed in Tables 5 and 6. Table 7 summarizes the budget resources requested.

Table 5. Percentage reduction in median time (months) to complete Environmental Assessments

	2005	2006	2007	2008	2009
Target:	N/A	N/A	N/A	12	12
Actual:	N/A	N/A	N/A		

NOTE: This is a new DOT-level performance target, to which FAA and other modal administrations will contribute. For FY 2008 and 2009, the department has set provisional targets that are subject to revision.

Table 6. Percentage reduction in median time (months) to complete Environmental Impact Statements

	2005	2006	2007	2008	2009
Target:	N/A	N/A	N/A	30	30
Actual:	N/A	N/A	N/A		

NOTE: This is a new DOT-level performance target, to which FAA and other modal administrations will contribute. For FY 2008 and 2009, the department has set provisional targets that are subject to revision.

Table 7. Budget Request for Streamlining Environmental Reviews

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Environmental Stewardship			
Streamline the Completion of Environmental Reviews (FY 2008 & FY 2009)			
AIP		34,874	36,776
Total		**34,874**	**36,776**
FTE		**46**	**46**

Performance Overview

This request will enable FAA to implement environmental streamlining activities that encourage federal and state agencies to establish and meet timelines for airport projects that require an EIS or EA. These initiatives will support compliance with Executive Order (E.O.) 13274: "Environmental Stewardship and Transportation Infrastructure Project Reviews" and Vision 100: The Century of Aviation Reauthorization Act by overcoming obstacles early in the environmental review process. It will also promote widespread implementation of environmental stewardship, and promote better integration of the planning and environmental review processes, leading to improved transportation decision-making.

The FAA's earliest initiatives to shorten the review of airport projects were outlined in the May 2001 report to Congress on the Environmental Review of Airport Development Projects. The FAA is actively implementing the provisions of E.O. 13274 and Vision 100 legislation, along with other administrative provisions, in an effort to improve the efficiency of its environmental reviews. These provisions have resulted in the devotion of more environmental staff resources; utilization of best practices in a team approach to critical airport development projects; early initiation of environmental considerations in the planning process; streamlining of documentation requirements; improved and expedited interagency coordination through concurrent reviews, approvals, and permitting; and improved accountability for schedules and deadlines. Recommendations in FAA's NextGen reauthorization proposal will also support program efforts in this area.

The requirements of the National Environmental Policy Act (NEPA) apply to a wide range of FAA actions, including environmental reviews required for the agency's capital improvement projects as well as those airport projects tracked by this performance measure. NEPA requires federal agencies to carefully consider and document the potential environmental impacts of proposed actions, in order to ensure informed agency decision-making. To conform to regulations issued by the President's Council on Environmental Quality (CEQ), FAA has issued agency-specific NEPA compliance procedures in revised Orders 1050.1E - Environmental Impacts: Policies and Procedures and 5050.4B – NEPA Implementing Instructions for Airport Actions. These revised Orders provide updated procedures that tailor the level of review to the true potential environmental effects of the project, thus reducing the burden on FAA while assuring environmental protection. The procedures allow the agency to categorically exclude many projects from detailed reviews, based on agency experience with similar projects. Projects not excluded from review may require extensive documentation, with significant associated time and monetary costs. To further reduce costs and documentation processing time, FAA will:

- Continue to pursue new categories of actions for exclusion from NEPA analysis;
- Track preparation time and costs for environmental assessments and environmental impact statements using an expanded agency tracking database;
- Promote increased dissemination of environmental documents through the electronic media;
- Seek additional methods and opportunities for making the FAA environmental review process more efficient and to add to our best practices guidance, and
- Undertake additional outreach and training of airport sponsors, consultants, and FAA personnel on NEPA guidance and environmental analysis and processing requirements.

E.O. 13423 – "Enhancing Government Performance Through Effective Environmental, Energy, and Fleet Management" – requires that executive agencies at appropriate organizational levels provide a formal structure, or Environmental Management System (EMS) for managing an organization's activities that affect the environmnent. The structure of an EMS allows an organization to continually improve its environmental performance. The FAA has implemented EMSs for each of its major organizations.

The Administration recognizes and encourages agencies to take advantage of the complementary activities of the EMS and NEPA environmental review processes. For example, an EMS can include extensive monitoring of actions taken by an organization that could significantly impact the environment. The NEPA review process also requires monitoring of major federal actions affecting the environment but does not provide an effective mechanism to ensure that the monitoring actually occurs. The FAA will work with the Council on Environmental Quality (CEQ) to prepare guidance that identifies opportunities for using EMS monitoring to enhance NEPA process efficiency and effectiveness. In addition, FAA will participate in CEQ's efforts to identify and demonstrate the advantages of using complementary EMS and NEPA processes to streamline the environmental review process.

Budget Request Justification

Setting Standards and Providing Oversight
(Grants-in-Aid for Airports, Office of Airports, $36.8 million, 46 FTE)

ARP strives to reduce undue delays in the planning of airport projects while maintaining the integrity of the environmental review process and complying with all environmental protection requirements. In FY 2009, FAA will continue to implement environmental streamlining provisions for capacity enhancement projects at congested airports as specified by Congress in Vision 100 legislation. Commissioning of new commercial runways, runway extensions and airport reconfigurations is dependent on the timely completion of environmental reviews. FAA staff will also continue to work towards the streamlining of environmental reviews of critical aviation projects designated under E.O. 13274.

Discretionary Increase Request: Environmental Evaluation Review
(Grants-in-Aid for Airports, Office of Airports, $100,000, 0 FTE)

One-time funding for an Environmental Evaluation Review is being requested which will be used to provide a program evaluation of the ARP Environmental Streamlining process as mandated in the Government Performance and Results Act. This evaluation will assess the environmental process and provide an understanding of our achievements to date and how we might achieve more effective results or address future conditions. These results are also important in identifying human resources, programs, capital needs, IT and other resources needed to achieve future outcomes for environmental stewardship and streamlining the environmental review process. This evaluation will provide insight on aviation infrastructure improvements, while enhancing the natural and human environment.

Performance Measure: Increase Percentage of DOT facilities Categorized as No Further Remedial Action Planned Under the Superfund Amendments and Reauthorization Act

This request for $38.8 million in ATO funding contributes to the DOT Environmental Stewardship strategic goal and to the DOT Facilities Cleanup performance measure. Key activities include remediation of contamination at sites owned by FAA, the upgrading and lifecycle management of fuel storage tanks (a significant source of contamination), and a variety of actions that support compliance with environmental and occupational safety and health regulations. The performance history and targets are displayed in Table 8. Table 9 summarizes the budget resources requested.

Table 8. Percentage of DOT facilities categorized as No Further Remedial Action Planned

	2005	2006	2007	2008	2009
Target:	93%	93%	93%	93%	93%
Actual:	92%	92%	93%	N/A	N/A

NOTE: This is a DOT-level performance target, to which FAA and other modal administrations contribute. The results presented here are for DOT as a whole.

Table 9. Budget Request for DOT Facility Cleanup

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Environmental Stewardship			
Increase Facilities Categorized as No Further Remedial Action Planned (FY 2008 & FY 2009)			
Operations		9,583	
F&E		29,448	
Safety & Operations			662
Air Traffic Organization			38,162
Total		**39,031**	**38,823**
FTE		**34**	**74**

Performance Overview

The mission of FAA's Environmental Cleanup Program is to identify, characterize and remediate contamination resulting from past disposal activities and hazardous materials spills, and to comply with federal, state and local cleanup regulations. The agency has 204 contaminated locations requiring cleanup, and is responsible for 70 of the 73 DOT facilities on the Environmental Protection Agency's (EPA) Federal Hazardous Waste Compliance Docket. The FAA has worked diligently to conduct site assessment, and to take remedial and closure actions for these facilities. On August 22, 2007, the EPA updated the Hazardous Waste Compliance Docket and listed the Jackson Homer Beacon Sites as having attained No Further Remedial Action Planned (NFRAP) status. With the listing of this site, FAA has attained NFRAP closure documentation for 65 of the 70 sites listed on the docket (93 percent). The FAA is now responsible for five sites that have not achieved NFRAP:

1) Ronald Reagan National Airport (DCA);
2) Kirksville Air Route Surveillance Radar (ARSR), AFS F-64 (Kirksville AFS);
3) Mike Monroney Aeronautical Center (MMAC);
4) William J. Hughes Technical Center (ACT), and
5) Omaha Ex AF Station Z-71 (Omaha).

To ensure that site contamination will be properly removed and that NFRAP status will be achieved, FAA's Environmental and Occupational Safety and Health Services Group provides funding and oversight support, and has initiated Environmental Cleanup Program tasks focused on these sites. It has short-term actions (1-5 years) to achieve NFRAP status for the Kirksville AFS, and the Omaha Ex AF Station, while longer-term actions (5-20 years) will be necessary to achieve NFRAP status for the MMAC, DCA and ACT.

Budget Request Justification

ATO Capital Programs Supporting FAA's Environmental Stewardship Performance Goals

Fuel Storage Tank Replacement and Monitoring (ATO, Capital Programs, $6.1 million): Under current life cycle management guidelines outlined in draft order 1050.16a, the 3,005 FAA tank systems upgraded in the mid 1980s to meet regulatory changes, have reached the end of their life cycles and must be replaced. The original estimated replacement cost was $60,000 per tank, not including the replacement of any other tank system components such as piping or monitors, for 2,741 tanks. This estimate has been revised to $80,000 per tank to incorporate new regulatory requirements, changes in NAS operations, and forecasts of NAS system installations and life cycle replacement. The number of tanks was revised to include day tanks at the Air Route Traffic Control Centers (ARTCC) under the ARTCC Fuel Storage Tank Initiative Program. Additionally, funding is required to meet new State of California fuel storage tank regulations. These requirements are being incorporated into the baseline cost projections.

An additional cost component of the fuel storage tank program is continued support of the ARTCC lifecycle compliance initiative under which pipelines are being redesigned to achieve compliance with the EPA underground storage tank regulations. In addition, FAA must address its fuel storage tank liability at formerly owned sites. Approximately 90 percent of former fuel storage tanks have leaked in the past. If these sites are not cleaned up, fuel will contaminate drinking water, destroy wetlands, and damage the environment.

FY 2009 funding will be used to continue life cycle maintenance of 3,005 fuel storage tanks to support mission-critical activities, to repair emergency systems affected by unforeseen integrity losses, to meet regulatory requirement for state tank registration and licensing, and to comply with environmental requirements.

Hazardous Materials Management (ATO, Capital Programs, $18.0 million)

The FAA is responsible for cleanup of environmental contamination at sites that it has owned or operated. The agency has identified contamination at 204 locations nationwide, including 65 sites that are on the Federal Hazardous Waste Compliance Docket, published by EPA. Site investigations revealed that toxic contamination resulted from a variety of hazardous substances, including cleaning solvents, degreasing agents, pesticides, asbestos, polychlorinated biphenyls (PCBs), and heavy metals.

The FAA has mandatory cleanup schedules in place as part of enforcement agreements with regulatory agencies. These agreements require FAA to remediate contaminated soil and groundwater. Extensive contamination at the Technical Center prompted EPA to place the site on its National Priorities List, as one of the Nation's most environmentally dangerous sites. Other contaminated sites and the requirements of the Hazardous Materials Management program account for a large portion of unfunded liabilities documented in FAA's Financial Statement. Required cleanups at these and other FAA sites have cost over $100 million in the past 10 years. Projected cleanup costs to closure are $330 million (FY 2007 dollars).

The agency developed the Hazardous Materials Management program to manage and remediate contaminated sites. To achieve compliance with all federal, state, and local environmental cleanup statutes, including the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, FAA must continue mandated program activities. The FAA is performing assessment, remediation, and closure activities as aggressively as funding will allow. FY 2009 funding is requested to conduct contaminant investigations, implement site remedial projects, complete regulatory closures, and to continue work towards attaining NFRAP closure documentation for FAA sites that remain on EPA's Federal Hazardous Waste Compliance Docket.

NAS Facilities OSHA and Environmental Standards Compliance (ATO, Capital Programs, $26.0 million)

Environmental and occupational safety and health (EOSH) concerns at FAA facilities have resulted in regulatory actions against FAA and disruptions to NAS operations. For example, employees registered numerous complaints regarding indoor air quality at the Jacksonville ARTCC with the Centers for Disease Control in January 2005. The majority of the complaints were asbestos and mold related, requiring initiation of an aggressive cleanup program. In addition, there are approximately twenty EOSH events each month that disrupt NAS operations. One example was the fire at the Miami Center in August 2004. Personnel were rapidly evacuated and the fire was quickly extinguished. Fortunately, there were only eight departure delays. The Administrator signed an agreement with OSHA to upgrade nearly 400 control towers to meet fire life safety standards.

In FY 2009, FAA will continue fire life safety upgrades at air traffic control towers (ATCTs) to comply with OSHA regulations; develop fire prevention plans and model specifications; and train tower occupants, resident engineers, maintenance technicians, and employees on safe practices in high-risk areas. Specific elements include:

- Retrofit nearly 400 towers to provide earlier fire detection and notification and to protect single egress paths;
- Initiate 15 fire life safety designs;
- Initiate 25 fire life safety construction projects, and
- Certify 15 completed fire life safety ATCT upgrade projects as compliant with OSHA requirements.

Environmental and Occupational Safety and Health Services (ATO, Salaries & Expenses, $9.2 million)

The continued viability and effectiveness of the ATO Capital programs described above requires a high level of expertise maintained across a broad spectrum of complex environmental, health, and safety disciplines and associated regulations. ATO Salaries and Expense funds are required to contract with subject matter experts, provide ongoing technical training for FAA employees, and provide required equipment and materials, such as personal protective equipment necessary for the safety of employees.

Marginal Cost of Performance for Grants-in-Aid for Airports Discretionary Increase Request

Expanded Environmental Research in Airport Cooperative Research Program (ACRP)

FY 2008 REQUESTED PROGRAM CHANGES					
AIP Funding Supporting Environmental Stewardship					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$258,756	82.0	$5,000	0.0	$263,756	82.0

The ACRP is uniquely qualified to carry out applied airport environmental research. Increased funding will significantly increase the ability of airport operators to cope with future environmental issues. During the research topic selection process in FY 2008 more than 140 research topics will be submitted for consideration for funding by the ACRP Board of Governors. The requested expansion of ACRP's environmental program will allow FAA to initiate approximately 50 percent more new studies in FY 2009.

Marginal Cost

Airport Cooperative Research Program (ACRP)					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
10,000	1.0	5,000	0.0	15,000	1.0

Output Measures	Without Increase	With Increase	Change
Increase in airport research studies	25 new studies in FY 2009	13 additional studies	A 50% increase in the number of research studies that can be funded

Metric for ACRP: Each ACRP study costs about $300,000. The addition of $5 million will enable the ACRP to award contracts for 13 additional airport environmental research studies – after ACRP administrative costs are deducted.

Marginal Cost of Performance
Office of Aviation Policy, Planning and Environment (AEP)
Discretionary Increase Requests

Integration of Environmental Performance into NextGen

Introduction

The Office of Policy, Planning and the Environment, specifically the Office of Environment and Energy, is charged with developing, recommending, and coordinating national policy and programs relating to aviation environmental and energy matters. It also represents the U.S. Government at various international organizations and forums in these areas. Further, it leads the environmental initiatives under the NextGen plan.

FY 2009 REQUESTED PROGRAM CHANGES					
AEP Safety and Operations Funding Supporting Environmental Stewardship					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$4,841	31.0	$704	0.0	$5,545	31.0

This funding will be used to manage numerous projects and initiatives of the environmental road map for NextGen. The increase will support effective integration with the airport, air traffic, and vehicle working groups under the Joint Planning and Development Office (JPDO), and will allow for better coordination with various FAA offices and outside stakeholders to accomplish the NextGen environmental goals. Further, these funds will help accelerate the use of new procedures, technologies, policies to reduce, mitigate, and manage the environmental impacts and the constraints they pose to the growth of the U.S. and international aviation system. Aircraft noise and emissions that impact local communities have the greatest likelihood of preventing the full realization of the capacity opportunities in the NextGen plan, especially in impeding aviation growth in the airport vicinity. In addition, with increasing concerns over climate change, aviation could face significant new challenges to manage increases in greenhouse gas emissions and to sustain aviation growth both domestically and internationally.

Marginal Cost

Integration of Environmental Performance into NextGen					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$0	0.0	$521	0.0	$521	0.0

There are two output measures identified with the increased funding level. They are –

1. The absolute reduction of significant noise, air and water quality related impacts, while pursuing sustainable growth and
2. Quieter, cleaner, and more energy-efficient aviation operations, while pursuing sustainable growth.

The marginal cost of performance is more specifically outlined in the tables which follow.

OUTCOME MEASURE: Reduction of Significant Noise, Air and Water Quality Related Impacts, While Pursuing Sustainable Growth		
Without Increase	**With Increase**	**Change**
Unable to implement new procedures, policies, and technologies to meet NextGen environmental performance requirements	Ability to limit significant airspace and airport environmental impacts to less than 200% to allow NAS growth	Avoid/mitigate 140-200% growth in aviation noise and emissions to relieve environmental constraints on NAS growth
Significant, increasing exposure to aircraft noise, especially in the airport footprint area	Reduction in exposure to significant aircraft noise (as measured by 65 DNL (Day/ Night Average) from 500,000 today to zero in 2025	Gradual, over a 15-year period, but significant noise exposure decrease
Increased exposure to health related impacts of aircraft noise emissions	Reduction in health impacts related to aircraft noise emissions	Gradual, significant health impacts reduction related to aircraft noise emissions
Increased water body contamination related to airport/aircraft deicing and stormwater runoff	Reduced water body contamination from airport/aircraft deicing and stormwater runoff to zero level by 2025	Gradual, over a 15-year period, but significant reduction in water body contamination from airport/aircraft deicing and stormwater runoff
Increasing concern over aviation's potential contribution to climate change impacts	Metrics and measures in place to reduce concerns on climate impacts	Gradual, but significant impact and perception reduction

OUTCOME MEASURE: Quieter, Cleaner, and More Energy-Efficient Aviation Operations, While Pursuing Sustainable Growth		
Without Increase	**With Increase**	**Change**
Unable to determine and guide improved technology and operational procedures to reduce aircraft noise, emissions, fuel burn at or above 2X that adversely affect capacity growth	Timely and coordinated actions to integrate state-of-the-art noise, emissions, and energy measures in the NAS	Greener NextGen reduces environmental constraints that can impede aviation growth below 2X
Lagged development of lower emissions, energy, and noise air navigation procedures	Accelerated implementation of environmentally friendly air traffic procedures	Greater utilization of environmentally compatible flight procedures in the NAS- thus reducing constraints
No further emissions or noise reductions achieved	Increased technology options for NOx reductions and noise reductions in aircraft	Lower NOx fleet operating in the NAS- thus reducing constraints
No further fuel efficiencies achieved	Increased technology options for fuel efficiency reductions in aircraft beyond forecast technology	More fuel efficient fleet operating in the NAS; reduced constraints
Delayed or no integration of alternative fuels into aviation operations	Integration of alternative fuels into aviation operations	Gradual and achievable integration of alternative fuels into aviation operations

National Resource Funding for Parks

Introduction

The National Parks Overflights Act of 1987 and the National Parks Air Tour Management Act of 2000 require FAA to take into consideration policy, technical and scientific environmental issues. All of these issues have significant impacts for aviation, in particular for airspace restrictions. This funding would be used to highlight impacts to national parks due to aircraft noise and other factors. Both the Senate and House follow aviation concerns involving national parks with interest, and are considering additional provisions in FAA's proposed reauthorization.

Marginal Cost

National Resource Specialist for Parks					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$0	0.0	$183	0.0	$183	0.0

Output Measures	Without Increase	With Increase	Change
Reduced delays in FAA environmental reviews with relevancy to national parks	One or more years added to airport and/or airspace environmental reviews affecting national parks	Streamlined environmental FAA reviews relative to national parks	Savings of 1+ years for each FAA environmental review
	Completion of zero environmental documents for air tour management plans for parks (about 100 parks need plans)	Ability to manage complex, contentious environmental issues with NPS and complete timely documents.	Gradual reduction in backlog of air tour environmental documents, bringing air tour management plans on line per legislation
Reduced litigation risk due to National Park Service opposition	High litigation risk affects one major airport and airspace proposal per year	Lowered litigation risks for all aviation proposals and a savings of 1+ FTE, which could be more productively employed on other airport capacity, airspace design and environmental reviews, reducing a current backlog	Lowered litigation risk can save 1+ FTE of equivalent effort per individual proposal
Avoidance of constraints placed on aviation due to national parks	Airports and airspace are adversely affected to avoid national park impacts [3]	National park impacts are better defined and managed to avoid adverse NAS effects	Appropriate addressing of national park impacts, with lowered level of adverse effects on the NAS

[3] Example: The effects of one proposal to establish a 42 x 52 nautical mile flight free zone over the Grand Canyon was evaluated by MITRE:

+About 180,000 flights adversely affected (including major routes serving the southern California and basin, Las Vegas, and Phoenix)

+Need for significant airspace redesign over 100,000 square miles to manage NAS consequences
+Conservative additional cost to users of $30 million/year, up to a possible $90 million/year)

SECURITY, PREPAREDNESS & RESPONSE

Introduction

While primary responsibility for transportation security is under the purview of the Transportation Security Administration (TSA)—an agency within the Department of Homeland Security—FAA continues to make important contributions to the security of the National Airspace System (NAS). The agency also provides financial and other assistance to help airports meet security requirements and ensures the security of FAA personnel, facilities, equipment, and data. The agency works closely with TSA and other federal agencies to support a safe and secure NAS.

Organization

The FAA's *Flight Plan* does not include an explicit Security goal. For purposes of this performance budget, FAA resources that support DOT-level security objective are presented.

Narrative sections contain parenthetical inserts that summarize resource requests. For Safety and Operations and Grants-in-Aid for Airports (AIP), the inserts show the total resources for that appropriation that support the Security goal. For ATO Capital, the inserts show resources for selected individual programs. Unlike Safety, the resources associated with individual Security goals are not discrete, and attempting to divide dollars among the goals would be somewhat arbitrary.

For complete disclosure of IT funding directly supporting DOT objectives, please refer to the technology investments justifications in Section 3 both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program section.

Table 1 summarizes the Security budget request. Table 2 provides the discretionary increase budget request by allocation.

Summary Budget Request

Table 1. Total Security Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Security, Preparedness, and Response			
Operations	44,778	84,222	
F & E	66,301	44,659	
Safety & Operations			125,759
Air Traffic Organization			21,137
AIP	87,695	72,522	71,678
Total	**198,775**	**201,403**	**218,574**
FTE	**358**	**452**	**450**

Table 2. Discretionary Increase Requests

	($000)	FTE
SAFETY AND OPERATIONS		
Security and Hazardous Materials		
ID Media Program	6,270	11.0
Office of Information Services		
Information Security Enhancement	7,600	0.0
SAFETY AND OPERATIONS TOTAL	***13,870***	***11.0***

Performance Overview

While FAA does not contribute directly to DOT's Security performance goal, the agency is responsible for the safe transportation of hazardous materials in air commerce. The FAA develops and implements national policy on hazardous materials through inspections, training, and outreach to those involved in the production and air transport of hazardous materials worldwide. The agency also safeguards airline passengers through investigations of violations of both hazardous material regulations and alcohol and drug-related charges against airmen. Additional efforts concentrate on securing FAA personnel and infrastructure as discussed in the following paragraphs.

Budget Request Justification

While NAS security is critical to the security of the flying public during all stages of flight, most of FAA's security-related resources focus on enhancing the security of its personnel, facilities, and assets.

Securing FAA Facilities, Personnel, Communications, and Investigations
(Safety and Operations, Security and Hazardous Materials, $71.1 million, 325 FTE)

Security and Hazardous Materials (ASH) is responsible for ensuring the integrity of individuals who work in or support the NAS, protecting FAA employees and facilities from terrorist and other criminal acts, protecting classified and sensitive unclassified information, and securing communications. One hundred percent of the following programs' requirements will be accomplished with requested workforce and funding levels.

Facilities

ASH manages FAA's Facility Security Management Program (FSMP), which ensures compliance with both Homeland Security Presidential Directive 7 (HSPD-7) and Executive Order (EO) 12958, as amended by EO 13292. This directive, dated December 17, 2003, requires all federal agencies to protect and ensure the confidentiality, integrity and availability of all critical infrastructures. The FSMP ensures the adequate protection of FAA personnel and facilities and protects operations against terrorism, vandalism, sabotage, fraud, waste, and abuse.

Discretionary Increase Request: ID Media Program
(Safety and Operations, Security and Hazardous Materials, $6.3 million, 11 FTE)

ASH is responsible for the implementation of both Homeland Security Presidential Directive 12 (HSPD-12) and the policy for a Common Identification Standard for Federal Employees and Contractors (ID Media Program) for FAA. The directive mandates the creation and use of a smartcard for use in accessing all federally controlled facilities and systems. This increase will enable ASH to add staff to standardize and automate employee and contractor identification media issuance agency-wide, and to strengthen procedures and processes with respect to identity proofing, investigation, and media issuance affecting all FAA worksites and to provide Public Key Infrastructure (PKI) and Card Management System (CMS) support for Personal Identity Verification (PIV) cards used by FAA federal and contractor workforce employees.

Communications

ASH leads the agency in protecting classified and sensitive unclassified information and securing communications. The Communications Security Program (COMSEC) provides procedures to safeguard U.S. classified cryptographic material and equipment. COMSEC supports FAA mission of maintaining a secure information environment for the many sensitive undertakings within the NAS, including the work of the Departments of Defense, State, Justice, and the National Security Agency.

ASH's National Security Coordination function provides support to sensitive and classified counter-terrorism, narcotics smuggling interdiction, law enforcement, or other national and homeland security activities involving FAA assets as required at the national level. This support involves, but is not limited to, the coordination of inter-agency, inter-departmental, and intra-departmental activities in support of aviation security, transportation security, and various national and homeland security matters.

Emergency Operations and Communications ensure crisis management support, providing FAA officials with timely, critical information to plan, direct, and control all aspects of FAA essential operations. This program manages and maintains FAA Headquarters' Continuity of Operations (COOP) facilities to provide alternate locations from which FAA essential functions and command and control may be assured. Additionally, it directs and guides the development of the FAA-wide plan to sustain essential government services during a pandemic outbreak. It also provides a Washington Operations Center Complex from which to monitor world events, collect information, make notifications, coordinate response, provide communications and support services, and act as an interagency focal point.

The Classified and Sensitive Security Information Protection Program develops standards and programmatic controls and provides agency requirements on the creation, storage, accountability, dissemination, and destruction of classified and sensitive information. This directly supports FAA's mission of protecting the security of FAA personnel and assets as well as the safety of the traveling public.

The Technical Surveillance Countermeasures Program (TSCM) supports the Classified and Sensitive Security Information Protection Program, protecting telephone systems, equipment, conference rooms, and office areas that are used for classified and sensitive information processing.

Investigations

The Law Enforcement Assistance Program supports federal, state, and local agencies by denying NAS access to any person(s) who would threaten national and homeland security by committing criminal acts. Law Enforcement Assistance provides aviation-related support to law enforcement agencies seeking criminal prosecution or conducting airborne drug interdiction. This program also involves conducting ramp inspections of aircraft at airports to look for identifying characteristics that may indicate the aircraft is used to commit criminal acts.

The FAA conducts two types of investigations for alleged violations of regulations—administrative and regulatory. Administrative investigations examine possible breaches of conduct that could impact the hiring, employment, and/or clearances of FAA employees and contractors. Included in this category are investigations of DOT/FAA Hotline complaints. Regulatory investigations of airmen are conducted for violations of federal aviation regulations. These typically involve alcohol or drug-related charges against airmen for driving under the influence or driving while intoxicated—charges which must be reported to FAA.

The FAA ensures that employment, or continued employment, of FAA personnel will promote the efficiency of services provided and safeguard national security. This program ensures that all employees, applicants and contractors have the appropriate background investigation as required by Executive, DOT and FAA Orders, receive fair and equitable treatment, and are granted national security clearances when needed. This program also serves as a framework for the adjudicative authority for all agency security clearance denials and revocations.

ATO Capital Programs Related to Security

Facility Security Risk Management (FSRM) (ATO, Capital Programs, $15.0 million)

This program contributes to the security goal by reducing the risk of intrusion or unauthorized entry into FAA facilities as required by HSPD-7. The FAA has developed a prioritized listing of FAA-staffed facilities to determine security risk management modifications, procedures, and measures. ASH conducts routine facility inspections to ensure compliance with published security directives. FY 2009 funding will be used to support accreditation of forty-nine facilities, complete construction at three Air Traffic Control Towers (ATCTs) and five Terminal Radar Approach Control facilities (TRACONs), complete access control and intrusion detection at six TRACONs and five ATCTs, and install fences at thirty ATCTs.

Securing Airport Infrastructure
(Grants-in-Aid for Airports, Office of Airports, $71.7 million, 2 FTE)

The grants issued under Grants-in-Aid for Airports (AIP) provide funding to airports for equipment and facilities used to control access to their critical operations areas. In order to receive funding, projects must be identified in TSA-approved airport security plans covered by Airport Security regulations as well as airports with security needs not covered by the regulation.

In FY 2009, ARP anticipates awarding over $70 million in security-related AIP grants. Security projects required by statute or regulation carry the highest priority for AIP funding. Projects providing for the security of passengers and other persons in the terminal, as well as the terminal buildings themselves, are treated equally with projects to secure aircraft and the aircraft operations area. The most common type of security project supported by AIP funding is the installation of access control equipment. The ARP staff manages and executes the AIP grant program, providing guidance on AIP eligibility. The ARP staff also formulates the Airports' Capital Improvement Program that identifies security needs and works closely with the respective airport owners and the TSA (local federal security directors) to identify and fund eligible security requirements and/or needs.

Emergency Airspace Operations

NAS Recovery Communications (Safety and Operations - Capital Program, Security and Hazardous Materials, $10 million)

The NAS Recovery Communications (RCOM) program provides the FAA with command and control communications (C3) capability to directly manage and operate the NAS during local, regional and national emergencies, when normal common-carrier communications are interrupted. The NAS C3 provides and enhances a variety of fixed-position, portable, and transportable C3 systems to support emergency operations. Such C3 systems include the automatic digital network/defense messaging system; secure telephone unit third generation/secure telephone equipment; secure facsimile; very high frequency (VHF)/Frequency Modulated (FM); high-frequency single-side band; satellite telephone network; wireless notification system; secure conferencing system; Emergency Operations Network (EON); classified Automated Detection and Process Terminal (ADAPT); and communications in emergency situations. These C3 systems enable FAA and other federal agencies to exchange classified and unclassified communications to promote national security. The RCOM program also supports the Washington Operations Center Complex and modernizes several FAA "continuity of operations" sites, which ensures FAA executives have command and communications during times of crisis.

The RCOM program contributes to the FAA's security goal by ensuring FAA's C3 structure can provide classified and unclassified, time-critical, public and NAS information for the FAA Administrator during emergencies. The FAA Administrator shares this information with staff members, key regional managers, the Secretary of Transportation, and other national-level executive personnel.

- Procure and install VHF/FM equipment for Chicago SMO, Pacific Northwest Mountain SMO, Gateway SMO and Memphis SMO
- Implement Phase III of Emergency Operations Network
- Procure equipment for classified portion of ADAPT
- Engineer system requirements for VHF/FM Pittsburgh SMO, Red River SMO and Gateway SMO
- Support Communication Support Team missions as required
- Continue modernizing classified facilities as required
- Continue modernization of Regional Operations Centers nationwide
- Continue work on various interagency classified projects
- Implement upgrade of the nationwide HF system
- Continued EON development
- Engineering and implementation of new CST Van

Information Security

(Safety and Operations, Office of Information Systems Security/Chief Information Officer, $49.2 million, 76 FTE)

The Office of Information Services/Chief Information Officer (AIO) is responsible for ensuring FAA's critical information systems, networks, and administrative systems are protected from cyber-terrorism and malicious activities by hackers and other unauthorized personnel as required by HSPD-7, the Computer Security Act of 1987, the Federal Information Security Management Act (FISMA) of 2002, and the OMB Circular A-130. For FAA, this means ensuring the protection of NAS Information Systems as well as other federal information systems.

In FY 2005, the Government Accountability Office (GAO) conducted an audit of cyber-security controls in the NAS, which highlighted significant shortfalls in the areas of remediation and certification/accreditation. In addition, FISMA requires the Inspector General (IG) to perform annual assessments of the agency's Information System Security program and to provide recommendations for improvement. The FAA's response to the GAO audit and implementation of the annual recommendations is ongoing. Each year the Congress provides a letter grade assessment of the cyber-security program. While DOT/FAA has improved its grade in recent years, (from a "C-" to a "B" in FY 2007) there is much more to do.

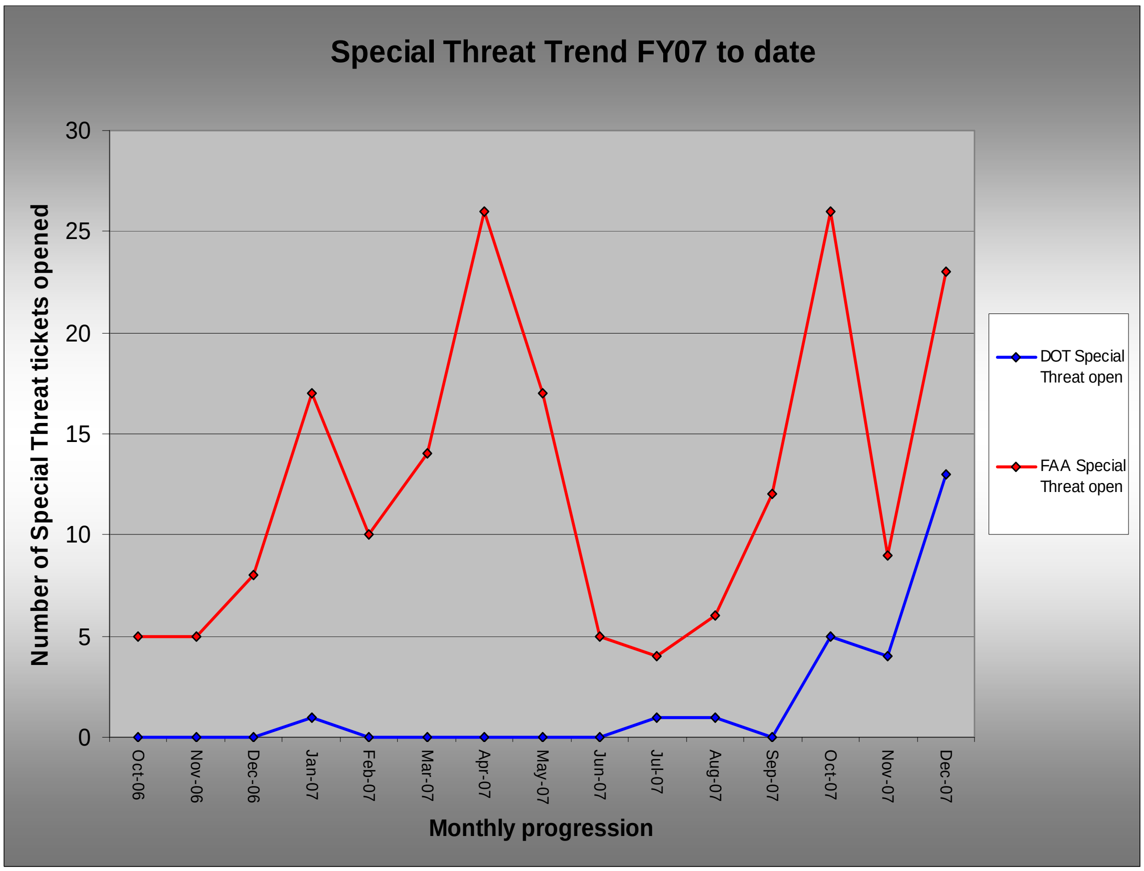
This effort contributes to the DOT and FAA Security goal by implementing a cyber-security program to adequately protect DOT systems integrated with the national critical infrastructure and by employing advancements in secure, certified, and accredited information technology and communications to improve the exchange of information. The table on the following page outlines the activities supported by funding in this area.

The Cyber Security Management Center (CSMC), the successor to the CSIRC, monitors the NAS and administrative systems to detect intrusions. In FY 2009, CSMC will continue to increase its monitoring of local area networks and desktops. In the event of an intrusion, CSMC works with the impacted organization to assess damage and restore the system. Funding is needed to add licenses, refresh software, update equipment, and provide subject matter experts to the center to keep pace with cyber terrorists and hackers who are employing increasingly sophisticated means to compromise government information systems. In addition, the Department of Transportation (DOT) will join with FAA to protect the cyber assets of the Department. DOT and FAA have agreed to merge operations and management of the DOT Transportation Cyber Incident Response Center and FAA CSIRC into the Cyber Security Management Center to protect information technology assets. This will require funding for contract support, hardware and software. A disaster recovery site for the CSMC operation has been established which requires funding for leases, utilities, hardware and software.

A new requirement which supports FAA Telecommunications Infrastructure (FTI) is the monitoring and analysis of 72 Harris sensors. This new task includes incident handling responsibility, remediation coordination, second-level analysis, signature creation, sensor tuning and ArcSight configuration. Also, CSMC will monitor new sensor systems for ERAM, Common ARTS, and NAIMES and an additional 620 sensors for wireless. Also, sensor monitoring for ATO, ARC, ARP and all en route centers has increased by 600 percent. There is an increase in SPECIAL THREAT activity affecting administration and operations networks, and ATO date exfiltration.

INFORMATION SECURITY ACTIVITIES (Safety and Operations, Office of Information Systems Security/Chief Information Officer, $49.2 million, 76 FTE)
➔ Enhancement of the NAS architecture to include cyber-security.
➔ Develop processes that would allow for faster decision loops to support near-real-time planning.
➔ Harden individual systems and network elements by completing remediation for the discovered vulnerabilities in each of the NAS and administrative systems.
➔ Continue to enhance boundary protection to NAS facilities while beginning protective methodologies down to the desktop.
➔ Improve recovery rate during times of cyber-attacks through information sharing from the Cyber Security Management Center (CSMC).
➔ Conduct systemic monitoring at the CSMC.
➔ Address the challenge of providing cyber-protection while maintaining reliability, availability and integrity through applied research and development initiatives.
➔ Provide security training and raise the security proficiency of FAA's information technology workforce.

This program directly supports the FYs 2008-2012 FAA *Flight Plan* Organizational Excellence Goal: "*Achieve zero cyber security events that disable or significantly degrade FAA services*." Without sufficient funding in this area, FAA is in danger of not meeting this goal. Special Threat events are targeted attacks on federal government systems which pose a serious and imminent threat to those systems. These are events specific in nature, objective and patterned, and by design are hostile in intent. To date, FAA has had 81 such attacks. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the target (in this case FAA or other agencies) is capable. "Special Threat" responses were initiated to allow better communication of such events and identification and mitigation of systems that have been compromised or affected by these sophisticated attacks. The chart below shows the monthly Special Threat event trend for October 2006 through December 2007.



The requested funding will also enable the agency to reduce identity fraud, protect personnel privacy, and improve operational efficiency. Broadly speaking, this funding serves to increase the reliability, availability, and integrity of the NAS, provide mission support and administrative information, and address all other FAA information systems requirements.

Discretionary Increase Request: Information Security Enhancement
(Safety and Operations, Office of Information Services/Chief Information Officer, $7.6 million, 0.0 FTE)

Under FISMA, all information systems must identify and provide information security protection equal to the risk and magnitude of harm resulting from unauthorized access, use, disclosure, disruption, modification, or destruction of information that supports the agency and the NAS. Increased funding dollars will be used to recertify existing FAA systems and address critical vulnerabilities discovered in the agency's IT systems. Funding will also support the maintenance and upgrade of CSIRC which will improve FAA's capacity to detect and respond to cyber-security threats.

Marginal Cost of Performance for Security and Hazardous Materials ID Media Program Discretionary Increase Request

The protection of FAA's critical infrastructure is a national and homeland security concern that continues to receive a high level of attention in view of the continued threat of hostile terrorist activity within the United States as well as against U.S. interests abroad. ASH develops and implements policy and establishes requirements that are met by other FAA organizations to protect the agency's federal and contractor workforce and facilities, systems, and operations. Protection of the NAS and FAA activities pertaining to it, in turn, contributes to the safety of the traveling public and to homeland security.

In FY 2009, ASH will build upon the HSPD-12 Common Identification Standard, Identification Management System (IDMS) and PIV-II smartcard-issuing system created in FY 2007 and put into large-scale production during FY 2008 to replace the PIV-I cards currently issued to FAA personnel. ASH will use its own field staff, as well as designated, part-time agents provided for use in identification media enrollment and PIV issuance at local sites. This will allow for the issuance of another 40,000 PIV-II smartcards by the end of FY 2009, and thus will lay the groundwork for full system deployment. A total of 90,000 active cardholders with fully provisioned active cards will have been achieved by the end of calendar year 2009.

FY 2009 REQUESTED PROGRAM CHANGES					
ASH – Safety and Operations Funding Supporting Security					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$64,837	314.0	$6,270	11.0	$71,107	325.0

The objective of the ID Media Program is to ensure that only authorized personnel are allowed access to critical FAA facilities and systems. The HSPD-12-mandated system, enhanced enrollment and issuance criteria, and new PIV-II smartcard will significantly strengthen the previously existing system and provide better protection for FAA personnel, assets, and data. These new technologies will promote future cyber and physical security efficiencies that are not yet quantifiable, and improve protection of personal privacy information.

New requirements, which will now be automated and institutionalized by the new system and smartcards, involve more stringent identity-proofing of prospective cardholders, government-wide standardization of minimum investigative requirements for access to federal facilities and data, and standardization of government-wide identification media appearance. In addition, these requirements call for incorporation of biometric identification factor data and PIN numbers within the smartcard's chip to enable scalable enhanced security measures when required in the future. In FAA's version, immediate benefits in the form of network logon, document encryption, and digital signature capabilities will be actualized even before follow-on LAC features are implemented. The core system also provides both the authorized connection from FAA IDMS to the Federal Bridge as well as the capabilities in the cards and system to support inter and intra-agency identity verification.

FY 2009 funding will permit the establishment of enrollment and satellite issuing stations at larger field facilities to support PIV-II smartcard issuance to employees and contractors. In addition, the 9 FAA Regional Offices, Technical Center, Aeronautical Center and Headquarters FAA sites are targeted to begin Personal Identity Verification card issuance by the end of FY 2008. During FY 2009, 40,000 smartcards will be issued and the groundwork and processes to complete the issuance of 10,000 more cards to achieve full deployment by 2010 will be in place. Funding cannot be pulled from other ASH projects to complete the program without severe, adverse impact to those projects. Without this requested increase, as well as inadequate funding in FY 2008, the full deployment of PIV-II smartcards, the security benefits from this new system and compliance with the mandated HSPD-12 and OMB objectives will be indefinitely delayed.

This request is also discussed in the Budget Request Justification section above, and in Section 3, Operations, under Staff Offices – Security and Hazardous Materials (ASH).

MARGINAL COST ANALYSIS

ID Media Program					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$5,525	19.0	$6,270	11.0	$11,795	30.0

Output Measures	Without Increase	With Increase	Change
PIV-II cards Issued	10,000	40,000	30,000

ORGANIZATIONAL EXCELLENCE

As the aviation community continues to face a tough economic environment, FAA faces many difficult management challenges. FAA's central management strategy for achieving organizational excellence is to deliver the results described in the *Flight Plan* and to refine our focus on the President's Management Agenda (PMA). The *Flight Plan* is the means for the agency to improve performance and measure success.

More efficient and effective management of resources is the major aim of FAA's efforts to achieve Organizational Excellence. Working with employees and industry partners, FAA strives to invest in high-performing programs and services. At the same time, it must end those that are redundant or ineffective. Likewise, the agency must lower costs and use resources wisely while maintaining its focus on customer requirements and aligning its products and services to their needs.

In addition, the agency is committed to attracting, training, motivating, and retaining highly qualified employees. In its pursuit of Organizational Excellence, FAA promotes the development of leaders who know how to build and run a performance-based organization, and enhance fiscal accountability to ensure that the right resources go to the right programs, allowing the agency to achieve all of its goals.

With the establishment of the ATO in FY 2004, the *Flight Plan* and its emphasis on performance results found a new focus. This management tool, plus the enormous effort the agency expends in strengthening the ATO, will allow it to achieve its business and human resource goals in FY 2009 and beyond.

This is especially important for ATO as it continues to solidify its organization while also planning for an impending retirement bubble. Over the next 10 years, approximately 72 percent of the agency's nearly 15,000 controllers will become eligible to retire. Total losses over the next 10 years are expected to be over 13,000. The ATO is diligently working to expedite quality training of new hires to replace the highly skilled workforce that is retiring, as detailed in the 10-Year Strategy for the Air Traffic Control Workforce first submitted to Congress in December 2004. Updates to the plan were issued in August 2006 and March 2007.

Section Organization

This budget request is organized into two primary groupings: (a) agency programs and initiatives by PMA and the FAA *Flight Plan* Organizational Excellence performance objectives and (b) agency programs and initiatives by organization-specific funding dollars/FTEs and requisite budget justifications. The Organizational Excellence funding directly supports DOT's Major Acquisition measures, which are also included in the *Flight Plan*, as well as DOT's performance measures for Major Federally Funded Infrastructure projects. The narrative summaries for Safety and Operations and Grants-in-Aid for Airports (AIP) programs present the total amounts for each involved organization. In addition, discretionary increases and their marginal cost of performance justifications appear at the end of this section.

For complete disclosure of IT funding directly supporting DOT strategic goals, please refer to the technology investments justifications in Section 3, both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program section.

Table 1 summarizes the Organizational Excellence budget request. Exhibits II-3 and IV-1 provide additional detail.

Summary Budget Request

FAA requests $481.2 million to implement the Organization Excellence goals to ensure the success of FAA's mission through stronger leadership, a better-trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Table 1 summarizes the Organizational Excellence budget request. Table 2 provides the discretionary increase budget request by allocation.

Table 1. Total Organizational Excellence Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2007 ACTUAL	FY 2008 ENACTED	FY 2009 REQUEST
Organizational Excellence (FY 2007 and FY 2008)			
Operations	140,272	155,488	
F & E	284,451	273,286	
Safety & Operations			
Air Traffic Organization			
AIP	11,595	9,903	
Total	**436,319**	**438,677**	
FTE	**1,114**	**1,089**	
Organizational Excellence (FY 2009)			
FAA Activities Supporting the Achievement of DOT's President's Management Agenda Goals			
Safety & Operations			200,407
Air Traffic Organization			204,815
AIP			8,321
Total			**413,542**
FTE			**996**
Percentage of Major Federally Funded Transportation Infrastructure Projects with less than 2 percent Annual Growth in the Project Completion Milestone as Reported in the Finance Plan			
AIP			2,000
Total			**2,000**
FTE			**4**
Percentage of Financial Plan Cost Estimates for Major Federally Funded Transportation Infrastructure Projects with Less than 2 percent Annual Growth			
AIP			2,000
Total			**2,000**
FTE			**4**
For Major DOT Systems, the Percentage of Scheduled Milestones Established in the Acquisition Project Baselines that are			
Air Traffic Organization			31,850
Total			**31,850**
FTE			**0**
For Major DOT Systems, the Percentage of Cost Goals Established in the Acquisition Project Baselines that are			
Air Traffic Organization			31,850
Total			**31,850**
FTE			**0**
Organizational Excellence $ Total	**436,319**	**438,677**	**481,242**
Organizational Excellence FTE Total	**1,114**	**1,089**	**1,004**

Table 2. Discretionary Increase Requests

	($000)	FTE
Safety and Operations		
Regions and Centers		
ARC Capitalization Support	2,000	26.0
SAFETY AND OPERATIONS TOTAL	***2,000***	***26.00***
Grants-in-Aid for Airports		
Office of Airports		
System of Airport Reports (SOAR)	1,200	0.0
Grants Management Staff	370	5.0
Enterprise Architect Specialist	74	0.5
Non-primary Evaluation Review	500	0.0
GRANTS-IN-AID FOR AIRPORTS TOTAL	***2,144***	***5.5***
TOTAL	***4,144***	***31.5***

FAA uses the PMA along with the *Flight Plan* to improve performance and measure success. The funding required to support FAA's management reform initiatives allows the agency to strengthen its internal systems, paving the way for the achievement of other strategic goals set forth in the *Flight Plan*. The agency's contributions to DOT's major acquisitions and federally-funded infrastructure programs performance measures improve the management of the Department's capital investments. These contributions result from FAA's major air traffic control systems and airport infrastructure projects that are on schedule and within estimated costs. Each of the Organizational Excellence performance measures is briefly described below.

Performance Measure: For Major DOT Acquisitions, Percentage of Scheduled Milestones Established in Acquisition Project Baselines that are Met

The following two acquisition measures are incorporated into both the DOT and FAA *Flight Plan* performance targets.

Table 3. Percentage of FAA's major system acquisitions on schedule

	2005	2006	2007	2008	2009
Target:	80.0%	85.0%	87.5%	90.0%	90.0%
Actual:	92.0%	97.4%	97.0%	N/A	N/A

Performance Measure: For Major DOT Acquisitions, Percentage of Cost Goals Established in Acquisition Project Baselines that are Met

Table 4. Percentage of FAA's major system acquisitions within established cost baselines

	2005	2006	2007	2008	2009
Target:	80.0%	85.0%	87.5%	90.0%	90.0%
Actual:	97.0%	100%	100%	N/A	N/A

FAA continues to improve its acquisition program implementation to ensure that by FY 2008, 90 percent of critical programs are on schedule and within 10 percent of budget. For FY 2005, 92 percent of schedule goals were met and 97 percent of acquisitions were within 10 percent of budget. In FY 2006, 97.4 percent of schedule goals were met and 100 percent of major acquisitions were within 10 percent of budget.

In DOT's FYs 2006 – 2011 Strategic Plan, the two transportation infrastructure measures were revised to measure project cost and schedule performance on an annual basis rather than performance over the lifecycle of the project.

Performance Measure: Major Federally-Funded Transportation Infrastructure Projects with Less than 2 Percent Annual Growth in the Project Completion Milestone

Table 5-A. Percentage of Transportation Infrastructure Projects with less than 2 percent annual growth in the project completion milestone[1]

	2005	2006	2007	2008[1]	2009
Target:	N/A	N/A	N/A	90.0%	90.0%
Actual:	N/A	N/A	N/A	N/A	N/A

Table 5-B. Percentage of Transportation Infrastructure Projects that meet Schedule Milestones or miss them by less than 10%

	2005	2006	2007	2008[1]	2009
Target:	95.0%	95.0%	95.0%	90.0%	90.0%
Actual:	95.0%	91.0%	88.0%	N/A	N/A

[1]Measure redefined in DOT Strategic Plan FYs 2006-2011.

Performance Measure: Percent of Finance Plan Cost Estimates For Major Federally-Funded Transportation Infrastructure Projects with Less Than 2 Percent Annual Growth

Table 6-A. Percentage of Finance Plan Cost Estimates for Major Federally-Funded Transportation Infrastructure Projects with Less than 2 Percent Annual Growth

	2005	2006	2007	2008[1]	2009
Target:	N/A	N/A	N/A	90.0%	90.0%
Actual:	N/A	N/A	N/A	N/A	N/A

Table 6-B. Percentage of Major Federally-Funded Transportation Infrastructure Projects that meet cost estimates established in project or contract agreements, or miss them by less than 10 percent

	2005	2006	2007	2008[1]	2009
Target:	95.0%	95.0%	95.0%	90%	90%
Actual:	79.0%	82.0%	84.0%	N/A	N/A

[1]Measure redefined in DOT Strategic Plan FY 2006 – FY 2011.

FAA contributes to DOT's transportation infrastructure goals along with other modal administrations. These targets promote better management of the agency's mega-projects, chiefly the construction of new air traffic system components and airport projects such as terminals and runways. On large airport infrastructure projects, like a new commercial service runway, the amount of federal funding is approximately 20 percent of the total cost with the balance of funding being derived from local sources. This permits federal funding to remain within the targeted budget amount.

Performance Overview

Human Capital

Acquiring a Highly Skilled Workforce - To support the effective management of human capital and to ensure FAA has the appropriate human resources to meet mission requirements, the *Flight Plan* identifies FAA's strategic human capital goals which tie directly to the PMA through the DOT's Organizational Excellence goal. The human capital initiatives support FAA's *Flight Plan* by building a skilled and knowledgeable workforce that is capable of promoting a safe and efficient National Airspace System (NAS) and providing world class aviation services to the flying public. FAA is also committed to making human capital decisions that are robust, data-driven and results-oriented.

Air Traffic Controller Retirement Bubble - FAA is preparing for the growing number of air traffic controller retirements projected through FY 2017. Through strategic workforce planning, the agency issued its *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce* in December 2004 that sets a course of action to ensure a sufficient number of qualified controllers to meet capacity and air traffic needs of the future. Updates to the plan were issued in August 2006 and March 2007. The next update to the plan is expected to be out in March 2008.

Conflict Management - FAA's FY 2008-2012 *Flight Plan* embraces Conflict Management as a strategic initiative and includes the development of a corporate approach to conflict management. Data analyses indicate that the average FAA manager spends approximately six hours per week addressing conflict in the organization. CEDR strives to reduce these hours employees spend in conflict. In order to reduce costs and improve productivity, FAA established the Center for Early Dispute Resolution (CEDR) in late 2005 as a pilot program.

In its brief history, CEDR has provided Early Dispute Resolution Services in 289 cases involving approximately 630 people. These cases have included assistance to 16 groups totaling 222 members. In addition, CEDR has provided conflict management training to over 400 people. During FY 2008, CEDR's operations will provide service to FAA Headquarters, the Aeronautical Center, and the Eastern Service Area.

The CEDR pilot program provides early dispute resolution services, conflict management training, and data analysis to quantify the direct and indirect costs of conflict. CEDR provides one central place for members of the workforce to get help early in resolving conflict before it becomes necessary to engage in other, more formal and costly processes such as Equal Employment Opportunity (EEO) and grievances. CEDR Services include mediation, coaching, training, facilitated conversations and assistance to workplace teams in resolving group conflicts. CEDR also offers two types of training: 1) a Constructive Conflict Management (CCM) course, developed in concert with FAA's Center for Management and Executive Leadership; and, 2) individualized conflict management training designed to meet specific organizational needs. In addition, CEDR is developing a new Conflict Resolution Skills & Practice program.

Conflict data analysis makes CEDR unique among early dispute or Alternative Dispute Resolution (ADR) organizations in the federal sector. CEDR is making this data and analysis approach to build a business case for providing early dispute and conflict management training to potential clients.

Linking Employee Compensation to Performance - The FAA's Organizational Success Increase (OSI) and Short Term Incentive (STI) programs help to strategically manage FAA's workforce by linking pay to performance. Each fiscal year, FAA's Management Board establishes FAA strategic goals, corporate projects, and performance targets in the four Goal Areas (Safety, Capacity, International Leadership, and Organizational Excellence). OSI goals are directly linked to the FAA *Flight Plan*. The accomplishment of these agency-wide goals serves as the basis for granting an OSI as an annual adjustment to the base salaries of eligible FAA employees. The STI program is intended to help communicate corporate goals and the Administrator's priorities for the year, while providing incentives to the executive leadership for helping lead the accomplishment of these goals and priorities.

Personnel reform for the agency, granted in 1998, is starting to bear fruit, with conversion from the traditional GS-Schedule pay system to pay-for-performance. Accountability for results is systemic throughout FAA, with 90 percent of our employees on the pay-for-performance system, including our executives. *Flight Plan* performance targets must be achieved before annual pay raises are granted. Executives and managers have a good deal of discretion in rewarding high-performing employees, and incentives are present to ensure quality work and innovation are suitably rewarded. Executives are also eligible for short-term incentive increases when specific performance thresholds are met or exceeded. This conversion is allowing the agency to flatten pay bands and tie performance to pay increases.

Labor Management Relations - In the FY 2008-2012 *Flight Plan*, FAA continued its strategy to improve labor management relations while delivering quality customer service. The performance target is to "Reduce grievance processing time by 30 percent (to an average of 102 days) by FY 2010 over the FY2006 baseline of 146 days and maintain the reduction through 2012." The agency's goal is to manage and appropriately address employee concerns and grievances while promoting stronger labor management relations and a cooperative, collaborative work environment. Performance against this goal directly impacts FAA's ability to deliver consistent, high-quality airspace services for its customers.

Financial Management

FAA continues to implement two strategies contained in the FY 2008-2012 *Flight Plan* to address the need for cost reduction and improved financial management. These include a centrally managed cost control program led by the Office of Financial Services, better financial and procurement oversight, and improvements in the tools and training necessary for financial management.

Cost Control - As part of the cost reduction program, FAA will implement agency-wide cost reduction initiatives as well as individual cost reduction efforts within each organization. These cost reduction efforts include the Strategic Sourcing for the Acquisition of Various Equipment and Supplies (SAVES) initiative, which is an ambitious effort to implement best practices from the private sector in the procurement of administrative supplies, equipment, and IT hardware. To-date, the SAVES program has achieved $4 million in cost savings.

Improved Financial Performance - Ongoing improvements in financial performance will focus on providing more timely and accurate financial information to assist management in their decision making, thereby driving improved results in FAA operations. Planned business process improvements will focus on routine capitalization of projects, a major overhaul of financial policy and procedures, enhancements to corporate financial and acquisition systems, streamlined processes for managing agency reimbursable agreements, and training – all of which continue to improve timeliness and accuracy of financial information.

Financial Oversight of Agency Procurements - The Administrator issued guidance in August 2005 that requires better oversight of service contracts by:

- Amending FAA procurement policies to require approval of the Deputy Administrator for any support service contract award involving less than three bids.
- Empowering the Chief Financial Officer (CFO) to exercise greater oversight and fiscal control over all agency procurements, including support services contracts. Written authorization from the CFO is required before FAA issues any procurement request for products and services costing $10 million or more.

Within the CFO's organization, the Office of Financial Controls implemented a contract review process for all contracts with a value of $10 million or more effective October 1, 2005. CFO approval is based on a review of the business case justification, cost estimates, and statement of work to be performed. In the first two years since the new approval process was implemented, the CFO evaluated over 85 proposed acquisitions with an estimated contract value of $5 billion.

Competitive Sourcing - In FY 2005, FAA completed the public/private Competitive Outsourcing study of the Automated Flight Service Stations (AFSS), the largest and most complex A-76 competitive sourcing acquisition undertaken in government. As a result, FAA will save $2.2 billion during the 13-year period 2003-2015.

Budget and Performance Integration - The main objective of the PMA budget and performance integration effort is to build FAA's budget in a way that concretely demonstrates what the agency is doing with its allocated funding. The goal is to show how increases or decreases in the agency's budget affect its performance metrics and how activities across the six goal areas work together.

The PMA goal stresses the implementation and use of performance measures to track program viability. In particular, the implementation of efficiency measures has been noted as one of six criteria to reach "green" status.

Resources are focused on the development of efficiency measures across FAA. In FY 2007, all FAA organizations' Business Plans included new targets for their efficiency measures. Among the efficiency measures developed are measures for each program assessed through Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART) review:

- Airport Improvement Program (AIP) Grants-in-Aid for Airports
- Regulation and Certification (now Aviation Safety - AVS)
- Air Traffic Services (now Air Traffic Organization)
- Facilities and Equipment (now mostly Air Traffic Organization)
- Research, Engineering & Development (R,E&D)

For example, one of the measures ATO is tracking looks at how much of its labor costs are incurred outside of the operational facilities. Targets have been established and provide a compass for future decision-making. For a complete discussion of the PART program, refer to Section 3E, Performance Overview.

Real Property Asset Management

During FY 2006, FAA was designated as the lead for DOT's efforts in support of the PMA initiative for federal real property management. FAA's Aviation Logistics Office maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 69,500 buildings, structures, and land parcels. Federal real property is tracked in FAA's Real Estate Management System which also is the repository for DOT's entire real property inventory. A Department-wide Asset Management Plan was approved by OMB, and performance metrics and targets were established and incorporated in the Department's Three-Year Timeline for Real Property.

E-Government, Information Technology and Communications

Information Systems Security - Under Organizational Excellence, FAA has set a performance target to improve the management of the agency's over two billion dollar investment in Information Technology, and protect FAA's critical information systems, networks, and administrative systems from cyber terrorism and malicious activities by hackers and other unauthorized personnel. The Office of the Chief Information Officer has the lead for the *Flight Plan* performance target to ensure zero cyber security events that disable or significantly degrade FAA service. Funding for these activities comes from the Security goal. For more detail on Information Systems Security, please see the Security section of the budget.

Expanded Electronic Government - The main objective under the E-Government goal is to ensure that critical electronic services and information delivered to the users (air traffic controllers, airline pilots, public) are robust and efficiently delivered.

Budget Request Justification

The following section provides a rationale for the budget request supporting FAA's Organizational Excellence goal. The narrative is organized around the activities that support this goal: human capital resources, financial management, real property asset management, information technology and other important organizational support programs.

Human Capital

Workforce Planning and Labor Relations
(Safety and Operations, Human Resource Management, $25.2 million, 112 FTE)

Acquiring a Highly Skilled Workforce - Initiatives supporting Human Capital development include workforce and human capital planning and measurement, design and implementation of a Human Capital Accountability System, and the use of information technology to improve the application and selection process. In addition, FAA continues to focus on innovative recruitment strategies including professional marketing and branding campaigns aimed at attracting new talent to FAA. These initiatives are directly aligned to the *Flight Plan* and PMA. The funding request related to these activities is required to: 1) identify and fulfill current and future human capital needs to meet FAA's mission; 2) implement corporate systems, policies, programs, and tools to build a results-oriented, high performance workforce; 3) make strategic human resource investments and provide a professional, safe and secure work environment to attract and retain a dedicated and qualified workforce; and 4) improve labor management relations while delivering quality service.

Leadership Development - FAA will continue to pursue initiatives aimed at meeting the FY 2009 performance target for developing stronger leadership. This includes corporate policies to improve managerial selection and strengthen probationary requirements for managers; corporate managerial training programs for Senior Leadership; and corporate employee training programs to support professional development, promote continuous learning, and build leadership competence within FAA's workforce.

Labor Management Relations - In promoting better labor-management relations in FY 2009, FAA will continue to utilize service level agreements to – meet the requirements of lines of business and staff offices, provide labor relations training for agency supervisors and managers, and use the Grievance Electronic Tracking System for data collection, monitoring and reporting.

Addressing the Air Traffic Controller Retirement Bubble
(ATO, Salaries and Expenses, $15.9 million, 70 FTE)

Air Traffic Controller Retirement Bubble - Additionally, FAA is examining and improving the process for hiring air traffic controllers. By studying workforce demographics, hiring, and training practices, FAA is positioning itself to assure its customers of a smooth, transparent, and successful transition to a new air traffic controller workforce. The agency is holding itself accountable for managing this workforce plan by continuing to maintain the air traffic control workforce at or up to 2 percent above the projected annual totals in the Air Traffic Controller Workforce Plan.

Financial Management
(Safety and Operations, Financial Services, $26.8 million, 41 FTE)

Cost Control - In addition to SAVES, organizations throughout the agency will identify and implement cost efficiency activities to reduce costs. These activities will include:

- Containing cost of Worker's Compensation payments (OWCP);
- Consolidation of facilities and services;
- Strategic sourcing for products and services;
- Reducing lease costs; and,
- Eliminating or reducing excess assets.

Improved Financial Performance - FAA is planning to improve the use of information from DELPHI, its financial management system. DELPHI provides FAA with more accurate financial data and allows the agency to better manage its spending on operations, as well as capital investments to ensure the safety of the airways. Planned enhancements to the DELPHI system include improved capitalization workflow and document imaging, possible migration of some legacy systems into new DELPHI functionality, enhanced reporting capability, and continued systems improvements for internal controls.

During FYs 2008–2009, FAA will continue to improve its overall financial management by integrating cost and financial information into the agency's business processes. FAA will accomplish this by:

- Continuing to improve DELPHI through the introduction of commitment accounting and enhancements to budget execution to better track F&E project authorizations;
- Implementing enhancements to the acquisition system;
- Providing enhanced financial training to assure that executives, managers, and staff understand their roles in the stewardship of financial resources;
- Providing executives and managers with the tools necessary to make data driven decisions;
- Implementing FAA's Cost Accounting System (CAS) for the Regions and Center Operations;
- Continuing to make improvements to CAS; and
- Developing new and improving existing financial and travel policy guidance to improve data integrity.

FY 2009 efforts will include:

- Hiring additional staff in the Financial Services organization to oversee and the capitalization of FAA's assets to ensure that the material weakness related to timely capitalization does not reoccur;
- Implementing imaging to facilitate invoice tracking and payment;
- Continued enhancement to financial reporting tools to help organizations better understand the cost of operations;
- Implementing enhancements to the acquisition system; and
- Continuing to make improvements to CAS.

These efforts will be used to improve the way FAA conducts business. The requested budget will enable the continued development and delivery of financial services to support the agency's public mission.

Eliminating Improper Payments – FAA has historically had a very low percentage of improper payments and continues to support DOT in reducing the risks of such payments. FAA will continue to enhance and improve business processes that strengthen the internal controls on the agency's payment process that result in even lower percentages.

Discretionary Increase Request: ARC Capitalization Support
(Region and Center Operations, $2.0 million, 26.0 FTE)

The ability of FAA to achieve and maintain an unqualified audit opinion is a critical factor in securing the agency's financial management credibility. ARC supports the annual audit process through continuous asset capitalization activities across the three Logistics Services Areas and within FAA's Aeronautical Center.

This year ARC will add appropriate staff necessary to address newly established capitalization procedures as well as to accomplish a significant amount of backlog projects. The recently established capitalization "To-Be" procedures implement changes in roles and responsibilities, organizational structures, business processes, automation, and policies in order to successfully sustain the timely capitalization of FAA assets. FY 2009 audit samples are to be given on a quarterly basis and will follow a new detailed binder standard format. Clean up efforts are also required to address a backlog of approximately 1,000 projects.

Full funding for 26 FTEs are required in FY 2009 to bring FAA into compliance with the new financial audit capitalization standards, address and achieve capitalization targets, and to successfully support future audit activities. Ultimately, by improving the agency's audit readiness, we improve our likelihood for achieving an unqualified audit opinion.

E-Government, Information Technology and Communications
(Safety and Operations, Office of Information Services, $12.3 million, 19 FTE)

E-Government - In FY 2009, FAA's electronic government initiatives in support of the PMA goal will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at key customer groups, as well as projects dedicated to improving internal efficiency and effectiveness. In addition to Information Systems Security, specific E-Government initiatives include Enterprise Architecture, IT Capital Planning, continued agency leadership in Federal lines of business programs, and implementation of consolidated enterprise IT services. FY 2009 activities will involve integrating the Enterprise Architecture into the agency IT investment process in accordance with the 2005 policy, implementing consolidated Help Desk and support services, and implementing FAA information/data resource governance framework.

Improved Financial Management of IT Activities - Under the Chief Information Officer's (CIO) leadership, FAA will improve information processes, optimize IT investments, and support the acquisition and deployment of systems for the NAS. The agency will also continue to carry out its efforts to bring IT costs under control, create agency-wide metrics that track IT costs, integrate the Enterprise Architecture into the agency-wide IT investment process, and consolidate various data repositories. Additionally, the CIO's office will work towards data standardization, which will reduce the total lifecycle cost of software adaptation for NAS systems.

Improving Employee Attitudes, Customer Satisfaction, and Mission Effectiveness
(Safety and Operations, Aviation Safety, $67.4 million, 408 FTE)

AVS has a variety of activities within Organizational Excellence. For example, AVS supports the Customer Satisfaction performance target by continuing to administer the American Customer Satisfaction Index (ACSI) survey. This survey is the nationally recognized gold standard of measuring customer satisfaction in industry and government.

Most of the AVS Organizational Excellence budget supports AVS internal efforts to become more effective and efficient. For example, skill competencies to be used for recruiting for all positions within AVS have been identified. These new business and interpersonal competencies are required to operate and maintain the Safety Management System (SMS) in AVS. The list of skill competencies establishes a baseline and will be reevaluated in the next three to five years. It includes risk management, evaluation, systems thinking, organizational awareness, workload management, communications, interpersonal skills, teamwork, and negotiating and influencing.

In addition, AVS has revamped its employee overview programs, as well as its initial and recurrent training to stress the need for a risk management approach. AVS management has placed a premium on communication and employee outreach to help the workforce accept this significant cultural change.

Discretionary Increase Request: System of Airport Reports (SOAR)
(Grants-in-Aid for Airports, Office of Airports, $1.2 million, 0.0 FTE)

The requested increase will be used to obtain the contractor support and materials to perform several modifications to the System of Airport Reports (SOAR) that will result in performance and quality improvements, cost reductions, federal requirement compliance, and increased customer satisfaction. In addition, SOAR modifications will permit ARP to efficiently and effectively administer AIP while reducing the overall cost of the AIP grant.

SOAR modifications will include a technology refresh to make SOAR a completely web-based architecture application and the implementation of Single Sign-On (SSO) to the active directory. The web-based architecture will reduce the complexity of the system, lower cost, and improve reliability thus eliminating the current need for special thin-client "CITRIX" desktop software and related servers. The SSO will provide for one initial intranet log-on for end users to access the system.

Modifications will also be made to support programmatic business processes, including the development of additional software functionality to allow end users to create and share queries and reports with peers. This will include grant performance tracking and metrics, increased oversight and system usability and will reduce long-term contractor dependency. Access to the additional reports by the program managers will provide necessary information needed to ensure efficient administration of AIP.

This request will also be used to create new interfaces to the SOAR Program eliminate manual data entry by contractors and permit external users to enter Air Carrier and Public Agency data into the Passenger Facility Charge (PFC) and Air Carrier Activity Information System (ACAIS). This modification will not only save the costs of entering the data but will also make it available to interested parties real time. Additionally, this funding will be used to implement the modifications specified in the strategy being developed by DOT to comply with the Federal Funding Accountability and Transparency Act of 2006 (FFATA) requirements. In addition to FFATA requirements, this SOAR modification will provide information to program managers about federal funding.

Discretionary Increase Request: Grants Management Staff
(Grants-in-Aid for Airports, Office of Airports, $370 thousand, 5.0 FTE)

This increase request provides additional Grants Management resources for the administration of the AIP. AIP program requirements have increased considerably since 2001 when the non-primary entitlement (NPE) program was introduced. Today, requirements and activities to support the overall AIP program continue to increase, including safety and capacity analyses, airspace reviews, construction safety plans, compliance issues, planning studies (master plan/system plans) and environmental studies (including Part 150 noise studies), grant administration and inspecting projects as appropriate.

The NPE program added over 1,000 grants per year to the annual workload, and labor and cost accounting data shows that these grants on average require the same or more staff attention than grants at larger airports. This is because most non-primary airport sponsors do not have the full-time professional staff of the larger airports. Even though efforts have been made to maximize the use of technology to streamline the grant administration process itself, this does not alleviate the workload associated with all of the other statutory and regulatory requirements. At the same time, the programs are being subject to increased outside review and audits to comply with new mandates for oversight and accountability of government programs.

Discretionary Increase Request: Enterprise Architecture Specialist
(Grants-in-Aid for Airports, Office of Airports, $74 thousand, 0.5 FTE)

This funding request will provide one full-time Enterprise Architecture Specialist position (0.5 FTE) to perform the following duties – Design, implement and operate processes for maximizing the value and assessing the risks of the organization's IT acquisitions; develop processes for selecting, managing, and evaluating the IT investments; and develop criteria to apply in considering investments in information systems. This position will also identify quantifiable measurements to determine the net benefits and risks of investments and identify information systems investments that may result in shared benefits or costs. Additionally, the position will provide Enterprise Architecture strategic and technical planning; policy, capital planning, and investment control; change management, systems engineering, architectural design, business process reengineering, and large scale program management.

Discretionary Increase Request: Non-primary Evaluation Review
(Grants-in-Aid for Airports, Office of Airports, $500 thousand, 0.0 FTE)

The requested one-time increase will be used to obtain contract support to provide an independent evaluation of the impact of non-primary airport apportionments. The study will evaluate the criteria used for including –

- Non-primary airports in the National Plan of Integrated Airports System (NPIAS) and the application of those criteria in the most recently published plan;
- Changes in non-primary airport capital needs between FYs 2001 – 2007, compared with the amounts apportioned to individual non-primary airports over the same period of time;
- Amounts of AIP funds granted to non-primary airports between FYs 2001 – 2007, by category of non-primary airport apportionment, state apportionment, and discretionary, compared with reported capital needs; and
- Exercise of authority to transfer non-primary airport apportionments.

The evaluation will complete an assessment of the non-primary program with recommendations for enhancing the administration of the program.

Marginal Cost of Performance for Safety and Operations Discretionary Increase Request

ARC Capitalization Support

(Region and Center Operations, $2.0 million, 26.0 FTE)

The ability of FAA to achieve and maintain an unqualified audit opinion is a critical factor in securing the agency's financial management credibility. ARC supports the annual audit process through continuous asset capitalization activities across the three Logistics Services Areas and within FAA's Aeronautical Center.

This year ARC will add appropriate staff necessary to address newly established capitalization procedures as well as to accomplish a significant amount of backlog projects. The recently established capitalization "To-Be" procedures implement changes in roles and responsibilities, organizational structures, business processes, automation, and policies in order to successfully sustain the timely capitalization of FAA assets. FY 2009 audit samples are to be given on a quarterly basis and will follow a new detailed binder standard format. Clean up efforts are also required to address a backlog of approximately 1,000 projects.

Full funding for 26 FTEs are required in FY 2009 to bring FAA into compliance with the new financial audit capitalization standards, address and achieve capitalization targets, and to successfully support future audit activities. Ultimately, by improving the agency's audit readiness, we improve our likelihood for achieving an unqualified audit opinion.

FY 2009 REQUESTED PROGRAM CHANGES					
ARC – Safety and Operations Supporting Organizational Excellence					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$57,050	5	$2,000	26	$59,050	31

Approach to Improved Capitalization Procedures

New process and policy changes, that are intended to improve overall capitalization performance, will also impose significant resource demands upon ARC.

Past audit folders have been unsatisfactorily complete, which has led to difficulties and delays in responding to documentation requests from auditors. ARC will use the additional resources to improve the quality of documentation and completeness of the contents of the project folders, leading to a more responsive audit posture for FAA.

FAA currently has a FY 2006 backlog of approximately 1,000 projects ($311 million). The additional resources will help FAA reduce the backlog by 500 projects in FY 2009. With the addition of the identified resources, ARC will take a systematic approach over the next 2 years, to address and eliminate the backlog and to sustain a level of effort that ensures all future assets are capitalized in accordance with established agency targets.

Further, a recurring finding of past FAA audits is that the agency does not capitalize assets in a timely manner. The additional resources are necessary to conduct required upfront analysis of supporting financial documentation to facilitate and expedite the capitalization of assets as they are placed in service. With these resources, FAA will reduce the time required to capitalize to 75 days in FY 2009. Without these resources, reviews of documentation will continue to occur at the end of projects, which typically delays capitalization up to 150 days or longer, resulting in an understatement of FAA assets.

In addition, FAA's holding table (mass additions) for pending low dollar assets has grown to over 20,000 transactions, totaling $105 million dating back to 2003. As noted in past audit findings, FAA has consistently failed to timely capitalize assets. This backlog of transactions represents assets that have not been captured over the past several years and clearly require immediate attention. In order to process these transactions as fixed assets, FTE resources are required to verify the individual invoices, bar codes, and object classes. The clean up effort is estimated to take approximately three years.

MARGINAL COST

ARC Capitalization Support					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$0	0.0	$2,000	26.0	$2,000	26.0

Output Measures	Without Increase	With Increase	Change
FY'06 Backlog Clean Up (projects)	125	500	400%
Time required to capitalize an asset from when place in service (days)	150	75	50%
Mass Additions Clean Up (transaction lines)	20,000	5,000	25%

Marginal Cost of Performance for Grants-in-Aid for Airports Discretionary Increase Requests

FY 2009 REQUESTED PROGRAM CHANGES					
ARP – Grants-in-Aid for Airports funding Supporting Organizational Excellence					
FY 2009 Baseline Estimates		FY 2009 Program Changes		FY 2009 Total Request	
($000)	FTE	($000)	FTE	($000)	FTE
$10,177	18.0	$2,144	5.5	$12,321	23.5

System of Airport Reports (SOAR)

SOAR is central to supporting ARP's goal of improving business processes to provide timely and reliable financial information to FAA organizations. The requested modifications will provide airport program managers the tools to more efficiently and effectively administer AIP while reducing the overall cost of the AIP grant. The discretionary increase will provide expanded capabilities to the system while enhancing features and functions that will result in performance and quality improvements, cost reductions, federal requirements compliance, and increased customer satisfaction. In addition, technological enhancements will eliminate the manual entry of the Passenger Facility Charge (PFC) and Aircraft Activity Information (ACAIS) into databases, thereby providing cost savings while also enabling access to the information by interested parties in real time.

MARGINAL COST

System of Airport Reports					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTEs	($000)	FTEs	($000)	FTEs
2,600	0.0	1,200	0.0	3,800	0.0

Output Measures	Without Increase	With Increase	Change
Requested modifications will provide program managers with the tools to enhance and improve the administration of the AIP.	0	5 % reduction through 2012	Reduce the upfront cost of AIP grants per million dollars of grant value (Non-Primary and Primary grants tracked separately) awarded by at least 5% over a five year period (thru 2012)

Grants Management Staff

The Airport Improvement Program (AIP) and the associated requirements continue to grow in complexity, due to increasingly detailed legislative provisions and judicial rulings affecting the relationship between various statutory requirements. The complexities affect the full range of functions provided by ARP, including statutory and regulatory issues; intergovernmental matters between federal, state and local agencies; land use and airspace protection issues including review of construction safety plans; multi-faceted environmental processing requirements; ensuring compliance with planning and design requirements to optimize airport safety; and ensuring compliance with federal grant assurances. These requirements apply to all public airport sponsors, including both primary and non-primary airports, the latter often needing a greater degree of support because many of them lack the full-time professional staff that the former have.

At the same time, the AIP program faces increasing oversight in terms of fiscal accountability. At every level, ARP management and staff continue to develop and implement measures to achieve Clean Audit opinions with no material weaknesses for the agency's financial statements. These measures include reviewing, maintaining and analyzing financial planning, accounting and electronic disbursement systems; ensure AIP funding is targeted to maximize return on funding investments; ensure financial closure of AIP grants in a timely manner; address inactive grants; and ensure timely AIP obligations of funds.

MARGINAL COST

Grants Management Staff					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTEs	($000)	FTEs	($000)	FTEs
0	0.0	370	5.0	370	5.0

Output Measures	Without Increase	With Increase	Change
Number of grants processed in FY 2009	2300 grants	2500 grants	200 new grants

Enterprise Architecture Specialist

The increased staffing will provide essential support to enable Enterprise Architecture Conformance for airports systems and process areas listed below:

Process Area		Definition
Regulatory Management	➔	Strategic planning and policy, standards, and regulations formulation governing commercial passenger, general aviation, cargo, and space transport; airworthiness of aircraft and parts; labor and medical qualifications; radio spectrum; airfield configuration and signage and lighting; ground vehicle surface operations (ramp, taxiway, runway), terminal area operations, aircraft noise and emissions; air quality; and medical and occupational health. The major processes include the following – Strategic Planning, Policy and Guidance Development, Public Comment Tracking, Regulatory and Standards Creation, Rule Publication, Policy Assistance and Advocacy
Manage Regulatory Compliance	➔	Monitor regulatory compliance and trends and conduct inspections of flight procedures, air navigation facilities, aircraft, engine, and parts, repair facilities, airports, flight schools, space transport, airborne electronic signals, navigational aids, and environmental conservation. Initiates enforcement action when merited. Develops data items used to identify and monitor system safety concerns. The major processes include the following – Program Evaluation (e.g. safety trend analysis, manage parts approval, environmental compliance), Program Monitoring & Oversight, Corrective Action (e.g. airworthiness directives)
Manage Aviation Economic Assistance	➔	Administration of grants to enhance the national integrated system of airports and for the improvement of safety in airport operations. Administration of passenger facility charges, carrier loan guarantees, aviation insurance, and foreign assistance in cooperation with other agencies of government, other governments, and international organizations.

MARGINAL COST

Enterprise Architecture Specialist					
FY 2009 Base		FY 2009 Increase Request		FY 2009 Total Request	
($000)	FTEs	($000)	FTEs	($000)	FTEs
0	0.0	74	0.5	74	0.5

Output Measures	Without Increase	With Increase	Change
Develop and document three key process areas for ARP's Enterprise Architecture.	0	3	Provide key IT process changes (see above)

FEDERAL AVIATION ADMINISTRATION
RESEARCH, DEVELOPMENT, AND TECHNOLOGY

For FY 2009 FAA requests $369,324,000 for research, development, and technology (RD&T) related programs across all of our appropriations accounts. The Research, Engineering, and Development Advisory Committee (REDAC) and FAA's National Aviation Research Plan (NARP) guide and direct FAA's research portfolio.

The FY 2009 budget request includes a significant increase for RD&T to fund additional NextGen projects. The majority of funding will support efforts to reduce congestion, primarily in the areas of system development and infrastructure. Additional NextGen efforts to reduce congestion include air-ground integration, self separation, and weather technology. FAA is also planning to increase research in an effort to reduce environmental impacts. This includes funding for Aircraft technologies and metric development. FAA will continue its efforts to improve safety, investing research dollars in several programs including aging aircraft, weather, and Aeromedical research. These programs are an important part of our efforts to modernize and transform the air transportation system.

The REDAC, established by Congress in 1989, ensures that FAA meets the Office of Management and Budget's Research and Development (R&D) investment criteria. The REDAC's 30 members represent corporations, universities, associations, consumers, and other agencies. The REDAC considers aviation research needs in six key areas: air traffic services, airport technology, aircraft safety, aviation information security, human factors, and the environment. The REDAC reports to the FAA Administrator on RD&T issues and provides a link between FAA's RD&T program and similar efforts in industry, academia, and government. The REDAC works to ensure that FAA's program goals and priorities properly link to national needs. The committee also periodically examines the quality and performance of R&D programs to provide FAA with advice on how best to allocate funds to ensure a good R&D program. The REDAC meets with FAA senior managers two times a year and annually reviews the agency's RD&T budget submission.

The NARP documents how FAA's R&D programs will assist in meeting near-term goals and prepare for the longer-term needs of the aviation system. It defines the strategies that address major operational challenges facing aviation and helps FAA ensure that efforts are focused on high quality, relevant research that is cost-effective and well managed. Since FAA is not the sole aviation research agency, the NARP specifically addresses the needs and programs of related federal agencies that complement FAA's efforts.

EXHIBIT V-1
RESEARCH, DEVELOPMENT & TECHNOLOGY
DEPARTMENT OF TRANSPORTATION
BUDGET AUTHORITY
(in thousands of dollars)

		FY 2007 Enacted	FY 2008 Enacted	FY 2009 Pres. Bud.
FEDERAL AVIATION ADMINISTRATION				
A. Research, Engineering and Development		**130,234**	**146,828**	**171,028**
A11	**Improve Aviation Safety**	**88,232**	**96,526**	**90,763**
a.	Fire Research and Safety	6,638	7,350	6,650
b.	Propulsion and Fuel System	4,048	4,086	3,669
c.	Advanced Structural/Structural Safety	2,843	7,083	2,920
d.	Atmospheric Hazards/Digital System Safety	3,848	3,574	4,838
e.	Aging Aircraft	18,621	15,946	14,589
f.	Aircraft Catastrophic Failure Prevention Research	1,512	2,202	436
g.	Flightdeck/Maintenance/System Integration Human Factors	7,999	9,200	7,465
h.	Aviation Safety Risk Analysis	5,292	9,517	12,488
I.	Air Traffic Control Airway Facilities Human Factors	9,654	10,000	10,469
j.	Aeromedical Research	7,032	7,760	8,395
k.	Weather Program Safety	19,545	16,888	16,968
l.	Unmanned Aircraft System	1,200	2,920	1,876
A12	**Improve Efficiency**	**21,166**	**30,234**	**43,254**
a.	JPDO	18,100	14,321	14,494
b.	Wake Turbulence	3,066	12,813	10,132
	GPS Civil Requirements		3,100	-
c.	NextGen: Air Ground Integration - Flightdeck/Maintenance System Integration			2,554
d.	NextGen: Self-Separation			8,025
e.	NextGen Weather in the Cockpit			8,049
A13	**Reduce Environmental Impact**	**16,018**	**15,469**	**31,658**
a.	Environment and Energy	16,018	15,469	15,608
b.	NextGen Environmental Research Aircraft Technologies, Fuels and Metrics			16,050
A14	**Mission Support**	**4,818**	**4,599**	**5,353**
a.	System Planning and Resource Management	1,388	1,184	1,817
b.	William J. Hughes Technical Center Laboratory Facility	3,430	3,415	3,536
B.1.	**Facilities & Equipment**	**93,928**	**114,300**	
a.	Engineering Development Testing & Evaluation	41,700	72,460	
b.	Plant	17,398	17,200	
c.	CAASD	34,830	24,640	
B.2.	**Air Traffic Organization**			**161,486**
a.	Engineering Development Testing & Evaluation			33,000
b.	Plant			18,400
c.	CAASD			28,728
d.	NextGen Demonstrations and Infrastructure Development			28,000
f.	NextGen System Development			41,400
g.	Operations			11,958
C. Airport Improvement Program, Airport Technology (T)		**27,870**	**28,712**	**34,348**
a.	Airport Technology Research	17,870	18,712	19,348
b.	Airport Cooperative Research	10,000	10,000	15,000
D.1.	**Operations**	**8,353**	**9,481**	
D.1.	**Safety and Operations**			**2,337**
E. Commercial Space Transportation		**125**	**140**	**125**
	Subtotal, Research and Development	**215,242**	**253,549**	**316,576**
	Subtotal, Technology Investment (T)	**27,870**	**28,712**	**34,348**
	Subtotal , Facilities (F)	**17,398**	**17,200**	**18,400**
	TOTAL FAA	**260,510**	**299,461**	**369,324**

EXHIBIT V-2
FEDERAL AVIATION ADMINISTRATION
FY 2009 RD&T Budget Request
($000)

	Performance Goals						
RD&T Program	*Safety*	*Reduced Congestion*	*Global Conn.*	*Environ.*	*Security Prep & Respons*	*Org. Excell.*	**FY 2008 Request**
Federal Aviation Administration							
Fire Research & Safety	6,650						6,650
Propulsion & Fuel Systems	3,669						3,669
Advanced Materials/Structural Safety	2,920						2,920
Digital system Safety/Atmospheric Hazards Research	4,838						4,838
Aging Aircraft	14,589						14,589
Aircraft Catastrophic Failure Prevention Research	436						436
Flightdeck/Maintenance/System Integration Human Factors	7,465						7,465
Aviation Safety Risk Analysis	12,488						12,488
ATC/Technical Operations	10,469						10,469
Aeromedical Research	8,395						8,395
Weather Research	16,968						16,968
Unmanned Aircraft Systems	1,876						1,876
JPDO		14,494					14,494
Wake Turbulence		10,132					10,132
NextGen – Air Ground Integration		2,554					2,554
NextGen – Self Separation		8,025					8,025
NextGen – Weather Technology in the Cockpit		8,049					8,049
Reduce Environmental Impact of Aviation				15,608			15,608
NextGen – Environmental Research Aircraft Technologies, Fuels and Metrics				16,050			16,050
System Planning & Resource Management						1,817	1,817
Technical Laboratory Facilities						3,536	3,536
Engineering Development Test & Evaluation	33,000						33,000
Plant						18,400	18,400
CAASD		28,728					28,728
NextGen Demonstration & Infrastructure		28,000					28,000
NextGen System Development		41,400					41,400
Air Traffic Organization—Operations	11,958						11,958
Airport Technology Research	10,239	9,109					19,348
Airport Cooperative Research Program	5,000	5,000		5,000			15,000
Safety and Operations	2,337						2,337
Commercial Space Transportation	125						125
Total FAA	**153,422**	**155,491**	**0**	**36,658**	**0**	**23,753**	**369,324**

Budget Item	Program Title	Budget Request
A11.a.	**Fire Research and Safety**	**$6,650,000**

GOALS:

Intended Outcomes: The Fire Research and Safety Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with aircraft fires and by mitigating the effects of a post-crash ground fire. The program supports FAA's aviation safety goal by developing technologies, procedures, test methods, and fire performance criteria that can prevent accidents caused by hidden in-flight fires and fuel tank explosions and improve survivability during a post-crash fire. Fire safety research focuses on near-term improvements in fire test methods and materials performance criteria, fire detection and suppression systems, aircraft fuel tank explosion protection, and long-range development of ultra-fire resistant cabin materials.

Agency Outputs: The FAA issues aircraft fire safety rules that govern material selection, design criteria, and operational procedures. The new test methods, reports, and journal publications produced by the Fire Research and Safety Program describe the technical basis for these regulations and offer guidance for regulatory compliance. Through this research, which is also producing new materials and government-owned patents, FAA provides industry with state-of-the-art safety products and information.

Research Goals: The FAA will work to reduce the number of accidents and incidents caused by in-flight fire, to prevent fuel tank explosions, and to improve survivability during a post-crash fire. Near term research will focus on improved fire test standards for interior and structural materials, improved fuel tank inerting systems and extended inerting applications, and new or improved fire detection and extinguishment systems. Additional long-range research will be conducted to develop the enabling technology for a fireproof aircraft cabin constructed of ultra-fire resistant materials. The following milestones directly support the ultimate strategic goals of in-flight fire prevention, fuel tank explosion prevention and improved post-crash fire survivability:

- By FY 2010, develop and validate a methodology for predicting the flammability of wing fuel tanks of aluminum or composite construction.
- By FY 2011, provide comprehensive guidance on the fire safety of high energy density lithium batteries in passenger carry-on items and aircraft power systems.
- By FY 2012, demonstrate the improvements in post-crash fire survivability, provided by ultra-fire resistant materials under full-scale test conditions.

Customer/Stakeholder Involvement: The Fire Research and Safety Program works with the following industry and government groups:

- Aircraft Safety Subcommittee of the FAA Research, Engineering and Development Advisory Committee – These representatives from industry, academia, and other government agencies annually review the program's research activities.
- Technical Community Representative Groups – The FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.
- Aircraft manufacturers (U.S. and foreign), airlines, foreign airworthiness authorities, chemical companies, material suppliers, and aircraft fire safety equipment manufacturers meet regularly to share information on interior material fire tests and improvement of fire detection and suppression systems.
- National Transportation Safety Board (NTSB) – The FAA works with and supports NTSB on in-flight fire incidents, on-site accident investigations, and related testing.
- Pipeline and Hazardous Materials Safety Administration (PHMSA) – PHMSA cooperatively develop with FAA requirements/guidelines for the safe transport of hazardous materials

R&D Partnerships: Fire Research and Safety Program R&D partners include:

- FAA-sponsored International Systems Fire Protection Working Group – R&D involves fuel tank protection, hidden fire safety, fire/smoke detectors, halon replacement, and lithium battery fire hazards.
- FAA-sponsored International Aircraft Materials Fire Test Working Group – R&D involves development and standardization of improved material fire tests.
- Interagency working group on fire and materials – promotes technology exchange among U.S. Government agencies and prevents unwarranted duplication of work.
- Interagency agreement with the National Institute of Standards and Technology – develops fire retardant mechanisms and rapid screening tools for flammability.
- Memorandum of cooperation with the British Civil Aviation Administration – R&D involves a variety of fire safety research efforts.
- Cabin safety research technical group – cooperates in and coordinates cabin safety research conducted and/or sponsored by the international regulatory authorities.
- Arrangements with Fortune 100 companies to share development costs for new fire resistant materials.

Accomplishments: The FAA operates the world's most extensive aircraft fire test facilities. The FAA certification engineers receive training in these facilities each year and, at the request of the NTSB, program personnel participate in major fire accident and incident investigations. The Fire Research and Safety Program annually publishes over two-dozen reports and papers (available to the public on-line at http://www.fire.tc.faa.gov/reports.asp) highlighting research results that have led to major improvements in aircraft safety.

Outstanding program accomplishments include:

FY 2007:

- Developed a cabin crew training video for fighting in-flight fires.
- Characterized the flammability of epoxy-graphite structural composites.
- Developed and standardized a next generation burner for insulation burn-through resistance.
- Evaluated the flammability of non-halogen, ultra-fire resistant plastics.

FY 2006:

- Evaluated the cabin hazards caused by outgassing from a composite fuselage material subjected to a simulated post-crash fuel fire.
- Determined the fire hazards of lithium ion batteries shipped as air cargo.
- Conducted engine nacelle fire extinguishment tests to determine the suitability of a promising new environmentally friendly agent, NOVEC 1230, as a replacement for the currently used halon.

FY 2005:

- Issued the first Department of Transportation licenses to manufacture the FAA-patented microscale combustion calorimeter for evaluating the heat release rate of extremely small research samples of advanced ultra-fire resistant material.
- Developed technology to support the use of low false alarm cargo fire/smoke detectors.
- Determined the vulnerability of AN-26 insulation to ignition by a small arc, resulting in the issuance of a proposed Airworthiness Directive requiring its removal from affected aircraft.
- Characterized the fire performance of ultra-fire resistant chlorobisphenol polymers for aircraft interior applications.

FY 2004:

- Conducted flight tests in National Aeronautics and Space Administration 747 shuttle carrying aircraft to measure performance of FAA fuel tank inerting system and measure fuel tank vapor concentration (first time ever done).
- Determined the limiting concentration of oxygen to prevent fuel tank explosions.
- Evaluated the effectiveness of halon hand-held extinguishers against hidden fires in standard and wide body aircraft.
- Developed technology and requirements for the protection of shipped oxygen cylinders during a cargo compartment fire, resulting in the issuance of a Notice of Proposed Rulemaking.

Previous Years:

- Developed and demonstrated a simple and cost effective fuel tank inerting system.
- Developed improved and new flammability tests for thermal acoustic insulation, measuring in-flight fire resistance and post-crash burn-through resistance, respectively.
- Developed minimum performance test standards for halon replacement agents.
- Developed and demonstrated an onboard cabin water spray system for significantly improving post-crash fire survivability.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements

- Develop and evaluate an onboard detection and extinguishment system to protect against hidden in-flight fires (under full-scale test conditions).
- Complete development of updated Advisory Circular on hand held extinguishers prescribing safe agent exposure levels.
- Examine lithium battery technology in passenger carry-on items and aircraft power systems for potential fire safety risks.
- Measure the flammability of <u>wing</u> fuel tank vapors under simulated operational conditions.
- Evaluate the effectiveness of intumscent paint for fuselage burn-through protection under full-scale fire test conditions.

Fire Resistant Materials

- Fabricate small-scale ultra-fire resistant cabin panels (sidewalls, ceiling) using fire smart polymer technology and measure fire and mechanical performance; down-select to optimal panel design.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Research on the prevention of hidden in-flight fires will continue to address the fire resistance of interior materials and the growing problem with lithium battery fire hazards. This research responds to FAA concerns with the high frequency of in-flight smoke/fume incidents, averaging more than two per day, and the diversions/returns that often occur.

Research related to the fire behavior of structural composites is driven by the new Boeing 787, the first large transport aircraft with a composite fuselage and wings. A number of fire safety concerns will be studied, associated with the replacement of aluminum with a combustible composite material that can burn and is a poor conductor of heat.

Research will also continue on the improvement of existing required flammability tests and the development of new tests for novel applications of materials that may impact future aircraft fire safety.

Fuel tank explosion protection research will focus on supporting the introduction of fuel tank inerting systems in the U.S. Fleet, and understanding and predicting the flammability of <u>wing</u> fuel tanks, which is an immediate concern for aluminum and composite (e.g., B-787) constructions.

Long term, applied research will continue to develop the enabling technology for ultra-fire resistant interior materials, and facilitate the transfer of that technology to the private sector through patents, reports, publications, and international standards.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements

- Develop improved fire test criteria for materials in hidden areas not previously addressed.
- Develop fire safety guidance for new high energy density lithium batteries in passenger carry-on items
- Develop fire test criteria to limit the emission of hazardous gases during post-crash fire exposure of a burn-through resistant fuselage, including composite construction.
- Develop small-scale fire test criteria to measure the effectiveness of intumescent paint used to impart burn-through resistance to an aluminum fuselage, if warranted.
- Demonstrate the application of non-intrusive oxygen measurement technology in aircraft fuel tanks.
- Develop an analytical model to predict the flammability in wing fuel tanks.

Fire Resistant Materials

Fabricate small-scale ultra-fire resistant thermoplastic components (e.g., seat tray, passenger service units) and measure fire and mechanical performance; down select optimal thermoplastic design.

Budget Item	Program Title	Budget Request
A11.b.	**Propulsion and Fuel Systems**	**$3,669,000**

GOALS:

Intended Outcomes: The Propulsion and Fuel Systems Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with the failure of aircraft engines, components, and fuel systems. The program supports FAA's aviation safety goal by developing technologies, procedures, test methods, and criteria to enhance the airworthiness, reliability, and performance of civil turbine and piston engines, propellers, fuels, and fuel management systems. In addition, the program is working with fuel, airframe, and engine manufacturers to test new unleaded fuels as they become available to seek a safe alternative to current leaded aviation gasoline (avgas). To improve safety, the program will conduct the research needed to develop tools, guidelines, and data to support improvements in turbine engine certification requirements.

Agency Outputs: The FAA issues certification and advisory standards, and it endorses the specifications and practices recommended by recognized technical societies to maintain the airworthiness of aircraft engines, fuels, and airframe fuel management systems. The agency also publishes information and sponsors technology workshops, demonstrations, and other means of training and technology transfer. The Propulsion and Fuel Systems Program provides the technical information, R&D resources, and technical oversight necessary for the agency to deliver the propulsion, fuel, and fuel transfer system technologies.

Research Goals: To enhance the safety and reduce the risk associated with the failure of engine systems, the propulsion program is developing criteria, guidelines, and data to support improvements of turbine engine certification standards. The current focus is to ensure the structural integrity and durability of critical rotating engine parts throughout their service life. This research is providing analytical tools to meet the requirements of Advisory Circular (AC) 33.14-1, "Damage Tolerance for High Energy Turbine Engine Rotors", allowing aircraft turbine engine manufacturers to assess the risk of fracture and manage the life of rotor disks. Research is also being conducted to establish an improved understanding of other material factors and manufacturing anomalies that can shorten the fatigue life of rotor disks. In the general aviation piston engine arena, the goal is to find a replacement for current leaded avgas (100LL). The replacement fuel should perform as well as 100LL in general aviation (GA) piston engines. This unleaded high octane replacement fuel must not cause any accidents and should be a seamless, transparent change to a GA pilot. Extensive laboratory and test cell dynamometer engine testing will evaluate and characterize all new fuel formulations provided by industry for consideration.

- By FY 2010, evaluate the feasibility of using ethanol and ethanol blends as a general aviation fuel.
- By FY 2012, evaluate the feasibility of modifying general aviation piston engine controls to accommodate alternative fuels for 100LL.
- By FY 2012, develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- By FY 2012 evaluate and characterize all candidate replacement formulations for 100LL.
- By FY 2012, develop advanced damage tolerance methods to reduce the risk of failure of turbine engine rotor disks.

Customer/Stakeholder Involvement: The Propulsion and Fuel Systems Program works with the following industry and government groups:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.

- The Coordinating Research Council (CRC) Unleaded Aviation Gasoline Development Group – representatives from Texaco, Exxon Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming facilitate two-way transfer of technology between government and industry to benefit all participants.
- The CRC Molecular Marker Ad Hoc Committee – representatives from turbine engine manufacturers, major oil companies and FAA provide oversight to ensure the safe implementation when adding molecular markers to jet fuel.
- The Aerospace Industries Association (AIA) – working subcommittees on rotor integrity and rotor manufacturing.
- The National Transportation Safety Board – Recommendations A-90-89 and A-90-90 recommend that a damage tolerance philosophy be implemented in the design and maintenance of failure critical engine parts and A-98-28 recommends that FAA in cooperation with industry address the uncontained engine failures caused by cold dwell fatigue.

R&D Partnerships: Propulsion and Fuel Systems Program R&D partners include:

- Turbine Rotor Material Design Program - Southwest Research Institute (SwRI) has teamed with Pratt and Whitney, General Electric, Honeywell, and Rolls Royce to provide DARWIN™, a probabilistic-based rotor life and risk management certification tool.
- The AIA working subcommittees on rotor integrity and rotor manufacturing.
- The Ohio State University, a member of the FAA Airworthiness Assurance Center of Excellence (COE), is conducting research on a failure mode of titanium rotor disks known as cold dwell fatigue.
- SwRI is conducting research to determine the acceptable level of fuel dye contamination allowable for the safe, continuous operation of turbine engines in partnership with the Defense Energy Support Center, Internal Revenue Service, Air Transport Association, American Petroleum Institute, General Electric Aircraft Engines, Pratt and Whitney, Rolls Royce, Honeywell and Boeing.
- CRC Unleaded Aviation Gasoline Development Group – includes Texaco, Exxon-Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming; this group facilitates two-way transfer of technology between government and industry to benefit all participants.
- The FAA General Aviation Center of Excellence in conjunction with direct grants with the University of North Dakota, South Dakota State University and Baylor University – these relationships produce feasibility studies for the use of ethanol fuel blends as a possible unleaded piston fuel replacement for 100LL avgas.

Accomplishments: Outstanding program accomplishments include:

FY 2007:

- Completed an enhanced version of the DARWIN™ code with the following new features: new analysis mode for titanium hard alpha anomalies, probabilistic treatment of multiple anomalies, and a crack formation module.
- Completed full scale engine tests of 45 fuel formulations provided by the CRC.

FY 2006:

- Continued the enhancement of the DARWIN™ probabilistic rotor design code.
- Completed research on an experimental GA fuel provided by Exxon-Mobil under a cooperative research and development agreement; results demonstrated that amine-based additives show some promise as a replacement for 100LL.

- Completed research investigating the feasibility of using ETBE, an ethanol fuel blend, as a GA fuel; results showed there are significant range penalties associated with this fuel that make it an undesirable replacement for 100LL.

FY 2005:

- Completed an enhanced version of the DARWIN™ code that addresses multiple subsurface defects in turbine engine rotor disks.

FY 2004:

- Populated a rotor manufacturing induced anomaly database for use by the engine industry in sharing lessons learned in the manufacture of critical rotating engine parts to prevent future accidents caused by manufacturing defects.
- Completed an industrial demonstration of the pool power controller for the vacuum arc remelting process that will aid in producing defect-free titanium material for the manufacturer of turbine engine rotor disks.
- Completed research on the performance in a GA piston engine of 30 unleaded fuel formulations specified by the CRC Unleaded Aviation Gasoline Development Group. The research showed that none of the candidate formulations match the detonation suppression capability of 100LL.

Previous Years:

- Demonstrated, verified, and industrialized the probabilistic rotor design and life management code known as DARWIN™ for titanium alloys that provides turbine engine manufacturers a tool to augment their safe life approach.
- Demonstrated and verified the DEFORM™ defect deformation code for analysis of titanium alloy defects during the rotor disk forging process.
- Proved that the fleet octane requirement is the single most critical parameter for development of high octane unleaded aviation gasoline and that the motor octane rating of any potential candidate must be 100 or greater.
- Defined detonation detection procedures that were adopted by the American Society for Testing and Materials as a test standard (ASTM D6424) for use on candidate unleaded replacement fuels.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for surface damage of turned surfaces and blade slots.

Unleaded Fuels and Fuel System Safety Research

- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas including ethanol and ethanol blends.
- Complete research on the effects of molecular markers in Jet A fuel.
- Continue research and engine tests on blended fuels containing ethanol for piston engines.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Continue to advance DARWIN™, the probabilistically based turbine engine rotor design and life management code to enhance its predictive capability. This code is an FAA approved means to support a damage tolerant based certification enhancement to the current safe life design approach.
- Continue to develop advanced damage tolerance methods for turbine rotor disks through experimentation and modeling to address the effects of complex time-temperature stress histories, small crack sizes, anomalies in nickel alloys, crack geometries, and surface residual stress on fatigue crack growth life.

- Continue to develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- Continue to assess industry-provided lead free fuel formulation candidates, including petrochemical and ethanol based fuels to replace 100LL avgas.

New Initiatives

No new initiatives are planned in FY 2009

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for automatic rotor modeling.
- Complete experiments to calibrate and verify analytical methods for time-dependent crack growth and thermo-mechanical fatigue crack growth.

Unleaded Fuels and Fuel System Safety Research

- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas including ethanol and ethanol blends.

Budget Item	Program Title	Budget Request
A11.c.	**Advanced Materials/Structural Safety**	**$2,920,000**

GOALS:

Intended Outcomes: The Advanced Materials/Structural Safety Program helps FAA achieve its strategic goal of increasing aviation safety by preventing accidents that would occur as a result of structural failure. The Advanced Materials/Structural Safety Program assesses the safety implications of new and present day composites, alloys, and other materials, and associated structures and fabrication techniques that can help to reduce aviation fatalities. The program is also enhancing aircraft crashworthiness.

Agency Outputs: The Advanced Materials/Structural Safety Program provides technical support for rule making and develops guidance to help the aviation industry comply with agency regulations.

Advanced Materials

The FAA establishes rules for the certification of safe and durable materials for use in aircraft construction. While the rules are the same for composite or metal structures, different behavioral characteristics of structural materials call for different means of compliance. Although Advisory Circular (AC) 20-107A, "Composite Structure" has been published, advances in technologies and materials require periodic updates and expansion of the AC. The FAA Chief Scientist/Technical Advisor Program disseminates current technical information to regulatory personnel through technical reports, handbooks, and guidance. The goal of this data exchange is to allow regulatory processes to keep pace with industry advances and benefit from state-of-the-art technology and design.

Structural Safety

The FAA revises or updates crashworthiness-related Federal Aviation Regulations to accommodate new information for overhead stowage bins, auxiliary fuel tanks and fuel systems, aircraft configurations, seat and restraint systems, and human tolerance injury criteria. The FAA is developing alternative methods to streamline the certification process (i.e. certification by analysis and component tests in lieu of full-scale tests).

Research Goals: To prevent accidents associated with the airframe and to improve the crashworthiness of airframes in the event of accidents, the Advanced Materials/Structural research focuses on developing analytical and testing methods for standardization; understanding how design, loading, and damage can affect the remaining life and strength of composite aircraft structures; developing maintenance and repair methods that are standardized and correlated with training and repair station capabilities; enhancing occupant survivability and reducing personal injury from accidents; improving crash characteristics of aircraft structures, cabin interiors, auxiliary fuel tanks, fuel systems, and occupant seat and restraint systems; and improving the efficiency of aircraft certification through the use of better analytical modeling of crash events.

- By FY 2009, generate composite material dynamic properties.
- By FY 2009, develop analytical modeling techniques of aircraft structures.
- By FY 2010, generate data using full-scale structure with a goal of uniform, accepted certification methodology for damage tolerance and fatigue of composite airframe.
- By FY 2010, develop test and analysis protocols for repeated loads and damage threats.
- By FY 2011, identify required data and test methods for high temperature materials to assure safety of new constructions.
- By FY 2012, initiate study of ceramics as they are used in engine components.
- By FY 2013, develop criteria for damage tolerance assessments of laminate composite structures.
- By FY 2013, generate methodology for demonstrating aircraft structure crashworthiness certification by analysis.

Customer/Stakeholder Involvement: The Advanced Materials/Structural Safety Program complies with or cooperates with the following legislation and industrial and government groups:

- Public Law 100-591, the Aviation Safety Research Act of 1988, and House of Representatives Report 100-894 – sets priorities to develop technologies, conduct data analysis for current aircraft, and anticipate problems related to future aircraft.
- The Aviation Rulemaking Advisory Committee (ARAC) – this FAA committee and its subcommittees help to ensure the effectiveness of the agency's rule making by identifying R&D requirements and priorities, providing guidance for the update of documents, such as AC20-107A, and encouraging industry's full participation in implementing new rules.
- Aircraft Safety Subcommittee of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.

R&D Partnerships: The Advanced Materials/Structural Safety Program benefits from a close working relationship with the FAA Center of Excellence lead by Wichita State University's National Institute of Aviation Research and the University of Washington. The research performed under this program is leveraged by the monetary and intellectual contributions of its core universities.

Advanced Materials

With the cooperation of other government agencies, FAA sponsors a primary, authoritative handbook (Composite Materials Handbook 17) facilitating the statistical characterization data of current and emerging composite materials. The best available data and technology source for testing and analysis, this international reference tool also includes guidance on data development and usage. On recommendations by the ARAC, material data contained in this handbook are acceptable for use in the certification process.

Structural Safety

The program maintains cooperative interagency agreements in the structural safety area with the U.S. Army and Navy in the analytical modeling area.

Memoranda of cooperation and exchange of personnel have been established between the program and the French, Italian, and Japanese governments in the crash testing area. The program has worked closely with Drexel University to develop dynamic crash computer modeling codes for transport airplane structures.

Accomplishments: The Advanced Materials/Structural Safety Program provides technical reports (available on-line at http//actlibrary.tc.faa.gov), handbooks, ACs, and certification guidance to aircraft manufacturers, maintainers, and operators. Outstanding program accomplishments include:

FY 2007:

- Completed the validation of analytical methodology to predict residual strength of a composite sandwich structures following an impact event.
- Established feasibility of embedded sensors to track damage in composite structures.
- Evaluated aging composite aircraft by a destructive evaluation and testing.
- Developed an updated ATR 42-300 model to analyze critical fuselage frame failure observed in the vertical drop test.
- Developed occupant protection criteria for side facing seats commonly used in business jets. Currently, no criteria exist.
- Evaluated the use of reticulated foam to mitigate post-crash fires using full-scale sled tests.

FY 2006:

- Developed software for analyzing bonded joints that can be used by the general aviation industry.
- Developed a web-based course on maintenance of composite airframe structures.
- Developed analytical models that predict durability of braided materials.
- Generated data on human neck injury criteria for side-facing aircraft seats that may be used to develop safety criteria for business jet with side-facing seats. Currently, no criteria exist for these seats.

FY 2005:

- Developed an aircraft seat cushion replacement methodology that may have the potential to replace future requirement for full-scale sled test currently required when replacing aircraft seat cushions.
- Established common practices for bonded joints in composites structures that served as a basis for an AC.

Previous years:

- Developed data on the procurement and processing of composites that resulted in a published AC.
- Analyzed data from ATR42-300 drop test to help establish crashworthiness criteria for commuter aircraft.
- Developed an economical data reduction method, characterizing statistically composite materials through shared databases, that is now used worldwide by the general aviation industry.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Assess the severity of control surface stiffness degradation and its effect on dynamic characteristics.
- Develop chemical characterization tests to ensure adequate surface preparation for bonded joints.
- Develop safety criteria for damage tolerance of fiber/metal laminates and friction stir welded joints.

Structural Safety

- Develop analytical models of aircraft crash events to reduce the number of full-scale tests and thus reduce the cost of certification.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

The program will continue to focus on damage tolerance and fatigue issues of composite airframes. In addition it will focus on the aging of composite materials. Composite control surfaces degradation on transport airplanes will be explored and linked to aircraft safety issues. Bonded joints will be studied for damage tolerance and durability. Researchers will also explore savings in maintenance costs, of using embedded sensors to monitor in-service damage and will investigate the long-term safety friction stir-welded parts and fiber/metal laminates proposed for use in new aircraft. In addition, they will collect data for new materials and applications, such as ceramics and high temperatures.

Research will continue to develop analytical models of aircraft crash events. This will focus on the development of criteria and methodologies to validate analysis techniques and assess the effectiveness of the analysis to properly describe the crash event.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Generate composite material dynamic properties.

Structural Safety

- Develop analytical modeling techniques of aircraft crash conditions.

Budget Item	Program Title	Budget Request
A11.d.	**Atmospheric Hazards/Digital System Safety**	**$4,838,000**

GOALS:

Intended Outcomes: The Atmospheric Hazards/Digital System Safety (DSS) Research Program supports FAA's strategic goal of increased safety by reducing the number of accidents or potential accidents associated with aircraft icing and failures to software-based digital flight controls and avionics systems. The program supports FAA's aviation safety goal by developing and testing technologies that detect frozen contamination, predict anti-icing fluid failure, and ensure safe operations both during and after flight in atmospheric icing conditions. To improve digital system safety, researchers are working to ensure the safe operation of emerging, highly complex software-based digital flight controls and avionics systems.

A major goal of the program is to reduce aviation's vulnerability to all in-flight icing hazards through the application of its research to improve certification criteria. Commercial airplanes are not yet certified to fly in icing conditions to an icing envelope that includes supercooled large droplet (SLD) icing conditions. The program's researchers have contributed to the development of technical data and advisory materials to correct this omission. A study by the Engine Harmonization Working Group indicates that over 100 in-service engine events, many resulting in power loss and at least six in multiple engine flameouts, occurred in high ice water content environments over the period 1988 to 2003. A future collaborative research effort will focus on this issue.

The program will develop new guidelines for testing, evaluating, and qualifying digital flight controls and avionics systems for the certification of aircraft platforms. Additionally, the program supports development of policy, guidance, technology, and training needs of the Aircraft Certification Service and Flight Standards Service that will assist and educate FAA and industry specialists in understanding digital systems safety and assessing how it may be safely employed in systems such as fly-by-wire, augmented manual flight controls, navigation and communication equipment, and autopilots.

Agency Outputs: The FAA establishes rules for the certification and operation of aircraft that encounter icing conditions as well as rules for the use of software, digital flight controls, and onboard avionics systems. The agency uses the research results to generate Advisory Circulars (ACs), and various other forms of technical information detailing acceptable means for meeting requirements, to guide government and industrial certification and airworthiness specialists and inspectors.

Research Goals: To reduce the number and severity of accidents, or potential accidents, associated with icing and failures to software-based digital flight controls and avionics systems, the program develops and assesses ways to ensure that airframes and engines can safely operate in atmospheric icing conditions, and ensure the proper operation of software, complex electronic hardware, and digital systems.

Atmospheric Hazards

- By FY 2010, complete characterization of high ice water content atmospheric environments potentially hazardous to engines.
- By FY 2011, complete experimental work on the physics of engine icing in high ice water content environments.
- By FY 2012, develop methods for the airworthiness testing of engines in simulated high ice water content environments.
- By FY 2013, develop data and methods supporting the evaluation of aircraft engines for operation in high ice water content environments.

Digital System Safety

- By FY 2010, evaluate complex hardware techniques and tools for qualification, verification, and assurance to develop additional evaluation methods that may improve the certification process for complex hardware.

- By FY 2010, determine potential safety, security, and certification issues of connecting aircraft systems to external systems, per onboard network security and integrity.
- By FY 2010, determine software development assurance levels.
- By FY 2011, evaluate the obsolescence and life cycle maintenance of aviation electronics to determine the availability and affordability of digital avionics repair parts.
- By FY 2011, evaluate model-based development criteria to promote faster development and shorter certification times for aircraft systems with safety-critical software and complex electronic hardware.
- By FY 2012, evaluate alternatives to existing verification and validation techniques; improved techniques will provide a way to identify system requirement errors early in the development process before implementation into the system.
- By FY 2013, determine applicability of safety engineering and reliability engineering to software development assurance standards (i.e., DO-178B).

Customer/Stakeholder Involvement: The Atmospheric Hazards/Digital System Safety Research Program collaborates with a broad segment of the aviation community to improve aircraft certification, inspection, and maintenance, including:

- Aircraft Safety Subcommittee of the FAA Research, Engineering, and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the Atmospheric Hazards/Digital System Safety Research Program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that the program's R&D projects support new rule making and the development of alternate means of compliance with existing rules.
- Ice Protection Harmonization Working Group and Engine Harmonization Working Group of the FAA Aviation Rulemaking Advisory Committee – groups that ensure the effectiveness of the agency's rule making. Members of the working group and full committee identify research requirements and priorities.
- G-12 Aircraft Ground Deicing Committee of the Society of Automotive Engineers (SAE) – this subcommittee assists in updating holdover time guidelines and establishing standards for de/anti-icing methodologies, deicing fluids, and ground ice detection.
- SAE AC-9C Aircraft Icing (In-flight) Subcommittee – this subcommittee assists in updating the Aircraft Icing Handbook, including the Icing Bibliography, and in establishing standards for icing simulation methods.
- RTCA (formerly known as Radio Technical Commission for Aeronautics) – members of this U.S. Federal Advisory Committee and its special committees help to ensure the effectiveness of the agency's rulemaking by identifying research requirements and priorities and providing guidance for Aircraft Certification Office engineers and the update of documents, such as avionics software, and electromagnetic hazards.
- Certification Authorities Software Team (CAST) – a group of international certification software and complex electronic hardware (CEH) specialists who collaborate and make recommendations to regulatory authorities on the resolution of software and CEH aspects of safety.

R&D Partnerships: The program maintains a number of cooperative relationships:

- National Aeronautics and Space Administration (NASA) Glenn Research Center – includes various cooperative efforts on aircraft icing activities.
- Transport Canada – based on an international agreement on research on aircraft ground deicing issues.
- Environment Canada – based on an international memorandum of cooperation for research on in-flight icing conditions.

- NASA Langley Research Center – assesses software-based digital flight controls and avionics systems and electromagnetic hazards research.
- Aerospace Vehicle Systems Institute (AVSI) – cooperative industry, government, and academia venture for investigation and standardization of aerospace vehicle systems to reduce life-cycle cost and accelerate development of systems, architectures, tools, and processes.

Accomplishments: Significant program accomplishments include:

Aircraft Icing

FY 2007:

- Conducted propeller icing test in McKinley Climatic Chamber and processed and published data.
- Conducted testing at flight Reynolds numbers on full-scale airfoil model of simulated runback ice for a thermal ice protection system.
- Developed technical data for the use of ground ice detectors.

FY 2006:

- Developed snow generation system to test the time of effectiveness of modern de/anti-icing fluids in a controlled laboratory environment.
- Completed development of facility simulation capability for SLD icing testing to show safe operation in SLD environments in accordance with new proposed rules.
- Completed documentation and analysis of residual and inter-cycle ice for pneumatic boots at low airspeeds to provide data for guidance to ensure safe operation of pneumatic boots on low speed aircraft in icing conditions.

FY 2005:

- Investigated and documented characteristic features of runback ice for thermal ice protection systems to provide data for guidance to ensure safe operation of thermally protected aircraft in icing conditions.
- Enhanced in-flight icing simulation capability at the McKinley Climatic Laboratory suitable for testing of full scale engines and rotor blades for substantiation of safe operation of engines and helicopters in icing conditions.

FY 2004:

- Investigated and analyzed atmospheric icing environment - supercooled water and mixed-phase conditions – to provide data for formulation of expanded atmospheric icing envelopes for new proposed rules.

Digital System Safety

FY 2007:

- Completed analysis of aspects of commercial off-the-shelf (COTS) component integration related to the verification of the integration of components into a generic aviation platform that includes a handbook that will be useful for FAA and industry practitioners of integrating IMA systems on aircraft. Results published in a technical report.
- Developed evaluation criteria for airworthiness of newly proposed databuses that will define a suitable approach to develop and evaluate data networks for safety-critical avionics; results will provide guidance to FAA certification engineers. Results published in a technical report.
- Defined a safe, secure process for implementing LANs onboard aircraft; results will provide a network assurance process for FAA certification engineers. Results published in a technical report.

FY 2006:

- Completed research on object-oriented technology (OOT) in aviation that will provide input for policy and guidance on the use of OOT systems and support harmonization with international certification authorities on the use of OOT.
- Completed research on component integration and verification considerations in integrated modular avionics (IMA) systems; results will lead to more effective systems development and enhance the certification of digital flight controls and avionics systems.
- Evaluated the criteria and use of microprocessors in aviation and the identification of safety concerns for microprocessors; results will be used to develop test methods for modern, complex microprocessors that will improve the process of certifying aircraft avionics.

FY 2005:

- Studied deterministic operations of Ethernet equipment and provided evaluation criteria for the certification of Ethernet databases; results were incorporated into a handbook that provides network designers with guidelines for developing Ethernet databases that will be deployable in certifiable avionics systems.
- Completed research on software development tools that led to a handbook for developers and certifying authorities to use to evaluate the tools from the system and software safety perspective and provided a basis for future software development tool qualification guidelines.
- Completed research on software verification tools that identified specific evaluation criteria that could be used to determine whether the performance of the tool was acceptable and thereby improve the ability of the certification engineer to qualify software using these tools.

Previous Years:

- Investigated issues concerning the structural coverage of object-oriented software that clearly showed that there is a desire and emerging trend by suppliers of commercial airborne safety-critical systems toward the use of object-oriented technology (OOT), and thereby an increasing need by certifiers for the proper application of structural coverage analysis to OOT.
- Investigated three forms of the modified condition decision coverage (MCDC) criterion that assists with the assessment of the requirements-based testing process for Level A software and provided data to support the right choice for the type of structural coverage to use.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Complete analysis of data from propeller icing test at McKinley Climatic Laboratory to provide data for guidance to ensure safe flight of propeller aircraft in icing conditions.
- Continue research to characterize high ice water content environments for engines to ensure their safe operation in such conditions.
- Continue experimental work on the physics of engine icing in high ice water content environments
- Develop improved methods for simulation of ice pellet, mixed, and other conditions for determination of fluid failure and holdover times.
- Continue study of aerodynamic effects of runback ice for thermal ice protection for simulated flight conditions.

Digital System Safety

- Complete and document methods to improve software velocity in production certification timeframes.
- Determine additional microprocessor evaluation issues pertaining to risk and safety.
- Evaluate onboard network security and integrity issues.
- Evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.
- Evaluate COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Researchers will continue to refine laboratory methods to determine de-icing fluid holdover times in a variety of environmental conditions. Study of the enhancement and validation of icing simulation methods, with an emphasis on engine testing in high ice water content conditions will continue. Researchers will also continue to evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.

New Initiatives

No new initiatives are planned for FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Continue collaborative flight research to acquire atmospheric data for high ice water content environments. Initiate processing and analysis of data.
- Continue experimental work on the physics of engine icing in high ice water content environments.
- Complete the development of methods for simulation of ice pellet and mixed conditions for determination of fluid failure and holdover times.
- Develop methods to test engines in simulated high ice water content environments.
- Complete investigation of runback ice formation and size and velocity effects on aerodynamic impact of runback ice for thermal ice protection for simulated flight conditions.

Digital System Safety

- Complete an additional microprocessor evaluation pertaining to risk and safety.
- Evaluate onboard network security and integrity issues.
- Evaluate complex electronic hardware techniques and tools for qualification, verification, and assurance.
- Evaluate COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics.
- Determine software development assurance level.
- Evaluate verification and validation techniques.

Budget Item	Program Title	Budget Request
A11.e.	**Aging Aircraft/Continued Airworthiness**	**$14,589,000**

GOALS:

Intended Outcomes: The Aging Aircraft/Continued Airworthiness Program (formerly known as the Aging Aircraft Program) contributes to FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with failure of aircraft structure, engines, and systems. The program supports FAA's aviation safety goal by developing technologies, procedures, technical data, and performance models to prevent accidents and mitigate accident severity related to civil aircraft failures as a function of their continued operation and usage. The program is focused on the structural integrity of fixed wing aircraft and rotorcraft, continued safety of aircraft engines, development of inspection technologies, and safety of electrical wiring interconnect systems (EWIS), mechanical systems, and flight controls.

Agency Outputs: The FAA issues rules and advisory materials for regulating aircraft design, construction, operation, modification, inspection, maintenance, repair, and safety. Technologies, procedures, technical data, and analytical models produced by the Aging Aircraft/Continued Airworthiness Program provide a major source of technical information used in developing these regulations and related advisories. Through this research, FAA also provides the aviation community with critical new safety technologies and data.

Research Goals: The goal of the Aging Aircraft/Continued Airworthiness Program is to understand and develop methods to counter the effects of age and usage on the airworthiness of an aircraft over its lifetime, including potential effects of modifications and repairs. The program conducts research, develops technologies and processes, and assesses current practices in order to eliminate or mitigate the potential failures related to aircraft aging processes, thereby reducing the number and severity of accidents.

To satisfy these goals the program conducts research to assess causes and consequences of airplane structural fatigue, corrosion, and other structural failures, and develop effective analytical tools to predict the behavior of these conditions. This includes development of nondestructive inspection technologies to detect these conditions. Similar research is conducted on aircraft engines and rotorcraft. Aircraft systems research to understand the causes and consequences of EWIS and mechanical systems failures, and the relationship of these failures to other aircraft systems and safety completes the program.

- By FY 2010, develop EWIS separation and segregation advisory guidance. This research supports development of guidelines for the design and modification of aircraft EWIS and improves safety by ensuring that adequate clearances for EWIS separation and segregation are provided in EWIS installation.
- By FY 2010, develop and validate a model-assisted probability of detection methodology to determine quantitative inspection reliability data, eliminating the need to conduct expensive and time consuming tests currently required to establish inspection reliability. Accurate probability of detection data is critical to determining the life of safety critical components.
- BY FY 2011, complete a study of risk-based fleet management for small-airplane continued operational safety.
- BY FY 2011, assess performance of in-situ damage detection technologies for inspection of remote and inaccessible areas in aircraft. In-situ monitoring provides the means to monitor structural behavior and identify damage not normally found between major maintenance checks.
- By FY 2011, complete study to assess need for new rudder design standards in transport category aircraft and need for new pilot training standards with regard to rudder usage.
- BY FY 2012, develop damage tolerance methodologies and standards for rotorcraft to establish guidance for certification.
- BY FY 2012, assess performance of traditional and advanced inspection systems necessary for evaluating the strength of bonded aircraft structures. The continued airworthiness of bonded aircraft structures, whose use is increasing, will require technologies to find hidden damage in these joints.

- By FY 2013, develop standards for rotorcraft that provide guidance for certification of Health and Usage Monitoring Systems (HUMS) for usage credits.
- By FY 2013, develop a predictive methodology for damage tolerance risk assessment and risk management for continued operational safety of small airplanes.

Customer/Stakeholder Involvement: The Continued Airworthiness Program coordinates with an extensive network of government and industry groups, including:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- The Aviation Rulemaking Advisory Committee – Industry representatives propose cost-effective rulemaking and research to address aircraft safety issues.
- Aircraft manufacturers, operators, foreign airworthiness authorities, academia, and industry trade groups consult on a wide range of current and future aging aircraft and continued airworthiness issues.

R&D Partnerships: The Aging Aircraft/Continued Airworthiness Program activities are closely coordinated with industry, NASA, and DoD. The FAA maintains interagency agreements with NASA, the U.S. Navy, the U.S. Air Force, and the Department of Energy (DOE). The FAA, DoD, and NASA have co-sponsored 10 joint aging aircraft conferences.

The FAA collaborates closely with several private and public organizations, including:

- The Joint Council on Aging Aircraft – leverages resources and coordinates the efforts of all DoD service organizations for common aging aircraft issues.
- The National Rotorcraft Technology Center – comprised of the U.S. Army, U.S. Navy, FAA, and NASA.
- Metallic Materials Properties Development and Standardization (MMPDS) Government/Industry Steering Group – a joint government and industry working group that funds and develops the metallic materials properties handbook.

Accomplishments: The Aging Aircraft/Continuing Airworthiness Program conducts a broad array of projects to meet the goals described above. Technical reports documenting the accomplishments of most projects are available on-line at http://aar400.tc.faa.gov/Programs/AgingAircraft/index.htm.

Outstanding program accomplishments include:

FY 2007:

- Completed the airworthiness evaluation of an aged Raytheon Beech 1900D.
- Completed the destructive and extended fatigue testing of fuselage sections from a retired Boeing 727. Results support formulation of policy on use of teardown data for airworthiness certification.
- Conducted the field test of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components.
- Completed assessment of ASTM and new fatigue crack growth test methods for use in addressing rotorcraft fatigue life.

- Developed methodology to evaluate mechanical systems on current transport category aircraft for safety and reliability.

FY 2006:

- Completed development of the MMPDS Handbook of FAA accepted material properties, which replaces MIL-HDBK-5 previously cancelled by the DoD. The MMPDS Handbook is an essential reference for aircraft manufacturer design engineers and is used by FAA for aircraft certification.
- Completed aircraft wire degradation research on common types of aircraft electrical wire as a function of laboratory controlled aging processes. Data generated are used to evaluate potential methods of monitoring wire performance in aircraft and wire reliability assessment methods.
- Completed research on the use of composite doublers as a safer, more cost-effective means for repair of damaged metallic aircraft structure.
- Completed development of a low cost, field prototype, generic scanning and imaging system that can be readily coupled to existing aircraft inspection devices, thereby improving flaw detection in metal and composite structure.
- Completed second-phase development of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components. This technology is a potential replacement of fluorescent penetrant inspection.

FY 2005:

- Completed airworthiness evaluations of two aging Cessna airplanes, a 402A and 402C, and a teardown evaluation of a T-34A accident aircraft.
- Evaluated and verified methods to assess multiple site damage.
- Developed the fatigue crack growth database that is used in support of damage tolerance assessments of airframe structure.
- Developed and demonstrated a prototype micro-energy, high-voltage nondestructive test method for inspecting aircraft wiring.
- Completed research to determine the interrelationship of landing gear lateral loads on the body and wing gear during ground turns of FAA's multiple main gear B-747SP aircraft. Results of this research support development of landing gear certification standards.

Previous Years:

- Established the FAA Arc Fault Evaluation Laboratory and initiated the evaluation of advanced circuit protection technologies and experiments to quantify damage created by arc fault conditions.
- In cooperation with industry, developed, validated, and facilitated the adoption of improved inspection procedures for detecting cracks and corrosion in rotorcraft.
- Demonstrated phased array inspection technology for critical engine titanium forgings. Phased array technology reliably detects smaller material flaws in critical engine component forgings.
- Developed rotorcraft component damage part database that allows determination of the origin and causal factors of rotorcraft structure and component failures.
- Developed and flight tested aircraft arc-fault circuit breaker prototypes; they mitigate the hazardous effects of potentially catastrophic arc-faults.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a predictive methodology for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Complete loads characterization of B-737/700 (transports) and B-767 (cargo) airplanes in typical operations (altitude, airspeed, acceleration, ground-air-ground cycles, and kinematics of flight and ground operation). Data will be used to assess assumptions in design and certification.
- Complete assessment of reliability of various advanced inspection technologies in detecting second layer cracks in typical transport aircraft fuselage structure.

- Initiate research on damage tolerance and durability issues for emerging structural technologies entering service, to ensure safety, support maintenance, and establish future certification policies and guidance.
- Complete validation of HUMS flight regime recognition methods for rotorcraft using the HUMS advisory circular.
- Complete an advanced risk assessment tool for conducting hazard analysis of EWIS systems. The tool will use a probabilistic method to support compliance with FAR 25.1309 requirements.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

The FY 2009 funding request will support Aging Aircraft/Continued Airworthiness research requirements that contribute to FAA's aviation safety goal. The program will continue its focus on developing technologies, technical information, procedures, and practices that help ensure the safety of aircraft structures and systems in the civil aircraft fleet. Research will continue on the development of damage tolerance methods and health and usage monitoring systems for rotorcraft. Research will continue on the development and evaluation of risk assessment and risk management methods for the continued operational safety of small airplanes. Research will continue on flight controls and mechanical systems, focusing on design, maintenance and pilot training to increase safety. Researchers will also continue efforts on engine airworthiness and propeller damage tolerance. Research in nondestructive inspection will continue its focus on the development of methods and technologies to assure the long term safety of metallic and composite structures.

New Initiatives

The program will begin research that investigates issues related to flight control safety for general aviation.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a comprehensive analysis tool for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Complete studies to quantitatively determine the impact of process variables on the performance of fluorescent penetrant inspection (FPI) and integrate results into industry inspection standards.
- Develop a rotorcraft certification plan for the use of HUMS.
- Continue research on damage tolerance and durability issues for emerging structural technologies entering service, to ensure safety, support maintenance, and establish future certification policies and guidance.
- Complete the evaluation of thermal acoustic technology as a potential replacement for FPI in inspecting critical engine components.
- Complete the evaluation of nondestructive inspection (NDI) technologies for identifying small cracks and corrosion in propeller systems.
- Complete testing of single-element, dual-load-path flight control linkages from transport category aircraft for corrosion and other anomalies that could affect safety.
- Complete upgrade of Arc Fault Evaluation Laboratory to accommodate more sophisticated separation and segregation testing of aircraft wiring (EWIS research).

Budget Item	Program Title	Budget Request
A11.f.	**Aircraft Catastrophic Failure Prevention Research**	**$436,000**

GOALS:

Intended Outcomes: The Aircraft Catastrophic Failure Prevention Program supports FAA's strategic goal of increasing aviation safety by reducing the number of fatal accidents from uncontained engine failures and engine malfunctions. The program supports FAA's safety goal by developing technologies and methods to assess risk and prevent occurrence of potentially catastrophic defects, failures, and malfunctions in aircraft, aircraft components, and aircraft systems. Its researchers assess the use of advanced materials to protect aircraft critical systems and passengers in the event of catastrophic engine failures. The program also uses historical accident data and National Transportation Safety Board recommendations to examine and investigate:

- Turbine engine uncontainment events, including the mitigation and modeling of aircraft vulnerability to uncontainment parameters stated in Advisory Circular (AC) 20-128, Phase II.
- Fan blade out analysis and other engine related impact events like bird strike and ice ingestion.
- Propulsion malfunction indications in response to Aerospace Industries Association (AIA) recommendations and proposed solutions.

Agency Outputs: With technical data from the Aircraft Catastrophic Failure Prevention Program, FAA establishes certification criteria for aircraft and revises regulations to certify new technologies. The agency also publishes ACs to outline acceptable means for meeting these rules. The program's objective is to ensure safe aircraft operation in the public domain.

Research Goals: To reduce the number of fatal accidents from uncontained engine failures, the program develops data and methods for evaluating aircraft vulnerability to uncontained engine failures and provides analytical tools for protecting identified critical systems that may need shielding from uncontained engine debris. Through the LSDYNA Aerospace Users Group, FAA is working with industry to establish standards for finite element analysis and guidance for use in support of certification.

- By 2010, develop a modular Uncontained Engine Debris Damage Assessment Model (UEDDAM) (version 4) to be compatible with Department of Defense code upgrades for supportability and incorporate industry recommended improvements.
- By 2012, develop revised guidance for fuselage protection from uncontained engine failure fragments that includes multiple fragment analysis.
- In the area of propulsion malfunctions, the program develops guidance on the symptoms that can be expected when malfunctions occur and evaluates the ability of available technologies to detect and annunciate the malfunctions to the flight crew. An important factor is to identify which engine is malfunctioning so that in the event of a commanded engine shutdown, the crew will not mistakenly shut down a good engine.
- By 2011, conduct a propulsion indication system demonstration bench test that will combine the sustained thrust anomaly recommendations with the engine damage recommendations into a complete indication system.
- By 2013, conduct propulsion indication system simulator flight evaluation to provide a visualization of the cockpit indication in the flight environment.

Customer/Stakeholder Involvement: The program collaborates with a broad cross section of the aviation community, including:

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.
- The Aviation Rulemaking Advisory Committee (ARAC) – helps to ensure the effectiveness of the agency's rule making. Members of the subcommittee and full committee identify research requirements, priorities, and provide guidance for the update of documents such as AC20-128, and encourage industry's full participation in implementing new rules.

R,E&D Partnerships: The Aircraft Catastrophic Failure Prevention Program partners with industry and other government agencies including:

- The National Aeronautics and Space Administration (NASA) and industry in support of the development and validation of explicit finite element analysis. The industry participates in the LSDYNA Aerospace Users Group to support quality control reviews of the code and also critique research objectives in material testing, model development and verification. NASA and FAA are teamed to develop high quality test data and analytical models that support the Aerospace Users Group efforts. The end goal is to develop guidance for the use of LS-DYNA in the certification process.
- The AIA Transport Committee – with participation of FAA and industry, has examined propulsion system malfunctions, identified inappropriate crew response, and recommended development of specific regulations and advisory materials to correct safety hazards. AIA has completed some preliminary efforts on propulsion issues with implications for follow-on ARAC work on FAR 25.1305.

Accomplishments: Results of Aircraft Catastrophic Failure Prevention Program research provide the technical basis for FAA rule changes and new or modified ACs. Researcher results are also provided to airframe and engine manufacturers and designers.

Engine Uncontainment Research

FY 2007:

- Complete testing and modeling of fabrics used in gas turbine engine containment systems. Test results will be compared with analytical results from fabric model version 3.1
- Complete testing and material model development for aluminum using the Johnson-Cook formula.
- Develop an oversight process for generic aerospace problems run in LSDYNA that ensures consistent results as computers and programs continue to evolve.

FY 2006:

- Delivered the UEDDAM, version 3.0 for evaluation of uncontained engine debris hazards to aircraft. UEDDAM uses a Monte Carlo approach to perform the vulnerability analysis in design cases where the released multiple fragments are analyzed.
- Conducted a workshop for the Department of Defense and ARAC on UEDDAM in November 2005.

FY 2005:

- Developed fabric attachment data and designs for fuselage shielding. Fabric material models were used to design full scale shields to be tested in an aircraft fuselage.
- Completed full-scale fabric shielding demonstration test of various fabric attachment designs in a retired commercial airplane at Naval Air Warfare Center (NAWC), China Lake.

FY 2004:

- Developed test data using spherical projectiles on aluminum, Lexan and composites, then evaluated material model ability to accurately predict the results.
- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Los Angeles Aircraft Certification Office (ACO).

Previous Years:

- Completed a collaborative effort with NASA, the U.S. Navy, and the U.S. Air Force to perform the first full-scale engine disk crack detection demonstration.
- Developed test data and improved analytical modeling of fabric shielding with revision to the fabric material model.
- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Boston ACO.
- Developed a significant database of small and full-scale test data to understand the interaction of multiple ballistic fabric layers in engine fan blade out containment systems.
- Completed a mitigation test for debris damage to pressurized fuel lines inside the aircraft due to an uncontained engine failure; prototype power panels showed promise.

Propulsion Malfunction

FY 2007:

- Completed detailed study of propulsion malfunctions classified as mechanical damage. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine. This effort recommended a focused follow-on effort to study an information based oil system display.

FY 2005:

- Completed detailed study of propulsion malfunctions classified as Sustained Thrust Anomalies. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine.

FY 2003:

- Completed an in-depth analysis of 80 in-service propulsion system malfunctions and developed recommendations for potential propulsion indication improvement.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Engine Uncontained Research

- Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).
- Improve material models for incorporation into the LSDYNA model that are verified and accepted by the aerospace users group as standardized models.

Propulsion Malfunction

- Continue development of an information based oil system display that can replace the prescriptive engine oil system gauges and minimize pilot interpretation and troubleshooting.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Research will continue on the NASA/FAA/industry program for modeling aircraft engine failures in LSDYNA. The FAA/NASA/academia will continue to evaluate improved material models and incorporate them into LSDYNA upon acceptance by the Aerospace Users Group. Users guidelines and training will continue to be developed and made available through George Washington University.

Propulsion malfunction research will complete a demonstration of the information-based display for the engine lubrication system. This demonstration is a key stepping stone to moving beyond the prescriptive instrument displays to an information based system intended to inform the pilot and connect the information with procedures which will minimize both pilot troubleshooting efforts and un-annunciated checklists.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Engine Uncontained Research

- Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).

Propulsion Malfunction

- Complete demonstration of an information based cockpit display for the engine lubrication system.

Budget Item	Program Title	Target-Level Request
A11.g.	**Flight Deck/Maintenance/System Integration Human Factors**	**$7,465,000**

GOALS:

Intended Outcomes: The Flight Deck/Maintenance/System Integration Human Factors Program helps achieve FAA's Flight Plan goals for increased safety and greater capacity by:

- Developing more effective methods for pilot, inspector, and maintenance technician training.
- Enhancing the understanding and application of error management strategies in flight and maintenance operations.
- Increasing human factors considerations in certifying new aircraft and in equipment design and modification.
- Improving pilot, inspector, and maintenance technician task performance.
- Developing methodologies to identify and mitigate risk factors in automation-related operator errors.
- Developing requirements, knowledge, guidance, and standards for design, certification, and use of automation-based technologies, tools, and support systems.
- Addressing human performance and human-system performance requirements associated with transitioning from 2015 to 2025 NextGen capabilities.

Agency Outputs: The Human Factors Research and Engineering program provides the research foundation for FAA guidelines, handbooks, advisory circulars, rules, and regulations that help to ensure the safety and efficiency of aircraft operations. It also develops human performance information that the agency provides to the aviation industry for use in designing and operating aircraft and training pilots and maintenance personnel.

Research Goals:

By FY 2008:

- Evaluate methods to mitigate the potential for incidents and accidents by assessing and removing causal factors of human error from flight deck operations and aviation maintenance.
- Begin analysis of how advanced technology in air and ground systems will impact inspection and maintenance processes in the future. Begin developing guidance on how advanced technology can be used for inspection training and reducing errors in transport and general aviation maintenance.
- Facilitate the operational implementation of the Human Factors Certification Job Aid, Version 8 for Parts 25 (Airworthiness Standards for Transport Category Airplanes) and 23 (Airworthiness Standards including Commuter Category Airplanes). This tool will support FAA certification personnel, aircraft designers, and researchers in addressing possible human factors concerns related to displays, controls, flight deck systems, pilot tasks, and procedures. It will also address equipment and testing assumptions.

By FY 2009:

- Develop a system safety approach to understand error patterns of pilots, maintenance personnel, and inspectors, and identify intervention strategies.
- Develop certification guidelines and human factors standards for integrating advanced technologies.
- Develop training guidelines for flight deck error management.
- Develop training guidelines for repair stations and maintenance shops. Include guidance on dealing with automation and new technologies.

By FY 2012:

- Provide guidance to improve design of computer-human interfaces to reduce information overload and resulting errors.
- Improve pilot situational awareness, and provide corrective mechanisms to compensate for pilot skills degradation or automation failure.
- Assess cognitive and contextual factors to improve operator performance and reduce errors.
- Apply program-generated knowledge of human factors to improve selection and training of aviation system personnel.
- Examine effective roles for pilots and how those roles are best supported by allocation of functions between human operators and automation.
- Address human automation integration issues regarding the certification of pilots, procedures, training, maintenance, and equipment associated with enhanced CNS/ATM operations necessary to achieve NextGen capabilities**.**

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- NASA's Aviation Safety Program.
- The FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- The FAA/Industry Safer Skies initiative – analyzes U.S. and global data to find the root causes of accidents and proposes the means to prevent their occurrence.
- The FAA Research, Engineering and Development Advisory Committee – Representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flight Deck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Joint Safety Analysis Teams and Joint Safety Implementation Teams within the Safer Skies Agenda – coordinated with NASA and industry, these efforts stress human factors issues in developing intervention strategies for the reduction of air carrier and general aviation accidents.
- DoD Human Factors Engineering Technical Advisory Group – FAA participates in this group to promote a joint vision for automation and related technical areas.
- Domestic and international aviation maintenance industry partners like Boeing, Continental Airlines, British Airways, and the International Association of Machinists– the emphasis is on achieving research results that can be applied to real-world problems.
- Society of Automotive Engineers G-10 subcommittees – FAA participates on all of the Society's subcommittees involving human factors to adapt their findings to aviation standards, guidelines, etc.
- Nineteen FAA grants to universities supporting research on air carrier training, flight deck automation, aviation accident analysis, general aviation, and aviation maintenance technician and inspector training.

Accomplishments: The program's accomplishments include:

FY 2007:

- Completed development of human factors Certification Job Aid for FAR Parts 25 and 23 flight decks.

- Developed reference manual describing pilot awareness, knowledge and skill elements for Technically Advanced Aircraft.
- Developed a "best practices" document to inform the aviation community of potential problems associated with fatigue in combination with environment when performing liquid penetrant and fluorescent magnetic particle inspection.
- Evaluate how well civilian, instrument rated helicopter pilots maintain control of their aircraft after inadvertent VFR flight into IMC across a variety of flight altitudes and speeds.
- Provided an understanding of how broadband technology may aid maintenance personnel in their tasks and improve the work environment
- Completed an international survey of maintenance human factors programs in maintenance organizations focused on training, error management, fatigue management, and other issues.
- Performed a field study of maintenance human factors issues in UAV systems to identify areas that will need new maintenance human factors guidance.
- Completed technical guidance for updating regulations regarding allowable manual control forces in aircraft control systems.
- Provided technical information for training and regulatory guidance consideration on pilot training and experience with transport category rudder control systems.
- Provided human factors guidance for design and use of synthetic vision systems.
- Completed initial technical assessment and recommendations for sensory deficiencies in the operation of unmanned aircraft.
- Provided guidance for the development of proficiency standards for very light jets.
- Completed electronic flight bag industry review, providing information on design characteristics, FAA approvals, and environmental qualifications.
- Completed validation study on the effectiveness of the Full Flight Training Simulator.
- Completed phase one study to identify current industry air carrier training issues.

FY 2006:

- Provided guidance for precision visual flight rules and simultaneous non-interfering routes that will allow rotorcraft with global positioning system navigation capabilities to stay within narrow, defined horizontal airspace limits while operating under visual flight rules.
- Completed detailed general aviation fatal accident human error analysis by using the Human Factors Analysis and Classification System to determine how often each error type is in the causal chain of events and finding the exact types of errors committed that lead to a fatal accident.
- Developed an industry-wide benchmark for aviation maintenance inspection. This computer based inspection training program will standardize inspection training processes in the general aviation industry.
- Provided guidance on an acceptable vision standard for personnel involved in nondestructive inspection and testing and visual inspection of aircraft and aircraft components.
- Improved a Line Operations Safety Audit (LOSA) methodology that has been adopted by the International Civil Aviation Organization (ICAO) to help air carriers identify human-centered safety vulnerabilities.
- Completed a Flight Plan Target automation report specifying pilot proficiency standards for Technically Advanced Aircraft.

FY 2005:

- Developed a manual adopted for use by ICAO that addresses appropriate human factors considerations in designing flight deck operating documents.
- Produced human factors design and evaluation considerations for aviation applications, such as electronic flight bags and head-up displays in air transports.
- Completed initial mapping of flight data parameters onto AQP qualification standards.
- Developed initial performance models for the use of automation in air carrier cockpits.
- Developed and validated a proceduralized pilot Crew Resource Management (CRM) training and assessment system.

FY 2004

- Developed an inexpensive, reliable method to measure night vision goggle cockpit lighting compatibility.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Identify human factors issues in instrument procedures design.
- Identify pattern of aircrew error associated with general aviation accidents where flight from VFR into instrument meteorological conditions is a factor.
- Continue developing maintenance human factors "best practices" documents, practical tools, and surveillance tools to aid industry.
- Continue to identify factors that can maximize the likelihood of successful implementation of ASAP for aircraft maintenance programs.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B certification and operational approval.
- Distribute automation knowledge assessment, diagnosis and remediation methodology for air carrier training guidance development.
- Explore improved automation training for pilots, reflecting results from industry survey.
- Begin the investigation of automation and new technology impacts on maintenance process, safety, technician skills, and need for regulation.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Complete detailed general aviation fatal accident human error analysis, using Human Factors Analysis and Classification System, to determine how often each error type is the "initiating" error in the causal chain of events and what are the exact types of errors committed that lead to a fatal accident.
- Develop improved methods to record and analyze flight safety data to reduce the likelihood of air carrier incidents and accidents.
- Investigate methods to encourage air carriers to expand ASAP programs to other segments of operations.
- Study the decision process of voluntary safety teams to improve the accuracy and reliability of safety event classifications.
- Develop advanced data analysis methods for linking various voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for low-time regional pilots.
- Identify the impact of selected weather-related training products on knowledge and behavior of general aviation pilots related to weather accident causes.
- Investigate methods to improve unexpected event pilot training.
- Investigate methods to incorporate safety data into scenario-based pilot training.

- Develop advanced methods to improve training and procedures for flight deck distractions during critical flight phases.
- Develop methods to incorporate situationally-oriented flight tasks into scenario-based training.
- Identify what human factors maintenance unmanned aircraft issues need be addressed so that FAA can begin to develop policies, procedures, and approval processes to enable operation of unmanned aerial vehicles.
- Develop educational materials that will help reduce general aviation accidents.
- Develop and evaluate off-the-shelf advanced technologies, such as virtual reality, for training and evaluation in aviation maintenance.
- Provide guidance and develop educational tools for the FAA/Industry Training Standards program that will integrate different technologies into any aircraft platform.
- Develop guidance for maintenance and operator training and qualification requirements related to the operation of unmanned aerial vehicles within the NAS.
- Investigate methods to improve new-hire pilot training for high density operations; develop guidelines.

FY 2009 PROGRAM REQUEST:

The program will continue to focus on providing technical information and advice to improve pilot, inspector, maintenance technician, and aviation system performance. The emphasis will remain on developing guidelines, tools, and training to enhance error capturing and mitigation capabilities in the flight deck and maintenance environments, and on developing human factors tools to ensure that human performance considerations are adequately addressed in the design, certification, and operational approval of flight decks, equipment, and procedures. Additional emphasis will be placed on encouraging maintenance shops and repair stations to have human factors maintenance programs and to offer maintenance human factors training.

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Develop human factors guidance for instrument procedures design.
- Report on methodology to encourage air carriers to implement Aviation Safety Action Program across operations.
- Investigate methods to apply Voluntary Aviation Safety Information-Sharing Program taxonomies to pilot training data.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B equipment certification operational approval.
- Develop improved automation training methods for new hire pilots.
- Continue the investigation of automation and new technology impacts on maintenance process, safety, technical skills, and need for regulation. Begin formulation of strategies to deal with these issues.
- Determine training vulnerabilities and investigate advanced training methods to address issues identified in automation survey of pilots.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.

- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Identify intervention strategies to either prevent or reduce the likelihood of general aviation accidents.
- Develop improved methods to record and analyze flight safety data to reduce the likelihood of air carrier incidents and accidents.
- Distribute recommendations on establishing effective decision-making strategies within voluntary safety program teams.
- Distribute report on financial analysis methods to determine the cost of FOQA events.
- Explore methods for advancing the linking of voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for both low-time regional pilots and pilots transitioning to new aircraft.
- Develop training tools to quickly incorporate safety data into scenario-based pilot training and evaluation.
- Report on training methods to prepare new-hire pilots to handle unexpected events in high density operations.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Provide human factors guidance for electronic flight bag certification, operational approval, and training.
- Develop proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.
- Develop human factors guidance for instrument procedures design.
- Complete guidance on communicating maintenance ASAP derived actions and recommendations using the web-based ASAP safety-information and program-tracking tool.
- Develop maintenance human factors "best practices" documents, practical tools, and surveillance tools to aid industry.
- Report on methodology to encourage air carriers to implement ASAP across operations.
- Investigate methods to apply VASIP taxonomies to pilot training; prepare phase I report.

Human-Centered Automation

- Develop certification guidelines for integrated technology in general aviation cockpits.
- Develop human factors guidance for ADS-B equipment certification and operational approval.
- Update automation knowledge assessment and diagnosis tool, and update remediation methodology and training guidelines; distribute report to industry.
- Develop new guidelines for training automation skills for new-hire pilots.
- Identify human error risks and mitigation strategies associated with new air carrier operations.
- Investigate automation and new technology impacts on maintenance human factors process, safety, technician skills, and need for regulation. Results can become the basis for strategies for dealing with maintenance of automation and new technologies as well as identifying best practices and tools for dealing with the issues identified.
- Based on results of the earlier air carrier pilot automation survey, determine training vulnerabilities and investigate advanced training methods to address the topic areas.

Human Performance Assessment

- Develop guidance stipulating the minimum see-and-avoid optical system needed for an unmanned aerial vehicle ground station operator to detect an approaching airborne object.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Distribute recommendations on establishing effective decision-making strategies within voluntary safety program teams.
- Provide a report on current LOSA analysis results.
- Distribute a report on financial analysis methods to determine the cost of FOQA events.
- Explore methods for advancing the linking of voluntary safety data sources.

Selection and Training

- Validate simulator training requirements for both low-time regional pilots and pilots transitioning to new aircraft.
- Test the application of advanced training technology, like virtual reality, for maintenance.
- Report on methods to link Threat and Error Management ASAP classification schemes to LOSA and AQP data.
- Develop training tools to quickly incorporate safety data into scenario-based pilot training and evaluation.
- Update training guidelines and procedures for flight deck distractions during critical flight phases.
- Develop new methods for improved jet upset training.
- Explore methods to overcome the expectancy effect in pilot simulator training and evaluation.
- Develop and validate standards to evaluate training methodologies proposed by air carriers.
- Report on training methods to prepare new-hire pilots to handle unexpected events in high-density operations.

Budget Item	Program Title	Budget Request
A11.h.	**Aviation Safety Risk Analysis/System Safety Management**	**$12,488,000**

Goals:

Intended Outcomes: The Aviation Safety Risk Analysis/System Safety Management Program (formerly known as the Aviation Safety Risk Analysis Program) helps achieve FAA's strategic goal of increasing aviation safety by promoting and expanding safety information sharing and safety risk management initiatives efforts. The program develops risk management methodologies, prototype tools, technical information, and safety management system procedures and practices that will improve aviation safety. In addition, the program aims to develop an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner. It also conducts research to evaluate proposed new technologies and procedures, which will improve safety by making relevant information available to the pilot during terminal operations.

Agency Outputs: The program will develop an infrastructure that enables the free sharing of de-identified, safety information that is derived from various government and industry sources in a protected, aggregated manner. In addition, the program is providing methodologies, research studies, and guidance material that provide aviation safety inspectors, aircraft certification engineers, analysts, and managers the capabilities of systematically assessing potential safety risks and applying proactive solutions to reduce aviation accidents and incidents. The program is also conducting research and analysis to maintain the desired level of safety while accommodating the need for more efficient use of the terminal area.

Research Goals: To reduce the number of aviation accidents and incidents by developing a secured safety information and analysis system that provides access to numerous databases, maintains their currency, enables interoperability across their different formats, provides the ability to identify future threats, conducts a causal analysis of those threats, and recommends solutions.

- By 2011, develop automated tools to monitor each database for potential safety issues and to analyze disparate data drawn from multiple sources, enhancing discovery, identification, and evaluation of safety risks.
- By 2012 develop advanced software capable of automatically gathering information from other databases and providing safety management personnel with information integrated with their day-to-day operations and duties.
- By 2013, expand the secured safety information and analysis system to other aviation users beyond the commercial operators.

To reduce the risk for passengers and crews and enhance the traffic control process in the terminal area operations, pilot-in-the-loop simulation evaluations and operational flight data analysis will be conducted.

- By 2010, characterize risks associated with undesired laser cockpit illumination, providing FAA with data to determine mitigation strategies.
- By 2011, complete an evaluation of air traffic and flight procedures for terminal area operations by using pilot-in-the-loop flight simulator.
- By 2012, develop methods to model unusual attitude encounters outside the normal operating envelope, allowing FAA to approve advanced flight simulators that more realistically model the behavior of an actual aircraft.
- By 2012, identify new navigation technologies and data requirements for the development of new procedures to enhance the capacity and safety of the terminal area.
- By 2013, identify contributing factors and develop models for landing performance of selected make, model, and series aircraft using standard operating practices to improve the safety and capacity in terminal areas.

Customer/Stakeholder Involvement: The program encourages broad industry and government participation across all projects.

- Subcommittee on Aircraft Safety of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- JPDO, Safety Working Group – a national-level integrated safety management framework that addresses all facets of the air transportation system, building safety design assurance into operations and products.
- Commercial Aviation Safety Team – a FAA/industry collaborative effort to develop and implement data-driven safety initiatives.

R&D Partnerships: The Program partners with industry, academia, and other governmental agencies, including:

- National Aeronautics and Space Administration via collaborative agreements to integrate advanced research text and digital analysis products into the Aviation Safety Information and Analysis Sharing (ASIAS) research efforts.
- The Civil Aviation Authority of the Netherlands to conduct joint research on aviation system safety initiatives via a Memorandum of Cooperation.
- Technical expertise from air carriers to provide industry reviews and recommendations regarding safety and efficiency of terminal area operations as well as air carriers' cooperation with data sharing agreements and governance models that allow for the free sharing of aviation data in accordance with approved voluntary safety information sharing agreements.

Accomplishments: Significant accomplishments from prior years include:

Risk Management Decision Support

FY 2007:

- Produced technical descriptions of the various business relationships between Title 14 Code of Federal Regulations (14 CFR 121) operators and 14 CFR 145 repair stations; the models will be used to identify the hazards and assess the risks involved these types of relationships.
- Completed a prototype software tool that contains an integrated framework and methodology for the identification, classification, and assessment of aviation maintenance and flight operations hazards.

FY 2006:

- Released a working prototype of an integrated framework that describes the methodology for identification, classification, and assessment of aviation system hazards and risks.
- Developed a preliminary methodology which provides a baseline assessment of the current safety oversight for effectiveness, efficiency, and sustainability and identifies data inputs and could provide metrics such as the responsiveness of the air carriers to corrective and preventive actions, effects of oversight on safety precursors, inspection output and inspector workload and readiness.

Aviation Safety Information and Analysis Sharing

FY 2007:

- Released first draft of the ASIAS Concept of Operations (CONOPS) that is focused on the new data sharing concepts among commercial aviation stakeholders.

Aircraft Maintenance - Maintainability and Reliability

FY 2007:

- Proposed a new quality management system to perform and monitor tool calibration at maintenance facilities; the new system will improve safety by reducing aircraft maintenance errors due to the use of out-of-tolerance tools.

FY 2005:

- Completed enhancements to the Maintenance Malfunction Information Reporting (MMIR) System with capability to collect usage and flight profile data – the helicopter industry and FAA are using the MMIR data to improve maintenance reliability and product design.

FY 2004:

- Provided technical data and recommendations for designing an effective repair station training program, including the recommended number of hours and topics for training mechanics, managers, supervisors, and inspectors. The FAA issued Advisory Circular (AC) 145-10 "Repair Station Training Program" in July 2005.

FY 2003:

- Developed an all-encompassing quality audit and quality assurance system that is referenced in AC 120-79, "Developing and Implementing a Continuing Analysis and Surveillance System (CASS)" that provides guidance to air operators in meeting the CASS requirement of 14 CFR Parts 121.373 and 135.431.

Safety Analysis Methodology

FY 2007:

- Completed a methodology to provide a different level of certification credit for design features intended to reduce flight crew errors.

FY 2005:

- Provided technical data on standard probabilities of certain environmental and operational conditions to support transport airplane certification or safety assessment purposes.

Terminal Area Safety

FY 2007:

- Completed flight evaluation of the critical terminal area situations under which red Land and Hold Short Operations lights must be illuminated and extinguished during high capacity operations at an airport by using pilot-in-the-loop flight simulation.
- Developed assessment tools and procedures to evaluate pilot workload during various flight conditions by using the LifeShirt® technology in simulated flight operations.

FY 2006:

- Developed methods to identify commercial aircraft touchdown points during commercial operations by using ILS or non-ILS information, these methods will aid in understanding causes of aircraft overruns and runway excursions.

FY 2005:

- Provided measures of pilot reaction to laser illumination collected using FAA's B-737 flight simulator to support AC 70-1 "Outdoor Laser Operations" and AC 70-2 "Reporting of Laser Illumination of Aircraft".

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety Information and Analysis Sharing

- Complete the ASIAS CONOPS that is focused on the new data sharing concepts among commercial aviation stakeholders.

- Develop ASIAS architecture for the implementation of emerging technologies and system to support the sharing of information between commercial aviation stakeholders.
- Develop automated tools to monitor databases for potential safety issues.
- Develop prototype ASIAS system and associated reports that show the benefit of using diverse textual and digital data sets for analyzing commercial aviation safety metrics and enhancements.
- Conduct analytical studies using ASIAS and other aviation safety data to (a) address hazards and risks of operating aircraft in the National Airspace System, and (b) to determine the effectiveness of FAA recommended and industry implemented safety enhancements.

Risk Management Decision Support

- Release a prototype decision support system that provides the FAA with improved certificate management and oversight capabilities. The major products will be identification of databases within FAA purview, redesigned databases, and possible location of and access to existing databases needed to populate the described methodology.

Aircraft Maintenance - Maintainability and Reliability

- Complete technical data for the purpose of preparing standards for carbon monoxide detection devices and inspection methods to determine the integrity of exhaust systems.

Safety Analysis Methodology

- Determine injury ratios for well-defined unsafe conditions (e.g., structure failure, electrical system failure, landing gear vibration, powerplant failure, and so forth) on aircraft systems or components.

Terminal Area Safety

- Evaluate the use of pilot-in-the-loop flight simulators for training of advanced maneuvers related to terminal area operations.
- Develop testing procedures and requirements to identify required navigational performance (RNP) constraints related to terminal area operations.
- Evaluate air traffic and flight procedures for terminal area operations by using the pilot-in-the-loop flight simulator.
- Evaluate devices and risks associated with undesired laser cockpit illumination.
- Analyze operational landing distance performance of selected aircraft make/model/series.
- Develop tools to model the safety hazards of rejected landing procedure and to identify possible training solutions.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

Government, industry, and academia aviation safety subject matter experts will be invited to demonstrate a working prototype of a network-based integration of information extracted from diverse, distributed sources. The research will continue to develop innovative, advanced tools and methodologies that will for the first time be able to convert and integrate aviation safety data that is currently distributed across multiple organizations and archives into information on the operational performance and safety of the aviation system. Using ASIAS and other aviation safety data, analytical studies to identify safety issues and verify mitigation and safety enhancements will continue. Research and analysis will continue to ensure that the FAA maintains a desired level of safety while accommodating the need for more efficient use of the terminal area.

New Initiatives

No new initiatives are planned for FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety information Analysis and Sharing (ASIAS)

- Expand ASIAS architecture to include the sharing of air traffic information and air carrier information among industry stakeholders.
- Continue development of automated tools to monitor databases for potential safety issues.
- Expand prototype system to include the concepts of sharing information and applications among industry stakeholders from an enterprise-level, allowing diverse industry stakeholders to analyze data on an industry-wide basis rather than individual organizational level. The prototype system will contain a technical process to query de-identified safety data from any participating airline Flight Operations Quality Assurance or Aviation Safety Action Program, aggregate it through a distributed database and make it accessible to appropriate industry stakeholders.
- Conduct analytical studies, e.g., aircraft hazard analysis, determination of risk values for potential unsafe conditions, and flight crew intervention design credit, using ASIAS and other aviation safety data. .
- Develop methods and risk models to evaluate advanced aircraft systems and component integration.

Terminal Area Safety

- Complete testing procedures and requirements to identify RNP constraints related to terminal area operations.
- Evaluate air traffic and flight procedures for terminal area operations by using the pilot-in-the-loop flight simulator.
- Analyze the operational landing distance performance of selected aircraft make/model/series.
- Evaluate devices and risks associated with undesired laser cockpit illumination.

Budget Item	Program Title	Request
A11.i.	**Air Traffic Control/Technical Operations Human Factors**	**$10,469,000**

GOALS:

Intended Outcomes: The Air Traffic Control/Technical Operations (ATC/TO) Human Factors Program supports FAA strategic goals for increased safety, greater capacity, and organizational excellence by developing research products and promoting the use of those products to meet the future demands of the aviation system. This research examines the roles of controllers and maintainers at increased capacity levels and how those roles are best supported by allocation of functions between human operators and automation. The ATC/TO program generates requirements for human interface characteristics of future air traffic workstations. It is enhancing our understanding of the role that ATC supervisors play in mitigating operational errors and runway incursions. The program also provides material to reduce human error incidents associated with the performance of controllers, system maintainers, and others who fill important safety roles. In addition, researchers are determining effective methods to present weather information to air traffic specialists for severe weather avoidance and accident prevention, developing methods to select new air traffic service providers and maintainers so that the applicant screening process is valid, reliable, and fair, and improving human-system integration in a manner that allows controllers to manage an increased number of aircraft in a sector while reducing task loading.

The research program works to improve system safety by:

- Developing:
  - Methods to identify new potential human error problems as the air traffic service providers' roles and responsibilities change as a result of increasing automation levels.
  - Organizational changes to transform the Technical Operations ATO safety culture.
  - Effective methods to present air traffic specialists weather information for accident prevention through severe weather avoidance.
- Improving:
  - Supervisory best practices so that first-line ATC supervisors can implement effective methods that suppress the operational error rate and reduce existing error severity.
  - Methods to select new air traffic service providers and maintainers so that the applicant screening process is valid, reliable, and fair.

The program works to improve the ATC contribution to system capacity by:

- Developing:
  - Integrated workstations that allow air traffic service providers to meet increased service demand at a reduced staffing level.
  - Methods to assess the value of proposed changes to workstations to determine if human-in-the-loop performance is enhanced to the required level.
  - Advanced workstation concepts for airport traffic control towers that use automation and advanced technology to increase services, increase capacity, and decrease the cost of air traffic services.
- Improving:
  - Human-system integration in a manner that allows air traffic service providers and pilots to cooperatively manage traffic loads as cockpit technology and air traffic workstations are more closely connected to efficiently move NAS air traffic.
  - Roles and responsibilities between air traffic service providers and pilots as technology evolves to meet future demands.

Agency Outputs: The Air Traffic Control/Technical Operations Human Factors Research Program provides leadership and products to motivate NAS evolution to assure that the system's human component will reliably perform to meet the flying public's needs. Outputs include:

- Air traffic workstations and concepts that increase workforce productivity by identifying key workload factors that must be mitigated to enable the humans in the system to manage the future NAS traffic flow.
- Candidate technology evaluations that purport to provide a specified human-in-the-loop performance level or safety benefit when used by the ATO workforce.
- ATO safety culture transformation through research in the Technical Operations community to identify needed effective interventions to move the ATO toward a "Just Culture."
- Future air traffic service provider and maintainer personnel selection criteria to enhance screening process efficiency and effectiveness.

Research Goals:

- By FY 2009, complete the future en route workstation second development stage that demonstrates potential controller productivity and sector capacity increases.
- By FY 2009, identify efficient automation use and the sharing of responsibilities between air traffic service providers and NAS users such as pilots and dispatchers.
- By FY 2012, improve computer-human interface design to reduce information overload and resulting errors.
- By FY 2012, apply program-generated human factors knowledge to improve aviation system personnel selection and training.

Customer/Stakeholder Involvement: The ATC/ATO Human Factors research program receives requirements from its internal FAA sponsoring organizations, primarily the following FAA Air Traffic Organization Air Traffic/Technical Operations research groups:

- Advanced Air Traffic Systems Requirements Group – En Route and Terminal Service units as well as System Engineering in Operations Planning operational personnel and systems developers articulate human factors research requirements for measuring the proposed technology benefits to controllers and maintainers. FAA Flight Standards and Aircraft Certification organizations will participate in the research requirements definition associated with pilot/controller interface with air-ground integration weather aspects as the FAA moves toward a future NAS vision.
- Individual and Team Performance Requirements Group – ATO Safety, En Route, Terminal, Technical Operations and System Engineering service units participate to identify human performance research needs involving safety culture, human error hazard identification, age, operational errors, runway incursion prevention, and employee attitudes.
- Technical Operations Requirements Group – The Technical Operations, En Route, and Terminal service units recommend NAS infrastructure operational and maintenance research including ATC systems displays, controls, and maintainability features specification.
- Personnel Selection and Training Requirements Group – ATO Technical Training and Development, Human Resources, FAA Academy, Workforce Services, and the Financial Services groups address personnel selection, training, and retention including the ability to successfully screen applicants for controller positions and for reduced training cost and time.

R&D Partnerships:

- Collaborative research with NASA includes identifying future NAS human factors air-ground integration research issues as technology brings changes to flight deck capabilities.

- Collaboration with EUROCONTROL includes participation in semi-annual Air Traffic Management (ATM) Seminars, leadership of an Action Plan 15 Safety workgroup for human reliability, and ATM Safety Research symposia participation.
- Program personnel represent the agency in the Normal Operations Safety Survey (NOSS) Study Group of ICAO.
- The University of Texas has performed NOSS research at ATM facilities in New Zealand, Australia, Canada, and Finland with ICAO endorsement.
- Cooperative research grants are in place with Massachusetts Institute of Technology (MIT), St. Louis University, New Mexico State University, Texas Tech University, and American Institutes for Research.

Accomplishments: Program highlights include:

FY 2007:

- Completed simulations that evaluate capacity enhancements when en route workstations are provided with data communications and aircraft self-spacing and self-separation provisions.
- ATC safety alerts study completion in response to National Transportation Safety Board concerns that controllers are not responding properly to prevent mid-air collisions and controlled flight into terrain accidents.
- Tower situation display demonstration with integrated flight data to reduce display clutter and integrate tower controller tasks.
- Initiation of a tower controller external vision requirements study to support staffed virtual tower development with no direct airport surface view.
- Safety Culture improvement project expansion to more facilities enabling the technical operations community to improve safety
- Transfer of the National Air Traffic Professionalism Program (NATPRO) to the En Route service unit as a research product that is making the transition to the operational domain.
- Updated en route and terminal job task analyses and developed air traffic controller performance standards

FY 2006:

- Explored human performance limitations to find controller workload limits using current technology and procedures as traffic levels increase.
- Completed an initial effort to transform the ATO work force safety culture.
- Initiated data collection to update the anthropometric database to guide maintenance workstation ergonomic design.
- Developed a maintenance domain alerts and alarms human factors design standard.
- Initiated development of a pre-screening alternative form for air traffic controller job applicants that are selected to take the Air Traffic Selection and Training (AT-SAT) test battery.
- Initiated a tower controller duties and functions task analysis to enhance the terminal training option method of selecting candidates.

FY 2005:

- Completed a proposed en route display systems performance analyses to determine if projected controller time and error savings were achievable.
- Performed a simulation that assessed the benefits of improved terminal weather displays for severe weather avoidance and demonstrated a potential six to 10 percent capacity enhancement.
- Developed a human error hazard analysis method for use in the early investment analysis stages to include the human error risk in the early requirement and decision process.
- Developed a safety audit method for air traffic controllers to manage risk during normal operations.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Initiation of an advanced terminal workstation demonstration to increase terminal airspace throughput, respond to changes in aircraft mix in the terminal environment including very light jets and Unmanned Aircraft Systems, and decrease environmental impact.
- Conduct an advanced integrated en route controller workstation assessment to move toward the goal of demonstrating a 66 percent increase in controller efficiency.
- Develop initial requirements for an advanced TRACON workstation that will increase capacity by at least 30 percent.
- Demonstrate integrated tower electronic flight data handling human factors aspects as the initial phase of staffed virtual tower development.
- Complete supervisory best practices development to reduce runway incursions.
- Complete the first stage of transforming the safety culture of the Technical Operations organization and assess intervention effectiveness.
- Complete data collection for the technical operations work force anthropometric measurement database.
- Complete method validation to assign applicants to tower versus radar training.
- Assess new technology and advance automation impact on selection and training for future air traffic service providers and maintainers.
- Completed tower supervisor best practices for the prevention of runway incursions.
- Developed interim color vision test for air traffic controller evaluation.

FY 2009 PROGRAM REQUEST

The program will continue to provide research that addresses human performance issues in ATC systems acquisition, design, operation, and maintenance over the next several years. The development of human factors concepts for future air traffic workstations that will accommodate increases in air traffic. The proactive analysis of human error causal factors continues to be the focus of a portion of this research program.

Advanced Air Traffic Systems

- Defining the characteristics of methods to meet the goal in the National Aviation Research Plan (NARP) to increase en route controller efficiency by 66 percent including air-ground integration aspects.
- Investigating human factors challenges in terminal airspace to increase traffic flow and integrate new procedures and technology such as data communications and fuel-efficient approaches that are forecast to be part of trajectory based operations.
- Simulating traffic loads predicted for the 2015 period and assessing how automation should be used at the controller workstation to meet capacity goals.
- Develop the airport traffic control workstation concept with emphasis on maintaining the day VFR operational tempo under reduced visibility operations.

Individual and Team Performance

- Continue work in human error analysis and reporting by expanding the application of research in transformation of the ATO safety culture.
- Refresh research in controller fatigue to develop scheduling tools and other mitigation methods as countermeasures for fatigue as a result of controller shift rotations.

Advanced Technical Operations (TO) Systems

- Assessing methods to reduce the potential for human error in system maintenance to enhance NAS reliability and availability.

- Design and develop training system and job aid specifications that reduce the amount of time that technicians spend away from their job in training.

Personnel Selection and Training

- Perform a strategic job task analysis based on the NextGen Concept of Operations to determine the knowledge, skills and abilities that will be needed by service providers in the future NAS.
- Refine the air traffic selection processes using the results of the updated Job Task Analysis activities to derive measures of controller performance for use in selection, training, and system development.
- Identify the critical performance requirements of the NAS maintainer job and the skills required to effectively perform on-the-job to develop personnel selection criteria.
- Conduct a task analysis for selected Technical Operations functions to identify a set of knowledge and skills, equipment, technical data, and discrete/critical steps required for the development of job aids.

New Initiatives

New initiatives will focus on the terminal portions of the ATC system. The NAS architecture plan introduces several automation concepts including variable separation minima and continuous decent approaches as methods to use automation and decision support tools to increase services, increase capacity in response to changes in demand, and decrease the cost of air traffic services. The research will address advanced terminal workstations:

- Perform an analysis to determine the human factors aspects of changes to services in the terminal area that emerge through the introduction of technology such as data communications.
- Determine air-ground integration issues particularly as they affect roles and responsibilities of pilots and air traffic service providers when servicing an environment with mixed aircraft equipage.
- Develop an advanced workstation concept for the terminal area to assure that the air traffic service provider can manage an increase in traffic.
- Plan and prepare for simulations of advanced terminal workstation concepts to determine the displays, controls, communication needs, surveillance information, and flight data information required to provide services and assure safety in the terminal area.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Air Traffic Systems

- Develop concept and design guidelines for standard automation platforms usable by controllers in converging TRACON and en route domains.
- Conduct simulations to determine the appropriate use of data communications in terminal airspace.
- Conduct an air-ground integration simulation regarding improved weather products at the controller workstation to enhance safety in the NAS.

Individual and Team Performance

- Develop the transition plan and educational material to transfer control of the technical operations safety culture project to a national level under operational management and funding.
- Develop a tool for human reliability analysis in collaboration with EUROCONTROL human factors experts to assess the impact of changes to air traffic management planned by both the US and European air traffic service providers.

Advanced Technical Operations (TO) Systems

- Deliver a human factors specification/standard for the design of TO workstations.
- Initiate a Human System Integration Study of the impact future air traffic maintenance concepts on the Technical Operations workforce.

Personnel Selection and Training

- Deliver the results of the strategic job task analysis to determine if changes to technology and operation of the NAS will demand a change to the selection and training of Air Traffic Service providers.
- Prepare strategic training analyses for new roles and responsibilities of Air Traffic Service providers in the future NAS.
- Undertake a task analysis for Technical Operations that provides a set of knowledge and skills, equipment, technical data, and discrete/critical steps required to perform tasks and develop job aid guidelines.

Budget Item	Program Title	Budget Request
A11.j.	**Aeromedical Research**	**$8,395,000**

GOALS:

Intended Outcomes: The Aeromedical Research Program supports FAA's Flight Plan Goal for Increased Safety by:

- Investigating and analyzing injury and death patterns in civilian flight accidents and incidents to determine their cause and develop preventive strategies.
- Supporting FAA regulatory and medical certification processes that develop safety and health regulations covering all aerospace craft occupants and their flight environments.
- Recommending and developing equipment, technology, and procedures for optimal:
  - Evacuation and egress of humans from aerospace craft;
  - Dynamic protection and safety of humans on aerospace craft; and
  - Safety, security and health of humans on aerospace craft.

Research program outcomes include improved safety, security, protection, survivability and health of aerospace craft passengers and aircrews. The Aeromedical Research Program supports FAA's Flight Plan goals to reduce the commercial fatal accident rate and the number of general aviation fatal accidents by:

- Exploiting new and evaluating existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures and environments.
- Providing research data to serve as the basis for new regulatory action in evaluation of existing regulations to continuously optimize human performance and safety at a minimum cost to the aviation industry.
- Analyzing pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability.
- Evaluating the complex mix of pilot, flight attendant and passenger activities in a wide range of environmental, behavioral, and physiological situations to propose standards and guidelines that will enhance the health, safety, and security of all aerospace travelers.

Agency Outputs: The Civil Aerospace Medical Institute (CAMI) is uniquely positioned to exploit new and evaluate existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures, and environments. Aeromedical research serves as the basis for new regulatory action and evaluation of existing regulations to continuously optimize human performance and safety at a minimum cost to the aviation industry. This research program analyzes pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability. The complex mix of pilot, flight attendant, and passenger activities in a wide range of environmental, behavioral, and physiological situations is evaluated to propose standards and guidelines that will enhance the health, safety, and security of all aerospace travelers.

Research Goals:

- By FY 2008, publish an assessment of the clarity and utility of signs and symbols used in passenger safety information. Research directly supports certification and harmonization.
- By FY 2009, develop enhanced medical/toxicological intervention methodologies to support standards and guidelines that will enhance the health, safety, and security of pilots, flight attendants and passengers.
- By FY 2010, establish fact-based criteria for the design of occupant restraint systems that will support occupant crash protection that is equivalent to the aircraft structure.

- By 2012, accomplish experimental projects in support of the following regulatory and certification operations:
  - Integrate analysis of biomedical, toxicological and molecular biological factors and stressors in uneventful flight and in aerospace craft incidents and accidents.
- Developing quantitative bioengineering criteria related to:
  - Optimum aerospace craft seat and restraint system certification.
  - Enhanced egress, flotation and onboard life support/rescue equipment certification.
- Developing quantitative bioaeronautical data associated with:
  - Regulatory oversight of health, safety and security risks for flight deck, cabin crew, and other occupants.
  - Aerospace radiation and environmental factors and their threat to all aerospace craft occupants.
  - Bioaeronautical, bioengineering and performance factors required to support cabin evacuation certification.
- Developing quantitative biomedical and performance criteria and recommendations to support development of:
  - Optimum life support equipment, emergency medical equipment, and operational procedures certification.
  - Aircrew medical standards, assessment/certification procedures, and pilot special medical issuance.

Customer/Stakeholder Involvement: The Aeromedical Research Program:

- Directly supports the bioaeronautics agenda set forth in the 2008 National Aviation Research Plan.
- Provides research for FAA, European Aviation Safety Authority and Transport Canada under the Aircraft Cabin Safety Research Plan. This is a coordinated, living plan to maximize the cost/benefit of aerospace craft cabin safety research nationally and internationally.
- Supports multi-year collaborative studies by FAA and other government and industrial entities to evaluate flight crew and passenger symptomatology, disease, and impairment.

R&D Partnerships: Staff members collaborate with and hold memberships, fellowships, and leadership positions in the following scientific, medical, and bioengineering societies associated with aerospace medicine and safety:

- Cabin Safety Harmonization Working Group.
- Seat Certification Streamlining Effort.
- The National Safety Council.
- Society of Automotive Engineers committee addressing safety research related to the work of this program.
- Aerospace Medical Association.
- Civil Aviation Medical Association.
- Professional Aeromedical Transport Association.
- American Society of Mechanical Engineers.
- American Opthomological Society.
- Direct collaboration with the DoD and NASA on crashworthiness, in-flight turbulence, aerospace medicine, ocular injury from lasers, and exposure to cosmic radiation.
- Participates in NATO aerospace medical advisory groups, the European Union, and many independent scientific organizations and academic institutions.
- Develops cooperative research and development agreements with industry to ensure collaborative projects benefiting both FAA and the aviation industry.

- Established National Research Council (NRC) postdoctoral associates to conduct research in molecular biology and environmental physiology at the Civil Aerospace Medical Institute.
- Collaborated academically with over 30 students/faculty members annually participating in aeromedical research.

Accomplishments:

FY 2007:

- Determined the distribution of fluoxetine, vardenafil, glucose, hemoglobin A1c, and sedating antihistaminics levels in postmortem cases from aviation accidents.
- Validated the differential expression of select biologically interesting genes discovered by microarray analysis during the course of an alcohol study using amplified RNA.
- Determined molecular changes as a result of decreased cabin oxygen levels at altitudes with significance to both the aviation industry and military pilots.
- Determined the clinical aspects of radiation exposure resulting from a terrorist attack, estimated the radiation levels in low-earth orbits, including radiation in Van Allen radiation belts, and estimated contribution of alpha particles from the sun to radiation levels at specific flight-altitudes and latitudes, during solar particle events.
- Evaluated atrial fibrillation in civil aviation.
- Compared personality inventories used in aviation research data.
- Developed cabin evacuation design computer model for very large transport aircraft and developed passenger management strategies using research data from flight attendant location trials.
- Conducted research to assess passenger safety awareness, evaluated the comprehensibility of graphical symbols for use on signs and placards aboard transport aircraft, and evaluated presentation media for maximum effectiveness in passenger safety briefings.
- Assessed head/neck injury potential for various aircraft interiors; assessed the injury potential in aircraft side-facing seats, and provided engineering/biodynamic requirements to support revision to TSO-C100 and SAE AS5276.
- Initiated collaborative research with industry partners to develop modeling strategies and validation techniques applicable to aircraft seat certification by analysis..
- Provided recommendations for life support equipment and medical requirements in civilian spacecraft
- Assessed risk of extended flight at altitudes less than 25,000 feet above sea level.
- Reviewed accidents involving Commemorative Air Force Aircraft 1968 to 2005.
- Evaluated design requirements for pulse oxygen systems to support development of engineering certification criteria.
- Evaluated the medical aspects of extending first-class FAA medical certificate for pilots under age 40 to 12 months.
- Developed software and procedures to support quality assurance evaluation of airman medical records.
- Presented analysis of civilian air show accidents.
- Evaluated the effectiveness of simulators in upset recovery training.
- Developed an Aircraft Accident/Injury and Autopsy Data System (AA-IADS) to provide injury description and injury mechanisms analysis to support the development of prevention/mitigation strategies.
- Evaluated aircraft windscreen transmittance characteristics as they relate to emerging laser technologies employed in the NAS, and evaluated potential vision protection modalities and/or procedures available to civilian aviators and ground-crew personnel.

FY 2006:

- Completed gene expression research review to identify fatigue in collaboration with the US Air Force.
- Conducted biodynamic evaluations to assess the head/neck injury potential relative to head impact with various aircraft interior structures. Research included initial evaluations of lap belt and shoulder strap mounted airbags to determine their potential for head/neck injury mitigation.
- Developed mathematical techniques to assess the performance of the above-mentioned test devices and aid the development of advanced modeling capability. Development of computer-modeling methods will provide faster, safer, more cost-effective aircraft certification decisions.
- Provided advisory materials for enhancing human health relative to in-flight cosmic and solar radiation exposures and cabin air quality via the internet and through other widely available media for all participants in aerospace flight. The solar radiation alert system provided near real-time warning of solar events, with recommendations for reduced aircraft flight altitudes and potential diversions for polar routes.

FY 2005:

- Continuously provided integrated toxicological and biomedical data on all aerospace accidents and significant incidents. Current findings indicate that about one in five pilots fatally injured in a civilian aircraft accident shows evidence of using a prescription drug; one in six has taken an over-the-counter drug; 1 in 20 has alcohol in excess of FAA regulations; and 1 in 12 is using a significant controlled dangerous substance. State-of-the-art techniques and methodology are continuously maintained in this world-class research program.
- Developed a research program to evaluate the potential use of centrifuge-based simulators for aircraft upset recovery training. Established a cooperative research grant with Embry-Riddle University to conduct background research relative to the use of centrifuge based simulators in upset recovery and to evaluate the effectiveness of simulator training in actual aircraft upset recovery situations. Established a contract with an industrial manufacturer to develop and demonstrate basic simulator methodology to perform upset recovery training using a short arm centrifuge based training device.
- Initiated development of cabin evacuation computer modeling to evaluate aircraft evacuation from current transport aircraft. Transport aircraft are currently certified by manned testing to determine if the aircraft evacuation capability meets requirements. Certification tests are expensive, can result in injured test subjects, and generally evaluate specific scenarios that may not be representative of actual evacuation requirements. Advancements in bioinformatics and the high costs of human subject testing have driven the development of cabin evacuation models to replace and/or streamline portions of manned tests.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Assess flight crew health risks during a flying career.
- Analyze the suitability for component tests and mathematical modeling as an alternative for showing regulatory compliance with crashworthiness standards for aircraft.
- Assess impact protection performance of aircraft seating systems.
- Develop protective equipment fit, comfort, and performance standards.
- Develop dynamic modeling capabilities in support of cabin safety, protection, and aircraft accident research.
- Assess guidelines to reduce in-flight sudden/subtle incapacitation.
- Evaluate autopsy data from fatal aviation accidents to determine protective equipment and design practices.
- Optimize life support equipment, emergency medical equipment, and operational procedures certification.
- Develop processes to ensure laboratory accreditation and ISO-9000 competency.
- Continue epidemiological assessments of biochemical, toxicological and molecular biological factors associated with fatal civilian aviation accidents.

- Develop advanced molecular biochemical techniques to enhance aviation forensic toxicology.
- Complete recommendations for life support equipment and medical requirements in civilian spacecraft.
- Complete technical and customer reports on the physiological evaluation of pulse oxygen systems for general aviation aircraft.
- Evaluate potential for airbag and advanced occupant restraint systems to reduce injury and allow unassisted aircraft evacuation.
- Develop advanced database technology to provide statistical and graphical analysis to evaluate medical certification criteria and mechanisms of injury in aircraft accidents/incidents.
- Support research conducted by industrial organizations to develop/analyze methods to detect/mitigate aircraft cabin contamination.
- Evaluate performance and protection characteristics of aircrew eye/respiratory protective equipment, including protection from chemical/biological agents.
- Develop research recommendations for Aviation Rule-Making Advisory Committee reviews of cabin air quality and altitude safety rules.
- Complete guidelines for maintaining aircraft cabin occupant health to include re-evaluation of the effectiveness of Automatic External Defibrillators (AED's) and the use of medical kit components in the flight environment.
- Evaluate physiological effect of hypoxia at altitudes that, under current regulations, do not require the use of supplemental oxygen.
- Develop instructional material on the radiation (cosmic and visual) environment during air travel.
- Establish an aircraft accident medical database.
- Develop vision standards for maintenance non-destructive inspection and testing.
- Conduct advanced aeromedical accident and pilot certification data analyses.
- Develop research program on crew and passenger safety requirements for very high altitude air or spacecraft.
- Develop data to support medical certification related to the use of vision testing technology developments.

FY 2009 PROGRAM REQUEST:

Complex medical decisions, based on epidemiological assessments, accompany initial and follow-up medical assessments of airmen who request special medical certification to allow continued flying despite clinical abnormalities. Cabin safety, health, and security for all human occupants of civilian aerospace craft require careful, cost-effective certification and regulation. To ensure fact-based scientific decisions concerning these issues, the following research will ensure optimal human safety, security, and health by providing a scientific basis for all decisions.

Ongoing Activities

Evaluate:

- Trends in toxicological, biochemical, molecular biological, physiological, and clinical findings from all major civil aviation aircraft crashes using advanced bioinformatic analytical systems.
- Effectiveness of programs dedicated to the enhancement of passenger safety, health, security, and performance in emergencies and uneventful flight.
- Risk posed by pilots with special medical issuances.
- Sensor systems to provide real time warning and support actions to mitigate the effects of intentional or unintentional chemical or biological aircraft contaminants.

Recommend:

- Safer aircraft cabin evacuation certification guidelines/procedures.
- Effective limits to radiation exposure (laser and ionizing).

- Methods to reduce head, neck, torso, and extremity injuries in aircraft crash environments to improve evacuation capability and improve certification procedures.
- Development of functional genomics technology to support accident investigation and fatigue identification in aircrew aerospace stress response analysis.

Initiatives:

- Implement molecular biological techniques in forensic toxicological investigations of aircraft accidents.
- Conduct collaborative research linking medical aircraft accident investigation with biodynamic and cabin evacuation research programs to develop bioaeronautical safety criteria.
- Expand biodynamic mathematical modeling and model validation to allow partial or full certification of aircraft restraint systems to include complex occupant protection systems.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Integrate analysis of biomedical, toxicological and molecular biological factors and stressors in uneventful flight and in aerospace craft incidents and accidents:
  - Analyze accuracy of pilot-reported medication usage compared with actual toxicology findings.
  - Perform epidemiological assessment of toxicology factors from fatal civilian aviation accidents.
  - Analyze use of molecular biological laboratory methods to enhance forensic toxicological investigation of aircraft accidents/incidents.
  - Analyze the rate at which postmortem alcohol can be produced in specimens from fatal aviation accident victims to aid in the discrimination between ethanol ingestion and postmortem formation.
  - Analyze application of gene expression technology in prevention of fatigue related accidents.
  - Develop instructional material on the radiation (cosmic and visual) environment during air travel.
  - Develop guidelines to reduce in-flight sudden/subtle incapacitation.
  - Establish an aircraft accident medical database.
  - Conduct advanced aeromedical accident and pilot certification data analyses.
  - Evaluate autopsy data from fatal aviation accidents to determine protective equipment and design practices.
- Develop quantitative bioengineering criteria:
  - Develop process to evaluate the use of component tests and mathematical modeling for improved aircraft seat certification criteria and anthropomorphic test devices to establish the correlation of occupant injury and measured impact dynamics.
  - Assess impact protection performance of aircraft seating systems.
  - Develop performance-based narrow and wide bodied aircraft cabin evacuation approval guidelines.
  - Develop protective equipment fit, comfort, and performance standards.
  - Develop dynamic modeling capabilities in support of cabin safety, protection, and aircraft accident research.
- Develop quantitative bioaeronautical data:
  - Enhance guidelines for maintaining aircraft cabin occupant health, including the CARI-6 radiobiological computer program covering large solar particle events.
  - Support research conducted by industrial organizations to develop/analyze methods to detect/mitigate aircraft cabin contamination.
  - Assess flight crew health risks during a flying career.
  - Develop quantitative biomedical and performance criteria and recommendations.
  - Analyze effectiveness of oxygen systems at very high altitudes.

Budget Item	Program Title	Budget Request
A11.k.	**Weather Program**	**$16,968,000**

GOALS:

Intended Outcomes: The Weather Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with hazardous weather conditions. The Weather Program strives to increase capacity by reducing the impacts of adverse weather events on the operational capacity of the National Airspace System (NAS). This research program also supports FAA Flight Plan goals of greater capacity. The FAA efforts undertaken in collaboration with the National Weather Service (NWS) and NASA increase FAA's ability to provide improved short-term and mid-term forecasts of naturally occurring atmospheric hazards, such as turbulence, severe convective activity, icing, and restricted visibility. Improved forecasts enhance flight safety, reduce air traffic controller and pilot workload, enable better flight planning, increase productivity, and enhance common situational awareness.

Agency Outputs: The weather research program develops new and improved weather algorithms for NAS platforms such as the Weather and Radar Processor, the Integrated Terminal Weather System, the Operational and Supportability Implementation System, the Advanced Technologies and Oceanic Procedures, the Dynamic Ocean Track System, and the Enhanced Traffic Management System. The NWS platforms also use these improved algorithms. The weather research program also provides knowledge that can be used by the FAA to support design approvals for weather data link systems and to issue appropriate operational approvals for weather products for use in the cockpit.

The weather capabilities developed by FAA provide the following benefits:

- Depiction of current and forecasted in-flight icing areas – enhances safety and regulatory adherence.
- Interactive data assimilation, editing, forecast and dissemination tools – improves aviation advisories and forecasts issued by the NWS as well as accessibility to users of aviation weather information.
- Depiction of current and forecast precipitation type and rate – enhances safety in the terminal area.
- Depiction of current and forecast terminal and en route convective weather – enhances terminal and en route capacity.
- Short-term prediction and forecast of ceiling and visibility in the national area – enhances en route safety.
- In-situ, remote detection, and forecast of en route turbulence, including clear-air turbulence – enhances en route safety.
- Design approval guidance for weather products, enabling depiction hardware, weather product software, and archiving weather data.
- Operational approval guidance for new products and non-government vendors.

Research Goals: Research is on-going to provide weather observations, warnings, and forecasts that are more accurate, accessible, and efficient, and to meet current and planned regulatory requirements. The goals of the research are:

- By FY 2009, develop a baseline consolidated convective weather forecast capability.
- By FY 2015, develop high-glance-value weather capabilities with longer forecast lead times and increased accuracy, for turbulence, severe convective activity, icing, and restricted visibility to be available electronically to all aviation users.
- By FY 2015, employ the aircraft as a node in the NAS. Enable flight deck weather information technologies that allow pilots and aircrews to engage in shared situation awareness and shared responsibilities with controllers, dispatchers, Flight Service Station specialists, pertaining to preflight, en route and post flight aviation safety decisions involving weather.

Customer/Stakeholder Involvement: The Weather Program works within FAA, industry and government groups to assure its priorities and plans are consistent with user needs. This is accomplished through:

- Close collaboration with FAA organizations such as the Air Traffic Organization Oceanic and Off-Shore Programs Office, various Aviation Safety Offices .
- Guidance from the FAA Research, Engineering, and Development Advisory Committee.
- Inputs from the National Aviation Weather Initiatives, which are strongly influenced by other NAS drivers including "Safer Skies" and Flight Plan Safety Objectives.
- Guidance from the Joint Planning and Development Office Next Generation Air Transportation System initiative.
- Inputs from the aviation community, such as the annual National Business Aircraft Association /Friends/Partners in Aviation Weather Forum, and scheduled public user group meetings.
- Feedback received from documents and publications.

R&D Partnerships: The Weather Program collaborates with the Department of Commerce in promoting and developing meteorological science, and in fostering support of research projects through the use of private and governmental research facilities. The program also leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research (in-flight icing, convective weather, turbulence, ceiling and visibility, modeling, weather radar techniques).
- National Oceanic and Atmospheric Administration laboratories (convective weather, turbulence, modeling, weather radar techniques, quality assessment/verification).
- Massachusetts Institute of Technology's Lincoln Laboratory (convective weather).
- National Weather Service's Aviation Weather Center and Environment Modeling Center (modeling).
- Naval Research Laboratory (volcanic ash, flight level winds, ceiling and visibility).
- NASA Research Centers (in-flight icing, turbulence, satellite data).
- Army Cold Regions Research and Engineering Laboratory (in-flight icing).
- Universities (modeling).
- Airlines, port authorities, cities (user assessments).

Accomplishments:

FY2007:

- Implemented in-flight icing severity nowcast capability operationally
- Obtained approval of turbulence detection algorithm by NWS NEXRAD System Recommendation and Evaluation Committee for operational implementation.
- Provided Helicopter Emergency Medical Services Aviation Digital Data Service (ADDS) enhancement to enable pilots to make NO-GO weather decisions.

FY2006:

- Obtained approval of in-flight icing severity nowcast capability for operational use.
- Implemented four-hour winter precipitation capability into Weather Support to Decision Making System, including Liquid Water Equivalent technology.

- Implemented terminal convective weather forecast capability into Integrated Terminal Weather System.

FY2005:

- Implemented improved accuracy and resolution of data on upper winds, temperature, and moisture through 13 kilometer rapid-update-cycle analyses and forecasts at the NWS.
- Implemented in-flight icing nowcast capability with higher resolution into ADDS.

FY2004:

- Implemented, up to 12-hour forecast of in-flight icing conditions into ADDS.
- Implemented up to 12-hour forecast of marine stratus burn-off at San Francisco International Airport.

Previous Years:

- Achieved the Department of Commerce 2003 Silver Medal.
- Implemented operationally new capabilities of:
  - Current and up to two-hour forecast of convective weather.
  -
  - Current and up to 12-hour forecasts of clear-air turbulence above 30,000 feet.
- Implemented operationally at the NWS the enhanced ADDS with a flight path tool depicting vertical cross sections of weather along user-specified flight routes.
- Completed convective storm growth and decay field tests in Dallas, Orlando, Memphis, and New York. This research resulted in the accurate short-term prediction of the initiation, growth, and decay of storm cells, and enhanced the strategic and tactical flow management planning that allows more effective routing of traffic to and from airports and runways.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Approved in-flight icing severity forecast capability for operational readiness.
- Implemented mid-level turbulence forecast capability operationally.
- Developed a baseline consolidated convective weather forecast capability.
- Developed continental states display of ceiling, visibility, and flight category analysis capability.
- Implemented an experimental Rapid Refresh Weather Research and Forecast (WRF) model.
- Developed volcanic ash dispersion forecast capability.
- Implemented turbulence detection algorithm into NEXRAD operations.
- Developed network enabled operations capability to interface ADDS to the System Wide Information Management platform.
- Conducted quality assessment evaluations utilizing the Real-Time Verification System (RTVS) of weather research capabilities to support the FAA/NWS aviation weather technology transfer process.
- Demonstrated capability to provide metadata tags via the RTVS to the SWIM architecture for JPDO verification.
- Completed a study to baseline weather products and determine pilot weather information needs in the cockpit.
- Completed revised Minimum Performance Standards Technical Standard Order (TSO)-C63c and certification methodology for certification of airborne weather radar with turbulence detection capability.
- Developed a database of pilot deviations, emergencies, and Air Traffic Flight Assists related to weather that will be used to define improvements to private pilot and instrument training for general aviation operators.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Develop consolidated convective weather forecast capability.
- Develop volcanic ash dispersion forecast capability.
- Transition weather research capabilities to operations in the NWS, FAA, and industry weather systems.
- Develop weather product evaluation process for certification and operational guidance.
- Define and validate pilot training requirements needed to effectively operate and interpret weather products correctly.
- Develop and validate software to assist the GA pilot with weather related decision-making, both pre-flight and en route.
- Identify, validate, and document data link system attributes that may affect the provision and use of weather-in-the-cockpit products and services.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop in-flight icing nowcast and forecast capabilities for Alaska.
- Test baseline consolidated convective weather forecast capability.
- Implement probabilistic and mountain-wave turbulence forecast capabilities for experimental use.
- Develop continental states display of ceiling, visibility, and flight category forecast capability.
- Integrate Canadian radar data into the real-time national three dimensional radar mosaics.
- Obtain FAA approval to test the flight level winds capability.
- Implement the Rapid Refresh Weather Research and Forecast model into NWS operations.
- Conduct quality assessment evaluations utilizing the RTVS of weather research capabilities to support the FAA/NWS aviation weather technology transfer process.
- Develop prototype RTVS-NEXGEN for meeting SWIM architecture requirements
- Define a weather product evaluation process for certification and operational guidance.
- Commence turbulence radar and Turbulence Auto-PIREP System infusion into the NAS.
- Complete development of software algorithms to assist GA pilot with weather related decision making in-flight.

Budget Item	Program Title	Budget Request
A11.l.	**Unmanned Aircraft Systems Research**	**$1,876,000**

GOALS:

Intended Outcomes: The Unmanned Aircraft System (UAS) Research Program supports FAA's strategic goal of increasing safety by conducting research needed to ensure the safe integration of the UAS in the NAS. The program's research activities focus on technology surveys, methodology development, data collection and generation, laboratory and field validation, and technology transfer.

Agency Outputs: Researchers are developing methodologies and tools to define UAS design and performance characteristics. They are evaluating technologies, conducting laboratory and field tests, performing analyses and simulations, and generating data to support standardization of UAS civil operations. New standards are being implemented to establish UAS certification procedures, airworthiness standards, operation requirements, inspection and maintenance processes, and safety oversight responsibilities. Policies and guidance materials are also being published to equip FAA certification engineers and safety inspectors with the knowledge and tools they need to ensure the safe integration of UAS into the NAS.

Research Goals: To safely integrate UAS into the NAS, FAA needs to develop airworthiness standards, devise operational requirements, establish maintenance procedures, and conduct safety oversight activities. The program is structured into seven research areas: technology survey; detect, sense and avoid (DSA); control, command, and communication (C3); flight termination, system safety, certification and airworthiness standards, and maintenance and repairs. The research will begin with a baseline survey to determine the existing technologies used in UAS. Technologies used to avoid mid-air collusions due to UAS operations will be examined. Communications issues that may arise due to the introduction of UAS into the NAS, as well as necessary safety procedures for the flight termination of UAS, will be researched. A system safety approach will be used to identify the severity of potential hazards, perform risk assessments, and evaluate mitigation strategies for UAS safe operations in the NAS. Data systems will be established to collect data on UAS design, operation, and maintenance that will provide required information to establish design and operation standards and provide technical basis for safety oversight.

- By FY 2010, complete UAS technology survey and gap analysis and document results in a technical report.
- By FY 2012, determine performance characteristics and operational requirements for DSA technologies.
- By FY 2012, analyze data on the safety implications of system performance impediments to C3 in different classes of airspaces and operational environment.
- By FY 2015, conduct field evaluations of UAS technologies in an operational environment, including DSA, C3, and flight termination technologies. The documented results will be used to develop certification and airworthiness standards.

Customer/Stakeholder Involvement: Full and safe integration of UAS into civil aviation requires FAA to work closely with other government and private agencies that have experience in developing and operating UAS:

- FAA Research, Engineering, and Development Advisory Committee (REDAC) Aircraft Safety Subcommittee – subcommittee representatives from industry, academia, and other government agencies annually review the activities of the program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that the program's R&D projects support new rule making and the development of alternate means of compliance with existing rules.

- Department of Defense (DoD) – the DoD is the largest UAS user requesting unrestricted access to the NAS. The FAA will collaborate with DoD through Memorandum of Understanding (MOU) and Interagency Agreements (IA) to leverage resources and implement new technologies for civil applications.
- JPDO – the JPDO has identified UAS integration to NAS as one of the emerging challenges to the nation's air transportation system.

R&D Partnerships:

- IA's with other government agencies (DoD and Department of Homeland Security) and Memorandum of Cooperation with foreign civil aviation authorities.
- The FAA Air Transportation Center of Excellence – various consortiums of university and industry partners who conduct R&D for FAA on a cost-matching basis, which currently consists of seven centers in different technical disciplines.
- The Civil Aviation Authority of the Netherlands to conduct joint research on unmanned aircraft system initiatives via a Memorandum of Cooperation.

Accomplishments:

FY2007:

- Established UAS research program plan.
- Completed the first sets of FAA-USAF joint flight tests to evaluate a DSA technology.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete survey of existing DSA capabilities and publish technical reports on UAS technology survey and gap analysis results.
- Conduct technology survey on UAS designs and operations.
- Determine performance characteristics and operational requirements for DSA technologies.
- Establish UAS data collection and information system.
- Determine potential safety implications of system performance impediments to C3.
- Determine initial system-level hazard identification for UAS operations in the NAS, determine their severities, analyze mitigation strategies, and make safety recommendations.
- Develop UAS system safety management framework as well as methods, and tools to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.

FY 2009 PROGRAM REQUEST:

New Initiatives

- A safety mitigation strategy for particular UAS operations in given classes of airspaces will be initiated. This effort will be based on results of the initial study on UAS hazards and recommendations from the UAS Systems Safety Risk Working Group.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete technology survey on UAS designs and operations.
- Determine performance characteristics and operational requirements for DSA technologies.
- Determine potential safety implications of system performance impediments to C3.
- Complete the initial system-level hazard identification for UAS operations in the NAS, determine their severities, analyze mitigation strategies, and make safety recommendations.

- Develop UAS system safety management framework as well as methods, and tools to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.
- Establish UAS data collection and information system and conduct system safety analysis on specific UAS operations.

Budget Item	Program Title	Budget Request
A12.a.	**Joint Planning and Development Office**	**$14,494,000.**

GOALS:

Intended Outcomes: As the steward of NextGen, the JPDO seeks to address long-term imbalances in aviation capacity and demand. At the same time, it seeks to ensure that the future operating environment is safe, well managed, environmentally responsible, and harmonized with international standards. JPDO's mission is to lead the transformation of today's aviation system into that of the future, the scope of which contributes to all of FAA's current strategic goals.

Agency Outputs: The JPDO is responsible for defining and facilitating the implementation of NextGen. At this stage in the transformation, outputs are a series of plans and analyses that define a proposed end-state and a path for achieving it. The objective is to drive collaborative decisions—involving government and industry—that will ultimately achieve the transformation.

Research Goals:

FY 2009

- Continue to refine and update the NextGen Enterprise Architecture products: Concept of Operations, Enterprise Architecture, Integrated Work Plan.
- Continue to coordinate with aviation and aeronautics research programs to ensure that research results in decisions that influence the most effective investment and implementation decision-making.
- Consistent with the enterprise architecture, continue to identify and facilitate all pre-implementation activities to support identification and resolution of policy issues, optimized technology transfer, risk management and a broad range of analysis to support decision-making.
- Track and ensure that partner agencies are implementing programs that support a transition to the end-state architecture as defined in the Integrated Work Plan.
- Develop FY 2011 Formulation Package to support NextGen resource planning and development of the NextGen business case and work with partner agencies to ensure alignment of partner agency budgets to the FY 2011 budget request.
- Continue NextGen modeling and simulation efforts that result in improved NextGen alternatives analysis, cost/benefits estimation, and integrate rationale and decisions into the NextGen business case.
- Develop FY 2011 NextGen business case.
- Continue to coordinate and conduct demonstrations that will test operational concepts, address operational challenges, and provide alternatives for architectural trade-offs. Demonstrations will explore human factors and safety characteristics of trajectory-based operations, high-density airport operations, airspace security, and globally interoperable system integration.

FY 2010

- Continue research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management as well as other priority areas identified in the Integrated Work Plan.
- Based on research results, assist agencies in deploying critical infrastructure for NextGen operations.
- Establish Policy for NAS wide aircraft equipage rules and Airspace/Route access.
- Initiate research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management.

FY 2011-2013

- Continue research and development to support all OEP solution sets.

FY 2014 and Beyond

- Continue development to support all OEP solution sets.
- Identify alternatives as a result of needed research that may be immature.

Customer/Stakeholder Involvement: The JPDO is truly a collaborative enterprise. Employees from NASA and the Departments of Transportation, Commerce, Defense, and Homeland Security actively lead and/or participate in JPDO activities. Similarly, the JPDO Board includes executives from each department/agency, as well as the White House Office of Science and Technology Policy. And the Senior Policy Committee includes Secretaries, Deputy Secretaries, and/or Administrators from the participating organizations, as well as the Director of the Office of Science and Technology Policy.

The private sector is also an integral part of JPDO's work. In FY 2006, the NextGen Institute was established as an alliance of major aviation stakeholder communities. The Institute operates under guidelines set forth in the funding agreement between FAA/JPDO and the host organization, the National Center for Advanced Technologies. The agreement states that the Institute will be governed by a 16-member council that is broadly representative of the aviation community. The Institute supports JPDO by recruiting and assigning industry experts to participate in forums and perform funded technical work. The Institute has already hosted a series of workshops to gather input on research, demonstrations, operational concepts, and financial implications. The Institute performs a variety of tasks in support of the planning process including studies, demonstration support, and strategic assessments and recommendations for NextGen design issues.

Accomplishments: Major accomplishments and associated benefits of the JPDO efforts include:

FY 2007

- Released Version 2 of the Enterprise Architecture and Concept of Operations.
- Released the initial baseline version of the Integrated Work Plan, which outlines the steps necessary to achieve the ConOps.
- Completed the NextGen Research and Development Plan, a five year view of the research and investment activities required to revise, coordinate, and cost the research and implementation agendas.
- Completed the first NextGen business case (Exhibit 300).

FY 2006

- Developed the NextGen Block-to-Block Concept of Operations and coordinated it through the NextGen stakeholder community for comment and feedback.
- Developed the NextGen Block-to-Block Enterprise Architecture, aligned the Architecture with the Concept of Operations, and began coordination and review through the NextGen stakeholder community.
- Baselined the Operational Improvement Roadmap to set research targets for the Integrated Product Teams.
- Published the NextGen FY 2008 Agency Budget Guidance for Research and Implementation, which begins to align programs to NextGen and identify key research areas.
- Delivered the FY 2005 Progress Report to Congress describing the JPDO's progress in carrying out the NextGen Integrated Plan.
- Developed initial JPDO Systems Engineering Management Plan (SEMP) to facilitate interaction with other agencies and stakeholders.
- Established the Architecture Integration Council, which includes the chief architects for all partner agencies. This body will ensure the cooperation and engagement of the relevant agencies' chief architects during development of the NextGen architecture.

FY 2005

- Made significant progress in resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced and updated the NextGen Integrated Plan as the long-term strategic business plan, detailing goals, objectives, and requirements for eight transformational areas.
- Established and staffed—with federal and industry participants—eight integrated product teams to work collaboratively with government and industry to develop research agendas and strategies for achieving NextGen.
- Performed the first major evaluation of the Operational Vision in Portfolio Segments, to validate the ability to deliver two to three times today's capacity.
- Established the NextGen Operational Improvement Roadmap to guide the transition from today's system to the next generation.
- Developed initial NextGen Segment Portfolios of policy, research and modernization requirements based on the OI Roadmap.

FY 2004

- Initiated resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced the outline for the Integrated National Plan as the long-term strategic business plan for NextGen that detailed NextGen goals and objectives, and requirements for transformation in eight specific areas, each individually significant yet interdependent on the others.
- Produced the framework for establishing with federal and industry participants eight integrated product teams that would work collaboratively with government and industry to plan for and develop research agendas and strategies for achieving NextGen.
- Established the framework for the NextGen Operational Improvement (OI) Roadmap to guide the transition from today's system to the NextGen.
- Developed initial plan for the NextGen Segment Portfolio's of needed policy, research and modernization requirements based on the NextGen OI Roadmap.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

FY 2008

- Released refinements and updates to the Enterprise Architecture and Concept of Operations.
- Released the Integrated Work Plan Version 1.
- Conducted analysis, modeling, and simulations to support FY 2010 business case development.
- Released the FY 2010 NextGen Business Case and Exhibit 300.
- Refined program management processes including risk management.
- Defined NextGen National Information Sharing framework and multi-agency governance.
- Developed NextGen Weather Functional Requirements and established NextGen Network Enabled Weather Program Office and multi-agency governance.
- Defined Aviation Safety Information Analysis and Sharing Concept and multi-agency governance.
- Developed National Safety Management System Standard and National Aviation Safety Strategic Plan.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

- Continue modeling, simulation, and evaluation to ensure benefits, costs, and trade-offs are understood across the full range of goals.

- Revise, coordinate, and cost the research and implementation agendas for subsequent years.
- Refine NextGen business case and work with agencies and industry on research areas and implementation of NextGen-related programs.
- Continue refining Concept of Operations, Enterprise Architecture, and Integrated Work Plan in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Continue facilitating strategic alignment of agency goals and objectives with NextGen goals and objectives and performance metrics.

New Initiatives

- Conduct demonstrations that will test operational concepts, demonstrate technologies that could address operational challenges, and provide alternatives for architectural tradeoffs.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA, FAA, DHS and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Planning and Agency/Industry Alignment

- Update, coordinate, validate and begin implementing the early opportunity for NextGen, and identify other opportunities for subsequent implementation.
- Coordinate aviation and aeronautics research programs to achieve the goal of more effective and directed research that will result in only performing the most promising and applicable research.
- Set goals, priorities and metrics and reporting structure, and coordinate research activities within JPDO member agencies and with U.S. aviation and aeronautical firms.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate.

Systems Integration and Transformation Analysis

- Continue to refine research plans, which will describe research and supporting activities required to drive implementation decisions to effect the NextGen transformation.
- Continue refining Concept of Operations, Enterprise Architecture, and Integrated Work Plan in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Continue modeling planned improvements to test their efficacy in accomplishing NextGen goals.
- Conduct analyses, trade studies, and demonstrations to select the best approaches/alternatives for transforming the current air transportation system to NextGen.

Budget Item	Program Title	Request
A12.b.	**Wake Turbulence**	**$10,132,000**

GOALS:

Intended Outcomes: The Wake Turbulence Program addresses FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." The program was originally focused on the near-term objectives of increasing airport capacity and the capacity of terminal airspace during inclement weather by developing modifications to air traffic control wake turbulence mitigation procedures used during these weather conditions. The program, in FY 2009, will address the broader research agenda required to progress to the envisioned NextGen. The Wake Turbulence Research Program will address how to mitigate wake turbulence and collision risk impacts to enable more efficient use of congested airspace and existing/future runways at the nation's busiest airports. Program outcomes include:

- Increased NextGen capability for more flights during less than visual flight rules conditions.
- Aircraft are able to fly closer together with the same or reduced safety risk

Agency Outputs: The Wake Turbulence Program conducts applied research to develop improved air traffic control aircraft separation processes that will help solve operational problems associated with today's generalized and static air navigation service provider (ANSP) wake turbulence and collision risk mitigation based separation standards. As an example, during periods of less than ideal weather and visibility conditions, implementation of an ANSP decision support tool that adjusts required wake separations based on wind conditions will allow air traffic control to operate these airports at arrival rates closer to their design capacity. Additionally, the research program will develop wake mitigation and collision risk technology application solutions that safely enable reduced aircraft separations in congested air corridors and during arrival and departure operations at our nation's busiest airports. The research program in FY 2009 will continue work begun in FY 2008 to address the feasibility and benefit of a wake/collision avoidance decision support capability for the flight deck.

Research Goals:

- By FY 2010, determine pilot and ANSP situational aircraft separation display concepts required for implementation of the NextGen "Trajectory Based Operation" and "High Density" concepts.
- By FY 2012, determine the NAS infrastructure requirements (ground and aircraft) for implementing the NextGen "Trajectory Based Operation" and "High Density" concepts within the constraints of aircraft generated wake vortices and aircraft collision risk.

Customer/Stakeholder Involvement: The program addresses the needs of the ATO and works with the agency's Aviation Safety organization to ensure new procedures and technology solutions are safe and that the airports and air routes targeted for their implementation are those with critical needs to reduce airport capacity constraints and air route congestion. The program works with controllers, airlines, pilots and aircraft manufacturers to include their recommendations and ensure that training and implementation issues are addressed in the program's research from the start.

Customers:

- Pilots;
- Air navigation service provider personnel;
- Air carrier operations; and
- Airport operations.

Stakeholders:

- Joint Planning and Development Office;
- Commercial pilot unions;
- FAA air navigation service provider unions;
- Other ICAO air navigation service providers; and
- Aircraft manufacturers.

R&D Partnerships: In addition to maintaining its partnership with the agency's Aviation Safety organization, this research program accomplishes its work via working relationships with industry, academia, and other government agencies. The coordination and tasking are accomplished through joint planning/reviews, contracts and interagency agreements with the program's partners:

- Volpe National Transportation Center;
- Mitre/Center for Advanced Aviation and Systems Development (CAASD);
- NASA Ames and Langley Research Centers;
- EUROCONTROL and associated research organizations; and
- Massachusetts Institute of Technology's Lincoln Laboratory.

Accomplishments: The following represent major accomplishments of the wake turbulence program:

- FY 2007 - Implement dependent staggered ILS approaches to St. Louis closely spaced parallel runways 12R/L and 30R/L.
- FY 2007 - Complete FAA assessment of NASA's concept for wind dependent wake turbulence mitigation procedure for aircraft arriving on closely spaced parallel runways.
- FY 2005-2007 – By analysis, simulation and evaluation prototype; demonstrated feasibility of a cross-wind based air traffic wake turbulence mitigation decision support tool concept for enabling more closely spaced departures from an airport's closely spaced parallel runways.
- FY 2005-2007 – Provided wake turbulence evaluation support in the integration of a new aircraft into the National Airspace System.
- FY 2004-2007 – Cooperative data exchange with European wake turbulence data collection efforts.
- FY 2002-2007 – Developed the most extensive wake turbulence transit and characterization data base in the world, used to determine feasibility of proposed changes to air traffic control's wake turbulence mitigation procedures.
- FY 2006 – Provided wake turbulence information necessary for the ICAO determination of wake turbulence mitigation separations required for the A-380 aircraft.
- FY 2006 – Completed a detailed proposal for modifying the current air traffic wake turbulence mitigation procedures used for dependent staggered instrument landing system (ILS) approaches to an airport's CSPR.
- FY 2005-2006 – Enhanced the pulsed Light Detection and Ranging (LIDAR), which can measure distance, speed and rotation, for wake data collection capability, enabling it to capture wakes from both arriving and departing aircraft.
- FY 2005 – Utilizing analyses of the wake turbulence data collected at San Francisco International Airport (SFO) and Lambert – St. Louis International Airport (STL) upgraded FAA's wake turbulence encounter model used for evaluating proposed changes to air traffic control procedures for routing aircraft into and out of airports.
- FY 2003-2004 – Three prototype pulsed LIDAR systems purchased and added to the STL wake turbulence data collection facility.
- FY 2003 – Provided for the development of a ground based pulsed Light Detection and Ranging (LIDAR) prototype system for detecting and tracking aircraft generated wake vortices.
- FY 2003 – Wake turbulence data collection facility established at STL.
- FY 2002 – Continued wake turbulence data collection at SFO.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop a national change to Air Traffic Order 7110.65 as it applies to the use of closely spaced parallel runways for dependent integrated landing system approach operations.
- Continue wake data collection and analyses at additional airports to support national and airport specific changes to air traffic control procedures for dependent integrated landing system approaches to an airport's closely spaced parallel runways.
- Evaluate reports of wake turbulence encounter as part of the FAA Safety Management System assurance process for changes to air traffic control procedures.
- Complete development of the enhanced suite of wake turbulence encounter analysis tools and begin their application in the evaluation of air route changes, modifications to en route air traffic control aircraft separation procedures changes and introduction of new aircraft designs.
- Analysis of wake turbulence data base to upgrade computational models of wake vortex transport and decay.
- Accomplish air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter analysis tools.
- Develop airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Development of wind prediction algorithm suitable for use in the development of a cross wind dependent wake mitigation for ground based decision support tool for approaches of 757 and "heavy" category aircraft to closely spaced parallel runways.
- Initiate development of ground and aircraft based situational display concepts (joint work with EUROCONTROL) relative to separation constraints (wake, weather, and visibility) required for implementation of the NextGen concept for air routes and approach/departure paths.
- Initiate program to evaluate the impact to fuel efficiency from the addition of a spiroid winglet to an aircraft's wing.

FY 2009 PROGRAM REQUEST:

In FY 2009, FAA must continue developing the capabilities needed to enable aircraft separation processes supportive of NextGen shared separation and dynamic spacing super density operations. These capabilities are highly dependent on technologies that accurately predict aircraft tracks, the track/decay of their generated wake vortices and provide this information to pilots and controllers. Some aspects of the NextGen Concept of Operations are dependent upon the aircraft being a participant in efficient, safe air traffic control processes that would minimize the effects of wake turbulence, reduce collision risk and keep traffic flowing in all weather and visibility conditions. The Wake Turbulence Program's research will result in enhanced technology assisted processes for safely mitigating aircraft wake encounter and collision risks while optimizing capacity, for all flight regimes, including the effects of weather.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Incorporate wake transport/decay and aircraft navigation performance analysis results into FAA wake encounter and collision risk models.
- Accomplish air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter and collision risk analysis tools.
- Complete two airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Continued data collection to determine the characteristics of wake vortices generated by departing and arriving aircraft. Data will be used in development of air navigation service provider decision support tools in reducing the required wake mitigation separation applied to airport single runway arrivals and departures.
- Continue development of ground and flight deck based situational display concepts (joint work with EUROCONTROL) for showing separation constraints (driven by collision risk, wake encounter risk, weather, and visibility) for aircraft operating in NextGen air corridors and high density airspace.

- Initiate development (joint work with EUROCONTROL) of analytical capability-benefit tradeoff models of potential procedures/processes/systems that would provide the desired Flight Deck capability for self separating from adjacent aircraft and their wakes.
- Complete development of approach to evaluate system-wide safety risk associated with the NextGen pair-wise separation concepts.
- Conduct experiments/analyses and aviation community forums to define in terms of collision and wake encounter hazard – what is a low, major and catastrophic impact safety event and acceptable safety risk for each.
- Initiate development of an air navigation service provider prototype decision support system for use in reducing required wake mitigation separations in dependent instrument landing system arrivals of B-757 and heavier aircraft on an airport's closely spaced parallel runways.

Budget Item	Program Title	Budget Request
A12.c.	**NextGen – Air Ground Integration**	**$2,554,000**

GOALS:

Supports FAA Strategic Goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Supports FAA R&D Goal: Air-Ground Integration.

Intended Outcomes: Demonstrate that operations (e.g., day and night, all weather), procedures and information can be standard and predictable for users (e.g., pilots, controllers, airlines, passengers) at all types of airports and for all aircraft.

Integration of air and ground capabilities poses challenges for pilots and controllers. A central core human factors issue is ensuring the right information is provided to the right human operators at the right time to make the right decisions. Transitions of increasingly sophisticated automation and procedures must be accompanied by supporting interoperability, with baseline systems and refinement of procedures to ensure efficient operations and mitigate potential automation surprises.

The safety factors that primarily have an impact on separation assurance must be jointly approached by both the flight deck and air traffic research communities. The increased levels of automation and new enabling technologies that will likely transform the NAS in the future will bring new and interesting human factors challenges.

REDAC findings are being addressed in both the baseline research programs and as part of future research planning. Ongoing research efforts support human factors guidelines for the design of instrument procedures, including the development of future procedures based on area navigation (RNAV) and the required navigation performance (RNP) of the aircraft. Execution of robust and leveraged research plans will be commensurate with program funding to address the most critical issues.

Other research efforts address operational and design constraints affecting human error detection and recovery, error prediction, and managing distractions in order to ensure continued situation awareness by the air crew. Training of pilots must be designed to ensure adequate understanding of avionics and automation capabilities, which are key to ensuring efficiency and effectiveness as pilots take on increased spacing and separation responsibilities.

Operational Improvements include provision for self-spacing, merging and passing in en route airspace via CDTI and ADS-B, with procedures based on RTSP for less than three-mile separation. Lateral and in-trail separation would be reduced to near VFR levels for single runway and for converging and closely spaced parallel runway operations using CDTI, ADS-B and wake vortex ground detection. Aircraft-to-aircraft separation would be delegated to the flight deck in oceanic airspace, with reduced longitudinal and lateral spacing via RNP, ADS/CDTI and data communication.

Agency Outputs: The Flightdeck/Maintenance/System Integration Human Factors Program addresses the pilot side of the air-ground integration challenge, and collaborates with the Air Traffic Control/Technical Operations Human Factors Program to ensure robust air-ground integration research. Through use of modeling, simulation, and demonstration, the program assesses interoperability of tools, develops design guidance, determines training requirements, and verifies procedures for ensuring efficient and effective human system integration in transitions of NextGen capabilities.

Outputs include:

- Define the changes in roles and responsibilities between pilots and controllers, and between humans and automation, required to implement NextGen.

- Define human and system performance requirements for design and operation of aircraft and air traffic management systems.
- Develop and apply error management strategies, mitigate risk factors, and reduce automation-related errors.
- Demonstrate the transition of self-separation responsibility to pilots.

Research Goals:

By FY 2008:

- Evaluate methods to mitigate the potential for incidents and accidents by assessing and removing causal factors of human error from flight deck operations and aviation maintenance.
- Begin developing guidance on how advanced technology can be used for inspection training and reducing errors in general aviation maintenance.
- Facilitate the operational implementation of the Human Factors Certification Job Aid, Version 8 for Parts 25 (Airworthiness Standards for Transport Category Airplanes) and 23 (Airworthiness Standards including Commuter Category Airplanes). This tool will support FAA certification personnel, aircraft designers, and researchers in addressing possible human factors concerns related to displays, controls, flight deck systems, pilot tasks, and procedures. It will also address equipment and testing assumptions.

By FY 2009:

- Develop a system safety approach to understand error patterns of pilots, maintenance personnel, and inspectors, and identify intervention strategies.
- Develop certification guidelines and human factors standards for integrating advanced technologies.
- Develop training guidelines for flight deck error management.

By FY 2012:

- Improve design of computer-human interfaces to reduce information overload and resulting errors.
- Improve pilot situational awareness, and provide corrective mechanisms to compensate for pilot skills degradation or automation failure.
- Assess cognitive and contextual factors to improve operator performance and reduce errors.
- Apply program-generated knowledge of human factors to improve selection and training of aviation system personnel.
- Examine effective roles for pilots and how those roles are best supported by allocation of functions between human operators and automation.
- Address human automation integration issues regarding the certification of pilots, procedures, training, and equipment associated with enhanced CNS/ATM operations necessary to achieve NextGen capabilities.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- NASA's Aviation Safety Program.
- FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flightdeck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Collaborative research with NASA on its safety, airspace and air portal projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities. Complex full mission demonstrations using a distributed simulation architecture will leverage NASA cockpit and ATM simulation facilities and other resources.
- Grants will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators.

Accomplishments: This is a new program starting in FY 2009.

FY 2009 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and ATM leading to a full mission demonstration.

Roles and Responsibilities
- Define a transition roadmap for delegating spacing and separation responsibilities to the pilot, while ensuring concomitant changes in controller roles and procedures.

Human System Integration
- Develop certification and operational approval guidelines for NextGen integrated technology and applications.
- Identify requirements for collaborative ATM in use of probabilistic weather information by pilots and controllers.

Error Management
- Assess information requirements for use of pilot-automation interfaces necessary for NextGen separation.

Integrated Demonstrations
- Define a plan to integrate complex demonstrations, simulations, and field trials, which includes goals, operational environments, NextGen separation procedures, participants, roles and responsibilities, and measurements, supporting incremental transitions of NextGen concepts and capabilities.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Roles and Responsibilities
- Develop guidance addressing allocation of functions between the aircrew and automation, including information automatically displayed to the pilot compared to manually requested information.
- Develop guidance in changing roles as responsibilities shift from air traffic controllers to pilots.

Human System Integration
- Develop guidance for certification of NextGen avionics and flight deck integration.
- Identify human factors issues in the operational approval of NextGen avionics enabled capabilities.
- Complete a preliminary cognitive task analysis supporting common information between pilots and controllers in use of probabilistic weather information.
- Assess communication and display issues in use of NextGen weather information supporting collaborative ATM.

Error Management
- Develop guidance for use of pilot-automation interfaces necessary for NextGen separation.

Integrated Demonstrations

- Develop a simulation and demonstration roadmap laying out incremental objectives, simulation requirements, assumptions, and risks for assessing integration of controller tools, including for weather and wake separation.

Budget Item	Program Title	Budget Request
A12.d.	**NextGen – Self-Separation**	**$8,025,000**

GOALS:

Supports FAA Strategic Goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Supports FAA R&D Goal: Self-Separation.

Intended Outcomes: By 2015, develop initial standards and procedures for self-separation.

New technologies such as GPS, ADS-B, and CDTI afford the possibility of transitioning from classic air traffic control separation assurance procedures to aircraft self-separation. Many NextGen enhanced capabilities are based on various aircraft oriented activities such as spacing, merging, passing, etc. Research will assess the human factors risks and requirements associated with these various separation policies, procedures and maneuvers. The research results will provide technical information to support the development of standards, procedures, and training by Flight Standards to implement the JPDO plan for separation. Human factors research required to provide the scientific and technical information to address human performance issues include:

- Providing human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.
- Providing robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts. The NextGen benefits associated with reduced aircraft spacing at high density arrival and departure terminal and airports also leaves less buffer to accommodate non-normal events. The impact on safety and efficiency will be addressed.
- Understanding changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Developing advanced methods to certify pilots and automation for different separation operations.
- Developing error management strategies to identify and mitigate human-system errors in separation operations.
- Providing guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

This effort intends to support several NextGen Operational Improvements including:

- Self-spacing, merging and passing in en route airspace is allowed under certain conditions in certain airspace via cockpit display of traffic information (CDTI) and ADS-B.
- Procedures based on required total system performance (RTSP) for less than three mile separation are implemented.
- Trajectories are exchanged via data communications.

Procedural requirements need to be assessed for use of CDTI-assisted visual separation for increasing arrival and departure capacity including during instrument meteorological conditions. This would support several NextGen Operational Improvements including:

- In-trail separation is reduced to near VFR levels for single runway departure operations using ground based wake vortex prediction and detection, CDTI, and ADS-B.
- In-trail separation is reduced to near VFR levels for converging and closely spaced parallel runways based on ground based wake vortex prediction and detection, CDTI, and ADS-B.

The research program will develop plans addressing human performance requirements in transitions to airborne separation assurance and self-separation consistent with the NextGen Concept of Operations. This includes total system performance requirements, human error reduction, and mixed equipage with the effort supporting Operational Improvements such as:

- Aircraft-to-aircraft separation is delegated to the flight deck in oceanic airspace via CDTI and improved CNS (lower RTSP) and oceanic automation (satellite, aircraft, ground surface).
- Aircraft-to-aircraft oceanic longitudinal and lateral spacing is reduced to 15 X 15 nm by use of RNP, ADS/CDTI and data communications.

Agency Outputs: The Flightdeck/Maintenance/System Integration Human Factors Program develops human factors technical information to address roles and responsibilities for pilots and air service providers, human system integration, and error management strategies to implement Trajectory Based Operations, High-Density Arrival/Departure Airports, Flexible Terminal and Airports, and Networked Facilities capabilities. Human factors technical information will also support the standards, procedures, training, and policy required to implement the operational improvements leading to self-separation.

Outputs include:

- Define human factors technical information needed to support the development of standards, procedures, and training by Flight Standards to implement plans for aircraft separation.
- Develop and implement human-systems integration process for separation activities, e.g., spacing, merging, and passing, leading to self-separation.
- Define the changes in roles and responsibilities between pilots and controllers and between humans and automation required to implement separation activities.
- Define human and system performance requirements for separation activities, e.g., spacing, merging, and passing, leading to self-separation.
- Define the potential impact and human factors issues of new technologies such as enhanced vision, synthetic vision, and electronic flight bags on separation activities.
- Develop and apply error management strategies, mitigate risk factors, and reduce automation-related errors associated with separation activities.
- Develop the human factors criteria for the successful use of conflict alerts as they relate to separation maneuvers and how they are communicated and resolved between flight deck and ground monitors.

Research Goals: Conduct R&D to support the standards, procedures, training, and policy required to implement the NextGen operational improvements leading to self-separation including improved awareness of surface/runway operations, reduced separation, and shared separation.

- By 2011, enable oceanic and en route pair-wise separation.
- By 2015, complete research to enable surface movement in zero visibility conditions guided by cockpit display of aircraft and ground vehicles and associated procedures.
- By 2015, complete research and provide human factors guidance to reduce arrival and departure spacing including variable separation in a mixed equipage environment.
- By 2015, enable self-separation in oceanic airspace and high density en route corridors.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- Guidance from the Joint Planning and Development Office Next Generation Air Transportation System initiative.
- NASA's Aviation Safety Program.
- Close collaboration with FAA organizations, notably Flight Standards and Aircraft Certification in the AVS line of business.

- FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flightdeck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Collaborative research with NASA on its aviation safety and airspace projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities. Complex full mission simulations using a distributed simulation architecture will leverage NASA cockpit and ATM simulation facilities and other resources.
- Grants will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators.
- Coordination will occur with appropriate RTCA Committees, e.g., Airborne Separation Assistance System.

Accomplishments: This is a new program starting in FY 2009.

FY 2009 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and ATM leading to a full mission simulation in 2015.

Level 1 – Surface/Runway Operations Awareness

- Address human factors issues for the cockpit display of aircraft and ground vehicles to guide surface movement during low visibility conditions including runway queuing and runway configuration change.
- Develop human factors criteria for conflict alerting for use in modeling collision risk in surface movement.
- Develop the aircrew requirements for aircraft display and certification criteria necessary for use of staffed virtual towers.

Level 2 – Reduced Separation

- Assess human factors issues to support performance-based ATM.
- Define human factors issues and develop guidance for integrating RSP and RCP with RNP.
- Assess human factors issues for transition to RNP.
- Conduct modeling and simulation to assess pilot performance in reducing separation.
- Assess human factors issues in cockpit display requirements to transition from current operations to the 2015 goal of reduced arrival and departure spacing, including variable separation in a mixed equipage environment.

Level 3 – Shared Separation

- Develop human factors criteria for pilot training in use of limited delegation of separation authority in the oceanic environment.

Level 4 – Self-Separation

- Conduct modeling and simulation to assess human factors issues for airborne self-separation in classic and ANSP flow airspace involving high density en route corridors.

Cross-cutting all four levels

- Provide human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.

- Provide robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Assess changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Develop advanced methods to certify pilots and automation for different separation operations.
- Develop error management strategies to identify and mitigate human-system errors in separation operations.
- Provide guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Level 1 – Surface/Runway Operations Awareness

- Define pilot information requirements for runway queuing and runway configuration change during low visibility conditions.
- Assess standards for conflict alerting of aircraft and ground vehicles in surface movement.
- Complete a cognitive task analysis for surface movement for different aircraft types and mixed equipage for use of staffed virtual towers.

Level 2 – Reduced Separation

- Address pilot performance requirements in use of automatic maneuvers.
- Assess interoperability and procedural issues for integrating RSP and RCP with RNP.
- Identify pilot training and procedures for transition to RNP.
- Through modeling and simulation, assess pilot use of flight deck decision support for reduced separation.
- Define human factors issues for display requirements to support reducing arrival and departure spacing, including closely spaced parallel runways.

Level 3 – Shared Separation

- Evaluate pilot training requirements for use of limited delegation of separation authority in the oceanic environment.

Level 4 – Self-Separation

- Conduct preliminary modeling and simulation to assess pilot performance during self separation in classic and ANSP flow airspace.

Cross-cutting all four levels

- Provide human factors assessments on new information requirements to allow pilots to perform separation maneuvers safely and effectively.
- Provide robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Assess changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Develop advanced methods to certify pilots and automation for different separation operations.
- Develop error management strategies to identify and mitigate human-system errors in separation operations.
- Provide guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to separation operations.

Budget Item	Program Title	Budget Request
A12.e.	**NextGen – Weather Technology in the Cockpit**	**$8,049,000**

GOALS:

Intended Outcomes: By 2015, demonstrate common real-time awareness of current and forecast weather data by pilots and controllers.

To achieve a three times increase in capacity, increase arrival rates to 95 percent, and reduce gate-to-gate transit time by 30 percent – while maintaining safe operations – there must be a common weather picture to pilots, controllers, and users. Weather data, combined with other ATM system data, shall support a common situational awareness by pilots and controllers and automated and collaborative flight planning and decision making.

Although in many cases Part 121 operators have onboard weather, there are incongruities between how pilots view weather and what is used by controllers. NextGen intends to provide increasingly sophisticated weather products to controllers that should more closely parallel capabilities on the flight deck. Accruing NextGen benefits for weather necessitates effective integration of what information is provided to pilots and controllers and the training and procedures for its use.

For Part 91 operators failing to recognize and flying into adverse weather conditions is the leading factor of GA fatalities. There is a wide spectrum of weather products available to GA pilots and research is necessary to support the development of standards for weather products and weather data available to pilots and the appropriate use of weather data.

Use of weather information in Part 135 operations varies by size and type of aircraft. Research needs to examine differences and develop standards on its use.

Several Operational Improvements (OIs) identified by the JPDO Weather IPT (OIs #2, 12, 13, 22, and 29) can not be implemented without the completion of the research within the weather technology in the cockpit program.

Agency Outputs: Weather technology in the cockpit enables pilots and aircrews to engage in shared situational awareness and shared responsibilities with controllers, dispatchers, Flight Service Station (FSS) specialists, and others, pertaining to safe and efficient preflight, en route, and post flight aviation safety decisions involving weather.

There are two parts to this program: Cockpit Weather Technologies and Human Factors for Cockpit Weather Technologies. Cockpit Weather Technologies develops policy and standards for hardware and software requirements, including update rates, and guidelines and procedures for testing, evaluating, and qualifying weather systems for certification and operation on aircraft. Human Factors for Cockpit Weather Technologies addresses policy, standards, and guidance for the display of weather information and its use, including design guidance, training, procedures, and error management.

Research Goals: Research will enable development of policy, standards, and guidance needed to safely implement weather technologies in the cockpit to provide shared situational awareness and shared responsibilities. The goals of the research are:

- By 2010, develop design approval guidance for hardware and software standards.
- By 2010, develop design approval guidance for archiving weather data.
- By 2010, develop initial guidance for operational approval of new products and products from non-government vendors.
- By 2015, support a full mission demonstration assessing weather information in integrated NextGen air and ground capabilities for controllers and pilots.

Customer/Stakeholder Involvement: The Weather Program works within FAA, industry and government groups to assure its priorities and plans are consistent with user needs. This is accomplished through:

- Guidance from the JPDO Next Generation Air Transportation System initiative.
- Inputs from the aviation community, such as the annual National Business Aircraft Association conference, the Friends/Partners in Aviation Weather Forum, scheduled public user group meetings, and domestic and international aviation industry partners including Boeing.
- Subcommittees of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.
- RTCA SC-206 and Society of Automotive Engineers G-10 subcommittees.

R&D Partnerships: The Weather Program leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research.
- NASA Langley and Glenn Research Centers.
- Army Cold Regions Research and Engineering Laboratory.
- Universities.
- Airlines, pilots, and manufacturers.

Accomplishments: This narrative describes additional funding requested in FY 2009 for the weather technology in the cockpit initiative. The base funding for the weather technology in the cockpit initiative is described in the base Weather Program (A11.k). Accomplishments prior to FY 2009 are listed there.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

FY 2008 major accomplishments and activities are listed in the base Weather Program (A11.k) narrative.

FY 2009 PROGRAM REQUEST:

Ongoing Activities (Acceleration of activities in the base program)

- Identify, validate, and document data link system attributes that may affect the provision and use of weather-in-the-cockpit products and services.
- Develop initial guidance for operational approval of new products and products from non-government vendors.
- Accelerate turbulence radar and Turbulence Auto-PIREP System infusion into the NAS.

New Initiatives (Additions to those listed in the base program)

- Develop CONOPS for weather-in-the-cockpit, including GA operations.
- Evaluate use of aircraft to collect, process, and disseminate weather data (aircraft as a node in the system).
- Develop prototype weather products for use in the cockpit.

- Develop standards and guidance for design approval of weather decision support for cockpit use including integration of weather information with existing CNS/ATM information on multi-function displays.
- Develop guidance to weather program to enhance usability of forecasting products for pilot decision making.
- Evaluate procedures to include weather information into the flight deck decision process to include the use of internal, e.g., onboard weather radar, and external sources of weather information.
- Develop guidelines to identify and mitigate pilot errors related to weather information usage.
- Develop methods for effective cooperative use of weather information among pilots, controllers, dispatch, and Air Traffic Operation Centers to enhance weather-related safety and efficiency decisions.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Develop CONOPS for weather in the cockpit, including integration of weather information into flight deck decision support tools, weather dissemination management.
- Initiate feasibility study for use of aircraft to collect, process, and disseminate weather information.
- Develop standards and guidance for design approval of weather decision support for cockpit use including integration of weather information with existing CNS/ATM information on multi-function displays.
- Develop guidance to weather program to enhance usability of forecasting products for pilot decision making.
- Evaluate procedures to include weather information into the flight deck decision process to include the use of internal, e.g., onboard weather radar, and external sources of weather information.
- Develop guidelines to identify and mitigate pilot errors related to weather information usage.
- Develop methods for effective cooperative use of weather information among pilots, controllers, dispatch, and Air Traffic Operation Centers to enhance weather-related safety and efficiency decisions.

Budget Item	Program Title	Budget Request
A13.a.	**Environment and Energy**	**$15,608,000**

GOALS:

Intended Outcomes: The Environment and Energy Program helps achieve FAA's environmental compatibility goal and supports the FAA *Flight Plan*. The program also provides fundamental knowledge and tools to support the Next Generation Air Transportation System (NextGen) research and development plan. The efforts complement activities in technology and operational solutions and environmental management systems and models development under NextGen research.

The Program specifically supports the following outcomes:

The *Flight Plan* Noise Exposure Performance Target to reduce the number of people exposed to significant noise by four percent per year through FY 2012 as measured by a three-year moving average, from the three-year average for calendar year 2000 – 2002. Specific activities include:

- Conduct research and develop analytical tools to understand better the relationship between noise and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision-making.
- Through the PARTNER Center of Excellence (COE) identify and better measure the issues and impacts associated with aircraft noise, and generate improved solutions to mitigate these problems.
- Identify and assess the impact and enable implementation of operational procedures to reduce noise in the NAS.
- Minimize the impact of aircraft noise – actions include: advancing the state of science/knowledge concerning effects of aircraft noise; improving aircraft certification standards and existing operational procedures; and implementing improved noise control and mitigation measures.

The *Flight Plan* Aviation Fuel Efficiency Performance Target improves aviation fuel efficiency per revenue passenger-mile by one percent each year through FY 2012, as measured by a three-year moving average, from the three-year average for calendar years 2000-2002.

Specific activities include:

- Conduct research and develop analytical tools to understand better the relationship between noise and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision making.
- Through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) identify and better measure the issues and impacts associated with aviation emissions, and generate improved solutions to mitigate these problems.
- Assess the impact and enable implementation of operational procedures to reduce aviation emissions in the NAS.
- Minimize the impact of aviation emissions – actions include: advancing the state of science/knowledge concerning atmospheric/health effects of aviation emissions; and improving aircraft certification standards and operational procedures; and implementing improved emissions control and mitigation measures.

Flight Plan International targets include fostering international environmental standards, recommended practices, and guidance material that are technically feasible, economically reasonable, provide a measurable environmental benefit and take interdependencies between various emissions and between missions and noise into account. Specific activities include:

- Working with the international aviation community to reduce aircraft noise and emissions – actions include:
  - Improving aircraft certification standards and operational procedures.
  - Promoting compatible land use.
  - Assessing the benefits of abatement measures around populations exposed to aircraft operations.

The Program also contributes to the following outcomes:

- NextGen goal to promote environmental stewardship by reducing significant community noise and local air quality emissions impacts in absolute terms, limiting or reducing the impact of aviation greenhouse gas emissions on global climate, and balancing aviation's environmental impact with other societal objectives. Specific activities include:
  - Develop fundamental knowledge to aid in better science-based understanding of impacts of aircraft noise and aviation emissions on local air quality and climate change to enable the NextGen goal of three-fold growth in capacity by 2025, while reducing significant community noise and local air quality emissions in absolute terms.
  - Developing tools to assess the ability of technologies for airframes, more efficient engines, advanced propulsion concepts, new fuels and materials to reduce source noise and emissions.

Agency Outputs: The program is developing and validating methodologies, models, metrics, and tools to assess and mitigate the effect of aircraft noise and aviation emissions in a manner that balances the interrelationships between emissions and noise and considers economic consequences. It is also developing computer models and impact criteria for use by civil aviation authorities in assessing proposed actions. Researchers are also developing a better science-based understanding of the effects of aircraft noise and aviation emissions.

Research Goals:

- By FY 2009, develop and distribute a second generation of more robust integrated noise and emission prediction and modeling tools for global applications.
- By FY 2009, develop a second generation airline and technology environmental cost module for integrated noise and emissions tools using updated methodologies.
- By FY 2009, continue to develop and implement as they become available methods and models to analyze aircraft, auxiliary power units, and ground support equipment emissions and their impact on air quality.
- By FY 2009, implement a methodology for assessing hazardous air pollutant emissions in the vicinity of an airport; issue updated guidelines for national consistency in environmental assessment.
- By FY 2009, exercise databases of particulate matter emissions to assess trends as a function of engine combustor technology and other emissions, and impacts on health and welfare, in order to advise options for mitigation, as required.
- By FY 2009, advance our understanding of the evolution of volatile particulate matter emissions in order to specify measurement and sampling procedures for regulatory consideration.
- By FY 2009, complete an assessment of technology response to more stringent oxides of nitrogen (NOx) emissions standards, taking into account interdependencies and any tradeoffs among emissions and with noise.

- By FY 2009, establish benefits of implementation of a new continuous-descent arrival (CDA) noise abatement and fuel burn (emissions) reduction procedure at low-traffic airports during nighttime operations.
- By FY 2009, develop new technical guidance for noise and aircraft engine emissions certification.
- By FY 2010 provide computer models and impact criteria for use by civil aviation authorities in environmental assessments.
- By FY 2010, test and deploy first elements of the website to educate and inform the public about aviation and the environment and to enable the community to participate actively in public processes.
- By FY 2011, develop and disseminate a preliminary planning version of Aviation Environmental Design Tool that will allow integrated assessment of noise and emissions impact at the local and global levels.
- By FY 2013, develop and field a fully validated suite of tools, including the Environmental Design Space (EDS) and Aviation Environmental Portfolio Management (APMT) tools, which will allow cost benefit analyses.
- By FY 2013, use hazardous air pollutants and particulate matter direct measurements from engines to replace approximation methods and factors used in modeling tools.

In addition, the program is conducting government-industry sponsored research through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) to identify and measure more accurately the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.

Specifics of these cooperative research efforts include:

- By FY 2009 develop and disseminate new standards and methodologies to quantify and assess the impact of aircraft noise and aviation emissions for use by industry, government, and the public – also suggest a new metric to assess the acceptability of sonic boom from supersonic aircraft.
- By FY 2009, develop preliminary methodologies to quantify and assess the impact of Particulate Matter and Hazardous Air Pollutants (HAP).
- By FY 2010, assess the impacts of aviation on regional air quality including the effects of NOx emissions that result when aircraft climb and cruise.
- By FY 2010 test and deploy elements of an Internet capability to educate and inform the public about aviation and the environment.
- By FY 2011, assess the level of certainty of aviation's impact on climate change and advance the state of practical science research, with special emphasis on addressing the identified major uncertainties and gaps in our understanding of current and projected impacts of aviation on climate and to develop metrics that will enable us to characterize those impacts for purposes of advising options for mitigation.

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation. This unified regulatory approach to research identifies and influences technologies, models, regulations, and certification criteria that can improve our present and future global environment.

- *The FAA Aviation Rulemaking Advisory Committee* -- a formal standing committee composed of representatives from aviation associations and industry. The committee conveys its recommendations, advice, and information to FAA for consideration in rule making activities, and its harmonization working groups ensure that domestic and international aircraft noise certification regulations impose uniform standards upon the aircraft of all countries.
- *International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP)* -- this committee establishes and continually assesses the adequacy of international aviation environmental standards for aircraft noise and engine exhaust emissions.

- *The Federal Interagency Committee on Aviation Noise (FICAN)* -- encourages debate and agreement over needs for future aviation noise abatement and resulting new research efforts. FICAN conducts annual public forums in different geographic regions with the intent to better align noise abatement research with local public concerns.
- *Aviation Emissions Characterization (AEC) Roadmap* – developed by government and industry to coordinate research and regulatory activities. The objective of this long-range action plan is to gain the necessary understanding of particle formation, composition, and growth and transport mechanisms for assessing aviation's particulate emissions, and hazardous air pollutants, and understanding their impact on human health and the environment. Ultimately, if warranted, this activity will guide the development of aviation related technology that results in reduced particulate emissions.
- *NextGen* -- FAA is leading an Environmental Working Group (E-WG) responsible for leading environmental dimensions of the JPDO. The WG comprises FAA, NASA, the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the E-WG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on "Aviation and the Environment."
- *Climate Change Science Program (CCSP)* – The FAA is working with the CCSP program office and its individual member agencies to focus research efforts that address the uncertainties and gaps in our understanding of current and projected impacts of aviation on climate, and to develop metrics to characterize these impacts.

R&D Partnerships: Through a series of Memorandums of Agreement (MOA), FAA works closely with NASA to identify long-term source abatement technologies for noise and emissions. Together, the agencies also work with industry and academia to assess the possible global impact of aircraft engine exhaust emissions. In FY 2005, FAA signed an MOA with DoD to pursue joint activities to understand and mitigate aviation noise and emissions. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation's environmental impact.

- Through the JPDO NextGen, the program supports the E-WG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The EWG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures, as well as other relevant tools, metrics, and products to address aviation's environmental impact.
- The Volpe National Transportation Systems Center continues, in collaboration with the Environment and Energy Program, to provide substantial technical assistance in the areas of aircraft noise and engine emissions measurement and assessment.
- FICAN also offers a forum for partnership, as the Committee comprises all federal agencies concerned with aviation noise. The FAA works with this committee to foster greater, more cost-effective partnering in aviation noise research among all agencies.

Accomplishments: The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2007. Today's aircraft are also 70 percent more fuel-efficient-per-passenger-mile than jet aircraft of the 1960s. Reduced fuel consumption and technologies to reduce emissions have also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions. Specific recent accomplishments include:

FY 2007:

- Developed and demonstrated the first versions of AEDT, EDS and APMT. These tools will revolutionize approaches to aviation environmental assessment and regulation by enabling a comprehensive approach that assesses interdependencies and optimizes solutions based on cost-benefit analyses of impacts and mitigation. The tools will provide significant cost savings and other benefits to users.

- Released new versions of computer models to assess noise and emissions exposure incorporating the latest science and methodologies
- Completed the analyses supporting a Report to Congress, jointly with EPA, on the impact of aircraft emissions on air quality in nonattainment areas; ways to promote measures that allow aviation to enhance fuel efficiency and to reduce emissions; and opportunities to reduce air traffic inefficiencies that both waste fuel and increase emissions.
- Completed an assessment of the feasibility of using alternative fuels in commercial aviation. The assessment included a comprehensive assessment of well to tail emissions from coal and gas derived and renewable alternative fuels.

FY 2006:

- Released advanced version of highly influential advanced computer models for airport and heliport noise analysis –over 1000 users in over 40 countries. The models are used in over 160 U.S. airport studies involving more than $1.8 billion in airport noise compatibility grants, and recently provided the basis for an aircraft noise exposure prediction model for air tours in the Grand Canyon National Park.
- Released advanced version of a computer model that is used extensively by over 300 domestic and international users in airport air quality analyses and has won the EPA's highest endorsement.
- JPDO Environmental Integrated Product Team (E-IPT, now E-WG) instituted a framework for establishing national goals for aviation and the environment and completed a "gap analysis" of environmental R&D programs necessary to meet NextGen goals.
- Reported to Congress regarding a comprehensive national study of ways to reduce aircraft noise and emissions.

FY 2005:

- Developed a handbook on aviation emissions that serves as the definitive source on this evolving issue.
- Developed a first order approximation to help airports assess aircraft particulate emissions and demonstrate compliance with the National Environmental Policy Act and the Clean Air Act.
- Developed a novel methodology for assessing noise, local air quality emissions, and aviation climate impacts using a common currency.

FY 2004:

- Initiated a long-term, strategic effort to develop analytical tools to address the relationship between noise and emissions and different types of emissions. The long-term aim is a comprehensive approach to addressing all aspects of noise and emissions. The tools will facilitate better-informed decisions that can cost in excess of $10 billion to government and industry.
- Developed a modeling capability to produce annual inventories of aircraft greenhouse gas emissions and to assess aviation's forecasted global emissions.

FY 2003:

- Established the PARTNER COE to allow partnerships with universities, research institutions, and industry to conduct exploratory research to identify and better measure the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Demonstrated new Continuous Descent Arrival noise abatement procedures in collaboration with NASA, academia, manufacturers, and airline and airport operators.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Complete an annual assessment of noise exposure and fuel burn.
- Deliver Aviation Environmental Design Tool (AEDT) Version 2.0, including Environmental Design Space (EDS), capability for ICAO Committee on Aviation Environmental Protection (CAEP)/8 Application.
- Deliver Aviation Portfolio Management Tool (APMT) Version 2.0 for CAEP/8 Application.

- Develop alpha version of AEDT tool for local application.
- Assess noise and emissions for various technology, operational, and airspace enhancement scenarios.
- Demonstrate a new comprehensive approach to aviation environmental impact mitigation through a significant example problem.
- Continue upgrades to Integrated Noise Model (INM), Emissions and Dispersion Modeling System (EDMS), Modeling System For Assessing Global Noise Exposure (MAGENTA), and System For Assessing Aviation Global Emissions (SAGE) modules for incorporation into AEDT and to support existing customers as necessary.
- Develop business case and cost allocation for implementation of clean and quiet operational procedures.
- Work with candidate airports to identify opportunities to implement clean and quiet operational procedures.
- Explore provisions for clean and quiet procedure usage in airspace redesign projects.

Aircraft noise

- Promulgate new procedures and technical guidance for noise certification for aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft) that are both harmonized and simplified.
- Recommend and develop widely accepted impact metrics within noise community on sleep disturbance, annoyance, speech interference and perceptible vibration.
- Investigate the role of aviation noise in combined transportation noise around airports and its impact to communities.
- Investigate how average Day-Night-Level (DNL) performs compared to other noise impact metrics;
- Complete Land Use metrics study and publish a report.
- Conduct a study to analyze the four elements of the Balanced Approach (technology to reduce noise at the source, land use planning and management, quieter operational procedures, and operational restrictions) to noise abatement and their relationships.
- Continue to assess potential benefits of using newly developed noise reduction technologies and operational procedures; identify technology and operational goals for long-term reduction of aircraft noise.
- Continue developing interactive website/software to communicate complex noise technical information in a manner suitable for public distribution (NoiseQuest) and complete educational component of NoiseQuest.
- Advance the sonic boom metric definition and continue to assess the applicability of existing noise metrics to sonic boom and determined annoyance of low boom waveforms to inform future decision-making regarding supersonic flight over land.
- With the "Aviation emissions activity," conduct two COE focused sessions at a national and an international conference.

Aviation emissions

- Continue to develop and publish procedures and technical guidance materials for aircraft engine exhaust emissions testing and certification that are internationally harmonized and simplified, taking into account modernization in measurement methodologies and advancements in technical understanding.
- Continue to develop and disseminate methodologies and procedures to quantify and assess the impact of Particulate Matter and Hazardous Air Pollutant emissions on the environment.
- Conduct analysis of actual aircraft engine emissions measurements to better understand the generation of emissions during engine start-up, ground idle and taxi operation, during aircraft ground roll immediately prior to takeoff, and under varying ambient conditions.
- Continue to:
  - Assess potential benefits of using newly developed engine emissions reduction technologies, monitor state of technology advancements against the established goals for long term

reduction of aircraft engine NOx emissions, and initiate establishment of aircraft technology goals for long term reduction of fuel burn.
    - Assess potential benefits of optimized operational procedures to reduce emissions and fuel burn
    - Assess the atmospheric and health effects of aviation related emissions through the PARTNER COE.
    - Test and analyze particulate matter emissions and hazardous air pollutants from aircraft engines as identified under the AEC Roadmap; establish databases of PM emissions from aircraft engines that can be used for trends assessment.
- Initiate effort required to plan an additional study to collect particulate matter and plume evolution/expansion data using light detection and ranging (LIDAR) technology that can be used to enhance dispersion analytical models embodied in our local air quality tools.
- Develop preliminary agreed upon methods to measure PM emissions from commercial aircraft engines, taking into account an assessment of the impact of PM emissions.
- Assess whether there are unique health effects associated with particulate matter emissions and hazardous air pollutants from aviation sources.
- Initiate assessment of uncertainty of impact of aviation on climate change with special emphasis on practical application of research results to aid the development of models to assess mitigation options.
- Initiate an assessment of the impacts of aviation on regional air quality including the effects of emissions attributable to aircraft climb and cruise activities.
- With the "Aircraft noise activity," conduct two COE focused sessions at a national and an international conference.

FY 2009 PROGRAM REQUEST:

In accordance with the National Environmental Policy Act, FAA must consider and mitigate the environmental consequences of its actions. The FAA will continue to work with NASA, the manufacturing industry, and international authorities to support the development and implementation of aircraft environmental certification regulations through proactive response to changes in airplane and engine technology, measurement/analysis technology, regulatory policy, and international regulatory initiatives.

FAA will continue to work with NASA in research efforts identifying noise and emissions reduction technologies that may enter the marketplace within the next 10-15 years. The agency will use these research findings to consider new environmental certification standards and procedures for the next generation of transport aircraft.

Ongoing Activities

Aerospace systems have historically been designed – and regulations for their certification and use have been written – as though aviation noise and various emissions had nothing to do with one another. However, aviation noise and emissions are highly interdependent phenomena. Future environmentally responsible aviation policy and rule making must be based on a new, interdisciplinary approach. Furthermore, this approach must be made as affordable as it is effective.

Existing analytical tools are inadequate to assess interdependencies between noise and emissions or analyze the cost/benefit of proposed actions. Accordingly, FAA is developing a robust new comprehensive framework of aviation environmental analytical tools and methodologies to perform these functions. The long-term aim is to provide a seamless, comprehensive set of tools to address all aspects of noise and emissions. The elements of this framework include:

- EDS capability to provide integrated analysis of noise and emissions at the aircraft level.
- AEDT comprises EDS and other integrated aviation noise and emissions modules – will provide integrated capability of generating interrelationships between noise and emissions and among emissions at the local and global levels.

- APMT comprises AEDT and other modules – will provide the common, transparent cost/benefit methodology needed to optimize national aviation policy in harmony with environmental policy.
- These AEDT and APMT tools will allow:
  - Government agencies to understand how proposed actions and policy decisions affect aviation noise and emissions.
  - Industry to understand how operational decisions affect proposed projects affecting aviation noise and emissions.
  - The public to understand how actions by government and industry affect aviation noise and emissions.

Anticipated benefits of this initiative include the ability to:

- Optimize environmental benefits of proposed actions and investments.
- Improve data and analysis on airport/airspace capacity projects.
- Increase capability to address noise and emissions interdependencies in the resolution of community concerns.
- Aid in more effective R&D portfolio management.
- Remove environmental roadblocks to capacity growth.
- Continue global leadership for the United States in environmentally responsible aviation.

Other activities include:

- Continue activities through the COE to identify and measure better the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Continue updating and enhancing existing analytical tool modules (e.g., INM, EDMS, SAGE, MAGENTA), as necessary, to support existing customers and transition to AEDT.
- Support FAA role in the ICAO CAEP working groups for assessing the technological, scientific, operational, and economic aspects associated with maintaining international standards and recommended practices for aircraft noise and engine exhaust emissions.
- Continue efforts to maintain the currency of the regulation and technical guidance materials concerning aircraft noise and engine exhaust emissions certification requirements.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Complete an annual assessment of noise exposure and fuel burn.
- Complete a significant example analysis to demonstrate the benefit of cost-benefit analyses.
- Deliver Aviation Environmental Design Tool (AEDT) Version 3.0 for CAEP/8 application.
- Deliver Aviation Portfolio Management Tool (APMT) Version 3.0 for CAEP/8 application.
- Deliver Environmental Design Tool Version 3.0, including validated vehicle library and demonstrated capability within AEDT framework for CAEP/8 application.
- Complete integrated system level analyses of NextGen scenarios and strategies (e.g., operations, technologies, policies, etc.).
- Continue upgrades to INM, EDMS, MAGENTA, and SAGE modules for incorporation into AEDT and to support existing customers as necessary.
- Continue working with candidate airports for appropriate implementation of continuous descent arrival (CDA).
- Develop tools to aid in demonstrating CDA procedures in high-density environment.

Aircraft noise

- Promulgate new procedures and technical guidance for noise certification for aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft) that are both harmonized and simplified.
- Continue comprehensive noise annoyance survey.
- Assess potential health impacts of aircraft noise and investigate methodologies to incorporate these impacts in the APMT framework.
- Publish report on noise annoyance metrics, including new metric for supersonic aircraft.
- Complete peer review of noise annoyance data.
- Continue to develop guidance on land use best practices.
- Continue to assess potential global benefits of using newly-developed noise reduction technologies; identify technology goals for long term reduction of aircraft noise.
- Continue advancement of NoiseQuest website.
- With the "Aviation emissions activity," conduct two COE focused sessions at a national and an international conference.

Aviation emissions

- Continue to develop and publish:
  - Procedures and technical guidance materials for affordable engine exhaust emissions testing and certification that are both harmonized and simplified.
  - Develop and disseminate standards and methodologies to quantify and assess the impact of Particulate Matter (PM) and Hazardous Air Pollutants (HAPs) emissions in the aviation environment.
  - Assess potential global benefits of using newly developed emissions reduction technologies, and identify technology goals for long term reduction of aircraft engine emissions and fuel burn.
  - Advance best practices in aviation emissions PM and HAPs measurements.
  - Continue collecting PM and HAPs profiles and measurement data to improve and/or replace approximation methods and advance those data sources in models used to isolate sources, and identify aviation's contribution to impacts.
- Continue assessment of the relative effect of various emissions on climate forcing functions.
- Continue comparison of detailed chemistry computations to aviation environmental tools approximations.
- Continue developing a model of near field plume evolution/expansion to feed local air quality models.
- Assess whether there are unique health impacts or other environmental effects, particularly for NextGen scenarios, associated with particulate matter emissions and hazardous air pollutants from aviation sources, with specific focus on the aircraft engine.
- Continue assessment of uncertainty of impact of aviation on climate change.
- Complete assessment of the impacts of aviation on local and regional air quality including the effects of emissions attributable to aircraft climb and cruise activities.
- Initiate development of guidance material related to dispersion, chemical and transport modeling (i.e., assessment of aviation-related air pollutant concentrations that effect local and regional air quality).
- Continue evaluation of the necessity for establishing standards pertaining to particulate matter emissions from aircraft engines.
- With the "Aircraft noise activity," conduct two COE focused sessions at a national and an international conference.

Budget Item	Program Title	Budget Request
A13.b.	**NextGen Environmental Research–Aircraft Technologies, Fuels and Metrics**	**$ 16,050,000**

Goals:

Intended Outcomes: The NextGen Technologies, Fuels and Metrics program helps achieve the NextGen goals to increase capacity by reducing significant community noise, local air quality emissions impacts in absolute terms and aviation greenhouse gas emissions impacts on the global climate. The program is focused on reducing current levels of aircraft noise, local air quality and greenhouse gas emissions and energy use and advancing alternative fuels for aviation use.

The Program specifically supports the following outcomes:

Demonstrate aircraft and engine technologies that reduce noise and local air quality and greenhouse gas emissions at the source to a developmental level that will allow quicker industry uptake of these new environmental technologies in order to produce a fleet that will operate more efficiently with less energy usage and permit expansion of airports in a manner consistent with the environmental goals of the NextGen plan.

Specific activities include developing and demonstrating:

- Certifiable aircraft technology that increases aircraft fuel efficiency by 25 percent relative to 1997 subsonic aircraft technology;
- Certifiable engine technology that reduces landing and takeoff cycle (LTO) nitrogen oxide emissions by 50 percent, without increasing other gaseous or particle emissions, over the ICAO standard adopted in 2004;
- Certifiable aircraft technology that reduces noise levels by 10 dB at each of the three certification points relative to 1997 subsonic jet aircraft technology; and
- Determination of the extent to which new engine and aircraft technologies may be used to retrofit or re-engine aircraft so as to increase the level of penetration into the commercial fleet.

Demonstrate alternative fuels for aviation to reduce emissions affecting local air quality and greenhouse gas emissions and increase energy supply security for NextGen.

Specific activities include developing and demonstrating:

- The feasibility of use of alternative fuels in aircraft systems, including successful demonstration and quantification of benefits; and
- Ensuring safety and devising transition strategies that enable "drop in" replacement for petroleum derived turbine engine fuels.

Determining the appropriate goals and metrics to manage NextGen aviation environmental impacts that are needed to support Environmental Management Systems (EMSs) and allow a three times capacity growth.

Specific activities include:

- Establish and implement metrics to better assess and control noise, air quality and climate impacts from anticipated NextGen commercial aircraft operations.
- Evaluate and establish required technology and operational goals and targets to mitigate the environmental impact of projected NextGen and support EMSs implementation.

Agency Outputs: The program is protecting the environment by reducing significant aviation environmental impacts associated with noise, emissions, global climate impact, and energy production. The program will advance and mature, collaboratively with industry, engine and airframe technologies to reduce aviation noise, local air quality and greenhouse gas emissions and energy use. It will also assess the feasibility of and developing alternative aviation fuels that could serve as "drop in" replacements for today's petroleum derived turbine engine fuels. Ultimately the program will demonstrate advanced technologies and alternative fuels in integrated ground and flight demonstrations.

The program is also helping to achieve NextGen goals by develoing metrics to define and measure significant aviation environmental impacts. The program will improve the fundamental understanding of aviation environmental health and welfare and climate impacts and translate impact into improved metrics that can be used to better assess and mitigate aviation's contribution. This program will identify the gaps in scientific knowledge to support NextGen; focus research in areas that will reduce key uncertainties to levels that allow action; and develop metrics to enable sound analyses. Ultimately, the program will enable establishing goals and targets to support establishing dynamic EMSs to better manage and reduce aviation's environmental impacts.

Research Goals:

- By FY 2009, establish consortium for Continuous Low Energy, Emissions and Noise (CLEEN) Technologies and award grants and contracts to conduct research.
- By FY 2009, complete detailed feasibility study, including economic feasibility, environmental impacts, and assessment of "drop in" potential for gas turbine alternative fuels.
- By FY 2010, complete system analyses and identify and pursue the development of first round engine and airframe technologies that will be the most effective at producing environmental benefits.
- By FY 2010, complete effort to experimentally measure environmental impacts of "drop in" alternative turbine engine fuels.
- BY FY 2010, initiate demonstration of CLEEN technologies in ground rig tests
- By 2010, estimate how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- By FY2010, establish the relationship between aircraft engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- By FY2010, establish preliminary metrics and goals to guide CLEEN technology and alternative fuels development and support EMSs.
- By FY 2011, initiate effort to experimentally assess environmental impacts and benefits and costs of renewable alternative turbine engine fuels.
- By FY2011, complete assessment of aviation's impact on climate change.
- By FY 2012, complete demonstration of CLEEN technologies in ground rig tests.
- By FY 2013, demonstrate airframe and engine technologies to reduce noise, emissions and fuel burn in integrated ground demonstrations for large and regional jets.
- By FY 2013, complete system analyses to identify the most promising CLEEN technologies for flight tests.
- By FY 2012, conduct significant demonstration of "drop in" alternative turbine engine fuels.
- By FY 2012, conduct renewable alternative turbine engine fuels safety, environmental and business case assessments.
- By FY 2013, complete assessment of "drop in" alterative turbine engine fuels and develop implementation plan.
- By FY2013, reduce key uncertainties of aviation impacts to levels that better inform appropriate action.
- By FY 2014, complete system analyses and identify and pursue the development of second round engine and airframe technologies that will be the most effective at producing environmental benefits.

- By FY 2014, demonstrate first round of CLEEN airframe and engine technologies to reduce noise, emissions and fuel burn in integrated flight demonstrations for large and regional jets.
- By FY2014, refine metrics that more accurately capture aviation emissions health and welfare and climate impact and goals to facilitate EMSs implementation.

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation and explore alternative gas turbine fuels.

- *NextGen* -- FAA leads an Environmental Working Group (E-WG) responsible for leading environmental dimensions of the JPDO. The E-WG comprises FAA, NASA, the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the WG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on "Aviation and the Environment", including advanced technology and alternative fuels development.
- *Commercial Alternative Aviation Fuel Initiative (CAAFI)* -- Concerns about rising fuel costs, energy supply security and the environmental effects of aviation are providing a significant stimulus to take a fresh look at the use of alternative fuels for aviation. To forge a way ahead, FAA founded the Commercial Aviation Alternative Fuels Initiative (CAAFI) together with Airports Council International-North America (ACI-NA), the Air Transport Association (ATA) and the Aerospace Industries Association (AIA). CAAFI is teaming with the DoD to leverage their substantial efforts advancing alternative fuels for military aviation– driven by energy security considerations. CAAFI is also working with other Federal agencies such as NASA.

R&D Partnerships: As does the Environment and Energy Research Program and other NextGen activities, the NextGen AircraftTechnologies, Fuels and Metrics Program relies on a series of Memorandums of Agreement (MOA), to work closely with NASA and DoD. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation's environmental impact.

- Through the JPDO NextGen, the program supports the E-WG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, Department of the Interior, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The E-WG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures, as well as other relevant tools, metrics, and products to address aviation's environmental impact.

Accomplishments: This is a new effort to address the challenges of NextGen. However, relevant stakeholders have achieved significant accomplishments mitigating aviation's environmental impact. The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2006. Today's aircraft are also 70 percent more fuel-efficient-per-passenger-mile than jet aircraft of the 1960s. Reduced fuel consumption has also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

There were no activities in FY 2008 as this is an FY 2009 new initiative.

FY 2009 PROGRAM REQUEST:

Anticipated increases in air transportation demand will place significant environmental pressures on various segments of the NextGen. The primary environmental constraints on the capacity and flexibility of the NextGen could be community noise, local air quality, global climate impacts, and energy production and consumption. Environmental issues have constrained airport and airspace growth over the past decade. To ensure environmental impacts don't become a constraint on growth in NexGen, we need to accelerate introduction of quieter and cleaner technology in our fleets. Ninety percent of the environmental improvements (noise and emissions reductions) in the aviation system in the last 30 years have come from improved technology. Without a pipeline of near term (5-10 years) technology improvements, we cannot achieve the absolute reduction of significant noise and air quality impacts that we believe are necessary to enable NextGen growth. We need robust research and development to enable technology solutions to manage and mitigate environmental constraints. The goal is to have a fleet of quieter, cleaner aircraft that operate more efficiently with less energy.

We are currently facing larger research and development challenges at a time when we need to make larger technological leaps. Solutions that involve technology improvements in engines and airframes in a foreseeable timeframe require successful maturation and certification of new technologies within the next 5-10 years. This initiative establishes a world-class research consortium that can pursue technology goals to significantly reduce aviation noise, emissions, and fuel consumption. Establishing a world-class research consortium with industry- targeted on maturing technology- will help accelerate introduction of quieter and cleaner technology in our fleets so environmental issues do not become constraints.

The NextGen environmental goal is to reduce significant health and welfare impacts of aviation community noise and local air quality (namely NOx) emissions in absolute terms, notwithstanding growth. Although there is no quantitative goal for greenhouse gas emissions, the NextGen environmental goal does call for limiting or reducing the impact of aviation greenhouse gas emissions on global climate. There is a need to explore the appropriate metrics and system goals to establish significant impacts. There is also a need to develop a robust science-based understanding of impacts of NextGen aviation emissions on earth's climate and translate these impacts into improved metrics that can be used to better assess and mitigate aviation's contribution to climate change. These goals and metrics will enable Environmental Management Systems (EMSs) to mitigate impacts in a dynamic and cost-beneficial manner.

Elements of this initiative include:

- In collaboration with industry, mature noise, emissions and fuel burn reductions technologies (previously conceived by NASA and industry to Technology Readiness Levels (TRL) of 3-4) to levels (TRL 6) that enable industry to expedite introduction of these technologies into current and future products.
- Assess and advance the development of alternative "drop in" and renewable turbine fuels for aviation.
- Develop metrics to better assess and control noise, air quality and climate impacts from NextGen commercial aircraft operations and establish goals and targets to support EMSs implementation to mitigate impacts.

Ongoing Activities

- This is a new activity.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise, emissions and fuel burn reduction technologies maturation

- Establish consortium for Continuous Low Energy, Emissions and Noise (CLEEN) Technologies.
- Award grants and contracts to conduct research.
- Develop a detailed plan to achieve NextGen environmental goals.

- Identify promising noise, local air quality and greenhouse gas, and fuel burn reduction technologies for maturation.
- Conduct component level analyses for promising technologies to optimize environmental and fuel burn performance.
- Conduct detailed integrated system level analyses for large and regional jets to identify the most promising technologies for further maturation.
- Initiate design of demonstration experiments.

Alternative turbine engine fuels

- Complete detailed feasibility study, including economic feasibility of "drop in" alternative turbine engine fuels.
- Initiate planning for experimentally quantifying environmental impacts of "drop in" gas turbine fuels in commercial aircraft engines.
- Initiate efforts to explore the potential of renewable gas turbine fuels for commercial applications.

NextGen Environmental Metrics, Goals and Targets

- Initiate efforts to determine how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- Determine research efforts necessary to reduce key uncertainties and enhance models.
- Initiate comprehensive modeling efforts to establish the relationship between aviation engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- Identify and assess potential metrics to quantify the climate related impacts of commercial aircraft operations.
- Initiate baseline analyses of potential climate response due to aviation emissions with quantified uncertainties, based on the best available science and modeling tools.

Budget Item	Program Title	Contract Dollars
A14.a.	**System Planning and Resource Management**	**$1,817,000**

Goals:

Supports FAA Strategic Goals:
- Increased Safety
- Greater Capacity
- International Leadership
- Organizational Excellence

Supports FAA R&D Goal:
- World Leadership

Intended Outcomes: Demonstrate the value of working with international partners to leverage research programs and studies in order to improve safety and promote seamless operations worldwide. The ongoing activity will manage the FAA's R,E&D portfolio, meet the President's criteria for R&D, increase program efficiency, and maintain management and operating costs.

This activity produces the National Aviation Research Plan (NARP), an annual strategic plan for FAA R&D; administers the congressionally mandated R,E&D Advisory Committee (REDAC); conducts external program coordination; fosters future research opportunities; and provides program advocacy and outreach.

Agency Outputs: In FY 2009 FAA will:

- Publish the annual National Aviation Research Plan.
- Host two REDAC meetings and multiple subcommittee meetings. The Committee provides advice on and reviews plans for the annual FAA R&D budget, and produces periodic and special reports providing advice and recommendations to FAA on its R&D program.
- Support the NextGen initiative.
- Prepare the annual R,E&D budget submission.
- Manage the R,E&D portfolio.
- Coordinate research activities with NASA through FAA's R&D Field Offices.
- Investigate measures for the exchange of research information.

Research Goal:

- In FY 2009 through FY 2013, the FAA will maintain an R,E&D management workforce of no more than 10 percent of the total R,E&D workforce and will sustain the System Planning and Resource Management budget at two percent or less of the total R,E&D budget.
- Develop a strategic mapping for international collaboration.
- Identify a process to measure quality, timeliness, and value of collaboration.

Customer/Stakeholder Involvement: The REDAC reviews FAA research commitments annually and provides guidance for future R,E&D investments. The members of this committee and its associated subcommittees are subject matter experts drawn from various associations, user groups, corporations, government agencies, as well as universities and research centers. Their combined presence in the REDAC fulfills a congressional requirement for FAA R&D to be mindful of aviation community and stakeholder input.

R&D Partnerships: DOT, JPDO, NASA and other Federal Agencies, and EUROCONTROL.

Accomplishments: Program accomplishments include:

- Published the National Aviation Research Plan (February 2007) and submitted to Congress with The President's FY 2008 Budget.
- Managed two REDAC meetings and over twelve subcommittee meetings, which reviewed FAA's proposed FY 2009 R,E&D program.
- Developed the FY 2009 R,E&D budget submission.
- Supported the JPDO's NextGen activities.
- Met the research goal for R,E&D management workforce and funding for System Planning and Resource Management in FY 2007.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Deliver the National Aviation Research Plan to Congress (February 2008) and submit to Congress with The President's FY 2009 Budget.
- Provide strategic direction for the FAA R,E&D program.
- Obtain REDAC guidance for the FY 2010 R,E&D Program.
- Obtain REDAC review of and recommendations for FY 2010 R,E&D Program.
- Developed the FY 2010 R,E&D budget submission.
- Coordinate R&D activities with NASA and other partners.
- Support NextGen activities.

FY 2009 PROGRAM REQUEST:

Ongoing Activities

FAA will continue supporting the work of the REDAC in its task to advise the Administrator on the R&D Program. In particular, it will seek the counsel and guidance of the committee for the FY 2011 program, review the proposed FY 2011 program prior to submission of the budget requirements to the DOT, and seek the committee's guidance during the execution of the R&D program. The agency will publish, as required by Congress, the National Aviation Research Plan and submit it to Congress concurrent with The FY 2010 President's Budget Request.

The program will review the President's R&D criteria, ensuring that the agency's R&D program remains viable and meets national priorities. It will also publish program activities and accomplishments, as well as foster external review of and encourage customer input to the R&D program.

The agency will maintain its field offices at the NASA Ames and Langley Research Centers as a vital part of efforts to coordinate and integrate the research and development programs of NASA and the FAA.

New Initiatives

The new initiative starting in FY 2009 is to provide management for the NextGen R&D program. The purpose is to identify high value products being produced by the R&D program and to promote the use of these products globally, generating value in the international market.

In FY 2009 this initiative will investigate measures for the exchange of research information and begin to examine strategies and processes for international collaboration.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Deliver the National Aviation Research Plan to the Congress (February 2009) and submit to Congress with The President's FY 2010 Budget.
- Administer and facilitate REDAC activities by:

    - Obtaining REDAC recommendations on planned R,E&D investments for FY 2011.
    - Aiding the REDAC in its preparation of other reports, as requested by the Administrator.
- Prepare the FY 2011 R,E&D budget submission.
- Manage FAA's R&D portfolio.
- Support NextGen activities.
- Coordinate R&D activities with NASA and other partners.
- Investigate measures for the exchange of research information.

Budget Item	Program Title	Budget Request
A14.b.	**William J. Hughes Technical Center Laboratory Facility**	**$3,536,000**

GOALS:

Intended Outcomes: FAA sustains research facilities located at the William J. Hughes Technical Center (WJHTC) in support of its R&D program goals. These facilities consist of the Research and Development Flight Program (Aircraft), Simulation facilities, and the Research and Development Human Factors Laboratory (RDHFL).

Agency Outputs: R&D programs require specialized facilities to emulate and evaluate field conditions. For example, human factors projects require ground-based laboratories to perform human-in-the-loop simulations, measure human performance, and evaluate human factors issues. These laboratories are comprised of integrated cockpit and air traffic control workstation simulators, and the performance issues they delve into reflect the perspectives of the pilot and flight crew. Airborne and navigation projects require additional "flying laboratories" that are specially instrumented and reconfigurable to support a variety of projects.

Customer/Stakeholder Involvement: The WJHTC facilities directly support agency projects and integrated product teams in the following areas:

- Capacity and air traffic management technology.
- Communications, Navigation, And Surveillance.
- Operational Evolution Plan (OEP) concept validation.
- NextGen.
- Weather.
- Airport technology.
- Aircraft safety technology.
- Human Factors.
- Information Security.
- Environment and Energy.
- Automated Dependent Surveillance-Broadcast.
- Terminal Instrumentation Procedures (TERPS).
- Wide Area Augmentation System.

R&D Partnerships: In addition to FAA's research programs, WJHTC laboratories cooperate with the Canadian Ministry of Transport, NASA, U.S. Air Force, EUROCONTROL, RTCA, Aircraft Owners and Pilots Association, International Civil Aviation Association, academia, and industry.

Accomplishments: The technical laboratory facilities provide the reliable test bed infrastructure to support R&D program goals and outputs.

FY 2008 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

The following programs are supported by the laboratories:

- Runway Incursion.
- Information Security.
- Separation Standards.

- Wide Area Augmentation System (WAAS).
- TERPS.
- Satellite Communication.
- Data Link.
- Acquisition Human Factors.
- Delay Reduction.
- Dynamic Vertical Reduced Separation Minima (DRVSM).
- The OEP.
- Airspace Re-sectorization Studies.

FY 2009 PROGRAM REQUEST:

The WJHTC will sustain technical laboratories/facilities that support R&D programs.

Ongoing Activities

- NextGen.
- Capacity Initiatives (Airspace, Procedures).
- Information Security.
- Satellite Communication and Navigation Programs.
- Separation Standards.
- Wide Area Augmentation System.
- TERPS.
- Runway Incursion.
- Aircraft Safety.
- Air Traffic Control/Airway Facilities Human Factors.
- OEP Concept Validation.
- DRVSM.

New Initiatives

No new initiatives are planned in FY 2009.

KEY FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

The test beds at the WJHTC provide the necessary infrastructure for R&D programs to achieve agency goals. Specific milestones and products are contained within individual programs.

DETAILED JUSTIFICATION FOR ENGINEERING DEVELOPMENT, TESTING & EVALUATION

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A01	**Advanced Technology Development and Prototyping**	**$33,000,000**	**Various**	**A-28, M-08, M-46, M-47, S-09, W-10**

FAA Strategic Goals: Increased Safety – Reduce the commercial airline fatal accident rate; Reduce the number of fatal accidents in general aviation; and Reduce the risk of runway incursions.

Reduced Congestion – Increase airport capacity to meet projected demand; Increase reliability and on-time performance of scheduled air carriers

Organizational Excellence – Improve program delivery capability at reduced cost.

Description of Problem: The FAA's mission is to provide the safest and most efficient aerospace system in the world. As the leading authority in the international aerospace community, FAA is responsive to the dynamic nature of customer needs and economic conditions. A key element of this mission is the safe and efficient use of airspace. To accomplish this mission, FAA's Advanced Technology Development and Prototyping program develops and validates technology and systems that support air traffic services. These initiatives support the goals, strategies, and initiatives of the agency's Flight Plan, including the requirements associated with the evolving air traffic system architecture and improvements in airport safety and capacity.

For FY 2009, $33,000,000 of the requested $41,400,000 provides for the following R,D&T activities:

1. Runway Incursion Reduction Program (RIRP) ($10,000,000):
   Description of Solution: Runway incursions remain on the National Transportation Safety Board's (NTSB) "Most Wanted" list of critical safety issues. During 2007, FAA convened aviation industry stakeholders to a "Call to Action" session to establish near, mid and long-term action plans to mitigate the continuing risk of runway incursions. Several areas of increased technology development emphasis emerged from that session, with the RIRP remaining the principal vehicle for initial development, demonstration, evaluation and establishment of these program initiatives. The reduction of high-hazard runway incursions remains the key safety objective as specified in FAA's Flight Plan. The RIRP will initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation.

   The requested funds provide for continuing operational testing and demonstrations of Runway Status Lights enhancements at complex airports. Under prior year efforts, RWSL operational test beds will be established at three additional complex and high-risk airports identified within an FY2007 GAO report on runway safety. Operational evaluation and maintenance of those test beds will be provided until the national RWSL deployment is scheduled at those facilities. Consistent with objectives identified during the 2007 "Call to Action", Low Cost Ground Surveillance (LCGS) product test beds deployed as part of a pilot program will be sustained in support of added runway safety application development. LCGS test beds will be augmented with selected Advanced-Surface Movement Guidance and Control System (A-SMGCS) applications to evaluate the operational utility of these applications in a small-medium airport setting. Taxiway guidance algorithms and data link delivery of runway safety alerts are emerging concepts that will be developed and evaluated.

   Benefits: The demonstration, evaluation and transition of mature runway safety technologies will reduce the incidence of high-hazard (Category A/B) incursion and ultimately reduce the risk of a runway collision. Early development, testing and maturation of viable technologies result in reduced technical, cost and acquisition schedule risk, with early delivery of runway safety benefits.

2. System Capacity, Planning and Improvement ($6,500,000):

Description of Solution: Rapidly changing economic, operational, environmental, and technical environments are exerting extreme pressure on the NAS. Aircraft delays cost the airlines and their passengers millions of dollars each year. As the number of aircraft operations increases to meet demand, delays will also increase, unless improvements are made to aviation system capacity. The FAA has made a firm commitment to its stakeholders in the FY 2008-2012 Flight Plan, the NextGen Integrated Plan, and the Operational Evolution Partnership (OEP) to increase capacity, provide system agility, and improve airport infrastructure. This program focuses on providing new and effective performance measures and analyses directed at resolving problems in the three core OEP domains: Airport Development, Air Traffic Operations, and Aircraft and Operator Requirements.

The program will provide data which will be used to develop and analyze airport solution sets contained in the Future Airport Capacity Task (FACT) report; implement the performance-based navigation roadmap by developing Area Navigation (RNAV) and Required Navigation Performance (RNP) routes and procedures; and support the 35 OEP airports' master plans for airfield improvement. Additional studies will analyze the effect of new equipment and technology, as well as high altitude airspace redesign to alleviate delays and congestion. These efforts will be sustained by the use of the Performance Data Analysis and Reporting System (PDARS), Design Team Studies, and Capacity and International Benchmark reports. U.S. aviation policy objectives will be furthered by means of participation in international organizations such as the Civil Air Navigation Services Organization (CANSO) and ICAO. PDARS Staffing Analysis will be used by FAA decision-makers to effectively and efficiently operate with a better prepared, better trained, safer, diverse workforce. These programs collectively drive the achievement of the office mission and support of the Agency.

Benefits: Capacity studies identify the operational benefits and delay-reduction cost savings of capacity enhancement alternatives. Program output includes: flight operational data for use in performance analysis; system safety, delay, flexibility, predictability, and user access performance measures on a daily basis; and travel times within geometric areas and for route segments (arrival fix to runway, runway to departure fix, etc.). Output also includes methodologies and prototypes for measuring the benefits and costs of airport, airspace, and procedural enhancements. This strategy combines program and project performance data with financial data to improve investment decision-making, thereby achieving optimal strategic and operational outcomes. PDARS is the Air Traffic Control System Command Center's primary tool for accessing radar data and provides an objective tool for operational planning, assessment and support of flow management initiatives. Integration of PDARS with Airport Surface Detection Equipment (ASDE-X); Out, Off, On, and In time (OOOI) data; Micro-EARTS; restrictions data; and playbook scenarios will minimize ground delays. These enhancements, which encompass the final phase of PDARS development and are an ATO community requirement, are critical for analyzing surface operations and baselining OEP performance. PDARS is a well-accepted and often-used tool at all major ATC facilities. The impact will be realized on assessments of such issues as wake turbulence mitigation, New Large Aircraft (NLA), Very Light Jets (VLJs), reduced separation criteria, and alternative flow management methods.

3. Operational Concept Validation and Infrastructure Evolution ($7,400,000):
   Description of Solution: Rapidly changing economic, operational, environmental, and technical drivers continue to exert extreme demands on near term and future capabilities of the NAS. Aircraft delays cost the airlines and their passengers millions of dollars each year. As the number of aircraft operations increase to meet demand, delays will also increase unless improvements are made to aviation system capacity. According to the NextGen Integrated Plan, the air transportation system is under extreme pressure to accommodate a growing demand in a system that is riddled with traffic congestion, flight delays, and aging technology. The FAA has made a firm commitment to its stakeholders via the FY 2008-2012 Flight Plan, the NextGen Integrated Plan, and the Operational Evolution Partnership (OEP) to increase capacity, provide system agility, and improve airport infrastructure. This program focuses on providing new and effective performance measures and analysis directed at resolving the following four problem areas: Air Traffic Flow Efficiency, En Route Congestion, Terminal Area Congestion, and Alignment of Initiatives across ATO Service Units.

   This work evaluates and incorporates lessons learned from the recent delivery of decision support tools to provide guidance on "if", "when", and "where" advanced decision support and operational enhancements will be integrated into the NAS. The program develops and exercises advanced analysis capabilities to consider the benefit and operational feasibility of the supported procedural changes. In particular, the program is analyzing the methods for "genericizing" controller areas of specialty recognizing differences between high and low altitude work, opportunities to use multi-sector planners, and the expanded role of Traffic Flow Managers in managing airspace capacity versus limiting demand. Associated with the changes in roles and responsibilities are opportunities for restructuring the services provided by air traffic control facilities to best support the re-aligned roles of humans in the NAS as enabled by new automation and communication capabilities. Simulation and human-in-the-loop experimentation are used to integrate this new guidance revealing the type, update rate, and display requirements that need to be established to ensure optimum controller performance. Funding includes validation of concepts for ground–ground and air-ground communications to support transfer of information and activities with the aviation community to validate assumptions about flight deck evolution.

Benefits: The program uses analyses and associated white papers to validate whether future system requirements meet NextGen goals, including the flight data processing evolution in En Route Automation Modernization (ERAM), future communications and voice switch, changes in surveillance requirements and associated procedures, establishment of new roles and responsibilities to support increased productivity, etc. Advanced facility planning identifies the system requirements to meet the operational needs and identifies opportunities for modernization, modification and/or expansion of air traffic control infrastructure including facilities. This programs allows FAA to analyze the facility configuration alternatives (separate new, refurbish old; collocate with other facility, consolidation) using considerations such as risk to service and workload distribution. Identifying the correct investment alternative reduces cost and improves efficiency.

4. NAS Weather Requirements ($1,000,000):
Description of Solution: One of FAA's top priorities is predicting and responding to weather. Weather has a significant impact on safety and efficiency and affects activities across all domains. The NAS Weather Group minimizes the negative impacts of weather on the NAS operations by increasing operational predictability during weather events (particularly during winter weather and convective weather situations). The NAS Weather Group develops aviation weather policy and standards; represents FAA in the Joint Planning and Development Office (JPDO) Weather Integrated Planning Team; and manages the research and development (RE&D) and ATO Capital Activity-1 weather portfolio. The NAS Weather Group manages the NAS Requirements Development program to align requirements, priorities, programs, and resources and develops metrics to understand the impacts of weather on the NAS. The program creates strategic plans and defines weather requirements, and policy and standards. FAA is the Meteorology Authority for the U.S. under the International Civil Aviation Organization (ICAO). On behalf of FAA, the NAS Weather Group provides national and international leadership to optimize aviation weather systems and services by establishing consensus and cooperation within FAA and between Government agencies, private weather services, research organizations and user groups on aviation weather requirements and priorities.

The requested funds will continue the contract support that provides a flexible means to direct attention and resources to concerns affecting safety, system efficiency and international leadership, changing focus as needs develop. The expertise paid for by this budget activity includes specialized, technical engineering and meteorological skills not available in FAA, giving this office a unique capability to analyze mission needs and establish requirements. The program operates to provide timely evaluation of selected services or technologies and serves as the Agency's only mechanism to look at weather from a NAS-wide perspective. Contract support provides analysis; conducts studies, prepares various concepts of use and implementation plans, develops plans and new procedures to transition from existing technologies and practices to advanced capabilities that satisfy user needs and impact overall NAS system capacity; works to transition weather products from research and development onto operational NWS and FAA platforms; and supports reconciliation of U.S. NAS aviation weather requirements with international aviation weather requirements. Support will also be used to establish requirements in support of the Joint Planning and Development Office, Weather Integrated Product Team (JDPO, WxIPT) and to support reconciliation of U.S. NAS aviation weather requirements with international aviation weather requirements.

Benefits: A large amount of work accomplished by the program is geared toward the movement of aviation weather products, including safety risk management functions from R&D into operational use. FY 2009 products include an enhancement that predicts location and intensity of turbulence and icing products for operational use in Alaska plus various other products in the experimental and testing stages of implementation. Funds will allow development of Operational Improvements (OIs) and Preliminary Implementation Plans (PIPs) for weather; alignment of JPDO Weather Enterprise Architecture with FAA Enterprise Architecture Roadmap; development of plans to align FAA with NextGen policies to optimize government and commercial vendor's roles in observations, forecasting, and dissemination; and update of a NAS wide weather mission and needs statement for NextGen. The NAS Weather Group will also be able to develop the NextGen Network Enabled Weather Requirements, continue to manage the Weather Portfolio Investment Management Plan and develop various Concept and Requirements Definition (CRD) for weather.

5. Airspace Management Laboratory ($4,000,000):
Description of Solution: The goal of the Airspace and Aeronautical Information Management (AIM) Laboratory is to field advanced information systems and decision support tools that allow FAA to cost-effectively manage the NAS without sacrificing service delivery or safety. The Laboratory uses operational research, statistical analysis and modeling to evaluate potential NAS improvements. Subsequently, the Airspace and AIM Laboratory uses information management and process automation to provide new systems that improve safety, quality and efficiency. Tangible results of Laboratory research can be seen in new technologies that improve the quality and efficiency of proposed and actual obstacle assessments. The laboratory is a contributor to future air traffic management concepts like System Wide Information Management (SWIM) and NextGen. Trends towards global harmonization of aviation require the FAA to develop new information systems and tools to maintain leadership in global aviation. The Laboratory leads international aeronautical data standardization efforts and is working to incorporate these standards and recommended practices into FAA Aeronautical Information Management (AIM) systems.

The FY 2009 investment in the Airspace and AIM Laboratory will ensure that the FAA can continue to benefit from demonstrated modeling, metrics, system engineering, and information management capabilities developed in the Laboratory. This year's funding supports two strategies: ensuring FAA continues investments needed to manage FAA airspace and aeronautical assets efficiently and safely; and putting FAA on a path towards international leadership. Key initiatives in FY 2009 include:

Demonstrating and developing new capabilities to improve collection, processing and distribution of NAS resources that air traffic control and pilots depend upon to operate safely and efficiently. Efforts in this area include: determining if proposed towers and obstructions pose a hazard to air traffic, and evaluating terrain and obstacles to determine the lowest permissible flight level.

Developing information systems, decision support tools and advanced geo-spatial capabilities to collect, manage and analyze air traffic control operational data such as flight information, flight plans, airspace utilization, and navigation structures. These Laboratory products allow FAA lines of business to evaluate performance metrics, determine fee for service charges (both international over-flights and domestic), and estimate airspace and Air Traffic Control (ATC) benefits from new technologies (e.g. NextGen).

Streamlining input, storage and output for FAA AIM systems to ensure FAA has a single source of high quality data on navigation aids, airspace, communication systems, routes and procedures. The information is used to create customer products such as charts and publications as well as internal FAA products such as NAS modernization and improvement plans, environmental analyses, and infrastructure data needed to run the FAA ATC systems (e.g., Host Computer System (HCS), En Route Automation Modernization (ERAM), Standard Terminal Automation Replacement System (STARS), and Automated Radar Terminal System (ARTS))

The Laboratory's leadership in Aeronautical Information Management (AIM) Systems is critical to FAA's ability to interoperate in a global aeronautical environment and, hence, to realize substantial cost savings. Our key objective in FY 2009 is to improve NAS safety by incorporating end-to-end data integrity best practices, modernizing aeronautical data products through information engineering and by allowing FAA to deliver a consistent aeronautical product set.

Benefits: Airspace and AIM Laboratory information management and workflow systems, decision support tools, airspace system data repositories, and international standards work provide direct and indirect cost savings to the FAA. Work completed by the Laboratory leads to:

- Cost savings through automation of manual data processing and evaluation activities;
- Cost savings by streamlining integration and coordination of multi-division work;
- Cost savings by providing decision makers with timely access to airspace system data; and
- Cost savings by leading the adoption of standards for electronic data sharing and distribution of FAA aeronautical data.

Illustrative cost savings from Laboratory projects include:

- Obstruction Evaluation System. The use of automation to improve the quality, accuracy and timeliness of FAA Obstruction Evaluations (OE) and Airport Airspace Analysis (AAA) has led to a significant cost savings within ATO and FAA Airports divisions. The development of new terminal procedure screening tools will provide further annual cost savings over the coming year.
- SDAT MVA/MIA Automation System. The MVA/MIA Automation System is designed to assist field offices in complying with safety analyses designed to protect aircraft from terrain and obstacles while under the direction of air traffic controllers. The use of decision support tools is estimated to reduce evaluation times from several weeks to a single week with cost savings near $2 million annually.
- International Over-flight Billing and User Fee calculations. Laboratory developed calculation and quality control systems are used to identify international over-lights and calculate over-flight charges for the FAA.

6. Airspace Redesign ($3,000,000):
Description of Solution: The redesign of the nation's airspace is critical NAS modernization. Efficiently designed airspace allows users to get the full benefits of new technology, procedures and infrastructure (e.g. runways). Sector complexity and contention for airspace resources (e.g. departure fixes) cause a significant number of delays, restrictions and ultimately congestion. The Airspace Management Program (AMP) seeks to optimize terminal, En Route and oceanic airspace by improving design and allowing users to use new technologies and procedures to increase efficient travel. This effort funds the development and implementation of sectors and routes.

AMP will redesign airspace in New York/Philadelphia, Chicago, Western Corridor, Houston, and High Altitude Airspace, with F&E funding planned at least for New York/ Philadelphia, Chicago, and national integration efforts of the program office. AMP will also support the new flows associated with new runways in Chicago. AMP must fund infrastructure changes resulting from airspace redesign, such as communications modifications, changes in frequencies, connectivity of radio site to the control facility, and controller-to-controller connectivity; surveillance infrastructure modifications to ensure proper radar coverage; automation modifications to the host data processing or flight data processing; interfacility transmission modifications; additional consoles and communications backup needs; and modifications to the facility power and cabling.

Benefits: The AMP projects supported by these FY 2009 funds are projected to deliver as much as $121 million of direct operating cost benefits by 2009. These benefits are realized through the reduction of restrictions, shorter flight distances, more fuel efficient routes, and reduced delays. The most significant benefits will be in the key metropolitan areas. Airspace redesign in New York and Philadelphia metropolitan areas will reduce delays by 30-45 percent in the next 10 years; based on today's flight statistics. In Chicago, airspace redesign will ensure return on the runway investments. Airspace redesign will also provide internal FAA benefits. Without airspace redesign, sector splitting and growth in the number of sectors will be the only methods to manage complexity and congestion, increasing operations costs by millions every year. Reducing the number of sectors in the high altitude airspace through standardization and reallocation of airspace boundaries could provide a minimum of $20 million of annual FAA cost savings.

Wind Profiling and Weather Research Juneau ($1,100,000):
Description of Solution: A FAA report to Congress in February 1995 determined severe upper air turbulence and wind shear raised potential hazards for aircraft executing tight departure procedures in the Juneau area. The report directed FAA to study the problem of wind shear, turbulence and intense horizontal and vertical rotors. This program, referred to as the Juneau Area Wind System (JAWS), is an outgrowth of the safety study and subsequent Congressional funding. The requested funding will allow for the continued operation of JAWS.

Benefits: The potential benefits of JAWS are categorized into safety benefits and efficiency benefits. Three significant incidents involving transport aircraft that occurred during turning departures between 1993 and 1995 led to the implementation of wind restrictions and the need for JAWS. These wind restrictions along with additional routes have mitigated the safety risk significantly. In addition, general aviation users rely on JAWS for wind information and receive this information via the Juneau AFSS or the internet.

The benefit of JAWS was derived from the wind measurements providing the ability to conduct departures and arrivals that are wind restricted. The FAA tracks the number of Required Navigation Performance (RNP) operations that could not have been conducted via an alternative route. In addition, Alaska Airlines provided data as to the number of turning departures that were conducted. Over 850 annual flight disruptions were estimated to be avoided by JAWS. This is a conservative number in that it only applies to flights that could not have operated on an alternative route which does not require wind measurements. With additional research into a wind warning system, JAWS has the potential to address another 28 to 35 flights annually that are currently disrupted due to the wind conditions.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A03	**NAS Improvement of System Support Laboratory**	**$1,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to the FAA's Capital Investment Plan (CIP) programs. As CIP projects and their supporting systems are delivered, installed, and eventually removed, it is necessary to modify, upgrade, and reorganize the Laboratory infrastructure which occupies more than 160,000 square feet.

Description of Solution: The Technical Center's System Support Laboratory provides the environment to implement, test, and integrate new systems into the National Airspace System (NAS). Once accepted, the systems become part of the test bed and are used to provide support to the operational field sites over the life-cycle of the operational systems. To maintain a viable test bed, it is periodically necessary to upgrade and enhance those portions of the facilities that support the systems and form an integral part of the test bed. Electronic switching systems are used to permit replication of the myriad-fielded system configurations and to permit multiple parallel testing configurations to run with a minimum of system components. The switching systems must be upgraded, enhanced, and expanded to meet the changing needs of the CIP system deliverables.

In FY 2007, $1,198,000 was appropriated for system support laboratory improvements, such as the Business Continuity Plan design and beginning of modifications, the mockup tower renovation, router and firewall, rack servers and tape silos, and power quality monitoring and usage system expansion. In FY 2008, $1,000,000 was appropriated for various improvements to the Laboratory systems in order to support CIP programs.

For FY 2009, $1,000,000 is requested for various improvements to the Laboratory systems in order to support CIP programs.

Benefits: The program improves FAA's centralized state-of-the-art laboratory environment that supports the implementation, testing, and integration of new NAS systems prior to their delivery to the various FAA field sites. The single, centralized support laboratory helps FAA the avoiding cost of establishing and maintaining multiple laboratories for each project, program, Service Unit, and Line of Business.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A04	**William J. Hughes Technical Center Facilities**	**$12,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A05	**William J. Hughes Technical Center Infrastructure Sustainment**	**$5,400,000**	**1**	**F-16**

FAA Strategic Goal: Organizational Excellence – Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to FAA's Capital Investment Plan (CIP) programs. These laboratories provide around the clock operations support for all En Route and terminal ATC facilities throughout the nation. Within this complex reside the air traffic control simulation facilities where dynamic simulations are conducted in support of CIP programs. In addition, the Human Factors Laboratory is used to conduct studies of the validity, operational effectiveness, and impact of advanced technologies on the air traffic controller and maintenance technician. These facilities must be sustained and supported to meet mandated objectives associated with the CIP.

Description of Solution: For FY 2009, $12,000,000 is requested to sustain FAA's laboratory test beds and will be used for hardware and software support, software licensing fees, and other costs associated with operating these multi-user facilities. These laboratories include the En Route and terminal test beds; navigational, scan radar, and automated tracking sites; communications switching equipment; the aircraft fleet (flying laboratories); aircraft simulation systems such as the target generator; the technical computer data center; and the Human Factors Laboratory.

Benefits: This support is necessary for the successful development and implementation of various programs of the CIP. In addition, ATC field facilities support mission will continue throughout the transition from today's system to the full implementation of FAA's modernization efforts. These facilities provide in-house testing required to ensure new systems and modifications are thoroughly evaluated in an integrated environment to minimize problems prior to field deployment. A stable funding source obviates the need for each program office to establish and sustain the infrastructure needed to support their programs and fielded systems. This has been a proven method to sustain the Test Beds and to minimize FAA's costs.

Description of Problem: The William J. Hughes Technical Center (WJHTC) owns and operates test and evaluation facilities, research and development facilities, administrative and storage facilities, and numerous project test sites. The Technical Center must keep the Central Utilities Plant (CUP), utility distribution systems, and the building infrastructure in operating order. The WJHTC must also comply with International Building Codes, the National Fire Codes (NFC), the Americans with Disabilities Act (ADA) and current energy policies.

Electrical testing during a 2005 scheduled power outage revealed that the Building 300's substations are in marginal condition. A private engineering firm's mechanical and electrical evaluation of twenty buildings identified significant deficiencies. A portion of Building 301's exterior glazing is single pane, energy inefficient and needs to be replaced. The oversized HVAC systems at Building 316 create high office humidity, poor indoor air quality and mold growth. The Center's Water Plant was constructed in the 1940's and is well beyond its estimated service life.

Description of Solution: $5,400,000 is requested for FY 2009 for the following activity tasks:

- Electrical substation replacement: The American National Standards Institute/Institute of Electrical and Electronic Engineers considers average life of a transformer to be 20 to 25 years. The existing transformers and equipment are 29 years old. This funding will allow replacement of two electrical substations in Building 300. Preventative maintenance testing has indicated these substations are in marginal condition. The substation replacement would improve the reliability of electrical power to Building 300. The FAA estimates the cost savings from one avoided power failure would pay for the entire program. This program is essential to the success of the Business Continuity Plan (BCP).

- Mechanical and electrical system improvements: The ten-year master plan, prepared in FY 2005, recommended replacement of mechanical and electrical systems at 16 Center facilities. This program replaces systems and equipment beyond their useful lives, and upgrades all deficient systems and equipment before serious operation and maintenance problems occur. The improvements will increase energy efficiency at these facilities by as much as 20 percent.

- Replacement of exterior windows and metal panels: This program replaces single pane glazing at Building 301 as well as and poorly insulated metal panels that are over forty years old. The program will provide a significant energy savings opportunity. The funding will eliminate asbestos material and improve facility security by better controlling building access from the airport operations area.

- Heating, Ventilating and Air Conditioning (HVAC) systems improvements: This program implements recommendations to improve working conditions in Building 316. The program will eliminate high office humidity, mold growth, and poor indoor air quality. The program will result in decreased maintenance costs, and improved employee productivity due to reduced sick leave usage.
- Water plant replacement: This program replaces a water plant that has significant structural problems and is over 60 years old, well beyond the estimated service life. The plant replacement will drastically improve water generation reliability, a critical feature since this plant provides potable water to all Center facilities. Finally, the replacement effort will reduces maintenance costs, as the repair of a small portion of the plant distribution piping in 2006 cost approximately $100,000.

Benefits: The modifications will ensure the continued reliable operation of the WJHTC by replacing aged mechanical, electrical, and life safety equipment and required utility and other support systems before serious problems occur. The work will also improve life cycle infrastructure planning; update certain facilities, facility support systems and utility distribution systems; reduce energy consumption on a per square foot basis; and enable the Center to support FAA programs to successfully complete their mission.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A09	**Center for Advanced Aviation System Development (CAASD)**	**$28,728,000**	*Various*	**M-03**

FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The technologies in the National Airspace System (NAS) are complex. Although FAA employees are highly knowledgeable about those technologies, it would be impossible to employ all of the research, science and engineering expertise needed to develop and improve them. The FAA also requires highly specialized simulation and computer modeling capabilities that it does not have in-house.

Description of Solution: The Center for Advanced Aviation System Development (CAASD) is a Federally Funded Research and Development Center (FFRDC), operating under a Memorandum of Agreement with the MITRE Corporation. CAASD has unique knowledge, skills, and capabilities in aviation research, systems engineering, and analysis. CAASD also conducts a continuing program of research, development, system architecture, and high-level system engineering to meet FAA's long-term NAS requirements. A long-term contractual relationship is in the best interest of the public and FAA, because it stabilizes funding and supports an established and experienced work force that provides continuity of services. In addition, CAASD's charter permits access to sensitive and confidential agency information and data that is not normally available to support contractors. CAASD's expertise is critical to FAA in transforming the nation's air transportation system in an effective and timely manner

The FY 2009 funding will support approximately 258 MITRE Technical Staff years (MTS) of research and systems engineering as well as technical and operational analyses. This staffing level is well below the Congressional ceiling of 425 MTS. The FFRDC Executive Board has approved the third edition of the FFRDC Long Range Plan (FY 2008 – FY 2012).

For FY 2009 FAA requests $76,000,000 to continue research and development, advanced analysis, and engineering in the following areas.

NAS and NextGen Systems Integration and Evolution. Develop and integrate the NextGen enterprise architecture, operational concepts, capability action plans, and roadmaps to achieve an integrated evolution and align agencies' enterprise architectures; analyze NAS-wide strategic issues involving multiple outcomes for efficient investment and operational decisions; provide definition, structure, and content for the NAS EA and ensure alignment with the evolving NextGen architecture; provide recommendations for U.S. and international flight data processing to improve NAS operations and global harmonization; assess and provide recommendations for NAS evolution paths to maximize the use of common capabilities and automation platforms that will support investment decision making; validate the productivity gains, operational feasibility and user benefits of selected NAS initiatives to effect the transition to NextGen; assess service and cost benefits and provide recommendations for implementing net-centric strategies that reduce NAS complexity and improve user access to information.

Communications Modernization. Conduct technical analyses on architecture alternatives at the program, service, and domain levels to ascertain which alternatives meet the required level of NAS communications service at least cost; conduct engineering analysis, network definition, and transition strategy studies for the FAA's Voice Communications and SWIM programs to provide robust network-enabled operations and to reduce the overall FAA communications costs; conduct cost analyses on spectrum and radio technology issues applied to the problem of extending the existing air-ground voice communications systems. As options for life extension develop, CAASD will work with the FAA's NextGen plan and other CAAs around the world to develop the next generation system. This will enable the FAA to take a global leadership role in aviation communications; provide technical and operational insight into the implementation of digital and data communications services in the NAS. Ensure that FAA and the user community understand the operational benefits to be gained.

Performance Based NAS. Provide new concepts for achieving a performance-based NAS, for example, the RNP Parallel Approach Transition (RPAT) concept, which utilized CAASD's operational knowledge, laboratories, and visual tools in its development; conduct technical analyses to identify airports and runways that will benefit from RNP and RNAV procedures; develop algorithms and prototype performance case analyses to validate Flight Standards procedure development tools; identify problems that emerge in the implementation of RNP and RNAV procedures and recommend resolutions and new criteria requirements using CAASD's air traffic, airline, and avionics expertise; analyze and model all aspects of navigation assets, including Wide Area Augmentation System (WAAS), Local Area Augmentation System, (LAAS), divestiture of navigation aides, modernization of GPS, and interoperability with other Global Navigation Satellite System (GNSS) systems (e.g., Galileo).

En Route Evolution. Perform system engineering analyses for new technologies, capabilities, and procedures for the en route system architecture and operational applications; develop concept of operations and prototypes to demonstrate and evaluate new capabilities and procedures; conduct risk management analyses to identify and mitigate the key risks for capability completion; conduct benefit and cost analyses for new capabilities; assess and prioritize candidate en route extensible capabilities; develop system-level requirements for capabilities that can be transferred to the development contractor; validate innovative approaches that can reduce the time and cost of training controllers; develop and conduct field evaluations of a simulation training prototype that will provide effective transition of automation and procedural advancements into operation use; validate the operational feasibility and expected productivity gains from changing roles and responsibilities in the en route domain.

Terminal Operations and Evolution. Provide FAA with technical analyses that inform decision making on which technical architecture alternatives provide the required level of service and minimize costs; provide technical and operational insight into systems that can be used to safely permit reduced separation standards and/or significantly increase overall system capacity and productivity, including factors such as system technical performance, weather measurement performance, human factors engineering, operational evaluation, safety assessment, and decision support system design; provide operational feasibility and implementation risk analyses that assist the FAA in identifying and prioritizing among the more promising operational changes, procedures and enabling technologies; provide technical and operational expertise to enhance the quality and efficiency TRACON controller training, to allow for reduced training time and cost, improve trainee success rates, and improved workforce capabilities (e.g., reduced operational errors, improved productivity).

Airspace Design and Analysis. Structure and execute technical analyses that will inform FAA and Industry decisions on airspace design and management; engineer the processes that govern airspace strategic planning and analysis efforts; investigate, innovate, and develop modeling, simulation, and analysis capabilities facilitating airspace design; explore issues that influence strategic airspace management and design policy, such as sectorization concepts; integrate all the above efforts to provide a national, system-wide optimization of airspace, leveraging CAASD experience, and perspective to coordinate multi-regional and multi-facility design efforts and other national airspace activities.

NAS System Operations. Improve the NAS system-level performance by assessing system performance during severe weather and snowbird seasons; design, develop, and evaluate solutions to significant issues with FAA operational personnel and customers responsible for implementing the solutions; develop improved analytic techniques and capabilities for system operations analysis; develop operational strategies to manage emerging and chronic congestion problems by modeling capacity, delay, predictability, ripple effects, and access issues; design and evaluate solutions with FAA operational personnel and customers responsible for implementing the solutions; develop improved measurement techniques for assessing operations; improve the FAA's responsiveness to customer issues and improve traffic management strategies by modeling and assessing major operational problems with integrated analysis to verify alternate solutions; develop new modeling and analysis capabilities for analytic weaknesses; design, model, and assess new system operations procedures for new capabilities and airspace changes that will be implemented in the near future; develop analysis techniques and data to improve information on en route and terminal operations used in FAA operational and investment decision making; develop and evaluate new metrics to measure overall NAS operational performance.

Traffic Flow Management (TFM) Operational Evolution. Provide analysis of the TFM requirements and system design in order to ensure that developed system enhancements will meet the current and future operational needs in a cost-effective manner; develop metrics that provide insight into the performance of the TFM domain; provide assessment of concept maturity, operational feasibility and implementation risks; advance the maturity of concepts to account for uncertainty (e.g. probabilistically) in predictions and decision making, by developing algorithms and prototype capabilities and conducting (HITL) evaluation that will improve the FAA's ability to predict imbalances between traffic demand and real NAS capacity; translate concepts into requirements and assess the impact of enhancement capabilities on the TFM modernization system so that implementation cost and difficulty can be factored into the prioritization planning process for new capabilities and procedures.

Future NAS Performance and Analysis. Assess the NAS-wide operational impacts of investment options and decisions; improve understanding of the future environment, including anticipated demand at airports and for airspace; anticipate the impact of planned improvements on future airport and airspace capacity; perform analyses to assess the affordability and long-term economic implications of different investments, operational changes, or proposed policies.

Aviation Safety. Perform technical analyses of NAS-wide accident and runway incursion risk to identify airports or specific types of operations with the highest risk, and prioritize implementation of appropriate operational and technological mitigations, leading to a reduction in accidents and runway incursions; develop metrics and processes that allow FAA to proactively identify potential safety issues with both operations and architecture; identify risks before they lead to incidents or accidents; identify and assess the feasibility of new or advanced capabilities and standards that mitigate safety issues in the NAS.

Mission Oriented Investigation and Experimentation (MOIE). Develop the tools and techniques for studying system capacity, throughput, performance, system dynamics and adaptation to technology- and policy-driven change; identify opportunities for innovative solutions to NAS problems and enhancements to NAS capabilities and procedures, and capitalize on them through applied research and technology transfer; research future concepts and technologies to understand their potential impact on the NAS and to develop and refine concepts for operational use and potential benefits; use prototyping and in-lab demonstration and experimentation to learn what works and what doesn't, and incorporate stakeholder feedback and building industry consensus on the way forward in key areas; strengthen FFRDC systems engineering skills and tools by exploring new regimens including complexity theory, agent-based modeling, and productivity modeling; leverage collaborations with industry, academia, and the broader aviation research community.

NAS-Wide Information System Security. Provide technical guidance on the most effective way to engineer security capabilities into the NAS, emphasizing a NAS-wide approach that reduces overall cost by leveraging shared services and building security into the underlying IT infrastructure; provide guidance on security threats, technology, standards, and practices being applied in other government and commercial enterprises in order to evolve Information Systems Security (ISS) to adapt to changing threats and technology advances; develop requirements and recommend solutions for effective cyber incident management program; advise the FAA on creating an IT infrastructure that will be resilient, flexible, and adaptable, and provide a defense-in-depth strategy; apply MITRE experience with the DOD's successful transition to Network Centric Operations and CAASD's NAS domain knowledge to provide technical guidance on deploying network centric technologies within the NAS while maintaining ISS defense-in-depth.

Broadcast and Surveillance Services. Research ADS-B ground and cockpit-based solutions that will permit the FAA to deploy ADS-B throughout the entire NAS in a cost effective and timely manner, while reducing the cost of ownership for FAA surveillance infrastructure and ATC, and improving safety for all NAS users; prototype basic and advanced ADS-B applications that will result in improved efficiency and capacity for FAA and the airlines. This includes transforming applications that will leverage the aircraft as an active part of the NAS, as in the NextGen vision, and result in more efficient NAS operations; assess the impact of ADS-B on safety, capacity, and efficiency benefits for the FAA and users. This includes performing user coordination and lab simulations prior to deployment, and data collection and analysis after deployment; develop domestic and international requirements and engineering standards for future ADS-B applications, in close coordination with the users and manufacturers, as part of RTCA, the ICAO, FAA, RFG, and Eurocontrol standards development activities.

Special Studies, Laboratory and Data Enhancements. Manage the breadth of the CAASD FAA work program in a manner that ensures the activities contributing to each individual outcome benefit from the broader perspective of the entire work program; provide the CAASD work program with a research environment where prototypes and capabilities can be brought together with the appropriate mixture of fidelity and development flexibility to facilitate integration investigations, compressed spiraling of operational concepts and procedure development; exploration of new technologies, visualization of concepts, exploration of human factor issues, and transition of prototypes between the lab and the field; provide the CAASD work program with a an efficient aviation data repository system and associated tools to support data analysis that results in more useful products across the work program at a lower cost; provide the CAASD work program with a flexible model of the NAS capable of quickly and reliably estimating the high-level impacts of new technologies, procedures, or infrastructure improvements on key system performance metrics; conduct special studies of key subjects, as directed by FAA senior management.

Of this amount, $28,728,000 is classified as funding research, development, and technology programs.

Benefits: High quality research, systems engineering, and analytical capabilities help FAA meet the technically complex challenges in the NAS. CAASD provides independent advanced research and development required by the FAA to obtain technical analyses, prototypes and operational concepts needed to fulfill the vision for NAS architecture, FAA's Flight Plan, the Operational Evolution Partnership (OEP) – FAA's plan to NextGen - and the NextGen Integrated Plan. CAASD efforts support all Flight Plan goals across the board and the FFRDC continues to play a key role in defining NextGen. Its expertise is critical to FAA's efforts to transform the nation's air transportation system in an effective and timely manner.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A08	**NextGen Demonstrations and Infrastructure Development**	**$28,000,000**	*Various*	**M-49**

- FAA Strategic Goal: Greater Capacity – Increase reliability and on-time performance of scheduled carriers.

The FAA has identified this program as a "Transformational" program for NextGen.

Description of Problem: The Joint Planning and Development Office (JPDO) is the steward of NextGen. Over the past year, the JPDO developed a NextGen Concept of Operations (ConOps) and an initial Enterprise Architecture. These documents establish a framework for the future, based on today's best information. These documents defined two major concepts NextGen will develop: Four Dimension Trajectory Based Operations (TBO) and Air Traffic Management.

Four Dimension Trajectory Based Operations — The four dimensions measure latitude, longitude, altitude and time. A set of systems would collect and disseminate 4D data to provide complete situational awareness to pilots, controllers and air traffic managers. The goal is to allow flights to find their best route, rather than restrict them to controlled paths.

Air Traffic Management — Currently FAA controls air traffic in the NAS using defined flight paths and airspace restrictions that do not take full advantage of the capabilities of an aircraft or its systems. NextGen would transition FAA to a more collaborative environment where pilots and FAA managers would work together to tailor an aircraft's route for optimum safety and efficiency.

Beyond defining these initial concepts, JPDO, with its many partners, must test and mature these concepts and the technologies that support them. This investment prepares partner agencies to make investment decisions and deploy new capabilities.

FY 2008 was the first year JPDO requested funding for demonstrations and infrastructure development activities to test central NextGen concepts. The results will be used to identify early implementation opportunities, refine longer-term objectives, and if results dictate, eliminate certain concepts from further consideration.

Description of Solution: For FY 2009, $28,000,000 is requested to fund the following activities:

1. International Air Traffic Interoperability ($6,400,000). This demonstration is designed to help the FAA promote safe, affordable and rapidly implemented innovations into Air Traffic Management (ATM). This effort, known as the Atlantic Interoperability Initiative to Reduce Emissions (AIIRE), will use commercial aircraft along oceanic routes to demonstrate and accelerate Airline and Air Navigation Service Providers (ANSP) efficiency improvements using existing systems and technologies. The flight trials development stage will include system architecture, design, hardware and software development (where applicable), procedures development, simulations, component and subsystem testing and certification, and system checkout. Flight trial execution could include scripted flight tests, limited operational testing and extended operational evaluations with revenue aircraft. The AIIRE program contributes directly to NextGen concepts and supports international collaboration, avoids overlap, and will "deconflict" activities with national and international organizations (FAA, DOD, EC, Eurocontrol, SESAR, ICAO, ANSP, Airlines, and industry partners). Further, this international interoperability air traffic demonstration and development initiative will assist the international communities and the FAA in validating 4D Trajectory Based Operations (TBO) and Performance-based Air Traffic Management (PATM) alternatives.

2. High Density Airport (HDA) Capacity and Efficiency Improvement Project ($5,000,000). This demonstration will serve as the first transition step to TBO. This concept attempts to take advantage of existing ground technologies and functionality while leveraging airborne navigational capabilities that already exist on most commercial production and many in-service airplanes. Trajectory Based Management (TBM) will be accomplished using fully defined 3D paths to ensure aircraft sequencing and spacing (path stretching using dog-legs or offsets). The 3D paths permit a more orderly and predictable traffic patterns and use path clearances rather than the conventional speed, altitude, and heading clearances to manage aircraft spacing. This technique has the potential to reduce controller workload and allow the airplane to precisely follow a continuous path using the accuracy of Required Navigation Performance (RNP) operations. Execution of the demonstration will include data collection from real operations to show benefits in capacity, environmental (noise, computed emissions), and fuel efficiency. Site selection will require deployment of ATM ground automation prototypes to functionally support 3D path operations. The automation tools include the Center TRACON Automation System Traffic Management Advisor (CTAS TMA) and the En Route Descent Advisor (EDA).

3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration ($5,700,000). This demonstration has two objectives. The first objective will utilize the advanced capabilities of the UAS community to serve as a testbed for exploring future 4D trajectory based concepts. The second objective examines potential concepts for the wide-spread integration of UAS into the future NextGen environment. Today's generation of UAS offer a perfect testbed for "trajectory based" concept validation, in that they basically fly 4DT profiles today and are equipped with toolsets (data-link, GPS) needed for 4D. Use of the UAS community will allow the FAA to evaluate planned 4D automation toolsets, which will be evolving in the next few years. More importantly to the DoD community, these demonstrations will provide a platform for validation of RTCA SC-203 UAS performance requirements now under development. This validation will provide the FAA confidence in the safety case for UAS, and allow the FAA to transition the Minimum Aviation System Performance Standards (MASPS) documents into guidance material such as Advisory Circulars and Technical Standard Orders (TSO).

4. Virtual Tower (Staffed and Autonomous) ($5,900,000). The Virtual Tower (VT) program will demonstrate and validate the potential of emerging alternative approaches to performing local and ground air traffic control tower operations for other than the current Airport Traffic Control Tower (ATCT). Projected growth in air traffic and the high cost of building, sustaining and replacing air traffic control towers necessitate the development and evaluation of new concepts that do not require the construction of a new tower or its co-location within or immediately adjacent to the airport property. Such a concept is envisioned and outlined in the JPDO's NextGen ConOps. The ConOps outlines a future air traffic system in which tower ANSP services are provided from remote locations, thus not requiring the ANSP to be physically present in a tower in or near the airport property. The Virtual tower demonstrations will be at field sites (medium to low density airports) that have yet to be determined. The field site selection for virtual towers (both staffed and autonomous) is expected to occur in FY 2008.

5. JPDO Program Management ($5,000,000). The JPDO's oversight of NextGen requires approximately $18 million annually in support from the FAA. Prior to FY 2008, the entire amount was requested through the Research, Engineering, and Development appropriation. Beginning in FY 2008, as a few programs move toward implementation, there is a rationale for requesting part of the funding through the ATO Capital appropriation. A detailed description of the program management request can be found in the RE&D budget request.

Benefits: These demonstration and early implementation initiatives will provide JPDO and its partner agencies critical information to refine operating concepts and tools, including the following:

1. International Air Traffic Interoperability. The expected benefits are proof-of-concept and working prototypes for an operational environment with flight profile predictability and efficiency on long-duration international flights, where fuel burn optimization is a prime concern. This activity will demonstrate the benefits of flexibility in a four-dimensionally managed environment through en route flexibility; demonstrate exchange of operational data between aircraft operators and air traffic service providers for informed decision making in near real-time to increase productivity; and demonstrate efficient transition from the oceanic/en route phase of flight to the domestic/en route and offshore descent phases of flight to increase transition area efficiency and productivity.

2. High Density Airport (HDA) Capacity and Efficiency Improvement Project. This demonstration will show enhanced airspace use to accommodate the expected demand. It links two important activities: time based metering and procedures that reduce separation minima (RNAV/RNP) to more fully and efficiently utilize every landing opportunity at the airport runway. The demonstration will also test whether or not the FAA can increase capacity without additional staffing.

3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration. Initially, UAS will be used as surrogate transportation aircraft in this demonstration. The results of these tasks will allow for early implementation of trajectory management flight planning capabilities for all aircraft operating in the NAS. Significant benefits can be realized in airspace designated for high performance

aircraft through problem identification and resolution earlier in the process, workload spread more evenly, and more effective management of airspace.

4. Virtual Tower (Staffed and Autonomous). The near-term goal and expected benefits are a proof-of-concept and working prototype for a Staffed Virtual Tower (SVT). The longer-term goal will be the Autonomous Virtual Tower (AVT). Both systems will support the projected growth in air traffic by providing additional options for providing ATCT services at airports not currently served, and potentially lower man-power costs. Further, these systems offer a potential reduction in the higher cost of building, maintaining and replacing ATCTs throughout the NAS.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A09	**Next Generation Air Transportation System (NextGen) – System Development**	**$41,400,000**	**Various**	**M-48**

FAA Strategic Goal: Increased Safety - Reduce the commercial airline fatal accident rate. Reduce the number of fatal accidents in general aviation. Reduce the risk of runway incursions. Enhance the safety of FAA's air traffic systems.

FAA Strategic Goal: Greater Capacity - Increase capacity to meet projected demand and reduce congestion. Increase reliability and on-time performance of scheduled carriers. Address environmental issues associated with capacity enhancements

FAA Strategic Goal: Organizational Excellence - Improve financial management while delivering quality customer service

The FAA has identified this program as a "Transformational Program" for NextGen.

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand by 2025. The JPDO's 2004 Integrated Plan identified three key performance targets to achieve the desired capability by 2025. These are (1) satisfy future growth in demand up to three times current levels; (2) reduce domestic curb-to-curb transit time by 30 percent; and (3) minimize the impact of weather and other disruptions to achieve 95 percent on time performance. Achieving these targets by 2025 is a challenge. In addition, an increase in demand to three times current levels could cause a similar increase in the number of accidents, aircraft noise and emissions, and air traffic controller workload. This line item provides the research and development required to resolve these potential problems.

Description of Solution: The solution involves four areas of research and development – safety, capacity, human factors, and environment. The safety research includes expanding information sharing and data analysis to identify and mitigate risks before they lead to accidents. The capacity research develops new air traffic management systems to support NextGen; measures NextGen concepts to determine if they achieve the targets for 2025; and develops flexible airspace categories to increase throughput. The human factors research provides higher efficiency levels in air traffic control and identifies the new role for controllers as more responsibility shifts to the flight crew. The environmental research explores new procedures, and adapts new technologies and fuels into the National Airspace System (NAS) to reduce emissions, fuel burn, and noise; and includes demonstrations, methods to adapt the current infrastructure, and estimates of costs and benefits.

For FY 2009, a total of $41,400,000 is requested for the following activities:

1. Air Traffic Control/Technical Operations Human Factors – Controller Efficiency ($3,800,000). A key performance target of NextGen for the year 2025 is to satisfy growth in demand up to three times current levels. Achieving this target could require three times the current number of air traffic controllers unless we increase efficiency levels through the use of automation and technology. Automation and technology must work in concert with the humans in the system to meet the targeted efficiency levels. Human factors aspects of existing air traffic control systems are a limiting factor for traffic loads. Projected traffic loads will exceed the capability of our current mode of air traffic control when traffic levels exceed 130 percent of 2004 levels (baseline). In FY 2009, research will define preliminary roles and responsibilities for actors in the NAS to achieve required performance and define requirements for integrated en route situation displays.

2. Air Traffic Control/Technical Operations Human Factors – Air/Ground Integration ($2,900,000). Achieving the capacity targets of NextGen and achieving self-separation between aircraft by the flight crew requires significant changes in the roles and responsibilities between pilots and controllers and between humans and automation. Integration of air and ground capabilities poses challenges for the air traffic service provider and the flight crew. A core human factors issue is to ensure that safety is maintained. Information on intent as well as positive information on delegation of authority must be clear and unambiguous; and new types of human error modes, which may be introduced by new technology and procedures, will require the management of safety risk in the changing environment. The FY 2009 research will complete preliminary human error and safety analysis concerning changes in air traffic service provider and flight crew roles and responsibilities to manage safety of the NAS; and develop initial information requirements for air traffic service providers and aircraft operators to perform trajectory negotiations.

3. Environment and Energy –Advanced Noise and Emission Reduction ($2,500,000). Achieving the NextGen target of three times current levels of capacity could cause a three times increase in

aircraft noise, fuel burn and emissions. The potential for environmental impacts could constrain capacity growth and prevent full realization of NextGen. Reducing the significant environmental impact of aviation in absolute terms will require new operational procedures, aircraft technologies, and alternative fuels to allow the desired increase in capacity. The solutions must demonstrate an acceptable benefit-to-cost ratio and infrastructure adaptation plan. There must be sufficient knowledge of human health and welfare and climate change impacts of aviation to enable appropriate means to mitigate these effects. The FY 2009 research will evaluate the potential NAS environmental benefits of new aircraft technologies and alternative fuels; initiate a comprehensive analysis of the impacts on the NAS of new aircraft types [e.g., aircraft featuring Continuous Low Emissions, Energy, and Noise (CLEEN) technologies, Very Light Jet (VLJ), Unmanned Aerial Vehicle (UAV), Supersonic Business Jet (SSBJ)] and assess approaches to optimize environmental performance; and initiate efforts to identify any NAS adaptation required to adopt new CLEEN technologies and alternative fuels.

4. Environment and Energy – Validation Modeling ($4,500,000). Achieving the NextGen target of three times current levels of capacity could cause a threefold increase in aircraft noise, fuel burn, and emissions. Reducing significant noise and emissions impacts due to increasing capacity will require a thorough understanding of the economic and operational impacts of the system alternatives. As the system solutions to increase capacity develop, alternative operational procedures must be explored and validated to ensure that proposed solutions are sufficient to prevent environmental constraints that might limit the required capacity increases. Models and metrics must be developed and demonstrated to implement Environmental Management Systems (EMSs) to manage and mitigate NextGen environmental impacts. The FY 2009 research will explore advanced algorithms, automated systems and approaches for en route, surface, and terminal operations automated systems optimize reducing significant climate, air quality and aircraft noise impacts; define existing and planned environmental mitigation methods to counter NAS constraints of today and for NextGen; initiate development of the Aviation Environmental Design Tool (AEDT) regional version to enable evaluation of airspace environmental impacts and support EMSs; and apply metrics for health and human welfare and climate impacts to develop a sample NAS EMS and define benefits of mitigation actions.

5. New ATM Requirement ($5,400,000). Achieving NextGen will require a full-scale transformation of the air traffic control system, because FAA's current system simply is not scalable to handle the required changes. The new system must demonstrate higher capacity levels at faster speeds than today. Specifically, it must achieve three times current levels of capacity, a 30 percent reduction in curb-to-curb transit times; and 95 percent on time performance. A system transformation of this magnitude requires air traffic control to change from tracking aircraft to managing trajectories. Identifying the new operational requirements to achieve this change in air traffic control is the key to developing a transition strategy from our current system to NextGen. The FY 2009 research will consider the impacts of NextGen operations (e.g. closely spaced RNP routes) on Traffic Alert and Collision Avoidance System (TCAS) and develop requirements for TCAS 8, develop standards for L-Band and C-band data communications to provide international standards for air-ground communications and wireless air traffic control surface communications, and develop software assurance standards for the integrated air-ground decision support systems foreseen as necessary for NextGen.

6. Operations Concept Validation – Validation Modeling ($4,000,000). As proposed system alternatives for NextGen develop, there must be an understanding of the economic and operational impact of the proposed solutions. This requires a thorough understanding of aerospace system operations, the impact of change on system performance and risk, and how the system impacts the nation. This program will develop the methods, metrics, and models that evaluate how much proposed solution increases capacity, reduces transit time, or increases on time arrivals. The demonstration must address the combined solution as a system in terms of its progress toward and ultimate achievement of the NextGen targets. The FY 2009 research will provide an end-to-end NAS Operational Concept that integrates the capabilities envisioned across the solution sets, and it will provide a set of scenarios that describe operational changes for NextGen solution sets including: flexible terminal operations, surface management, and data communications for traffic flow management and conflict resolution.

7. System Safety Management Transformation ($16,300,000). Achieving NextGen will require a full-scale transformation of the air traffic control system, because the current system simply is not scalable to handle the required changes. At the same time, safety will remain the top priority of FAA. Transforming the system will require a thorough understanding of the operational safety impact of system alternatives. While pursuing 3 times current levels of capacity, FAA will continue to pursue reduced fatality rates. This will require data analysis capabilities to predict, identify, and mitigate safety risks before they become accidents; safety guidelines to help stakeholders develop their own safety management systems; and modeling to help measure progress toward achieving FAA goals. The FY 2009 research will begin the development of Aviation Safety Information Analysis Sharing (ASIAS) capabilities, to include NextGen member agency aviation safety information needs; baseline risk assessment for system-wide risks for current operations; and conduct initial safety assessments of proposed concepts, algorithms, and technologies.

8. Wake Turbulence – Re-categorization ($2,000,000). Achieving the NextGen target of three times current levels of capacity requires improved airspace access by a changing fleet mix and updated separation standards that increase capacity to allow efficient use of congested airspace while at the same time maintaining safe operations. Current separation standards are designed to protect the smallest aircraft in one category from the largest aircraft in the next category. There is a wide range of wing span and weight within each category. While different airports serve different categories of aircraft; however, the same six categories are used by all air traffic controllers at all airports. Allowing the six categories to adapt to conditions could increase flexibility and throughput**.** The FY 2009 research will develop enhanced analysis tools to link observed wake behavior to standards for required separation; determine safety risk associated with new standards relative to existing standards; simulate and validate new separation standards; coordinate with EUROCONTROL on new separation standards; and conduct analysis to link wake transport and demise characteristics to aircraft flight and surrounding weather parameters.

Benefits: Research and development identifies constraints and barriers, and separates solutions that are effective from those that are not. Each research element in this line item has a target that involves a demonstration. The demonstrations will prove concepts and show that it is possible to meet the target operationally by the year 2025. The benefits are: (1) capacity increased to three times current levels; (2) curb-to-curb transit time reduced by 30 percent; (3) on time performance increased to 95 percent; (4) noise and emissions reduced in a cost effective way to allow three times capacity; (5) air traffic controller efficiency increased to three times current levels; (6) aerospace-related fatality rate reduced commensurate with capacity increase; and (7) understanding of economic and operational impact of system alternatives. Benefits for the items in this FY 2009 request are as follows:

1. Air Traffic Control/Technical Operations Human Factors – Controller Efficiency. This program element targets a demonstration of three times improvement in air traffic controller efficiency (e.g. greater number of aircraft) and effectiveness (e.g., fewer operational errors) through automation and standardization of operations, procedures, and information. Interim progress will be measured by demonstrating 130 percent controller efficiency; 166 percent controller efficiency; 230 percent controller efficiency; and finally 300 percent controller efficiency. Research supports operational implementation by 2025.

2. Air Traffic Control/Technical Operations Human Factors – Air/Ground Integration. This program element contributes the controller perspective to defining the changes in roles and responsibilities between pilots and controllers and between humans and automation required to implement NextGen. The R&D outcome is to conduct a full mission demonstration of integrated NextGen air and ground capabilities for pilot separation responsibility and controller efficiency. There will be interim measures of progress through a series of demonstrations involve multiple research products and programs. Research supports operational implementation by 2025.

3. Environment and Energy – Advanced Noise and Emission Reduction. This program element targets a reduction of significant aviation noise and emissions in absolute terms (to enable three times capacity) in a cost-beneficial way and a reduction of uncertainties in particulate matter and climate impacts to levels that enable appropriate action. Progress will be measured by demonstrating (under the following program element) no environmental constraints at 130 percent capacity; no environmental constraints at 166 percent capacity; no environmental constraints at 230 percent

capacity; and finally no environmental constraints at 300 percent capacity. Research supports operational implementation by 2025.

4. Environment and Energy – Validation Modeling. This program element targets system knowledge to understand economic (including implementation) and operational impact (environmental relative to capacity) of NextGen system alternatives. This program element explores new procedures and measures progress on environmental improvements relative to new procedures, technologies, and fuels performed under the above program element. Progress will be measured by demonstrating no environmental constraints at 130 percent capacity; at 166 percent capacity; at 230 percent capacity; and finally at 300 percent capacity. Research supports operational implementation by 2025.

5. New ATM Requirement. This program element conducts research to develop systems that support the capacity enhancements for the seven solution sets of NextGen. The research will demonstrate that the planned system can handle growth in demand up to three times current levels; demonstrate that gate-to-gate transit time can be reduced by 30 percent; and demonstrate that the system will allow achievement of a 95 percent on-time arrival rate. Progress on this research will be measured under the following program element. Research supports operational implementation by 2025.

6. Operations Concept Validation – Validation Modeling. This program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to capacity improvements) of NextGen system alternatives. It will measure the proposed NextGen system alternatives to determine whether or not the system meets the capacity targets of NextGen. It will develop methods, metrics, and models to measure capacity improvements. Progress will be measured by demonstrating capacity increases to 130 percent current levels; 166 percent; 230 percent; and 300 percent.

7. System Safety Management Transformation. This program element contributes to reducing the fatality rate commensurate with increases in capacity under NextGen. By 2015, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to safety) of NextGen system alternatives. The research outcomes include an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner; and demonstration of a National Level System Safety Assessment working prototype that will proactively identify emerging risk across the NextGen. Research supports operational implementation by 2025.

8. Wake Turbulence – Re-categorization. This program element will contribute to the target to demonstrate that NextGen can handle growth in demand up to three times current levels. It will focus on re-categorization of airspace in three steps. It will provide static changes using the six current aircraft weight categories to safely adjust wake separation distances to account for fleet mix changes; develop an alternate set of flexible airspace classifications for use under specific conditions to increase the capability to place more aircraft in the same volume of airspace; and support dynamic, pair-wise separation. Research supports operational implementation by 2025.

Airport Technology Research	**FY 2009 Request: $19,348**

Overview:

For FY 2009, research will be conducted in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to ACs, manuals, and technical specifications that airports rely on when expending AIP funds.

***FY 2008 Base:**

FAA managers and engineering staff both at Headquarters and at the William J. Hughes Technical Center review projects proposed for research. The FAA's Research and Advisory Airport Subcommittee meets with

FAA engineers and managers every six months to review research progress as well as the proposed future research requirements and priorities that are reflected in this submittal. The Subcommittee includes representatives from airports, aviation associations, aviation industry, aircraft manufacturers, and the Airline Pilots Association. This mix of airport users ensures that the research proposed is what the airport community needs and reflects their priorities.

The research conducted is producing significant benefits in increased safety and potential cost savings. For example, a GAO report in February 2002 estimated the costs to widen taxiways from 75 feet to 100 feet to meet the standard for new large aircraft such as the A-380 would be $509 million. As a result of research efforts that measured B-747 taxiway deviations at the John F. Kennedy and Anchorage airports, FAA was able to conduct a rigorous risk assessment that justified modification to standards that will permit operations of A-380 aircraft on existing 75-foot-wide taxiways with some conditions. This research project alone could avoid expenditure of hundreds of millions in AIP funds to unnecessarily widen taxiways. Other ongoing pavement research has produced a new pavement design procedure - FAA Rigid and Flexible Integrated Elastic Layered Design (FAARFIELD) - for thickness design, rehabilitation and overlay design using improved material specifications that promise to reduce pavement thickness while maintaining pavement life. New design procedures also promises to save hundreds of millions of dollars in pavement construction and rehabilitation.

In support of safety, research is being conducted in airport lighting and marking to improve pilot situational awareness and reduce runway incursions. Research in innovative methods to reduce the hazard of wildlife strikes to aircraft is also ongoing. Research results are published in a widely distributed manual that provides practical techniques for controlling wildlife near airports. The FAA is evaluating bird detection radar in a cooperative program with the Department of Defense and industry to provide real-time bird hazard data to airport users. Ongoing research is also conducted in aircraft rescue and firefighting and in the use of runway deicers and associated environmental issues.

***Anticipated FY 2008 Accomplishments:**

- Complete evaluation of NextGen High Reach Extendable Turret (HRET) prototype on FAA Fire Research Vehicle.
- Complete technical evaluations of radar systems for the detection of birds.
- Complete studies on methods for wildlife hazards management.
- Complete evaluation of fire modeling for fuselage shapes and dimensions.
- Complete evaluation of radar-based FOD detection system.
- Complete remote airfield lighting system evaluation.
- Conduct field testing of new heliport visual aids.
- Complete airport capacity and delay desktop model.

- Complete the update of Advisory Circular AC 150/5320-6E of FAARFIELD computer program for pavement thickness design.
- Complete asphalt mix design for gyratory compactor.
- Modify the National Airport Pavement Test Facility (NAPTF) test machine for eight and ten wheel landing gears.

*** FY08 Base and Anticipated Accomplishments assumes an enacted authorization with Contract Authority at or above $3,514,500,000.**

FY 2009 Budget Request:

The table below summarizes the research activities funded by this request. ($000)

Research Project	FY 2008*	FY 2009	Increase/
		Request	Decrease
Contracts			
Advanced Airport Pavement Design	750	450	(300)
Pavement Design & Evaluation Methodology	900	900	0
National Airport Dynamic Tests	2,500	2,500	0
Field Instrumentation & Testing	540	540	0
Improved Paving Materials	1,100	1,100	0
Non-Destructive Pavement Testing	760	980	220
Pavement Roughness	370	420	50
Material Testing Laboratory	300	300	0
CEAT-University of Illinois		300	300
Airport Planning	500	350	(150)
Airport Design	700	700	0
Operation of NLA	771	800	29
Composite Materials Firefighting	0	436	436
Airport Wildlife Hazards Abatement	2,500	2,500	0
Airport Visual Guidance/Incursions Reduction	2,050	1,825	(225)
Soft Ground Systems Follow on	300	300	0
Surface Technology	1,000	1,000	0
Rescue and Fire Fighting	600	600	0
Subtotal--Contracts	**15,641**	**16,001**	**360**
In-House (FTEs)	**3,071**	**3,347**	**276**
TOTAL	**18,712**	**19,348**	**636**

There are several projects from FY 2008 for which reduced funding is requested in FY 2009. With the release of FAARFIELD, the advanced design project will focus on maintaining the software and continue at a much-reduced funding level ($450,000). Funding for the Improved Paving Material project ($1,350,000) will be complemented with continuing requirements for Field Instrumentation and Testing ($540,000). Work on another new project, Pavement Design and Methodology, will be continued in FY 2009 to investigate and develop the next phase of rigid pavement design procedures, characterization of curling for design, and pavement material characterization ($900,000).

For the Wildlife Hazard Abatement program funding, we are not requesting any increase in FY 2009. We have made considerable progress in recent years evaluating and developing performance standards for radar systems to detect birds in the vicinity of airports, and we will continue improvements to the radar and demonstrate operations at large airports. We will focus research in the human factors aspect of incorporating the bird detection radar information into a user friendly format available to airport users that will support notification of the presence of birds at or near airports.

*** FY08 Base and Anticipated Accomplishments assumes an enacted authorization with Contract Authority at or above $3,514,500,000.**

Airport Cooperative Research Program	FY 2009 Request: $ 15,000

Overview:

For FY 2009, FAA proposes to continue funding this program from the Grants-in-Aid for Airports appropriation and increase the amount from $10 million to $15 million. ACRP was authorized by section 712 of Vision 100 – Century of Aviation Reauthorization Act. ACRP was authorized at $10 million per year for a four-year pilot program to identify problems that are shared by airport operating agencies and can be solved through applied research, but that are not being adequately addressed by existing Federal research programs. Environmental issues impact every aspect of airport operations, and research is needed in order to plan for, study, and mitigate the impact future environmental requirements will place on airports. Current environmental research in the ACRP includes: minimizing the impact of deicing and anti-icing fluids through new formulations and improved runoff management; airport related hazardous air pollutants and particulate emissions; aircraft noise impacts on the local community; climate change implications from airport operations; and the evaluation of alternative aviation fuels. However, much more research is needed as our society's awareness and sensitivity to environmental issues increases in the future.

The ACRP is uniquely qualified to carry out applied airport environmental research. Increased funding will significantly increase the ability of airport operators to cope with future environmental issues, such as water quality of airport runoff, air quality from engine emissions and aircraft noise.

The FY 2008 FAA reauthorization bill includes authorizing ACRP at the $15 million level with up to $5 million for environmental research studies.

***FY 2008 Base:**

The Secretary of Transportation signed the Memorandum of Agreement among DOT, FAA, and National Academy of Sciences to implement the ACRP. The Secretary also appointed the 13 members of the board of governors of the ACRP. The Transportation Research Board (TRB) of the National Academy is administering the program. The ACRP board of governors has met every 6 months to review progress and select additional topics to fund. Over 130 submitted topics will be reviewed at the July 2007 meeting and the most promising topics selected for contract award in FY 2008. The Board of Governors selects the highest rated topics, subject to the funds available, to proceed to contract solicitation and award. The TRB appoints expert technical panels for each selected project. The technical panels convert the topics into requests for proposals to select contractors to perform the research. The panels also monitor each project to ensure it stays on track and meets project deliverables.

The ACRP program is off to a good start. Over 70 research projects are underway. The first two studies were delivered in FY 2007.

***Anticipated FY 2008 Accomplishments:**

- ACRP Technical Panels monitor progress and deliverables on research projects awarded in FY 2007 and FY 2008.
- Board of governors meet twice during FY 2008 to select projects to fund with the funds appropriated in FY 2008.
- TRB appoint project technical panels to monitor FY 2008 research projects awarded.

*** FY08 Base and Anticipated Accomplishments assumes an enacted authorization with Contract Authority at or above $3,514,500,000.**

EXHIBIT V-3
SUPPORT FOR SECRETARIAL AND ADMINISTRATION RD&T PRIORITIES
($000)

Priority	Supporting RD&T Programs	FY 2009 Request ($000)
Safety — *Secretarial Priority*	Fire Research and Safety (A11.a)	$6,650
	Propulsion and Fuel System (A11.b)	3,669
	Advanced Structural/Structural Safety (A11.c)	2,920
	Atmospheric Hazards/Digital System Safety (A11.d)	4,838
	Aging Aircraft (A11.e)	14,589
	Aircraft Catastrophic Failure Prevention Research (A11.f)	436

	Flightdeck/Maintenance/System Integration Human Factors (A11.g) Aviation Safety Risk Analysis (A11.h) Air Traffic Control Airway Facilities Human Factors (A11.i) Aeromedical Research (A11.j) Weather Program Safety (A11.k) Unmanned Aircraft System (A11.l) Engineering Development Testing & Evaluation (1A01) Airport Technology Research Airport Cooperative Research Air Traffic Organization—Operations Safety and Operations Commercial Space Transportation	7,465 12,488 10,469 8,395 16,968 1,876 33,000 10,239 5,273 11,958 2,337 125
System Performance and Reliability – *Secretarial Priority*	JPDO (A12.a) Wake Turbulence (A12.b)	$14,494 10,132
21st Century Solutions for 21st Century Transportation Problems – *Secretarial Priority*	Air Ground Integration (A12.c) Self-Separation (A12.d) Weather Technology in the Cockpit (A12.e) Environmental Research Aircraft Technologies, Fuels and Metrics (A13.b) Demonstrations & Infrastructure Development (1A08) System Development (1A09)	$2,554 8,025 8,049 16,050 28,000 41,400

EXHIBIT V-4
IMPLEMENTATION OF R&D INVESTMENT CRITERIA

R&D Investment Criteria	How Applied	Actions Reflected in FY 2009 Request
Relevance	FAA uses established strategic and budget planning processes, which facilitates portfolio development, strategic decision making, and prioritization The R&D program is planned in consultation with internal and external stakeholders, including an external advisory committee, the FAA's Research, Engineering and Development Advisory Committee, and its internal Research and Development Executive Board Goals, priorities, R&D strategies, and benefits are published in the National Aviation Research Plan – these support both the FAA and DOT strategic plans. Relevance is assessed both prospectively and retrospectively through the Research Engineering and Development Advisory Committee and other external review mechanisms Within the FAA, researchers work closely with agency customers to ensure the continuing relevance of research products	The FAA's REDAC and its standing subcommittees reviewed FAA's proposed FY 2008 R&D program and endorsed the program without change at the full committee meeting April 2007
Quality	The Part on FAA's R&D Program found that it was well managed and results-oriented, with a strategic plan that sets forth clear long-term goals that are tied to program performance measures. FAA uses an external and internal peer – review process to ensure quality. Managers prepare and vet program plans through a process that ensures good science and proper use of public funds. Program quality is assessed retrospectively through the Research, Engineering and Development Advisory Committee and other internal and external regular and ad hoc reviews.	Individual programs are executed under the competitively based FAA Acquisition Management System. Management processes conform to FAA best practices all projects go through internal and external peer review. Programs/processes follow recognized best practices (e.g., ISO 9000, Malcolm Baldridge). The REDAC reviews program quality annually. FAA's R,D&T programs are monitored to identify programs variances in scheduling and funding needs. Over time, program goals are modified to reflect new technologies and innovations. The FY 2008 budget request reflects program needs based on current assessments. It includes identified changes resulting from the internal and external reviews.

Performance	The program has long-term performance measures tied to specific research projects that support accomplishment of nations and agency goals. The program has annual performance measures that can demonstrate progress toward long-term goals. Performance is documented in an Annual Performance Plan in Quarterly and Annual Performance Plan Goal Reports. FAA publishes annual results in R&D Annual Review. The program works with external organizations (REDAC, National Academy of Science, etc.) to obtain feedback/peer review.	As with the Quality criteria, the FAA applies the Relevance criteria in determining its annual budget requests and how it manages its R&D programs. The R&D program has developed long-term performance measures and performance is documented in a variety of publicly available reports and plans. The program also seeks external peer review to ensure performance goals are met.

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