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OVERVIEW

Introduction

The Federal Aviation Administration (FAA) remains the principal federal agency responsible for providing the safest and most efficient aerospace system in the world. Since 1958, FAA has regulated and overseen all aspects of civil aviation in the United States, proudly running the largest and safest air traffic control system in the world, and ensuring the safety of the traveling public. Today, the breadth of FAA's mission and capabilities is dedicated to achieving the next level of safety, efficiency, environmental responsibility and global leadership.

The FAA's mandate for increased safety through technological innovation has never been more clear. After four-and-a-half years of stop-gap funding measures, FAA has been empowered with a blueprint for the future of aviation. Our four-year reauthorization, the FAA Modernization and Reform Act of 2012 (P.L. 112-95), brings us through fiscal year 2015 and provides the continuity and focus for the many critical tasks that lay ahead.

With this new authorization come many new mandates, from Unmanned Aircraft Systems (UAS) to Next Generation Air Transportation System (NextGen) procedures and equipage. The FAA must work within challenging budget constraints to continue making our Nation's air traffic control system even smarter and safer. We must continue accelerating the benefits of new technologies, providing tangible efficiencies for the traveling public today. We must meet our mandate for UAS implementation, safely integrating these cutting edge technologies into our Nation's skies. We must produce a plan for providing operational incentives and an equipage incentive program that leverages public-private partnerships. The FY 2014 budget represents a roadmap to realizing our leadership's new vision for our ongoing mission.

The FAA's FY 2014 Budget request of $15.6 billion strikes the optimal balance between maintaining current infrastructure while deploying key NextGen benefits to our stakeholders, upholding our critical safety programs, and modernizing our aviation infrastructure at funding levels that are $351 million lower than FY 2012. We have taken a critical look at what we do, and in some cases, we have made tough choices about programs. We have heard our Administration's call in the Campaign to Cut Waste, and we have answered that call. We have streamlined our organization and processes to gain the benefits of a shared services business model while carefully prioritizing those technologies and programs that will most improve safety and efficiency today. The FAA remains deeply committed to providing the safest, most advanced and efficient aviation system in the world, and to ensuring air transportation remains safe and efficient wherever U.S. citizens travel.

Overview by Appropriation Account

Operations

The FY 2014 request of $9.7 billion represents an increase of just 0.6 percent above the FY 2012 enacted budget. This funding level includes $62 million in air traffic program adjustments, $30 million to provide maintenance for newly transitioned En Route Automation Modernization (ERAM) systems, as well as modest inflationary adjustments for FAA's workforce, rent and lease increases, and costs for a Service Center building project. The FY 2014 request also includes an increase of 3 safety-related full time equivalents (FTE).

This budget includes program adjustments of $62 million in the Air Traffic Organization. To achieve these savings, ATO will be evaluating cost savings and efficiency gains in the following areas: Contract Weather Observations, Facility Realignments and Consolidations, and the Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON).

Included in the Operations budget is $30 million for the maintenance support of ERAM systems that have newly transitioned to operational status during FY2012 and FY2013. ERAM is a critical system as it replaces HOST, the 40+ year-old legacy automation system infrastructure that supports high-altitude air traffic management. ERAM also serves as a foundational platform for NextGen capabilities. ERAM will facilitate the evolution of the National Airspace System (NAS) to trajectory based operations and will incorporate future NextGen capabilities, including en route automation processing necessary for other programs.

The FAA anticipates $5.4 million in unavoidable increases to rents, renewals of expiring leases, costs of guard services, taxes and costs for operating and maintaining its facilities. The request also includes $19.3 million for costs associated with our Southwest Regional Office Service Center building in Fort Worth, TX. Requested funds will provide the balance of the non-GSA related items like furnishings, equipment, and communications required for moving personnel into this new facility.

The FAA's Office of Finance and Management (AFN) continues to move forward in meeting the objectives identified in the Foundation for Success, consolidating operations under a more streamlined and efficient Shared Services business model. Our new organization is already helping FAA to operate more nimbly while avoiding duplication of effort. AFN has already made significant gains in shaping the organization, and is optimizing the structure of each of its four functional areas. As we progress forward with Shared Services, we expect the information technology component to yield the most dramatic efficiencies. To that end, our budget request includes a base transfer to consolidate multiple information technology units in FAA lines of business and staff offices into a single centralized IT shared services organization in alignment with the Federal Information Technology Shared Services Strategy policy. This Shared Service initiative that began in FY 2012, and will continue into FY 2014 and beyond, will establish an information services organization that will respond faster and more cost effectively to the evolving nature and adaptive capabilities of IT. The IT Shared Services effort will continue consolidating IT systems to achieve cost reductions by eliminating redundant and parallel systems within the Agency. This proposal moves approximately $213 million and 577 staff from the Air Traffic Organization, Office of Aviation Safety, Office of Commercial Space Transportation, Office of Human Resources Management, Office of Chief Counsel, and Office of Security and Hazardous Materials Safety into the Office of Information Services under the Assistant Administrator for Finance and Management.

Finally, FAA requests authority to increase the safety oversight activities within the Office of Commercial Space by converting contractors to federal employees (3 FTEs).

Facilities & Equipment (F&E)

The budget allows FAA to meet the challenge of both maintaining the capacity and safety of the current National Airspace System (NAS) while keeping our comprehensive modernization and transformation efforts moving forward. The FY 2014 request of $2.8 billion represents a 1.7 percent increase from the FY 2012 enacted level.

The F&E NextGen portfolio is $928 million in FY 2014, a 7.5 percent increase above the FY 2012 enacted level. This funding provides FAA with the resources needed to continue our ongoing NextGen modernization activities, including nation-wide Automatic Dependent Surveillance – Broadcast (ADS-B) deployment, and adding ADS-B service to the Gulf of Mexico and the Oceanic environments. In addition, funding is requested for follow-on ERAM software development for future NextGen capabilities and publication and accelerated development of Precision Based Navigation (PBN) procedures that will provide greater flexibility in the NAS and to facilitate more dynamic management of air traffic. An overview of NextGen is below and a fuller detailed discussion of the NextGen effort is included in Section 6 of this submission.

The remainder of our investment – representing over $1.8 billion – will be in legacy areas, including aging infrastructure, power systems, information technology, navigational aids, and weather systems. To support NextGen's mid-term goals, the Terminal Automation Modernization/Replacement (TAMR Phase 3) program will deploy Standard Terminal Automation Replacement System (STARS) hardware and software to continue the convergence to a single Terminal Automation platform. In addition, the FY 2014 funding request will continue the deployment of ERAM to achieve all Operational Readiness Dates (ORDs) by August 2014.

Research, Engineering & Development (RE&D)

The FY 2014 request of $166 million is a $1.5 million (1.0 percent) decrease from the FY 2012 enacted level. This supports FAA's continued work in both NextGen and other research areas such as fire safety, propulsion systems, advanced materials, aircraft icing, and continued airworthiness.

The RE&D NextGen portfolio is $61.4 million, an increase of $1.6 million above the FY 2012 enacted level, and supports NextGen-specific research into wake turbulence, human factors, and clean aircraft technologies. This includes $12 million for the Joint Planning and Development Office (JPDO) to continue their leadership in coordinating interagency initiatives.

The FAA has an integrated, performance-based plan to ensure that research and development (R&D) investments are well managed, deliver results, and address national aviation priorities. This plan integrates the FAA R&D programs into a portfolio that addresses the near-, mid-, and far-term research needs of the aviation community. The plan is based on three central FAA R&D principles (Improve Aviation Safety, Improve Efficiency, and Reduce Environmental Impact) that align with the National Science and Technology Council (NSTC) National Aeronautics Research and Development Plan.

The FAA's System Safety Management Program will provide an infrastructure that enables the free sharing and analysis of safety information provided by government and industry sources. This program offers methodologies, research studies, and guidance material to systematically assess potential safety risks and apply proactive solutions to reduce aviation accidents and incidents. The program also conducts operational research and analysis to maintain or improve safety and to improve terminal area efficiency.

FAA must meet our nation's growing need for UAS. Our RE&D request continues to support this critical area, providing $7.5 million to conduct research on UAS technologies which directly impact the safety of the NAS. The program is focused on sense and avoid and command and control requirements that will support the safe integration of UAS in the NAS within the 14 Code of Federal Regulations regulatory framework.

The NextGen Alternative Fuels for General Aviation program is funded at $5.6 million in order to support the recommendations of the Unleaded Avgas Transition Aviation Rulemaking Committee. The Environment and Energy program (including NextGen) is funded at $33.5 million. This program supports a range of activities, including research to mature certifiable clean and quiet aircraft technologies, and develop sustainable fuels. The program also supports enhanced NextGen environmental research via the Continuous Low Energy, Emission and Noise (CLEEN) program and other vehicles.

Grants-in-Aid for Airports

Airports remain a critical part of the aviation system infrastructure. Our FY 2014 request provides the funding needed to ensure safety, capacity, and efficiency at our nation's airports through a combination of grant funding and an increase in Passenger Facility Charges (PFCs). Our $2.9 billion request supports our continued focus on safety-related development projects, including runway safety area improvements, runway incursion reduction, aviation safety management, and improving infrastructure conditions.

The 2014 Budget proposes to lower AIP to $2.9 billion, offset in part by eliminating passenger and cargo entitlement funding for large hub airports. The Budget would also allow all commercial service airports to increase revenue through an increased PFC that provides them greater flexibility to generate their own revenue. The Budget provides FAA sufficient AIP resources to focus federal grants to support projects of high priority and aviation benefits in smaller commercial and general aviation airports that do not have access to additional revenue or other outside sources of capital.

The FAA requests $106.6 million for Personnel & Related Expenses, an increase of $5.6 million over the FY 2012 enacted budget. This increase provides additional Field Safety and Standardization Personnel to improve airport safety through implementation of SMS, conducting wildlife hazard assessments or site visits at general aviation airports, and improvements to runway safety areas. The requested increase also provides the funding necessary to redevelop the System of Airports Reports (SOAR), which is essential for the FAA to manage airports programs including the Airport Improvement Program (AIP), Passenger Facility Charge (PFC) program, and the National Plan of Integrated Airport Systems (NPIAS).

The budget also provides $29.5 million for Airport Technology Research to support enhanced safety and pavement research efforts and conduct noise studies, and $15 million for Airport Cooperative Research.

War Risk Insurance

The FY 2014 budget proposes that we work with the insurance companies and air carriers to build private capacity to insure against war risk occurrences. Our co-insurance proposal would build this private capacity through a transition period where risk is shared between FAA and private insurers. In the first year of transition, FAA would bear the majority of the risk, easing private insurers back into the market.

Private parties would play a large role in setting terms, conditions and pricing of coverage under the proposed arrangement. Air carriers and insurers would have flexibility to develop terms and conditions that meet the carriers' needs while enabling the insurers to offer coverage at affordable prices. The FAA is ready to work with insurers and carriers to find parameters that make for viable coverage under this proposal.

Under the co-insurance proposal, FAA and commercial insurance providers would jointly underwrite a common policy. In the case of a claim, FAA would pay an established fraction of the losses (for example 80 percent), and a commercial insurance company would pay the remainder (for example 20 percent). Air carriers would be free to negotiate the charge for the commercial fraction of the coverage with the insurance company. For FAA's share of the risk, FAA would charge the lesser of the current cap and a rate proportional to what the commercial insurance company is charging under the same policy.

NextGen

NextGen is not a single program. It encompasses many programs, systems, and procedures, at different levels of maturity. Some are being deployed now, some are in development and nearing deployment, and still more are being defined as the technology necessary for them becomes available. NextGen is a transformative change in the management and operation of how we fly. NextGen enhances safety, reduces delays, expands air traffic capacity, saves fuel and mitigates aviation's impact on the environment while ensuring the highest levels of safety.

This comprehensive initiative, which is already providing benefits, integrates new and existing technologies, including satellite navigation and advanced digital communications. Airports and aircraft in the NAS will be connected to NextGen's advanced infrastructure and will continually share real-time information to provide a better and safer travel experience.

This budget supports continued progress on our NextGen efforts. The entire FY 2014 NextGen portfolio totals $1.002 billion distributed among F&E programs ($928.1 million), Research, Engineering & Development programs ($61.4 million) and Operations activities ($12.6 million). This investment portfolio reflects an increase of $67.2 million, or approximately 7 percent, above the FY 2012 enacted level. This level of program funding enables the FAA to continue to support near-term NextGen commitments in a budget-constrained environment.

While the thrust of our work focuses on U.S. airports, airspace and aircraft, the FAA actively engages with global aviation partners to ensure operators receive benefits anywhere in the world.

One immediate benefit to the public is the NextGen Metroplex initiative. The FAA is working to improve the efficiency of airspace above congested metropolitan areas by designing precise GPS routes that will accelerate benefits while reducing bottlenecks and congestion. These routes will enhance safety and efficiency, and foster the flow of commerce. We are already making great progress in Houston, Atlanta, Charlotte, California, north Texas and in metropolitan Washington, D.C. Satellite-based navigation is expected to cut a total of seven million nautical miles from flight plans around these cities each year. These shorter routes, together with gradual descents that cut back on engine power, are projected to save at least 22 million gallons of fuel. For these cities, this represents total reduction in carbon emissions of 220,000 metric tons. That is the equivalent of removing more than 43,000 cars from the streets. We are accelerating these significant changes to our airspace, to complete in three years what would normally take five to 10 years to complete.

FY 2014 will see the continuation of NAS-Wide deployment of the lauded Automatic Dependent Surveillance–Broadcast (ADS-B), the cornerstone of our transformation to satellite enabled, GPS-based navigation. We expect the total complement of about 700 radio stations to be in place and operating by early 2014. FY 2014 funding is also included for the development of ADS-B software requirements for the Advanced Technologies and Oceanic Procedures (ATOP) automation platform.

In December 2011, the FAA announced contract awards to analyze fuel quality control procedures, conduct engine durability tests with alternative fuels and perform key testing to support qualification and certification of jet biofuels from alcohols, organic matter and other renewable materials. We expect these activities to support the next round of fuel approvals, scheduled to begin in 2014.

The business case for our NextGen investment has become a reality. Performance-based navigation offers better routes, added capacity, improved on-time performance, and lower fuel bills. NextGen will ultimately yield vast savings and efficiencies for both our nation and aviation industry. The FY 2014 budget request reflects FAA's unwavering commitment to delivering on the promise of NextGen. Our investment in NextGen is already yielding benefits, as demonstrated in the following examples:

- In the Gulf of Mexico, ADS-B-equipped helicopters cut 5-10 minutes off flight time, saving about 100 pounds of fuel per flight.
- JetBlue Airways has partnered with us to equip some of its aircraft with ADS-B so we can collect data from real world use of this technology. Its A320s will fly more direct routes from Boston and New York to Florida and the Caribbean.
- Airlines flying across the Pacific will be able to use a combination of improved capabilities to save an estimated 200 to 300 gallons of fuel per flight.
- We've estimated that NextGen will reduce total flight delays about 38 percent by 2020, while providing $24 billion in cumulative benefits to the traveling public, aircraft operators, and the FAA.
- Aircraft owners will save about 1.4 billion gallons of fuel by 2020, reducing carbon dioxide emissions by 14 million tons.

NextGen's contribution to our nation's economic recovery and future leadership is critical. We recognize the fiscal challenges our nation faces. America's future demands that we continue to invest in modern technologies that pave the way for tomorrow's capabilities. We continue to work in full partnership with industry, other agencies and departments, and with our labor groups to achieve a shared vision, leveraging powerful technologies and setting new standards for the future of global aviation.

Joint Planning and Development Office (JPDO)

JPDO ensures efficient coordination and collaboration among NextGen partner agencies, and reinforces agency accountability for NextGen through agency plans and reports that complement the long-term strategic plan. It addresses key interagency priorities identified by the Cabinet-level Senior Policy Committee for NextGen. This office maintains a future focus and is designed to provide the broader perspectives and insights that are necessary for Department decision-makers to review and assess NextGen investment and policy decisions.

Today, the JPDO continues to lead NextGen by overseeing research and development on that system and coordinating aviation research programs to achieve more effective and directed programs resulting in applicable research. During FY 2012, through careful management of multi-year research funds, the JPDO was able to retain all federal employees and to execute a few activities through the year. The JPDO's efforts have resulted in a national approach to complex NextGen related issues and reduced duplicative efforts which ultimately leads to cost savings.

The $12 million request for FY 2014 enables JPDO to continue coordinating goals, priorities and research activities within the federal government for NextGen and UAS integration. JPDO will continue leading efforts with NextGen partners to monitor execution of a national plan to achieve the integration of UAS into our airspace. JPDO will also continue to facilitate transfer of technology and review research activities such as those related to safety, weather, environment, and secure data exchange. Safety of trajectory-based operations is a research focus for FY 2014. In carrying out its plans, JPDO will ensure participation by the public and consult with stakeholders from the private sector. A more detailed overview of JPDO is provided in Section 7 of this submission.

Immediate Transportation Investment

The budget requests the enactment in FY 2014 of the President's Immediate Transportation Investment initiative to put Americans back to work while rebuilding and modernizing America's roads, rails and airports. This initiative includes $1 billion to support NextGen efforts and $2.0 billion to fund additional projects in the Airport Improvement Program (AIP).

While many aircraft flying today are equipped to fly in fast lanes, the current airspace design and infrastructure essentially keeps all the traffic in the local lanes. In order to provide better use of airspace, FAA needs to design the interconnecting system, develop efficient on and off ramps, establish the supporting infrastructure, and publish the maps that will allow aircraft to take advantage of 21st century technologies already available in their cockpits. The $1.0 billion provided by the Immediate Transportation Investment will accelerate delivery of this infrastructure, including significant investments in the areas of Future Facilities and NAS-Wide ADS-B Implementation.

Most of the Airport Improvement Program funding will be used for runway construction and other airport improvement projects aimed at increasing overall system efficiency in the future. Airports in all size categories are eligible to compete for the $2.0 billion in one-time funding.

To more equitably distribute the cost of air traffic services across the aviation user community, the Budget proposes to establish a new $100 per flight surcharge for air traffic services. Military aircraft, public aircraft, piston aircraft, air ambulances, aircraft operating outside of controlled airspace, and Canada-to-Canada flights would be exempt from the surcharge. In a challenging budget environment, we believe it is essential that those who benefit from our world-class aviation system help pay for its ongoing operation. This is consistent with recommendations from the President's deficit reduction commission. And we want to ensure that everyone is paying their fair share. To ensure appropriate input from stakeholders on the design of the fee, the proposal would also establish an expert Commission that could recommend to the President a replacement charge, or charges, that would raise no less in revenue than the enacted fee.

Cost Savings and IT Reinvestment

Our budget reflects our ongoing commitment to realizing cost efficiencies and avoidance. We have taken a hard look at our organizational structure, and we are making changes to create a more streamlined and efficient agency. The FAA is continuing to implement cost-cutting measures in the non-mission critical areas identified in the Campaign to Cut Waste, and to implement sound IT reinvestment strategies.

The FAA has taken aggressive measures to support the President's Campaign to Cut Waste. We have scrubbed our organizational processes to further promote efficient spending practices. This effort will reduce overall FAA spending in the areas of travel, information technology, printing, contracts, supplies, and equipment by $114 million between FY 2010 and FY 2013. In fact, in just 1 year – from FY 2010 to FY 2011 – FAA reduced its total travel expenses by 17 percent and its non-mission critical travel expenses by 30 percent. At the same time, we also reduced spending in certain classes of supplies by 21 percent.

The FAA remains committed to reducing spending on support contracts by 20 percent from the FY 2010 baseline. We have issued targets to individual offices within the agency, requiring that non-NAS advisory contract spending be held to levels that allow the agency to achieve its planned reduction such spending. The FAA program offices will review support contracts to explore efficiencies and to consolidate contractual requirements.

The FAA is performing a comprehensive review of our vehicle fleet requirements. We are pleased to report a projected decrease in our fleet inventory of 333 leased vehicles by FY 2014. This represents a reduction of 7.6 percent from our total FY 2012 inventory of 4,739 vehicles. It is relevant to note that the FAA is also "greening" our fleet, and that the majority of reductions to our vehicle inventory are SUVs (118) and trucks (193).

We have practiced enhanced conference oversight since FY 2010, with controls in place to safeguard effective use of taxpayer resources. For instance, we require Chief Financial Officer (CFO) review for any function exceeding $100,000 in cost, and all events with 20 or more people traveling outside their duty station have required direct approval from our Chief of Staff since March 2010. We have recently elevated that approval level to the Administrator. Along with reduced conference attendance requirements, our substantial savings in travel are being sustained through more extensive use of video conferencing.

As part of the drive to streamline software licensing and cut costs, FAA has commissioned a Software Agreements Work Group to achieve effective management of all software agreements in the FAA by FY 2014. The objectives are to provide standardization and rigor around the management of FAA software agreements and to save money.

The Software Agreements Work Group plans to centrally manage IT Software Agreements; establish a Software Agreement Service and Office, establish an accurate software agreement inventory with tools that provide easy search and access to agreement information, develop guidance for expiring agreements, develop a cost model for opportunity analysis, develop a software agreement negotiation strategy, improve collaboration with acquisition to streamline software purchases, mature software agreement processes to ensure adequate oversight of the software agreement lifecycle, and conduct a pilot to identify FAA-wide software licensing contract savings opportunities. We believe that the FAA can achieve up to 10 percent savings agency-wide in FY 2013 by optimizing software utilization and avoiding over-provisioning licenses.

The SAVES IT contracts have provided the FAA considerable cost savings, including an average of 34 percent in FY 2010 and 33 percent in FY 2011 over the cost of buying hardware and software and office supplies and equipment prior to the contracts. The FAA has used these strategic sourcing contracts for the purchasing of personal computing devices (laptops, tablets, workstations). The FAA documented savings of 33 percent in FY 2011 and 19 percent in FY 2012 against GSA prices for the same items. In FY 2012, the FAA has awarded five new SAVES IT hardware contracts to replace the expired contracts and the BPA. This effort aimed to reduce procurement costs and provide better insight into the IT commodities that are being purchased.

Implementing DOT's Strategic Goals

Safety

Safety is FAA's primary mission and our FY 2014 budget request reflects this most important of strategic objectives. The FAA will continue to focus resources on helping air travel become even safer. We have identified and eliminated many of the major risks in the system and we will continue to act on the remaining safety challenges and keep air travelers safe. Approximately 48 percent of our FY 2014 budget will be required to maintain and improve the agency's safety programs. Our day-to-day operations in the four key programs of Air Traffic, Aviation Safety, Airports, and Commercial Space Transportation contribute toward a reduction in air transportation related injuries and fatalities.

The FAA's implementation of a Safety Management System (SMS) is a critical component of our overall approach to safety. SMS is a systematic and continuous management process based on proactive identification of hazards and analyses of their risk. SMS gives us the foundation to gather information that takes safety to the next level. Our Aviation Safety Information Analysis and Sharing (ASIAS) team gathers crucial safety information data sources and uses sophisticated analysis tools to detect trends, identify precursors, and assess risks. We are pushing the science of advanced data analysis, developing cutting-edge tools to find emerging threats, as well as identifying previously undiscovered risks that are buried in terabytes of safety information.

Aviation safety inspector staff are key to leveraging standardized SMS processes to implement an integrated, risk-based method of oversight while supporting FAA's efforts in rulemaking, certification, and outreach activities that will move NextGen forward. This budget pays for safety inspectors who inspect the latest generation of innovative aircraft that Americans are building.

The FAA Safety Priority Goal for FY 2013 is to reduce risk of aviation accidents. We will reduce aviation fatalities by addressing risk factors both on the ground and in the air. The two key indicators for this Priority Goal are (1) Reduce commercial aviation air carrier fatalities to no more than 7.4 per 100 million persons on board in FY 2013 and (2) Reduce the general aviation fatal accident rate per 100,000 flight hours to no more than 1.06 in FY 2013. We achieved the target for the Commercial Air Carrier Fatality Rate with no fatalities in FY 2012. Although we did not meet the target for the General Aviation Fatal accident rate in FY 2012, the rate has improved from the FY 2009 result.

The FAA will continue to work on focus areas for reducing aviation related injuries and fatalities, such as in the air tour industry and Helicopter Emergency Medical Services (HEMS). Flying in inclement weather or in instrument conditions, even in a properly equipped aircraft with a properly rated pilot, increases risk. The HEMS weather tool was enhanced in 2012 to provide additional altitude and location specific data to increase safety. The FAA will collaborate with NASA to develop measurement technology and forecast capability of the high ice water content conditions that represent a critical safety hazard.

Finally, FAA reduction of runway incursions continues to be included as an important safety measure. Reducing the number of runway incursions lessens the probability of accidents that potentially involve fatalities, injuries, and significant property damage. As such, we place a high priority on initiatives that sustain and build on our progress in reducing runway incursions. In FY 2012, our target was to reduce the most serious runway incursions (category A&B) in all airports to a rate of no more than 0.395 per million operations. We met our goal by achieving a rate of 0.356 runway incursions. For FY 2013, the target remains to reduce the most serious runway incursions to a rate of no more than 0.395 per million operations. So far this year we have had no serious runway incursions. We continue to implement ambitious training programs for pilots, controllers and airport operators. We will implement solutions through technologies and advanced programs such as Runway Status Lights, Airport Surface Detection Equipment and new airport design standards. We will also continue to improve upon existing technologies like Engineered Materials Arresting Systems, which safely stop aircraft overruns. The Runway Incursion Reduction Program remains a catalyst for the acquisition of promising safety technologies that have reached a level of maturity appropriate for transition and implementation into the NAS.

Although the vast majority of runway incursion events pose no danger to the safety of passengers, each one is still documented and analyzed as a potential precursor of more serious events. It should be noted that the increase in total runway incursion events may be due, in part, to an increase in reporting. The recent increase in the number of events aligns with the transition to a non-punitive reporting system that encourages air traffic controllers to self-report mistakes. Also, our runway safety outreach to FAA staff, airports and the pilot community has elevated awareness of surface navigation procedures, which may also be contributing to an increase in reporting. But while the total reported number of incursions may have increased, over the past five years we have achieved a dramatic reduction in the most serious runway incursions. Pilot deviations continue to be the main source of incursions, followed by vehicle/pedestrian deviations and operational errors/deviations.

The FAA continues to oversee and enable the safe development of the commercial space transportation industry. The Administration's 2010 National Space Policy establishes specific goals to strengthen stability in space by, among other things, promoting safe and responsible operations in space. Our FY 2014 budget request enables FAA to perform the activities necessary to maintain our spotless safety record in the rapidly developing industry of commercial human space flight. The FAA will develop safety requirements, policies, processes and procedures to address and safeguard this burgeoning industry.

The FAA's 2014 budget supports continued aviation safety research, focusing on critical areas such as unmanned aircraft systems, fire and structural safety, and airworthiness. It further supports enhanced safety and pavement airport technology research. Weather systems research continues in naturally occurring atmospheric hazards including turbulence, severe convective activity, aircraft icing, and restricted visibility.

Aviation safety initiatives supported by this request will improve professional development, leadership training, and standardized qualifications and experience requirements for Part 121 air carriers flight crewmembers; continue to implement a safety management system; expand capabilities within the Aviation Safety Information Analysis and Sharing program; and continue the establishment of a database matching program with other federal entities to identify airmen who have intentionally falsified their Application for Airman Medical Certificate.

State of Good Repair

As good stewards of our aviation system, we apply asset management principles proactively to maintain and modernize our airport runways. We recognize 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. Delaying infrastructure investments today means that the long term cost to our nation – to our passengers and our environment – will far exceed the cost of going forward with the technology.

Airport infrastructure, particularly airfield facilities, is exposed to constant heavy use and harsh environmental conditions. Runways, taxiways, and aprons are designed to withstand the heavy equipment that operates on them, but even this infrastructure requires frequent maintenance and rehabilitation in order to keep it in good working condition. Runways and taxiways must be kept clear of snow, ice, and ponding water that can jeopardize aircraft directional control or braking action. Chemicals and plowing, as well as freeze-thaw cycles, all take a toll on runways, taxiways, and other paved areas. The smallest bit of broken asphalt or concrete can represent a major safety hazard to aircraft.

We have had a target to ensure that 93 percent of runways are in good condition for the past several years, and we have exceeded that goal, most recently reaching 97.4 percent. AIP grants 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. By continuing to surpass this target we are not only achieving the goal of a state of good repair, but we are also contributing to our overall primary goal of safety.

Economic Competitiveness

Our most critical investment for economic competitiveness is NextGen. The concept is simple: NextGen is a set of technologies, processes, procedures and policy that together will revolutionize how people fly. It is a transformation from ground-based radar to satellite control and navigation. It is a game changer for the controller, the pilot, and the passenger. If we want to get maximum return on the investment and support unconstrained market growth in aviation, we must take an aggressive approach to upgrading our infrastructure to maximize the benefits of NextGen. At some point, keeping the legacy systems going becomes more costly than replacing them with new technologies.

NextGen involves the total overhaul of our National Airspace System to make air travel more convenient and dependable while ensuring our stakeholders have the safest and most secure flights possible. It is the integration of new systems, new procedures, new aircraft performance capabilities, renewable fuels, new supporting infrastructure, and a new way to do business as the air transportation system.

The NextGen portfolio of investments focuses on the implementation and integration of key NextGen transformational technologies. The capabilities these technologies provide begin a shift of information flow from the ground to the cockpit. These include: Automatic Dependent Surveillance-Broadcast (ADS-B), System Wide Information Management (SWIM), Data Communications, NextGen Network-Enabled Weather (NNEW), and NAS Voice Switch (NVS).

Our NextGen efforts further include supporting Performance-Based Navigation (RNAV/RNP) between select metropolitan areas. Deployed over a three-to-four year period, these high-altitude performance-based routes will provide increased efficiency and flexibility to the aircraft using them, as well as significant savings in fuel usage.

We have already seen the benefits of implementing ADS-B in the Gulf of Mexico. For example, helicopters are saving about 100 pounds of fuel per ADS-B-IFR flight. We have also seen an approximate operational time savings of 10 percent in instrument flight rules (IFR) operations.

The FAA FY 2013 ERAM Priority Goal is to replace a 40-year old computer system serving 20 air traffic control centers with a modern, automated system that tracks and displays information on high altitude planes. ERAM enables FAA to maximize its use of airspace, substantially increase the number of flights that can be tracked and displayed, and enhance its back-up capability. We anticipate meeting this priority goal by achieving initial operating capability at eleven more En Route Centers in FY 2013, bringing the cumulative total to all twenty Centers by year's end.

Environmental Sustainability

Environmental protection and addressing the energy challenge are vital elements to ensure continued domestic air transportation viability and global leadership. We are continuing efforts to reduce greenhouse gas emissions, improve water use efficiency, prevent pollution, and improve building energy consumption.

Noise, air quality, climate, and energy are the most significant potential environmental constraints to increasing aviation capacity, efficiency, and flexibility. We contribute to DOT's environmental sustainability outcomes to:

- Reduce transportation-related carbon emissions, improved energy efficiency, and reduction in use of oil in the transportation sector and
- Reduce transportation-related air, water and noise pollution and impacts on ecosystems.

Satellite-based technologies are revolutionizing aviation. Aircraft will be safer, quieter, more efficient, burn less fuel and emit fewer greenhouse gases. There is a strong business case for NextGen that many companies have already embraced. Several airlines are benefiting by using more flexible routes that save fuel. Savings are being achieved because of better data communications and excellent cooperation among international users. Planes can safely change paths in order to catch a good tail wind across the ocean. We are promoting new technologies to reduce fuel burn and fuel costs and to decrease our carbon footprint.

We also need to find alternatives to petroleum-based fuels. For the past five years, the FAA in conjunction with industry, academia and other government agencies has been performing research on alternative fuels. Sustainable alternative fuels offer benefits for both our environment and our economy. They can help stabilize supply and the cost volatility in the jet fuel market.

We are committed to managing aviation's growth while reducing the negative impacts of aviation noise and air emissions. Through increased efforts on the Continuous Lower Energy, Emissions, and Noise (CLEEN) initiative, FAA will develop and mature clean and quiet technologies and advance alternative fuels. The Commercial Aviation Alternative Fuel Initiative (CAAFI) is moving forward to qualify and approve new aviation alternative fuels for operational use.

The budget request supports identifying and exploring advances in communication, navigation and surveillance technology to advance aircraft arrival and departure, surface movements, and en route/oceanic procedures for reduced noise, fuel burn, and engine emissions. It also supports updating and enhancing the Voluntary Airport Low Emissions (VALE) Program so that airports located in non-attainment or maintenance areas for National Ambient Air Quality Standards will have continued opportunities to reduce air emissions.

In addition, we are working to mitigate noise impacts for thousands of people in 65 day/night sound level or DNL (the energy-averaged sound level metric used by the aviation industry to determine the impact of noise) areas through ongoing noise compatibility efforts, which include the purchase and relocation of residences and businesses, the soundproofing of residences and buildings used for educational or medical purposes, the purchase and installation of noise barriers or monitors, recommended land use planning, and public outreach.

Organizational Excellence

The 2014 budget request provides for a capable leadership and a dynamic, well-trained workforce that possess the vital resources and reliable data necessary to support the continued success of FAA's mission for safety and efficiency. It further includes enhanced cost control measures to ensure savings that can be effectively managed to fund mission critical initiatives.

One of the key challenges we face is building the workforce of the future to meet the transition of NextGen. Effecting this transition will involve a systematic approach to getting the right number of people with the right skills, experience and competencies in the right jobs at the right time.

We will continue to ensure adequate numbers of safety inspectors and air traffic controllers. Workforce planning for mission critical and key occupations will benefit our managers as they make staffing decisions to achieve program goals based on a rigorous analysis of their organization's activities, workforce and expected technological advances. The flying public will benefit from a better prepared and well-trained workforce.

The FAA is delivering programs that build leadership capabilities, support professional development and promote continuous learning at executive, manager and employee levels. The development of our executive corps is grounded in creating a culture of accountability and professionalism. Building stronger leadership within the agency helps us to achieve strategic goals and manage people and resources effectively while driving continuous improvement.

Part of our organizational excellence goal is to protect agency IT assets from cyber-attacks, to ensure alignment between IT investment and agency business needs, and to provide certain enterprise-wide shared services. The FAA's Cyber Security Management Center (CSMC) is a core component of our overall Information Security Services. The CSMC is tasked with protecting DOT-wide information infrastructure using advanced cyber defense strategies. The CSMC works to enhance our architecture to include cyber security, to harden individual systems and networking elements, improve recover rate times, and enhance boundary protection by completing remediation of vulnerabilities, improved information sharing, and systemic monitoring of systems.

The FAA is continuing our IT Shared Services efforts. Throughout FY 2013 we have been continuing our efforts in implementing Information Technology Shared Services within the FAA in order to transform our IT service delivery to be more customer-driven, enterprise-centric and more efficient. One effort FAA is making towards improving efficiency and reducing IT costs is the transition to cloud computing. Another IT project we are working toward is the deployment of a new email system that will offer enhanced messaging, collaboration, mobility and communications capabilities.

The budget request supports activities to remediate moderate vulnerabilities identified for our information systems that support Human Resources, Finance, Security/Safety, and Air Traffic services. In the last few years, we have focused on high risk vulnerabilities. Now the focus is on remediating the moderate vulnerabilities. The request will cover contracts that will conduct information system assessments, certifications, recertifications, and risk mitigation activities. The funding will allow FAA to handle risks to its information systems sooner, which will save out-year dollars and prevent higher and more costly system vulnerabilities and remediations. We are defining strategies for improving mobility services that will provide the workforce with increased access to information. We continue our efforts on consolidating in community areas such as help desk, service contracts, and license agreements.

The FY 2014 budget request supports continued efforts to manage our acquisitions responsibly so we deliver programs on time and on budget. In addition, we continue to implement Real Property Asset Management to ensure that surplus assets are disposed in a timely manner. Since the start of the initiative in 2006, FAA has disposed approximately 13,000 assets with a replacement value of $520 million. Savings resulting from the disposition of property have been applied towards future disposition efforts, as well as updates, upgrades, repairs, and renovation of current assets.

Conclusion

The overall health of the U.S economy is highly dependent on the aviation industry. Civil aviation contributes roughly $1.3 trillion annually to the national economy and constitutes 5.2 percent of the gross domestic product. Aviation generated more than 10 million jobs, with earnings of $394 billion.

Aviation enables the economic benefits of tourism, shipping and travel for business or pleasure. Through our airports, it delivers economic impact to large and small communities across our Nation. The ongoing implementation of NextGen technologies, policies and procedures, will support the continued economic growth in the aviation industry and our country. The FAA's FY 2014 budget request will enable us to continue to protect and expand this vital economic engine, while fulfilling our mission of providing the safest and most efficient aerospace system in the world.

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EXHIBIT I-A
ORGANIZATION CHART
FY 2013

- **Office of the Administrator and Deputy Administrator** — FY 2013 20 FTE / 20 FTP
  - Total FAA FY 2013 45,646 FTE / 45,836 FTP
- **Director for Audit & Evaluation** — FY 2013 19 FTE / 19 FTP
- **Director for the Joint Planning & Development Office** — FY 2013 11 FTE / 11 FTP

- **Air Traffic Organization** — FY 2013 33,325 FTE / 33,342 FTP
- **Assistant Administrator for Human Resource Management** — FY 2013 578 FTE / 601 FTP
- **Assistant Administrator for Civil Rights** — FY 2013 77 FTE / 80 FTP
- **Assistant Administrator for Communciations** — FY 2013 31 FTE / 34 FTP
- **Associate Administrator for Aviation Safety** — FY 2013 7,630 FTE / 7,631 FTP
- **Assistant Administrator for Government & Industry Affairs** — FY 2013 10 FTE / 10 FTP
- **Assistant Administrator for Security & Hazardous Material Safety** — FY 2013 490 FTE / 504 FTP
- **Associate Administrator for Commercial Space Transportation** — FY 2013 73 FTE / 75 FTP
- **Assistant Administrator for Finance and Management** — FY 2013 1,445 FTE / 1,518 FTP
- **Assistant Administrator for Policy, International Affairs & Environment** — FY 2013 150 FTE / 172 FTP
- **Associate Administrator for Airports** — FY 2013 589 FTE / 602 FTP
- **Assistant Administrator for Next Generation Air Transportation System** — FY 2013 954 FTE / 955 FTP
- **Office of Chief Counsel** — FY 2013 244 FTE / 262 FTP

EXHIBIT I-B
ORGANIZATION CHART
FY 2014

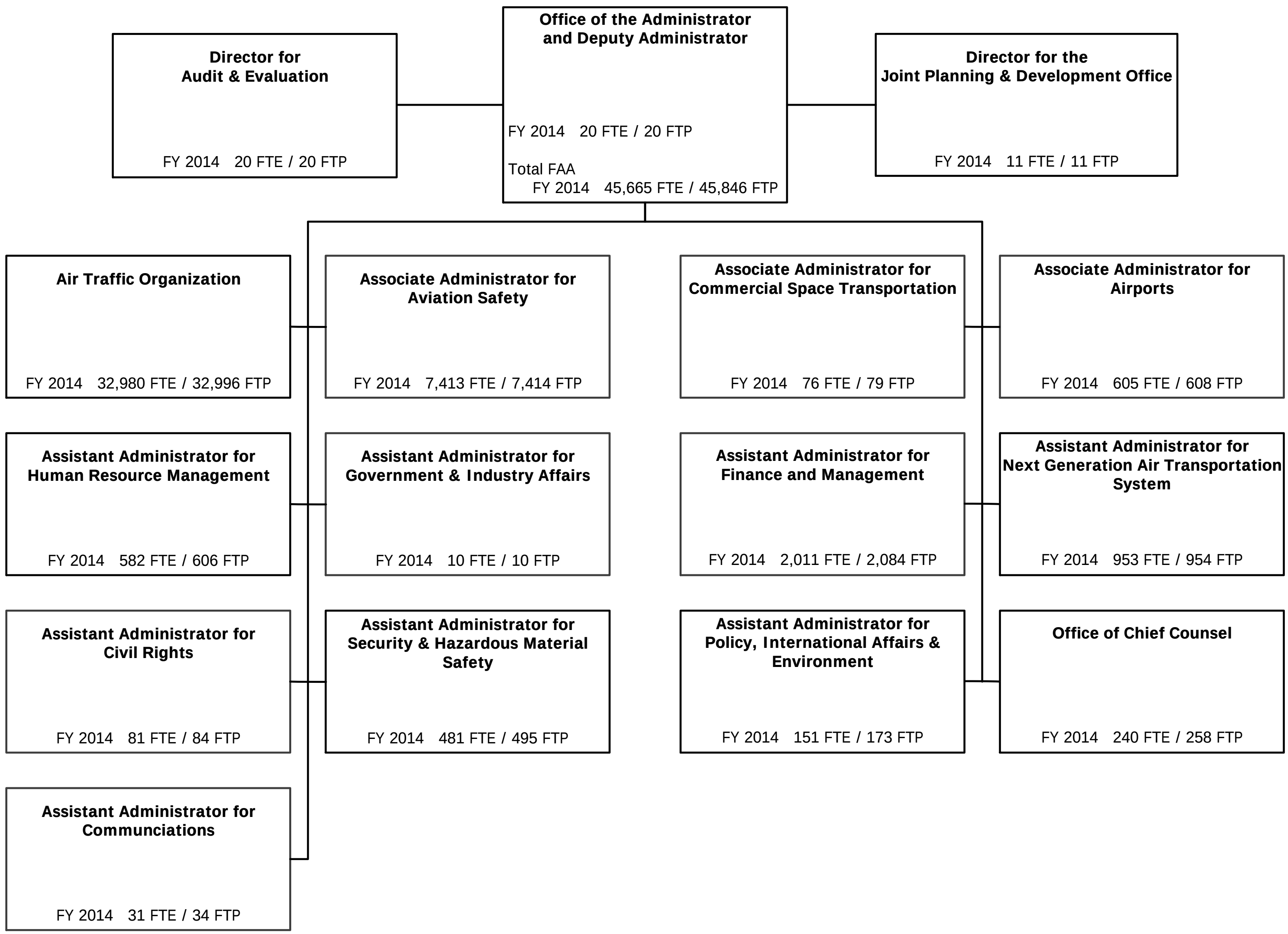

EXHIBIT II-1

FY 2014 COMPARATIVE STATEMENT OF NEW BUDGET AUTHORITY
FEDERAL AVIATION ADMINISTRATION
($000)

ACCOUNT NAME	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
Operations	$9,653,395	$9,712,474	$9,707,000
Rescission			
Subtotal	**$9,653,395**	**$9,712,474**	**$9,707,000**
Facilities and Equipment	$2,730,731	$2,747,443	$2,777,798
Hurricane Sandy Emergency Supplemental		$30,000	
Rescission			
Subtotal	**$2,730,731**	**$2,777,443**	**$2,777,798**
Research, Engineering and Development	$167,556	$168,581	$166,000
Rescission			
Subtotal	**$167,556**	**$168,581**	**$166,000**
Grants-in-Aid for Airports			
Contract Authority (AATF)	$3,350,000	$3,350,000	$3,350,000
Cancellation			($450,000)
Subtotal	**$3,350,000**	**$3,350,000**	**$2,900,000**
Obligation Limitation [Non-Add]	[$3,350,000]	[3,370,502]	[$2,900,000]
Overflight Fees	$50,671	$126,000	$116,000
Overflight Fees (Transfer to EAS)	($50,000)	($50,000)	($116,000)
Aviation User Fees, Appropriation Temporarily Reduced		($76,000)	
	---------------	---------------	---------------
TOTAL	**$15,902,353**	**$16,008,498**	**$15,550,798**
Appropriations	$15,902,353	$16,008,498	$16,000,798
Rescissions	$0	$0	$0
Cancellations			($450,000)
Immediate Transportation Investment			
NextGen			$1,000,000
Grants-in-Aid for Airports			$2,000,000

EXHIBIT II-2

FY 2014 TOTAL BUDGETARY RESOURCES BY APPROPRIATION ACCOUNT
FEDERAL AVIATION ADMINISTRATION

Appropriations, Obligation Limitations, and Exempt Obligations
($000)

ACCOUNT NAME	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
Operations	**$9,653,395**	**$9,712,474**	**9,707,000**
Air Traffic Organization (ATO)	7,442,738	7,489,148	7,311,790
Aviation Safety (AVS)	1,252,991	1,260,659	1,204,777
Commercial Space Transportation (AST)	16,271	16,371	16,011
Finance & Management (AFN)	582,117	585,607	807,646
NextGen (ANG)	60,134	60,502	59,782
Human Resource Management (AHR)	98,858	99,463	107,193
Staff Offices	200,286	200,724	199,801
Facilities & Equipment	**$2,730,731**	**$2,777,443**	**$2,777,798**
Engineering, Development, Test and Evaluation	435,600	438,266	392,325
Air Traffic Control Facilities and Equipment*	1,406,731	1,415,340	1,523,223
Non-Air Traffic Control Facilities and Equipment	173,100	174,159	148,600
Facilities and Equipment Mission Support	240,300	241,771	231,650
Personnel and Related Expenses	475,000	477,907	482,000
Hurricane Sandy Emergency Supplemental		30,000	
Research, Engineering & Development	**$167,556**	**$168,581**	**$166,000**
Improve Aviation Safety	89,314	89,860	90,921
Improve Efficiency	34,174	34,383	35,823
Reduce Environmental Impacts	38,574	38,810	33,521
Mission Support	5,494	5,528	5,737
Grants-in-Aid for Airports	**$3,350,000**	**$3,370,502**	**$2,900,000**
Grants-in-Aid for Airports	3,198,750	3,218,326	2,748,900
Personnel & Related Expenses	101,000	101,618	106,600
Airport Technology Research	29,250	29,429	29,500
Small Community Air Service	6,000	6,037	0
Airport Cooperative Research Program	15,000	15,092	15,000
TOTAL:	**$15,901,682**	**$16,028,999**	**15,550,798**
Immediate Transportation Investment			**$3,000,000**
NextGen			1,000,000
Grants-in-Aid for Airports			2,000,000

Note: Totals may not add due to rounding.

EXHIBIT II-3
FY 2014 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
Appropriations, Obligation Limitations, & Exempt Obligations
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
1. SAFETY STRATEGIC GOAL			
A. Reduction in transportation-related fatalities and injuries (Aviation Safety)			
a. Reduce the commercial air carrier fatalities per 100 million persons on board by 24 percent over 9-year period (2010-2018). No more than 6.2 in 2018.	7,420,690	7,207,439	6,999,593
b. Reduce the general aviation fatal accident rate to less than 1 fatal accident per 100,000 flight hours by 2018.	200,578	205,332	176,528
c. Reduce category A&B runway incursions in all airports to a rate of no more than 0.395 per million operations in FY 2013.	414,510	424,333	364,808
d. Reduce hazardous materials incidents involving death or major injury	40,490	53,046	52,554
e. Other (Maintain zero commercial space transportation accidents - FAA strategic measure)	16,750	16,697	16,442
Subtotal Aviation Safety	**8,093,017**	**7,906,847**	**7,609,924**
Total – Safety Strategic Goal	**8,093,017**	**7,906,847**	**7,609,924**
2. STATE OF GOOD REPAIR STRATEGIC GOAL			
A. Runway Pavement in Good or Fair Condition			
a. Maintain runway pavement in good or fair condition for 93 percent of the paved runways in the National Plan of Integrated Airport Systems	1,106,979	1,059,396	910,435
Subtotal Runway Pavement	**1,106,979**	**1,059,396**	**910,435**
Total – State of Good Repair Strategic Goal	**1,106,979**	**1,059,396**	**910,435**
3. ECONOMIC COMPETITIVENESSS STRATEGIC GOAL			
A. Maximum economic returns on transportation policies and investments			
a. Maintain an average daily airport capacity for Core Airports of 86,835 arrivals and departures through FY 2016	2,544,997	3,329,993	3,261,815
b. Maintain operational availability of the National Airspace System at 99.7 percent through 2016	1,665,064	1,667,726	1,640,113
Subtotal Maximum Economic Returns	**4,210,061**	**4,997,720**	**4,901,927**

EXHIBIT II-3
FY 2014 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
Appropriations, Obligation Limitations, & Exempt Obligations
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
3. ECONOMIC COMPETITIVENESSS STRATEGIC GOAL			
C. Advance U.S. Transportations Interests Abroad			
a. Other (Programs supporting FAA strategic goal - Improved Global Performance through Collaboration)	16,422	16,964	16,807
Subtotal Competitive Air Transportation System	**16,422**	**16,964**	**16,807**
Total – Economic Competitiveness Strategic Goal	**4,647,992**	**5,406,708**	**5,222,885**
4. ENVIRONMENTAL SUSTAINABILITY STRATEGIC GOAL			
A. Reduction in transportation-related carbon emissions, improved energy efficiency, and reduction in use of oil in the transportation sector			
a. Improve National Airspace system (NAS) energy efficiency (fuel burned per distance flown) by at least 2 percent per year	3,572	29,698	32,298
Subtotal reduction in carbon emissions and improved energy efficiency	**3,572**	**29,698**	**32,298**
B. Reduction in transportation-related air, water and noise pollution and impacts on ecosystems			
a. Improve aviation noise exposure from 307,420 persons in 2011 by at least 2 percent per year to less than 328,000 persons in 2016	473,064	539,911	446,932
Subtotal aviation noise exposure	**473,064**	**539,911**	**446,932**
Total – Environmental Sustainability Strategic Goal	**476,636**	**569,608**	**479,229**
5. ORGANIZATIONAL EXCELLENCE GOAL			
A. Diverse and collaborative workforce	427,121	0	0
B. Defense mobility and emergency preparedness	68,196	113,202	51,603
C. Open government	352,388	164,908	286,558
D. Improved financial management	729,352	778,331	990,163
Total – Organizational Excellence Goal Goal	**1,577,057**	**1,056,440**	**1,328,324**
6. Hurricane Sandy Relief		**30,000**	
GRAND TOTAL	**15,901,682**	**16,029,000**	**15,550,797**

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL/Outcome	Program	FY 2014 Request
1. SAFETY		
i. Reduction in transportation-related fatalities and injuries	Ops - Air Traffic Organization (ATO)	4,405,938
	Ops - Aviation Safety (AVS)	1,205,245
	Ops - Commerical Space Transportation (AST)	16,010
	Ops - Communications (AOC)	765
	Ops - General Counsel (AGC)	23,173
	Ops - Aviation Policy, Planning, Environment and International (APL)	9,347
	Ops - Security and Hazardous Materials Safety (ASH)	51,173
	F&E - Activity 1: Engineering, Development, Test and Evaluation	13,500
	F&E - Activity 2: Air Traffic Control Facilities and Equipment	189,150
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	75,400
	F&E - Activity 4: Facilities and Equipment Mission Support	40,050
	F&E - Activity 5: Personnel and Related Expenses	63,400
	RE&D - A11: Improve Aviation Safety	90,921
	RE&D - A14: Mission Support	3,442
	AIP - Grants-in-Aid for Airports	1,195,771
	AIP - Personnel and Related Expenses	53,945
	AIP - Airport Technology Research	14,535
	AIP - Airport Cooperative Research	5,000
Subtotal - Fatalities and Injuries		**7,456,765**
Total – Safety		**7,456,765**
2. STATE OF GOOD REPAIR		
i. Increased percentage of airport runways in excellent, good, or fair condition	AIP - Grants-in-Aid for Airports	874,150
	AIP - Personnel and Related Expenses	22,829
	AIP - Airport Technology Research	13,456
Total – State of Good Repair		**910,435**

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL/Outcome	Program	FY 2014 Request
3. ECONOMIC COMPETITIVENESS		
i. Maximum economic returns on transportation policies and investments	Ops - Air Traffic Organization (ATO)	2,564,445
	Ops - NextGen (ANG)	59,777
	Ops - General Counsel (AGC)	5,395
	Ops - Aviation Policy, Planning, Environment and International (APL)	3,947
	F&E - Activity 1: Engineering, Development, Test and Evaluation	310,325
	F&E - Activity 2: Air Traffic Control Facilities and Equipment	1,196,364
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	0
	F&E - Activity 5: Personnel and Related Expenses	269,808
	AIP - Grants-in-Aid for Airports	365,604
	AIP - Personnel and Related Expenses	10,640
	AIP - Airport Cooperative Research	5,000
	AIP - Small Community Air Service	1,000
Subtotal - Maximum Economic Returns		**4,792,304**
ii. Competitive air transportation system responsive to consumer needs	Ops - Air Traffic Organization (ATO)	118,072
	Ops - Finance and Management (AFN)	0
	F&E - Activity 1: Engineering, Development, Test and Evaluation	32,200
	F&E - Activity 2: Air Traffic Control Facilities and Equipment	0
	F&E - Activity 4: Facilities and Equipment Mission Support	70,100
	F&E - Activity 5: Personnel and Related Expenses	80,592
	RE&D - A12: Economic Competitiveness	35,822
	RE&D - A14: Mission Support	1,721
Subtotal - Competitive Air Transportation System		**338,506**

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL/Outcome	Program	FY 2014 Request
iii. Advance U.S. transportation interests abroad	Ops - Air Traffic Organization (ATO)	9,111
	Ops - General Counsel (AGC)	1,398
	Ops - Aviation Policy, Planning, Environment and International (APL)	5,857
Subtotal - Advance U.S. Interests		16,366
Total – Economic Competitiveness		5,147,176
4. LIVABLE COMMUNITIES		
i. Increased access to convenient and affordable transportation choices	---	0
ii. Improved networks that accommodate pedestrians and bicycles	---	0
iv. Improved access to transportation for people with disabilities and older adults	---	0
Total – Livable Communities		**0**
5. ENVIRONMENTAL SUSTAINABILITY		
i. Reduction in transportation-related carbon emissions, improved energy efficiency, and reduction in use of oil in the transportation sector	Ops - General Counsel (AGC)	2,597
	Ops - Aviation Policy, Planning, Environment and International (APL)	9,335
	F&E - Activity 1: Engineering, Development, Test and Evaluation	10,000
	F&E - Activity2: Air Traffic Control Facilities and Equipment	8,700
	F&E - Activity 5: Personnel and Related Expenses	1,344
Subtotal – Emissions, Energy Efficiency and Oil		**31,976**

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL / Outcome	Program	FY 2014 Request
ii. Reduction in transportation-related air, water and noise pollution and impacts on ecosystems	Ops - Finance and Management (AFN)	0
	Ops - Aviation Policy, Planning, Environment and International (APL)	2,147
	F&E - Activity 2: Air Traffic Control Facilities and Equipment	26,000
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	20,000
	F&E - Activity 4: Facilities and Equipment Mission Support	17,900
	F&E - Activity 5: Personnel and Related Expenses	8,256
	RE&D - A13: Environmental Sustainability	33,521
	RE&D - A14: Mission Support	574
	AIP - Grants-in-Aid for Airports	313,375
	AIP - Personnel and Related Expenses	18,592
	AIP - Airport Technology Research	1,509
	AIP - Airport Cooperative Research	5,000
Subtotal – Reduced Pollution		446,874
iii. Environmentally Sustainable Practices in Transportation	---	0
iv. Environmentally Sustainable Practices in DOT Services and Facilities	---	0
Total – Environmental Sustainability		478,849

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL/Outcome	Program	FY 2014 Request
6. ORGANIZATIONAL EXCELLENCE		
i. Other FAA Organizational Excellence Outcomes - Emergency Preparedness	Ops - Finance and Management (AFN)	0
	Ops - Security and Hazardous Materials Safety (ASH)	39,049
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	0
	F&E - Activity 4: Facilities and Equipment Mission Support	11,500
	F&E - Activity 5: Personnel and Related Expenses	0
Subtotal – Emergency Preparedness		**50,549**
ii. Other FAA Organizational Excellences Outcomes - Open Government	Ops - Air Traffic Organization (ATO)	10,858
	Ops - Finance and Management (AFN)	214,485
	Ops - Communications (AOC)	1,739
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	53,200
	F&E - Activity 5: Personnel and Related Expenses	0
	AIP - Personnel and Related Expenses	148
Subtotal – Open Government		**280,429**
iii. Other FAA Organizational Outcome - Improved Financial Performance	Ops - Air Traffic Organization (ATO)	203,367
	Ops - Finance and Management (AFN)	488,663
	F&E - Activity 1: Engineering, Development, Test and Evaluation	26,300
	F&E - Activity 2: Air Traffic Control Facilities and Equipment	103,010
	F&E - Activity 3: Non-Air Traffic Control Facilities and Equipment	0
	F&E - Activity 4: Facilities and Equipment Mission Support	92,100
	F&E - Activity 5: Personnel and Related Expenses	57,600
	AIP - Personnel and Related Expenses	445
Subtotal - Improved Financial Performance		**971,485**
Total – Organizational Excellence		**1,302,463**

EXHIBIT II-3a
FY 2014 BUDGET REQUEST BY DOT OUTCOMES
($000)

DOT GOAL/Outcome	Program	FY 2014 Request
7.CORPORATE SERVICE FUNCTIONS DISTRIBUTED INDIRECTLY TO PROGRAMS		
	Ops - Finance and Management (AFN)	104,125
	Ops - Human Resource Management (AHR)	107,183
	Ops - Office of the Administrator (AOA)	4,158
	Ops - Civil Rights (ACR)	12,292
	Ops - Government and Industry Affairs (AGI)	1,584
	Ops - Communications (AOC)	3,710
	Ops - General Counsel (AGC)	13,189
	Ops - Audit & Evaluations (AAE)	3,098
	Ops - Aviation Policy, Planning, Environment and International (APL)	4,200
	Ops - Security and Hazardous Materials Safety (ASH)	1,570
Total – Corporate Services Functions		**255,109**
TOTAL FAA		**15,550,798**

EXHIBIT II-4

FY 2014 BUDGET AUTHORITY
FEDERAL AVIATION ADMINISTRATION
($000)

ACCOUNT NAME	Mandatory/ Discretionary	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
Operations	D	**$9,653,395**	**$9,712,474**	**$9,707,000**
General		$4,592,701	$4,620,808	$3,223,000
AATF		$5,060,694	$5,091,665	$6,484,000
Facilities & Equipment (AATF)	D	**$2,730,731**	**$2,777,443**	**$2,777,798**
Research, Engineering & Development (AATF)	D	**$167,556**	**$168,581**	**$166,000**
Grants in Aid for Airports (AATF)	M	**$3,350,000**	**$3,350,000**	**$3,350,000**
Cancellation - CHIMPS	D			($450,000)
Aviation User Fees	M	**$50,671**	**$126,000**	**$116,000**
Aviation User Fees (transfer to EAS)	M	**($50,000)**	**($50,000)**	**($116,000)**
Aviation User Fees, Appropriation Temporarily Reduce	D		**($76,000)**	
		---------------	---------------	---------------
TOTAL:		**$15,902,353**	**$16,008,498**	**$15,550,798**
[Mandatory]		$3,350,671	$3,426,000	$3,350,000
[Discretionary]		$12,551,682	$12,582,498	$12,200,798
		---------------	---------------	---------------
[General]		$4,592,701	$4,620,808	$3,223,000
[AATF]		$11,308,981	$11,387,690	$12,327,798
Immediate Transportation Investment (GF)	M			**$3,000,000**
NextGen				$1,000,000
Grants-in-Aid for Airports				$2,000,000

Note: Totals may not add due to rounding.

EXHIBIT II-5

FY 2014 OUTLAYS
FEDERAL AVIATION ADMINISTRATION
($000)

ACCOUNT NAME	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
Operations	**$9,730,599**	**$9,822,144**	**$9,824,016**
General	$4,669,905	$4,730,144	$3,340,016
AATF	$5,060,694	$5,092,000	$6,484,000
Facilities & Equipment	**$2,948,785**	**$2,862,343**	**$2,840,288**
General	**$30,585**	**$2,792**	**$0**
-Discretionary	$30,585	$2,792	$0
-Mandatory			
AATF	**$2,918,200**	**$2,859,551**	**$2,840,288**
-Discretionary	$2,915,653	$2,856,595	$2,840,288
-Mandatory	$2,547	$2,955	
Aviation Insurance Revolving Account (M)	**($158,604)**	**($137,000)**	**($102,000)**
Research, Engineering (TF) & Development	**$183,602**	**$182,208**	**$180,238**
Grants-in-Aid for Airports	**$3,149,057**	**$3,945,289**	**$3,659,171**
General			
-Discretionary	$5,418	$2,531	$0
-Mandatory			
AATF			
-Discretionary	$3,143,639	$3,942,758	$3,659,171
Aviation User Fees (Overflight) (M)		$76,000	
Aviation User Fees (D)		($76,000)	
Franchise Fund	**($14,000)**	**$15,000**	**($6,000)**
TOTAL:	**$15,839,440**	**$16,689,983**	**$16,395,713**
[Mandatory]	($156,057)	($58,045)	($102,000)
[Discretionary]	$15,995,497	$16,748,028	$16,497,713

Immediate Transportation Investment	
NextGen	$400,000
Grants-in-Aid for Airports	$360,000

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Account Name Operations Appropriation	2012 Actual	Annualization of 2013 Pay Raises	Annualization of 2013 FTE	2014 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2014 Baseline Estimate	Program Increases/ Decreases	FY 2014 Request
PERSONNEL RESOURCES (FTE)										
Direct FTE	42,488							42,488	-521	41,967
FINANCIAL RESOURCES										
Salaries and Benefits	$6,856,639			51,741		433		6,908,813	5,865	6,914,678
Travel	$154,761							154,761	-997	153,764
Transportation	$26,090							26,090	29	26,119
GSA Rent	$120,783				5,400			126,183	65	126,248
Rental Payments to Others	$57,692							57,692	1,201	58,893
Communications, Rent & Utilities	$265,846							265,846	-1,105	264,741
Printing	$4,367					76		4,443	-5	4,438
Other Services:								0	0	
-WCF								0	0	0
-Advisory and Assistance Services	$1,349,316					2,184		1,351,500	-37,037	1,314,463
-Other	$625,828					-1,098		624,730	26,756	651,486
Supplies	$132,223					-55		132,168	67	132,235
Equipment	$53,080							53,080	76	53,156
Lands and Structures	$2,192							2,192	2	2,194
Grants, Claims and Subsidies	$2,444							2,444	6	2,450
Insurance Claims and Indemnities	$2,134							2,134	1	2,135
TOTAL FAA	**$9,653,395**	**$0**	**$0**	**$51,741**	**$5,400**	**$1,540**	**$0**	**$9,712,076**	**($5,076)**	**$9,707,000**
Line of Business/Staff Office										
Air Traffic Organization (ATO)	$7,442,738			40,796		76		7,483,610	-171,820	7,311,790
Aviation Safety (AVS)	$1,252,991			7,630		104		1,260,725	-55,948	1,204,777
Commercial Space Transportation (AST)	$16,271			86				16,357	-346	16,011
Financial Services (AFN)	$582,117			1,298	5,400	-583		588,232	219,414	807,646
NextGen (ANG)	$60,134			198				60,332	-550	59,782
Human Resources (AHR)	$98,858			548		2,568		101,974	5,219	107,193
Staff Offices	$200,286			1,185		-625		200,846	-1,045	199,801
TOTAL FAA	**$9,653,395**	**$0**	**$0**	**$51,741**	**$5,400**	**$1,540**	**$0**	**$9,712,076**	**($5,076)**	**$9,707,000**

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

FACILITIES & EQUIPMENT

	2012 Actual	Annualization of 2013 FTE	2014 Pay Raise	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2014 Baseline Estimate	Program Increases/ Decreases	FY 2014 Request
PERSONNEL RESOURCES (FTE)									
Direct FTE	2,907	0					2,907	-74	2,833
FINANCIAL RESOURCES									
ADMINISTRATIVE EXPENSES									
Salaries and Benefits	422,056	0	3,143			0	425,199	-3,056	422,143
Travel	36,842					173	37,015	3,562	40,576
Transportation	2,290					11	2,301	256	2,557
GSA Rent	0					1	1	358	359
Rental Payments to Others	30,030					147	30,177	-690	29,487
Communications, Rent & Utilities	36,012					69	36,081	-9,860	26,221
Printing	282					0	282	-222	60
Other Services:	1,856,704					10,251	1,866,955	73,717	1,940,672
-WCF	0				1	0	1	32	33
Supplies	30,208					50	30,258	-10,832	19,426
Equipment	183,461					691	184,152	8,301	192,453
Lands and Structures	127,918					205	128,123	-30,653	97,470
Grants, Claims, Subsidies and Interest	4,928					44	4,972	1,369	6,341
Admin Subtotal	**$2,730,731**	**$0**	**$3,143**	**$0**	**$1**	**$11,642**	**$2,745,517**	**32,281**	**$2,777,798**
PROGRAMS									
Engineering, Development, Test and	435,600					2,191	437,791	-45,466	392,325
Air Traffic Control Facilities and Equipment	1,406,731					7,077	1,413,808	109,415	1,523,223
Non-Air Traffic Control Facilities and Equipment	173,100					871	173,971	-25,371	148,600
Facilities and Euipment Mission Support	240,300					1,209	241,509	-9,859	231,650
Personnel & Related Expenses	475,000		3,143		1	$294	478,438	$3,562	482,000
Programs Subtotal	**$2,730,731**	**$0**	**$3,143**	**$0**	**$1**	**$11,642**	**$2,745,517**	**$32,281**	**$2,777,798**
TOTAL	**$2,730,731**	**$0**	**$3,143**	**$0**	**$1**	**$11,642**	**$2,745,517**	**$32,281**	**$2,777,798**

EXHIBIT II-6

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

RESEARCH, ENGINEERING, & DEVELOPMENT

		Baseline Changes								
	2012 Actual	Annualization of Pay Raises	Annualization of FTE	2014 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2014 Baseline Estimate	Program Increases/ Decreases	FY 2014 Request
PERSONNEL RESOURCES (FTE)	255								5	260
Direct FTE	255								5	260
FINANCIAL RESOURCES										
Salaries and Benefits	38,549			289				38,838		38,838
Benefits for Former Personnel	0							0		0
Travel	2,179						11	2,190	0	2,190
Transportation	47						0	47	0	47
GSA Rent	0						0	0	0	0
Rental Payments to Others	0						0	0	0	0
Communications, Rent & Utilities	17						0	17	0	17
Printing	15						0	15	0	15
Other Services:	0						0	0	0	0
-WCF	0						0	0		0
-Advisory and Assistance Services	0						0	0		0
-Other	110,093						550	110,643	-2,490	108,153
Supplies	2,081						10	2,091	0	2,091
Equipment	1,463						7	1,470	0	1,470
Lands and Structures							0	0	0	0
Grants, Claims & Subsidies	13,112						66	13,178	0	13,178
Insurance Claims and Indemnities	0						0	0	0	0
Interest & Dividends	0						0	0	0	0
Admin Subtotal	**167,556**	**0**		**289**			**645**	**168,490**	**-2,490**	**166,000**
PROGRAMS										
Improve Aviation Safety	89,314			221			299	89,834	1,087	90,921
Improve Aviation Efficiency	34,174			31			150	34,355	1,467	35,822
Reduce Environmental Impact	38,574			20			180	38,774	-5,253	33,521
Mission Support	5,494			17			16	5,527	209	5,736
Programs Subtotal	**167,556**	**0**		**289**			**645**	**168,490**	**-2,490**	**166,000**
GRAND TOTAL	**167,556**	**0**		**289**			**645**	**168,490**	**-2,490**	**166,000**

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

		Baseline Changes								
	2012 Enacted	Annualization of 2013 Pay Raises	Annualization of 2012 FTE	2014 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2014 Baseline Estimate	Program Increases/ Decreases	FY 2014 Request
PERSONNEL RESOURCES (FTE)	589							589	16	605
Direct FTE	589							589	16	605
FINANCIAL RESOURCES										
ADMINISTRATIVE EXPENSES										
Salaries and Benefits	$86,916		$1,781	$652				$89,349	($3,296)	$86,053
Benefits for Former Personnel	$0							$0		$0
Travel	$3,705							$3,705	($300)	$3,405
Transportation	$94						$0	$94		$94
GSA Rent	$0							$0		$0
Rental Payments to Others	$582						$3	$585		$585
Communications, Rent & Utilities	$324						$2	$326		$326
Printing	$37							$37	($8)	$29
Other Services:										
-WCF	$0					$925		$925		$925
-Advisory and assistance services	$24,492					($288)	$122	$24,326	$1,749	$26,075
-Other	$23,414						$152	$23,566	$1,869	$25,435
Supplies	$687						$3	$690		$690
Equipment	$1,665						$8	$1,673		$1,673
Lands and Structures	$102						$1	$103		$103
Grants, Claims & Subsidies	$3,201,946							$3,201,946	($447,376)	$2,754,570
Insurance Claims and Indemnities	$0						$0	$0		$0
Interest & Dividends	$36						$0	$36		$36
Financial Transfers	$6,000							$6,000	($6,000)	$0
Administrative Subtotal	**$3,350,000**	**$0**	**$1,781**	**$652**	**$0**	**$637**	**$292**	**$3,353,362**	**($453,362)**	**$2,900,000**
PROGRAMS										
Grants-in-aid for Airports	$3,198,750							$3,198,750	($449,850)	$2,748,900
Personnel and Related Expenses	$101,000		$1,781	$626		$637	$87	$104,132	$2,468	$106,600
Airport Technology Research	$29,250			$25			$130	$29,405	$95	$29,500
Airport Cooperative Research	$15,000			$1			$75	$15,076	($76)	$15,000
Small Community Air Service (transfer to OST	$6,000							$6,000	($6,000)	
Programs Subtotal, Obligations	**$3,350,000**	**$0**	**$1,781**	**$652**	**$0**	**$637**	**$292**	**$3,353,362**	**($453,362)**	**$2,900,000**
GRAND TOTAL	**$3,350,000**	**$0**	**$1,781**	**$652**	**$0**	**$637**	**$292**	**$3,353,362**	**($453,362)**	**$2,900,000**

EXHIBIT II-7
WORKING CAPITAL FUND
FEDERAL AVIATION ADMINISTRATION
($000)

	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 REQUEST	FY 2012-2014 CHANGE
DIRECT:				
Facilities & Equipment	32	32	33	**1**
Grants-in-Aid for Airports	288	223	925	**637**
Operations	45,833	47,137	48,684	**2,851**
TOTAL	**$ 46,153**	**$ 47,392**	**$ 49,642**	**$ 3,489**

Footnote:

F&E, Grants-inAid for Airports funding only support E-gov Inititatives.

Operations funding support WCF projects including E-gov Initiatives.

EXHIBIT II-8
FEDERAL AVIATION ADMINISTRATION
PERSONNEL RESOURCE -- SUMMARY
TOTAL FULL-TIME EQUIVALENTS

	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations	42,488	41,964	41,967
Facilities & Equipment	2,907	2,833	2,833
Research, Engineering & Development	270	260	260
Grants-in-Aid for Airports	589	589	605
SUBTOTAL, DIRECT FUNDED	46,254	45,646	45,665
REIMBURSEMENTS / ALLOCATIONS / OTHER			
Reimbursements and 'Other'			
Operations	110	220	222
Aviation Insurance Revolving Fund	4	5	6
Facilities & Equipment	7	61	62
Grants-in-Aid for Airports	1	1	1
Administrative Services Franchise Fund	1,676	1,760	1,791
Allocations from other Organizations			
SUBTOTAL, REIMBURSE./ALLOC./OTH.	1,798	2,047	2,082
TOTAL FTEs	**48,052**	**47,693**	**47,747**

INFO:
Allocations to Other Agencies

EXHIBIT II-9
FEDERAL AVIATION ADMINISTRATION
RESOURCE SUMMARY – STAFFING
FULL-TIME PERMANENT POSITIONS

	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations	42,042	41,898	41,902
Facilities & Equipment	3,181	3,070	3,070
Research, Engineering & Development	276	266	266
Grants-in-Aid for Airports	602	602	608
SUBTOTAL, DIRECT FUNDED	46,101	45,836	45,846
REIMBURSEMENTS / ALLOCATIONS / OTH.			
Reimbursements and 'Other'			
Operations	175	175	175
Aviation Insurance Revolving Fund	5	5	6
Facilities & Equipment	-	35	39
Grants-in-Aid for Airports	2	2	2
Administrative Services Franchise Fund	1,566	1,664	1,682
Allocations from other Organizations [Account Title]			
SUBTOTAL, REIMBURSE./ALLOC./OTH.	1,748	1,881	1,904
TOTAL POSITIONS	**47,849**	**47,717**	**47,750**

INFO:
Allocations to Other Agencies

Up to 39 F&E reimbursable positions are being filled in FY 13 based on reimbursable workload. These additional positions carry over into FY 14 and are reflected in the requested amount.

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EXHIBIT III-2
ANNUAL PERFORMANCE RESULTS AND TARGETS

The Federal Aviation Administration (FAA) integrates performance results into its budget request to demonstrate alignment with the Department of Transportation's Strategic Plan. FAA tracks the following DOT level performance measures to demonstrate program results:

DOT Goal: Safety
Outcome: Reduction in transportation-related fatalities and injuries.

PRIORITY GOAL[1] **Reduce risk of aviation accidents. By September 30, 2013, reduce aviation fatalities by addressing risk factors both on the ground and in the air. Commercial aviation (i.e., airlines): Reduce fatalities to no more than 7.4 per 100 million people on board. General aviation (i.e., private planes): Reduce fatal accident rate per 100,000 flights hours to no more than 1.06.**					
PRIORITY GOAL-Key Indicator[2] Reduce commercial aviation air carrier fatalities to no more than 7.4 per 100 million persons on board in FY 2013. [2]	2010	2011	2012	2013	2014
Target	8.1	7.9	7.6	7.4	7.2
Actual	0.3	0.0[3]	0.0[4]	TBD	TBD

[1] This is a DOT Priority Goal.
[2] This measure supports the DOT Priority Goal.
[3] Preliminary estimate. Final data will be available in March 2013.
[4] Preliminary estimate. Final data will be available in March 2014.

PRIORITY GOAL-Key Indicator[1] Reduce the general aviation fatal accident rate per 100,000 flight hours to no more than 1.06 in FY 2013. [1]	2010	2011	2012	2013	2014
Target	1.10	1.08	1.07	1.06	1.05
Actual	1.10[2]	1.12[3]	1.10[4]	TBD	TBD

[1] This measure supports the DOT Priority Goal
[2] Result finalized in March 2012.
[3] Preliminary estimate. Final data will be available in March 2013.
[4] Preliminary estimate. Final data will be available in March 2014.

Reduce category A&B runway incursions in all airports to a rate of no more than 0.395 per million operations in FY 2013.	2010	2011	2012	2013	2014
Target	0.450	0.450	0.395	0.395	0.395
Actual	0.117	0.138	0.356	TBD	TBD

Number of accidents resulting in fatalities, injuries, or significant property damage to uninvolved public.[1]	2010	2011	2012	2013	2014
Target	0	0	0	0	0
Actual	0	0	0	TBD	TBD

[1] FAA D2025 target. Although not designated a DOT-level measure, Commercial Space Launch Accidents is included to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry.

Reduce the number of hazardous materials transportation incidents involving death or major injury to no more than 32 incidents in FY 2014. [1]	2010	2011	2012	2013	2014
Target	22-36	22-34	22-34	21-33	20-32
Actual	18	34	26	TBD	TBD

[1] This PHMSA-led DOT measure is supported by the Federal Aviation Administration.

DOT Goal: State of Good Repair
Outcome: Increased percentage of airport runways in excellent, good, or fair condition[1]

Maintain runway pavement in excellent, good, or fair condition for 93 percent of the paved runways in the National Plan of Integrated Airport Systems through 2016.	2010	2011	2012	2013	2014
Target	93.00%	93.00%	93.00%	93.00%	93.00%
Actual	97.20%	97.40%	97.5%	TBD	TBD

[1]FAA has established three categories for runway condition that meet strict standards for the operational safety of aircraft transiting runways at high speed. Runways in Fair condition are fully compliant with those standards, but may require a higher level of surveillance and day-to-day maintenance than runways in Good or Excellent condition.

DOT Goal: Economic Competitiveness
Outcome: Maximum economic returns on transportation policies and investments.

PRIORITY GOAL[1] **Air traffic control systems can improve the efficiency of airspace. By September 30, 2013, replace a 40-year old computer system serving 20 air traffic control centers with a modern, automated system that tracks and displays information on high altitude planes.**	2010	2011	2012	2013	2014
Target	N/A	2 IOCs	7 IOCs	11 IOCs	N/A
Actual	N/A	2 IOCs	7 ICOs	TBD	N/A

[1]This is a DOT Priority Goal.

Maintain an average daily airport capacity for Core Airports of 86,835 arrivals and departures through 2016.	2010	2011	2012	2013	2014
Target	101,290[1]	86,606[2]	86,835[3]	86,835	86,835
Actual	101,668	87,338	88,590	TBD	TBD

[1] In FY 2009, this target was revised from 102,648
[2] In FY 2011, this target was revised from 103,068
[3] In FY 2012, this target was revised from 86,606

Maintain adjusted operational availability of the National Airspace System (NAS) at 99.7 percent through 2016.	2010	2011	2012	2013	2014
Target	99.70%	99.70%	99.70%	99.70%	99.70%
Actual	99.79%	99.72%	99.75%	TBD	TBD

DOT Goal: Economic Competitiveness
Outcome: A competitive air transportation system responsive to consumer needs.

Maintain a NAS on-time arrival rate of 88 percent at Core airports through 2016.	2010	2011	2012	2013	2014
Target	88.00%	88.00%	88.00%	88.00%	88.00%
Actual	90.55%[1]	90.41%	92.36%	TBD	TBD

[1] Final result revised from preliminary estimate of 90.33%.

DOT Goal: Environmental Sustainability
Outcome: Reduction in transportation-related carbon emissions, improved energy efficiency, and reduction in use of oil in the transportation sector.

Improve National Airspace System (NAS) energy efficiency (fuel burned per distance flown) by at least 2 percent per year from 4.24 teragrams per billions of kilometers (Tg/Bkm) in 2010 to 3.91 Tg/Bkm in 2014.[1]	2010	2011	2012	2013	2014
Target	-10.00%	-12.00%	-14.00%	-16.00%	-18.00%
Actual	-15.25%	-14.50%	-14.76%	TBD	TBD

[1] Revised to reflect the change in measurement basis from three year moving average to yearly result, and change in baseline from calendar years 2000-2002 (three year average) to calendar year 2000 (FY 2001). Prior year targets and actuals have been recalculated from the historical time series data to show yearly performance instead of three year moving average.

DOT Goal: Environmental Sustainability
Outcome: Reduction in transportation-related air, water and noise pollution and impacts on ecosystems.

Improve Aviation Noise Exposure (the U.S. population exposed to significant aircraft noise around airports) from 307,420 persons in 2011 by at least 2 percent per year to less than 328,000 by 2016.[1]	2010	2011	2012	2013	2014
Target	419,000	402,000	386,000	371,000	356,000
Actual	317,596	315,293	319,901	TBD	TBD

[1] In FY 2011, this measure was revised to reflect the number of people exposed. Prior year percentages have been converted.

OPERATIONS

(Including transfer of funds)

For necessary expenses of the Federal Aviation Administration, not otherwise provided for, including operations and research activities related to commercial space transportation, administrative expenses for research and development, establishment of air navigation facilities, the operation (including leasing) and maintenance of aircraft, subsidizing the cost of aeronautical charts and maps sold to the public, lease or purchase of passenger motor vehicles for replacement only, in addition to amounts made available by Public Law 108-176, $9,707,000,000, of which $6,484,000,000 shall be derived from the Airport and Airway Trust Fund: Provided, That not to exceed 2 percent of any budget activity, except for aviation safety budget activity, may be transferred to any budget activity under this heading: Provided further, That no transfer may increase or decrease any appropriation by more than 2 percent: 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: Provided further, That none of the funds in this Act shall be available for new applicants for the second career training program: Provided further, That there may be credited to this appropriation as offsetting collections funds received from States, counties, municipalities, foreign authorities, other public authorities, and private sources including funds from fees authorized under Chapter 453 of title 49, United States Code, other than those authorized by section 45301(a)(1) of that title, which shall be available for expenses incurred in the provision of agency services, including receipts for the maintenance and operation of air navigation facilities, and for issuance, renewal or modification of certificates, including airman, aircraft, and repair station certificates, or for tests related thereto, or for processing major repair or alteration forms. Note.--A full-year 2013 appropriation for this account was not enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 112-175). The amounts included for 2013 reflect the annualized level provided by the continuing resolution.

Program and Financing (in millions of dollars)

Identification code: 69-1301-0-1-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
0001	Air Traffic Organization (ATO)	7,475	7,489	7,304
0002	NextGen	61	61	60
0003	Finance & Management	581	585	815
0004	Regulation & Certification	1,259	1,261	1,205
0005	Commercial Space	16	16	16
0006	Human Resources	99	99	107
0007	Staff Offices	200	201	200
0801	Reimbursable program	183	184	193
0900	Total new obligations	9,874	9,896	9,900
	Budget resources:			
1000	Unobligated balance brought forward, Oct. 1	63	48	55
1011	Unobligated balance transferred from other acct. (72-1037).	5	....	....
1011	Unobligated balance transferred from other acct. (69-0102).	1	....	....
1012	Unobligated balance transfers between expired & unexpired accounts	5	....	....
1021	Recoveries of prior year unpaid obligations	6	....	....
1050	Unobligated balance (total)	80	48	55
	Budget authority:			
	Appropriations, discretionary:			
1100	Appropriation	4,593	4,621	3,223
1160	Appropriation, discretionary (total)	4,593	4,621	3,223
	Spending authority from offsetting collections:			
	Discretionary:			
1700	Collected	5,167	5,282	6,677
1701	Change in uncollected payments, federal sources	99	....	....
1750	Spending auth from offsetting collections, disc (total)	5,266	5,282	6,677
1900	Budget authority (total)	9,859	9,903	9,900
1930	Total budgetary resources available	9,939	9,951	9,955
	Memorandum (non-add) entries:			
1940	Unobligated balance expiring	-17	....	....
1941	Unexpired unobligated balance, end of year	48	55	55
	Change in obligated balance:			
	Unpaid obligations:			
3000	Unpaid obligations, brought forward, Oct. 1	1,686	1,579	1,463
3010	Obligations incurred, unexpired accounts	9,874	9,896	9,900
3011	Obligations incurred, expired accounts	55	....	....
3020	Outlays (gross)	-9,923	-10,121	-10,017
3040	Recoveries of prior year unpaid obligations, unexpired	-6	....	....
3041	Recoveries of prior year unpaid obligations, expired	-107	....	....
3050	Unpaid obligations, end of year (gross)	1,579	1,463	1,346
	Uncollected payments:			
3060	Uncollected pymts, Fed sources, brought forward, Oct 1	-195	-236	-236
3070	Change in uncollected pymts, Fed sources, unexpired	-99	....	....
3071	Change in uncollected pymts, Fed sources, expired	58	....	....
3090	Uncollected pymts, Fed sources, end of year	-236	-236	-236
	Memorandum (non-add) entries:			
3100	Obligated balance, start of year	1,491	1,343	1,227
3200	Obligated balance, end of year	1,343	1,227	1,110
	Budget authority and outlays, net:			
	Discretionary:			
4000	Budget authority, gross	9,859	9,903	9,900
	Outlays, gross:			
4010	Outlays from new discretionary authority	8,526	8,737	8,735

Identification code: 69-1301-0-1-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
4011	Outlays from discretionary balances	1,397	1,275	1,282
4020	Outlays, gross (total)	9,923	10,012	10,017
	Offsets against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4030	Federal sources	-5,233	-5,250	-6,645
4033	Non-Federal sources	-20	-32	-32
4040	Offsets against gross budget authority and outlays (total)	-5,253	-5,282	-6,677
	Additional offsets against gross budget authority only:			
4050	Change in uncollected pymts, Federal sources, unexpired	-99	....	....
4052	Offsetting collections credited to expired accounts	85	....	....
4060	Additional offsets against budget authority only (total)	-14	....	....
4070	Budget authority, net (discretionary)	4,592	4,621	3,223
4080	Outlays, net (discretionary)	4,670	4,730	3,340
4180	Budget authority, net (total)	4,592	4,621	3,223
4190	Outlays, net (total)	4,670	4,730	3,340

These funds will be used to continue to promote aviation safety and efficiency. The Budget provides funding for the Air Traffic Organization (ATO) which is responsible for managing the air traffic control system. As a performance-based organization, the ATO is designed to provide cost-effective, efficient, and, above all, safe air traffic services. The Budget also funds the Aviation Safety Organization which ensures the safe operation of the airlines and certifies new aviation products. In addition, 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: 69-1301-0-1-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Direct obligations:			
	Personnel compensation:			
111	Full-time permanent	4,622	4,714	4,752
113	Other than full-time permanent	42	42	42
115	Other personnel compensation	399	389	392
119	Total personnel compensation	5,063	5,145	5,186
121	Civilian personnel benefits	1,736	1,754	1,766
130	Benefits for former personnel	1	1	1
210	Travel and transportation of persons	149	156	154
220	Transportation of things	28	26	26
231	Rental payments to GSA	121	129	134
232	Rental payments to others	61	58	58
233	Communications, utilities, and miscellaneous charges	240	260	259
240	Printing and reproduction	8	4	4
251	Advisory and assistance services	487	500	532
252	Other services	1,584	1,487	1,395
260	Supplies and materials	149	133	133
310	Equipment	58	53	53
320	Land and structures	3	2	2
410	Grants, subsidies, and contributions	2	2	2
420	Insurance claims and indemnities	1	2	2
990	Direct obligations	9,691	9,712	9,707
990	Reimbursable obligations	183	184	193
999	Total new obligations	9,874	9,896	9,900

Employment Summary

Identification code: 69-1301-0-1-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
1001	Direct civilian full-time equivalent employment	41,972	41,964	41,967
2001	Reimbursable civilian full-time equivalent employment	216	220	222

EXHIBIT III-1

OPERATIONS APPROPRIATIONS

Summary by Program Activity

Appropriations, Obligations Limitations, and Exempt Obligations

($000)

	FY 2012 Actual	FY 2013 CR ANNUALIZED	FY 2014 REQUEST	CHANGE FY 2014-2012
Air Traffic Organization (ATO)	7,442,738	7,489,148	7,311,790	(130,948)
Aviation Safety (AVS)	1,252,991	1,260,659	1,204,777	(48,214)
Commercial Space (AST)	16,271	16,371	16,011	(260)
Finance & Management (AFN)	582,117	585,607	807,646	225,529
NextGen (ANG)	60,134	60,502	59,782	(352)
Human Resources Management (AHR)	98,858	99,463	107,193	8,335
Staff Offices	200,286	200,724	199,801	(485)
TOTAL	**9,653,395**	**9,712,474**	**9,707,000**	**53,605**
FTEs				
Direct Funded	42,488	41,964	41,967	-521
Reimbursable, allocated, other	110	220	222	112

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. It also covers administrative and managerial costs for the FAA's regulatory, international, medical, engineering and development programs as well as policy oversight and overall management functions. The operations 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) establishment and survellance of civil air regulations to assure safety in aviation;
(4) development of standards, rules and regulations governing the physical fitness of airmen as well as the administration of an aviation medical research program;
(5) regulation of the commercial space transportation industry;
(6) administration of acquisition programs; and
(7) headquarters, administration and other staff offices.

EXHIBIT III-1a

OPERATIONS APPROPRIATIONS
SUMMARY ANALYSIS OF CHANGE FROM FY 2012 TO FY 2014
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Item	Change from FY 2012 to FY 2014 $	Change from FY 2012 to FY 2014 FTE
FY 2012 Base	**9,653,395**	**42,488**
Pay Inflation	51,741	
WCF Adjustments	1,540	
Rents and Leases Increases - GSA	5,400	
FY 2013 Adjustments		-524
Subtotal, Adjustments to Base	**$58,681**	**-524**
Adjustments to Programs		
Annualization of FY 2012 Hiring and PASS Contract	3,430	
PASS Contract	3,129	
NATCA Multi-Unit Pay Raise	1,139	
Safety Oversight	0	3
Service Center / Regional Buildings	19,300	
En Route Automation Modernization (ERAM) Maintenance	30,000	
Program Adjustments	-62,074	
Subtotal, Adjustments to Programs	**($5,076)**	**3**
FY 2014 Request	**$9,707,000**	**41,967**

Operations Summary
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$9,653,394**	**42,042**	**915**	**42,488**
Adjustments to Base	**$51,742**	**-144**	**-18**	**-524**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-144	-18	-524
Pay Inflation	$51,742			
Other Changes	**$9,238**			
NATCA Multi Unit Pay Raise	$1,139			
Working Capital Fund	$1,540			
Annualization of FY 2012 Hiring	$3,430			
PASS Contract	$3,129			
Discretionary Adjustments	**$54,700**	**4**	**1**	**3**
Safety Oversight		4	1	3
En Route Automation Modernization Maintenance (ERAM)	$30,000			
Rent & Leases Increases	$5,400			
Service Center / Regional Buildings	$19,300			
Base Transfers	**$0**			
Hangar 6	$0			
Administrative Support	$0			
Labor Technical Realignment	$0			
Civil Rights Realignment	$0			
Property Management Realignment	$0			
NextGen Global Outreach Realignment	$0			
Intervention Program Establishment	$0			
Emergency Operations Coordinator Realignment	$0			
Traffic Alert Collision and Avoidance System (TCAS) Refinement	$0			
Information Technology Resource Consolidation	$0			
Training Resources Realignment	$0			
Center for Management Executive Leadership (CMEL)	$0			
Program Adjustments	**-$62,074**			
FY 2014 Request	**$9,707,000**	**41,902**	**898**	**41,967**

Base Transfer Summary
($000)

Base Transfers	From	FTE	FTP	Funding	To	FTE	FTP	Funding
Hangar 6	AFN/ARC	-20	-19	-$7,849	ATO/AJW	20	19	$7,849
Administrative Support	AFN/ABA	-1	-1	-$72	ACR	1	1	$72
Labor Technical Realignment	ATO/AJG	-17	-17	-$2,442	AHR	17	17	$2,442
		3	3	$549		-3	-3	-$549
Civil Rights Realignment	ATO/AJG	-4	-4	-$1,499	ACR	4	4	$1,499
Property Management Realignment	ATO/AJW	0	0	-$2,800	AFN/ARC	0	0	$2,800
	ATO/AJV	3	3	$1,030		-3	-3	-$1,030
NextGen Global Outreach Realignment	ANG	-1	-1	-$300	APL	1	1	$300
Intervention Program Establishment	ATO/AJG	-1	-1	-$290	AAE	1	1	$290
Emergency Operations Coordinator Realignment	AHR	-1	-1	-$198	ASH	1	1	$198
Traffic Alert Collision and Avoidance System (TCAS) Refinement	ANG	0	0	-$250	ATO/AJM	0	0	$250
Information Technology Resource Consolidation	AST	0	0	-$346	AFN/AIO	578	577	$212,532
	AGC	-4	-4	-$888				
	ATO/AJG	-332	-331	-$141,020				
	AVS/AQS	-217	-217	-$63,148				
	APL	-6	-7	-$860				
	AHR	-9	-8	-$4,598				
	ASH	-10	-10	-$1,672				
Training Resources Realignment	ATO/AJG	-11	-11	-$1,529	AFN/ACQ	11	11	$1,529
Center for Management and Executive Leadership (CMEL)	AFN/ARC	0	0	-$8,120	AHR	0	0	$8,120
Total		-628	-626	-$236,302		628	626	$236,302

Operations Appropriation
Staffing Summary
FY 2012 – FY 2014

Group	Office	Code	Type	FY 2012 Actual	FY 2013 CR Annualized	FY2014 Request
	Air Traffic Organization	ATO	FTP	31,291	31,160	30,821
			OTFTP	686	686	687
			FTE	31,751	31,356	31,017
	Associate Administrator for Aviation Safety	AVS	FTP	7,455	7,455	7,238
			OTFTP	128	128	125
			FTE	7,470	7,463	7,246
	Associate Administrator for Commercial Space Transportation	AST	FTP	75	75	79
			OTFTP	1	1	2
			FTE	73	73	76
Assistant Administrator for Finance and Management	Financial Services	ABA	FTP	222	226	225
			OTFTP	1	2	2
			FTE	242	204	203
	Acquisition and Business Services	ACQ	FTP	248	246	257
			OTFTP	2	1	1
			FTE	256	235	246
	Information Services	AIO	FTP	210	216	793
			OTFTP	5	5	9
			FTE	117	196	774
	Regions and Center Operations	ARC	FTP	647	634	612
			OTFTP	28	10	9
			FTE	707	634	611
	Assistant Administrator for Next Generation Air Transportation System	ANG	FTP	202	194	193
			OTFTP	7	7	7
			FTE	202	195	194
	Assistant Administrator for Human Resource Management	AHR	FTP	599	601	606
			OTFTP	32	32	31
			FTE	620	578	582
Staff Offices	Office of the Administrator and Deputy	AOA	FTP	20	20	20
			OTFTP	4	4	4
			FTE	22	20	20
	Assistant Administrator for Audit and Evaluation	AAE	FTP	19	19	20
			OTFTP	0	0	0
			FTE	19	19	20
	Assistant Administrator for Civil Rights	ACR	FTP	79	79	84
			OTFTP	4	4	4
			FTE	79	76	81
	Asst. Administrator for Government and Industry Affairs	AGI	FTP	12	10	10
			OTFTP	0	0	0
			FTE	11	10	10
	Assistant Administrator for Communications	AOC	FTP	34	34	34
			OTFTP	1	1	1
			FTE	34	31	31
	Office of Chief Counsel	AGC	FTP	262	262	258
			OTFTP	9	9	9
			FTE	252	244	240
	Asst. Administrator for Policy, Int'l Affairs and Environment	APL	FTP	163	163	157
			OTFTP	7	7	7
			FTE	145	140	135
	Asst. Administrator for Security & Hazardous Materials	ASH	FTP	504	504	495
			OTFTP	0	0	0
			FTE	488	490	481
	Total		FTP	42,042	41,898	41,902
			OTFTP	915	897	898
			FTE	42,488	41,964	41,967

FY 2012 – FY 2014 Resource Summary

			FY2012 Actual	FY 2013 CR Annualized	FY 2014 Request
ATO		pcb	5,405,606,000	5,438,615,000	5,397,325,000
		o/o	2,037,132,000	2,049,673,000	1,914,465,000
ATO Total			**7,442,738,000**	**7,488,288,000**	**7,311,790,000**
AVS		pcb	1,011,109,000	1,017,286,000	995,517,000
		o/o	241,882,000	243,373,000	209,260,000
AVS Total			**1,252,991,000**	**1,260,659,000**	**1,204,777,000**
AST		pcb	11,429,000	11,500,000	11,517,000
		o/o	4,842,000	4,871,000	4,494,000
AST Total			**16,271,000**	**16,371,000**	**16,011,000**
Assistant Administrator for Finance and Management	ABA	pcb	32,427,000	32,713,000	32,763,000
		o/o	85,809,000	86,412,000	85,713,000
	ABA Total		**118,236,000**	**119,125,000**	**118,476,000**
	ACQ	pcb	30,280,000	30,470,000	32,067,000
		o/o	14,778,000	14,869,000	14,795,000
	ACQ Total		**45,058,000**	**45,339,000**	**46,862,000**
	AIO	pcb	32,099,000	32,022,000	113,896,000
		o/o	64,667,000	65,065,000	195,671,000
	AIO Total		**96,766,000**	**97,087,000**	**309,567,000**
	ARC	pcb	77,307,000	77,872,000	74,431,000
		o/o	244,750,000	246,256,000	258,310,000
	ARC Total		**322,057,000**	**324,128,000**	**332,741,000**
AFN Total			**582,117,000**	**585,679,000**	**807,646,000**
ANG		pcb	26,204,000	26,365,000	26,154,000
		o/o	33,930,000	34,137,000	33,628,000
ANG Total			**60,134,000**	**60,502,000**	**59,782,000**
AHR		pcb	72,636,000	73,080,000	73,776,000
		o/o	26,222,000	26,383,000	33,417,000
AHR Total			**98,858,000**	**99,463,000**	**107,193,000**
Staff Offices	AOA	pcb	3,029,000	3,048,000	3,052,000
		o/o	1,106,000	1,112,000	1,106,000
	AOA Total		**4,135,000**	**4,160,000**	**4,158,000**
	AAE	pcb	2,444,000	2,459,000	2,602,000
		o/o	346,000	348,000	496,000
	AAE Total		**2,790,000**	**2,807,000**	**3,098,000**
	ACR	pcb	9,416,000	9,474,000	10,044,000
		o/o	1,235,000	1,242,000	2,250,000
	ACR Total		**10,651,000**	**10,716,000**	**12,294,000**
	AGI	pcb	1,490,000	1,500,000	1,501,000
		o/o	83,000	83,000	83,000
	AGI Total		**1,573,000**	**1,583,000**	**1,584,000**
	AOC	pcb	5,693,000	5,728,000	5,823,000
		o/o	81,000	81,000	395,000
	AOC Total		**5,774,000**	**5,809,000**	**6,218,000**
	AGC	pcb	41,398,000	41,651,000	41,035,000
		o/o	5,607,000	5,642,000	4,736,000
	AGC Total		**47,005,000**	**47,293,000**	**45,771,000**
	APL	pcb	25,904,000	26,063,000	25,718,000
		o/o	9,048,000	9,103,000	9,115,000
	APL Total		**34,952,000**	**35,166,000**	**34,833,000**
	ASH	pcb	68,168,000	68,585,000	67,457,000
		o/o	25,238,000	25,393,000	24,388,000
	ASH Total		**93,406,000**	**93,978,000**	**91,845,000**
Grand Total			**$9,653,395,000**	**$9,712,474,000**	**$9,707,000,000**

Air Traffic Organization (ATO)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$7,442,738**	**31,291**	**686**	**31,751**
Adjustments to Base	**$40,796**	**-131**		**-395**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-131		-395
Pay Inflation	$40,796			
Other Changes	**$232**			
NATCA Multi Unit Pay Raise	$156			
Working Capital Fund (WCF)	$76			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments	**$30,000**			
Safety Oversight				
En Route Automation Modernization (ERAM) Maintenance	$30,000			
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$139,902**	**-339**	**1**	**-339**
Hangar 6	$7,849	19	1	20
Administrative Support				
Labor Technical Realignment	-$1,893	-14		-14
Civil Rights Realignment	-$1,499	-4		-4
Property Management Realignment	-$1,770	3		3
NextGen Global Outreach Realignment				
Intervention Program Establishment	-$290	-1		-1
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement	$250			
Information Technology Resource Consolidation	-$141,020	-331		-332
Training Resources Realignment	-$1,529	-11		-11
Center for Management and Executive Leadership (CMEL)				
Program Adjustments	**-$62,074**			
FY 2014 Request	**$7,311,790**	**30,821**	**687**	**31,017**

Executive Summary: Air Traffic Organization (ATO)

What Is The Request And What Will We Get For The Funds?

The request of $7,311,790,000 and 30,821 FTP / 31,017 FTE allows FAA to maintain our position as the global leader in delivering the world's safest, most secure air traffic services. The request provides an adjustment to base of $40,796,000 for pay inflation. It also provides for other changes of $156,000 for contract pay raises associated with the National Air Traffic Controllers Association (NATCA) Multi-Unit employees and $76,000 for the Working Capital Fund. Included in this request is a discretionary adjustment of $30,000,000 for En Route Automation Modernization (ERAM). This is for the maintenance support of operational ERAM systems that have transitioned to operational status during FY 2012 and FY 2013.

Additionally, this request provides for several base transfers that will have a net total of -$139,902,000 and -339 FTP / FTE. One of these base transfers is for Hangar 6 located at Ronald Reagan Washington National Airport. This will transfer $7,849,000 and 19 FTP / 20 FTE from the Office of the Assistant Administrator of Finance and Management (AFN). Another base transfer, Information Technology Resource Consolidation, -$141,020,000 and -332 FTE / FTP, represents the ATO IT unit realigned into the centralized IT Shared Services Organization (ITSSO).

This budget includes program adjustments of -$62,074,000. To achieve this level of savings, ATO will be evaluating cost savings and efficiency gains in the following areas: Contract Weather Observations, Facility Realignments and Consolidations, and Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON).

In FY 2014, the Air Traffic Organization proposes the merger of the En Route and Oceanic Services and Terminal Services units into one organization in order to improve operational and organizational efficiency.

Program Activity ($000)	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Total	**$7,442,738**	**$7,488,288**	**$7,311,790**	**-$130,948**
En Route & Oceanic – Terminal Services (in FY 2014)	1,787,832	1,810,759	3,987,582	28,692
Terminal	2,171,058	2,239,328		
Technical Operations	1,702,209	1,709,769	1,716,181	13,972
System Operations	287,535	297,131	288,104	569
Safety and Technical Training	270,572	260,541	271,146	574
Mission Support Services	283,484	280,111	284,821	1,337
Management Services	315,324	286,045	170,355	-144,969
Program Management	624,724	604,604	655,675	30,951
Program Adjustments			-62,074	-62,074

What Is The Program?

ATO is a Performance-Based Organization providing safe, secure, and cost-effective air traffic control services to commercial and private aviation and the military. We are more than 30,000 professional employees committed to providing safe and efficient air traffic control services. Many of our employees, including 14,895 air traffic controllers, 5,000 air traffic supervisors and air traffic managers, 1,800 engineers, and 6,100 maintenance technicians, directly serve our customers. Our remaining employees work in a wide variety of professions to sustain the smooth operations of ATO. They research, plan, and build air traffic control equipment and programs; manage payroll and benefits programs; maintain productive relationships with the aviation industry and the general public; and ensure that the environment and ATO employees are protected. ATO supports the Department of Transportation's (DOT) strategic goals and outcomes related to Safety: "Reduction in transportation related fatalities and injuries" and Economic Competitiveness: Maximum economic returns in transportation policies and investments." The ATO also supports DOT's Priority Goal: "Reduction of Total Runway Incursions."

Why Is This Particular Program Necessary?

ATO provides air traffic services for the Nation and is fully committed to the agency's mission. We handle 70,000 flights per day and transport 730 million passengers per year; a vital part of the Nation's economy. FAA data shows that civil aviation accounted for over $1.3 trillion in total economic activity, supporting 5.2 percent of U.S. Gross Domestic Product. Earning over $394 billion a year, 10 million people are employed in aviation-related fields.

Safety is ATO's highest priority. While the system is already exceedingly safe, we are making it safer by moving to a proactive safety culture in which every individual in ATO is committed to assessing and mitigating risks. While safety is paramount, we are also taking steps to enable growth and changes in aviation.

How Do You Know The Program Works?

ATO sets annual performance goals in safety, economic competitiveness, finance, international leadership, and organizational excellence. In safety, we track the commercial fatal accident rate, general aviation fatal accidents, rate of runway incursions, and operational errors. For economic competitiveness, we track average daily airport capacity, on-time arrivals, and adjusted operational availability. In the area of finance, we measure program performance using schedule and budget metrics. In international leadership, we target a number of countries for expanded use of Next Generation Air Transportation System (NextGen) systems and technologies. For organizational excellence, we maintain targets on the number of air traffic controllers on-board as well as new hires.

Over the past 10 years, ATO has made extensive progress in all areas. The safety of American aviation is unparalleled. Since 2001, we have coordinated more than 120 million successful flights on commercial aircraft, transporting over 7 billion passengers safely to their destinations. This outstanding record is attributable to our efforts at reducing fatal accident rates, deploying systems and procedures to reduce serious runway incursions, and conducting training programs aimed at reducing operational errors. We have institutionalized acquisition best practices and workforce planning development, key elements to FAA's success by being removed from the Government Accountability Office's High Risk List for Acquisitions in FY 2009. We provide direct assistance to over 100 countries around the world to help improve their aviation systems, and have entered into numerous bilateral agreements to extend global connectivity. Domestically, we continue to "staff-to-traffic," meeting the aggressive hiring targets identified in our annual, Congressionally-mandated Air Traffic Controller Workforce Plan. Overall, we achieved 28 of our 30 performance targets in FY 2012.

Why Do We Want / Need To Fund The Program At The Request Level?

ATO operates the most complex and technically advanced air traffic control system in the world. In FY 2014, an operating budget of $7,311,790,000 is required to sustain and improve effective and efficient air traffic control throughout U.S. airspace. Since our inception, we have been effective in restructuring and re-engineering our operational and administrative functions, and have achieved more than $2.8 billion in cost savings and cost avoidance.

Detailed Justification for the - Vice President En Route and Oceanic/Terminal Services, AJE-0/AJT-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – En Route and Oceanic Services/Terminal Services – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
En Route and Oceanic Services/Terminal	$3,958,890	$4,050,086	$3,987,582	$28,692

The FY 2014 budget request for En Route and Oceanic Services/Terminal Services is $3,987,582,000 and 19,856 FTP / 19,946 FTE. This request provides an adjustment to base of $28,536,000 for pay inflation and other changes of $156,000 for contract pay raises associated with the National Air Traffic Controllers Association (NATCA) Multi-Unit employees.

In FY 2014, the Air Traffic Organization proposes the merger of En Route and Oceanic Services and Terminal Services units into one organization in order to improve operational and organizational efficiency.

Key outputs expected to be achieved in the budget year with the requested resources:

- Maintain daily operation of the 402 service delivery points (23 en route and 379 terminal) in the U.S., Puerto Rico, and Guam.
- Select the required number of potential candidates to meet our hiring goal for air traffic controllers in accordance with the Air Traffic Controller Workforce Plan.

Key outcomes expected to be achieved in the budget year with the requested resources:

- Achieve an average daily airport capacity for the Nation's Core Airports of 103,068 arrivals and departures per day by FY 2011 and maintain that level through FY 2014.
- Achieve a National Airspace System (NAS) on-time arrival rate of 88 percent at the Nation's Core Airports and maintain that level through FY 2014. FY 2014 Target: 88 percent.
- Decrease the rate of commercial air carrier fatalities per 100 million passengers on-board aircraft by 50 percent by 2025. FY 2014 Target is 7.7.

The FY 2014 request will fund the following outputs and outcomes:

Safety

- Maintain the rate of serious runway incursions (Category A and B) at or below 20 per 1,000 events by improving training, procedures, evaluation, analysis and testing, and by designing, developing, and implementing an improved runway incursion analysis capability.
- Reduce risks in-flight by limiting the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) losses of standard separation within the National Airspace System (NAS) by developing a system that integrates remotely retrievable radar and other NAS data feeds to provide a common platform for the detection and reporting of suspected losses of separation in the En Route, Terminal, and surface environments by the end of FY 2014.
- Support the design, development, and implementation of an improved runway incursion analysis capability by developing a Runway Incursion Reduction Plan. This plan will determine root causal factors of pilot deviations, operational errors, and vehicle/pilot deviations and identify intervention strategies to eliminate and/or mitigate the root causal factors leading up to the incident while also providing a strategy for implementation of the recommendations.

- Provide the day-to-day management oversight and support for all terminal contract tower facilities and for contract weather services within Terminal's three service areas (Eastern, Central, and Western) to ensure safe and efficient operations.

Economic Competitiveness:

- Implement Wake Turbulence Re-categorization by implementing new technology-based solutions that will allow, when the runway crosswind is favorable, the lifting or reduction of the wake turbulence separation time constraint and is expected to yield more arrival and departure slots per airport which will directly increase the average daily airport arrival and departure capacity.
- Reduce means and variances of average time it takes to go from one core airport to another affecting at least 90 percent of passengers by supporting research to improve safety and increase throughput using wake turbulence monitoring, operational procedures, and controller tools.
- Meet 90 percent of all Next Generation Air Transportation System (NextGen) acquisition milestones on schedule and at or below original budget while continuing to expand FAA's NextGen Implementation Plan to incorporate critical path decisions and milestones necessary to accomplish the mid-term commitments.
- Provide the oversight, management, and support necessary to enable safe increases in capacity and efficiency through changes in airspace, improved procedures, and insertion of new technology into the operation. This includes providing complete analysis/report of NextGen arrival procedures initiatives and establishing a more effective separation standard for Instrument Flight Rule (IFR) operations between the final approach fix and runway threshold.
- Lead the evaluation and expansion of the use of Converging Runway Display Aids (CRDAs) at airports with intersecting runways.

Organizational Excellence:

- Support maintenance of the air traffic controller workforce within 2 percent, above or below, the projected annual totals in the Air Traffic Controller Workforce Plan.

What Is This Program?

En Route and Oceanic/Terminal Services program provides air traffic control operations from 402 service delivery points in the U.S., Puerto Rico, and Guam; and we control more than 59 million square miles of airspace over the continental U.S. and the Atlantic and Pacific Oceans including the South Pacific, to the Northern Polar Routes, the North Atlantic, the Caribbean, and the Gulf of Mexico. Every day we ensure that thousands of positively controlled aircraft, en route from one terminal area to another, are directed to the safest, most efficient path onto their destinations.

The terminal domain provides daily terminal ATC services, 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.

The en route and oceanic domain provide service by en route and oceanic controllers at 21 air route traffic control centers (ARTCCs) and 2 center radar approach control (CERAPS), who interface with more than 18 air navigation service providers. Terminal air traffic control (ATC) services include both airport surface operations and terminal area operations. Airport surface operations are conducted by controllers at 351 federal and contract towers located at the Nation's airports. Terminal area operations are conducted by controllers at 161 TRACON facilities, which routinely handle aircraft within 40 miles of an airport.

The Contract Weather Program provides quality weather monitoring, augmentation, and backup of automated weather systems (Automated Surface Observing System and Automated Weather Observation System). The program has undergone changes based on revalidated requirements and revised FAA Orders, which has reduced the program significantly. Weather observations continue under the Limited Aviation Weather Reporting Station (LAWRS) program.

En Route and Oceanic/Terminal Services supports the Department of Transportation's (DOT) Strategic Plan's Safety Goal to reduce transportation related injuries and fatalities. We measure our progress in achieving aviation safety by tracking the following performance targets, as well as accomplishing the identified related initiatives.

- Reduce the rate of fatalities per 100 million passengers on-board by 50 percent by FY 2025. FY 2014 Target: 7.7.
- Support development of a system that integrates recorded radar and other similar data feeds to provide a common platform for the detection and reporting of suspected loss of standard separation events.
- Improve situational awareness for pilots and controllers in the NAS by providing them with additional information concerning potential conflicts and offering possible resolutions.
- Complete the incorporation of Aerospace Performance Factor methodologies in all ARTCC facilities by the end of FY 2014.
- Enhance database source inputs and transition to a dashboard graphical user interface.
- Maintain and continuously improve the En Route and Oceanic Services Safety Management System (SMS) for the delivery of safe air traffic services.
- Execute the requirements of the En Route Continuous Improvement Plan, conduct internal audits, and provide safety-related training.
- Support performance measure to reduce the transportation and related injuries and fatalities through its support to achieve the annual FAA's Targets for Commercial Air Carrier Fatality Rate, General Aviation Fatal Accident Rate, and Total Runway Incursions.

This Service unit also supports the DOT's Strategic Plan's Economic Competitiveness Goal of achieving maximum economic returns on transportation policies and investments outcomes. Our performance is tracked by the following metrics, supported by achievement of related initiatives.

- Achieve an average daily airport capacity for the Nation's Core Airports of 103,068 arrivals and departures in FY 2014 and maintain a NAS on-time arrival rate of 88 percent at the Nation's Core Airports.
- Continue strategic investment in the current NAS infrastructure to sustain NAS services and reduce operational risk while providing a foundation to increase capacity in a safe and efficient manner for all users.
- Increase the percentage of oceanic airspace using reduced separation standards to 100 percent from previous fiscal year baselines.
- Supporting performance measure to maximize economic returns on transportation policies and investments through its support to achieve FAA's annual targets for average daily airport capacity at the Nation's Core Airports and adjusted operational availability.
- Supporting performance measure to be a competitive air transportation system responsive to consumers through its support to achieve FAA's annual targets for annual service volume and NAS on-time arrivals.
- Supporting performance measure U.S. transportation interests advanced in targeted markets around the world through its support to achieve FAA's annual targets for NextGen technologies.

En Route and Oceanic/Terminal Services support the FAA Mission and U.S. Transportation interests in advancing aviation in the U.S. and beyond. One of the activities we will assist in is to:

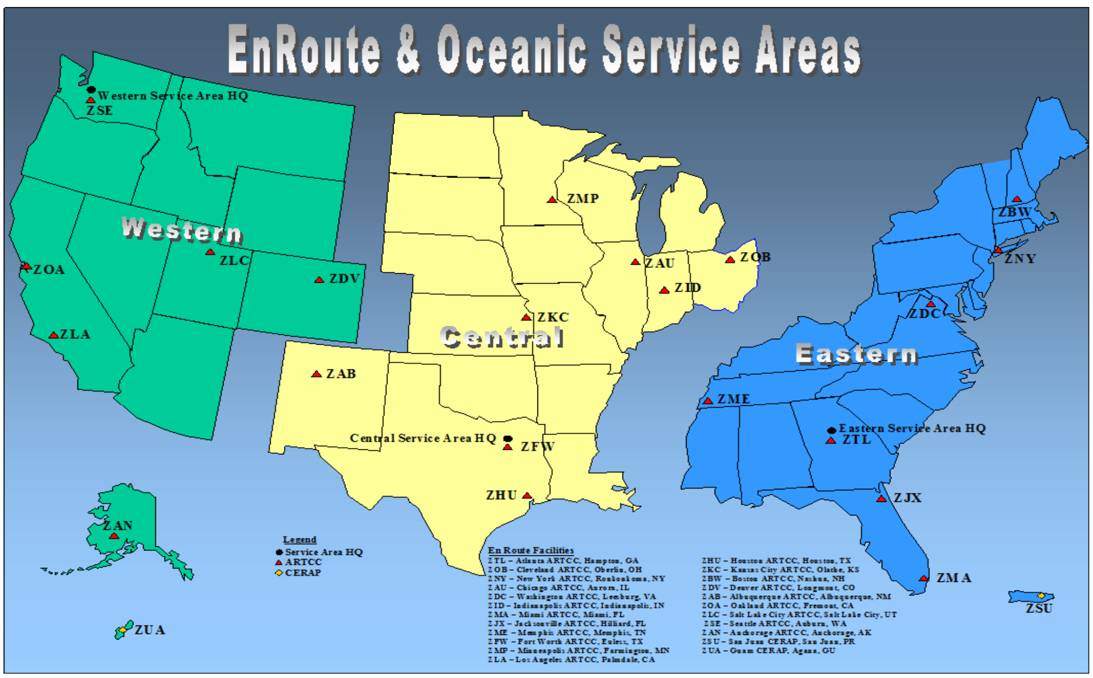
- Ensure harmonization of service improvements through collaboration with international and industry service providers by active participation and leadership in regional International Civil Aviation Organization (ICAO) and other inter-organizational workgroups and decision making processes.

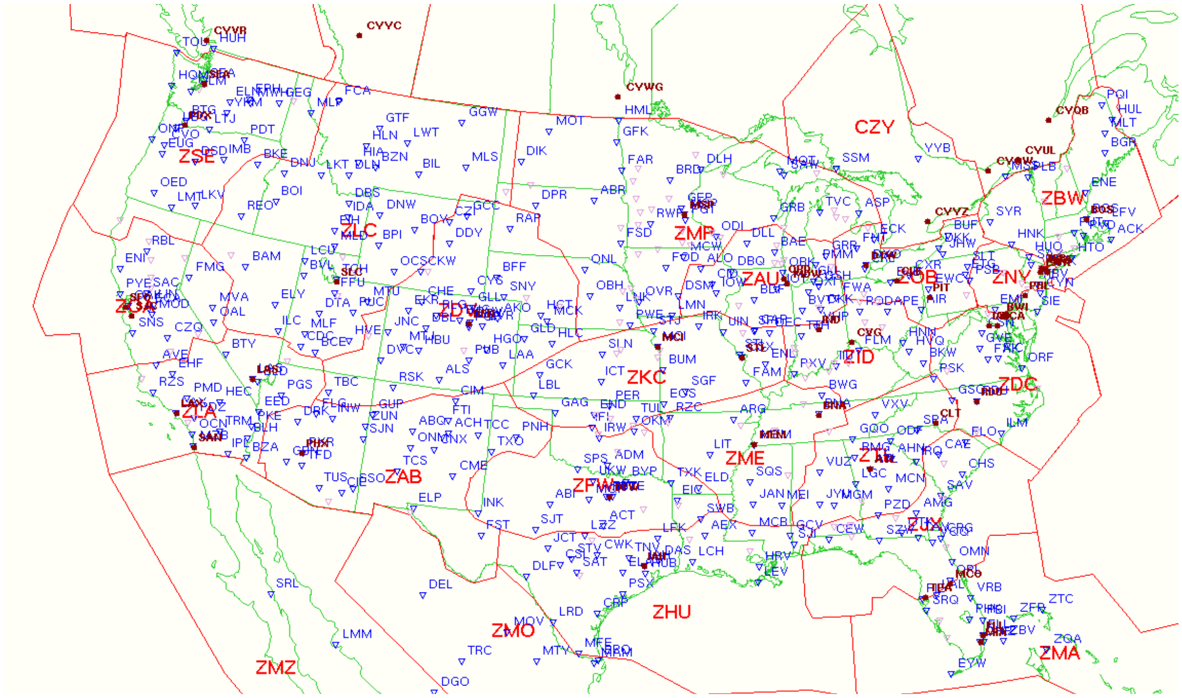
Our partners and stakeholders include:

- Department of Defense (DoD)
- Department of Homeland Security (DHS)
- National Aeronautics and Space Administration (NASA)
- Joint Planning and Development Office (JPDO)
- Academia
- Airlines and other aircraft operators
- Radio Technical Commission for Aeronautics (RTCA)

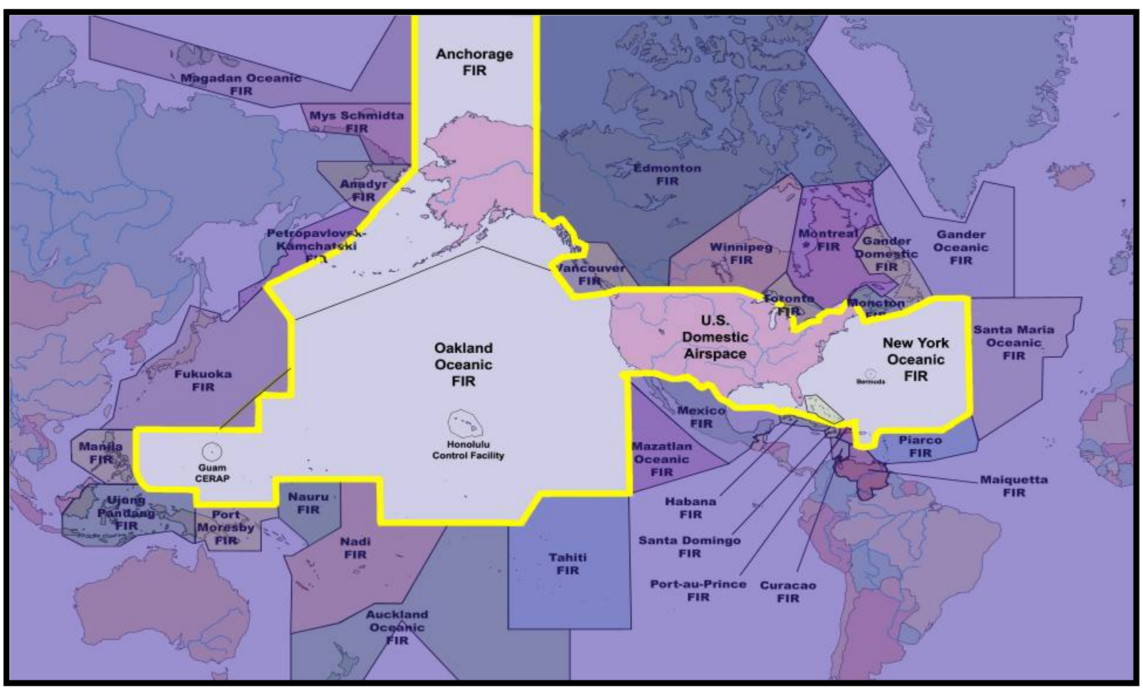
- National Air Traffic Controllers Association (NATCA)
- Professional Airways Safety Specialists (PASS)
- National Transportation Safety Board (NTSB)
- International Civil Aviation Organization (ICAO)
- EUROCONTROL and other Air Navigation Service Providers
- MITRE's Center for Advanced Aviation System Development (CAASD)
- Single European Sky Air Traffic Management Research (SESAR) program
- Other ATO Business Units, Service Units, and Offices
- Other FAA Offices and Lines of Business
- Aviation community
- State and municipal governments
- Air Line Pilots Association (ALPA)

En Route and Oceanic/Terminal Services is divided into three geographical service areas (Eastern, Central, and Western) to better manage the delivery of 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. The first chart below shows where the 23 service delivery points are for en route (21 ARTCCs and 2 CERAPs). The second chart depicts the location of ATO's air traffic control towers and en route center airspace.





In addition to the above charts, the En Route and Oceanic/Terminal Services also provides control services outside of the contiguous U.S. as shown in the chart below.



By the end of FY 2013, the accomplishments for En Route and Oceanic/Terminal Services include:

- Complete implementation of the Traffic Analysis and Review Program (TARP) in the En Route environment.
- Continue reporting loss of standard separation.

- On-going improvement and use of the SMS within En Route for the delivery of safe air traffic services. Building on prior SMS activities, we will develop an En Route and Oceanic Continuous Improvement Plan, conduct internal audits, and provide safety-related training.
- Improve global interoperability in the Oceanic and Offshore domains by initiating development of operational prototyping of Pre-Departure Oceanic Trajectory Management 4D (OTM4D).
- Continue efforts in support of Next Generation Air Transportation System (NextGen) that include technical development activities for Collaborative Pre-Departure OTM4D and a 5-Year En Route and Oceanic Research and Development Plan for NextGen mid-term and beyond.
- Continue efforts to ensure global harmonization of service improvements through collaboration with international and industry service providers by active participation and leadership in regional ICAO and inter-organizational workgroups and decision making processes.
- Continue reporting loss of standard separation.
- Support Root Cause Analysis Team (RCAT) in examining data from FAA investigations and attempt to determine root causal factors for the incident.
- Conduct research to improve safety and increase throughput using wake turbulence monitoring, operational procedures, and controller tools.
- Conduct annual review process for all sites to assess benefits for CRDA use.
- Using the cross-organizational Airport Obstructions Standards Committee (AOSC) to develop recommended standards and action plans for runway procedures and other initiatives identified by the AOSC Steering Committee, while maintaining an optimum balance among safety, capacity, and efficiency considerations.
- Continue to support establishment of Facility Hiring Plan requirements and selection of potential candidates for placement into terminal facilities in accordance with the ATC Workforce Hiring Plan.
- Deconflict congested airports in and out of closely located airports to provide greater efficiencies including assessing year end performance goals for the areas of New York, New Jersey, Philadelphia, and Chicago.
- Review the analysis conducted for airspace redesign efforts for the airports at Denver, Dallas-Fort Worth, Charlotte Douglas, and Chicago Midway to itemize benefits for redesign milestones.
- Review and validate the analysis conducted in 2012 to determine the feasibility of reducing the separation for dependent operations from 4,300 feet to 3,000 feet on closely spaced parallels.

By the end of FY 2014, anticipated accomplishments for En Route and Oceanic/Terminal Services include:

- Improve global interoperability in the Oceanic and Offshore domains by continuing development of operational prototyping of OTM4D.
- Continue efforts to ensure global harmonization of service improvements through collaboration with international and industry service providers by active participation and leadership in regional ICAO and inter-organizational workgroups and decision making processes.
- Continue to conduct research to improve safety and increase throughput using wake turbulence monitoring, operational procedures, and controller tools.
- Perform analyses to determine the safety of providing simultaneous parallel approaches with the use of NextGen displays.
- Analyze each facility that has widely space parallel approaches to determine if benefits can be derived from use of color displays to identify parallel operations in lieu of existing final monitor positions.
- Review and validate analysis and implementation strategy of color use for parallel operations.
- Conduct annual review process for all sites to assess benefits for CRDA use.
- Continue to support the RCAT in examining data from FAA investigations related to Pilot Deviations, loss of standard separation, and Vehicle/Pilot Deviations in order to determine root causal factors for the incident.
- Support Tower Flight Data Management (TFDM) system engineering activities to finalize requirements and continue prototyping activities.
- Establish a more effective separation standard for Instrument Flight Rule (IFR) operations between the final approach fix and runway threshold.
- Ensure terminal facilities can maximize airspace design for arrivals and departures by completing a study to assess the viability of reducing the separation minima from obstructions including assessing any reductions of separation minima for obstruction and terrain that is based upon new radar capabilities or NextGen technologies for terminal approach controls including validation of analyses for operations near obstructions and near terrain.

- Continue to support establishment of Facility Hiring Plan requirements and selection of potential candidates for placement into terminal facilities in accordance with the ATC Workforce Hiring Plan.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

En Route and Oceanic/Terminal Services will provide ATC operations at 402 service delivery points in the U.S., Puerto Rico, and Guam. This Service unit will continue to provide its owners, customers, and system operators the highest degree of safety and service in the most efficient manner.

We will ensure the Service unit meets future capacity demands by ensuring provision of safe and efficient air traffic control services throughout the en route portion of the NAS through targeted increases. The benefits and outcomes expected to be achieved with the funds provided in this budget request are:

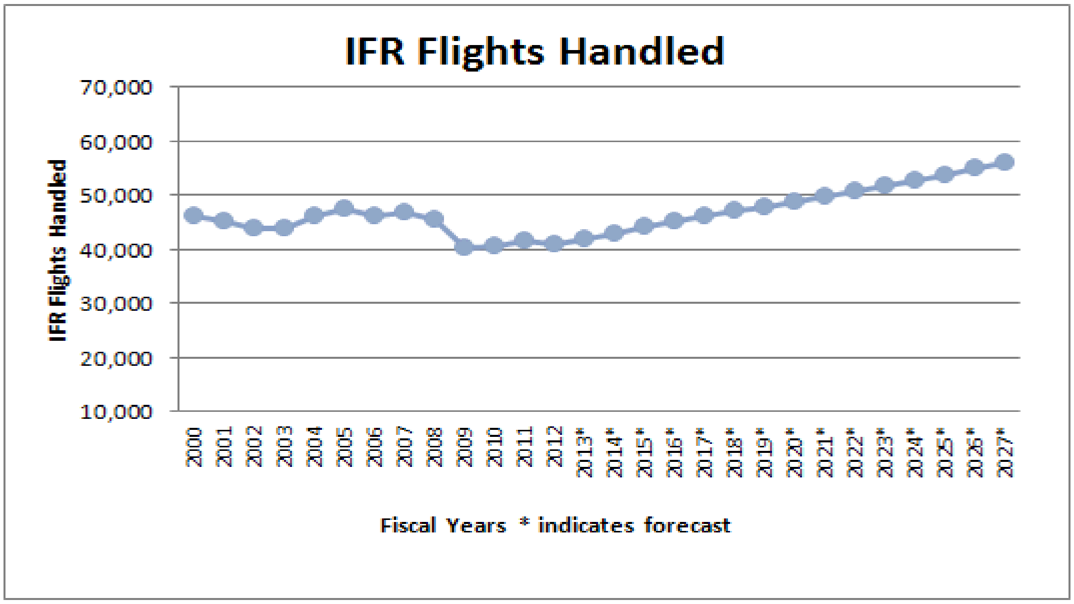
- Achieve and maintain an average daily airport capacity for the Nation's Core Airports of 103,068 arrivals and departures per day through 2014.
- Maintain a NAS on-time arrival rate of 88 percent at the Nation's Core Airports.
- Continue to decrease the number of operational errors.
- Maintain the En Route fiscal year end actual on-board acquisition position count at or within 5 percent of the fiscal year requirement published in the Acquisition Workforce Plan.
- Sustain adjusted operational availability of En Route equipment at 99.7 for the reportable facilities that support the Nation's Core Airports.
- Reduce the rate commercial air carrier fatalities per 100 million passengers on-board aircraft by 50 percent by 2025. FY 2014 Target is 7.7.
- Improve situational awareness for pilots and controllers in the NAS by providing them with additional information concerning potential conflicts and offering possible resolutions.

En Route and Oceanic/Terminal Services is also unique in that it is not redundant or duplicative of any other Federal, state, local, or private effort. There is no overlap between FAA's management of the NAS and any other entity. Public Law (49 U.S.C.A. § 106) charges FAA with "controlling the use of the navigable airspace of the United States by regulating both civil and military operations in that airspace in the interest of safety and efficiency." While other entities provide air traffic control services (e.g., Department of Defense and Contract Towers), they do so only under FAA's authority and oversight. These arrangements are documented through agreements, Executive Orders, and Executive Policy. The specific responsibility to operate the NAS is carried out through the ATO, with Terminal managing airport and arrival/departure operations near the airport. Any activities involving other parties are coordinated and carried out under the auspices of FAA and governed by advisory circulars for establishment of airport services. We coordinate air traffic services with the other ATO operating units (i.e., System Operations Services, and Technical Operations Services).

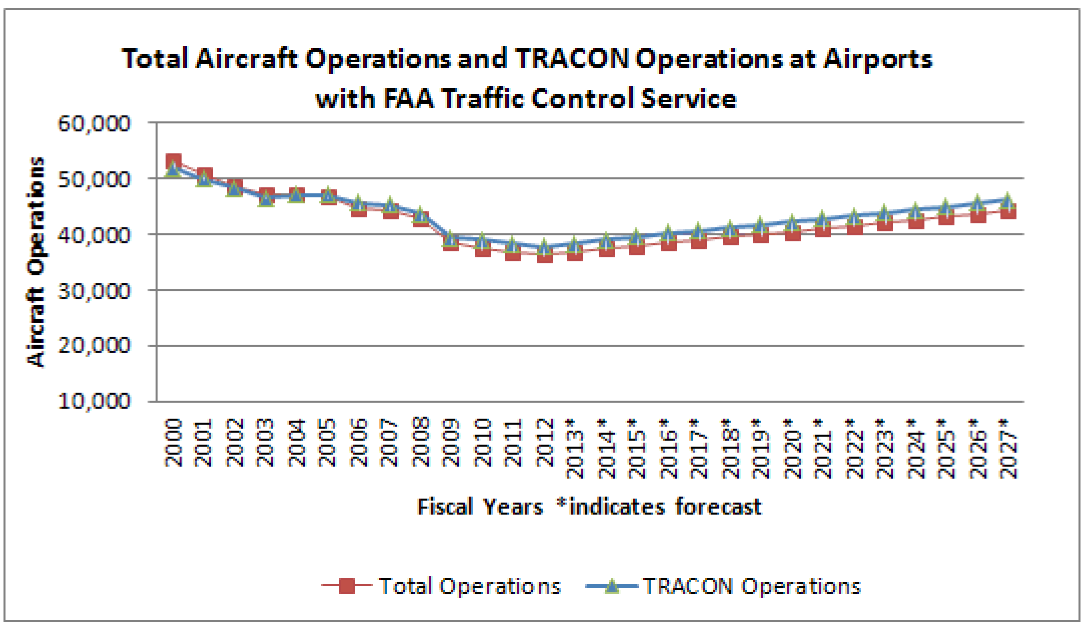
How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance.

The chart below depicts the number of Instrument Flight Rules (IFR) flights handled. 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 flyovers (an IFR flight that originates outside the center's area and passes through the area without landing).



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



In FY 2014, we will continue to increase safety efforts as well as increase capacity and efficiency of the NAS. We will continue to support achieving an average daily airport capacity for the Nation's Core Airports of 103,068 arrivals and departures per day in FY 2014 and a NAS on-time arrival rate of 88.0 percent at the Nation's Core Airports. In addition, we will continue efforts to decrease the number of operational errors in the En Route environment. In the Oceanic airspace, our plan is to reduce separation to improve the percentage of NAS on-time arrivals and increase fuel efficiency.

We have an important support role for initiatives related to the measurement and analysis of safety performance; global interoperability; reduction in transportation-related injuries; fatalities; and economic competitiveness. En Route's efforts support an air transportation system responsive to consumer needs and helps maintain a well-trained controller workforce.

En Route and Oceanic/Terminal Services unit is effective in achieving its annual performance goal for runway incursions. This goal is tracked at all airports for which Terminal is responsible. We have also achieved the annual performance goals for NAS on-time arrival and average daily airport capacity, which are tracked at the Nation's Core Airports and seven metropolitan areas. The Terminal domain also tracks efficiency measures: unit cost, productivity, and staffing ratio.

The Terminal domain has specific long-term performance measures, tied to specific programs/projects, which support the accomplishment of long-term DOT and FAA goals. Of the DOT performance goals, four serve as the long-term performance measures for the Terminal program (two Safety goals – "reducing the commercial air carrier and general aviation fatal accident rates;" two Reduced Congestion goals – "increase reliability/on-time performance of scheduled carriers" and "increase capacity for the Nation's Core Airports to meet projected demand/reduce congestion)."

The two Reduced Congestion goals," increase reliability/on-time performance of scheduled carriers" and "increase capacity," are direct indicators of Terminal's program performance for capacity and efficiency and are tracked against the Nation's Core Airports. Terminal manages one supplemental safety measure that is tracked against the FAA-staffed terminal facilities and the largest Federal Contract Towers for which Terminal is responsible for "reducing the rate of runway incursions." This supplemental safety goal is Terminal's leading indicator of safety performance. The four specific long-term performance measures are used by Terminal to measure progress towards the four DOT performance measures mentioned above.

Independent internal audits are also performed on a recurring basis by FAA's Office of Safety to ensure the operational services units are complying with established policies, orders, directives, and guidance. These periodic assessments are conducted on a site-by-site basis to ensure adherence at all levels of the organization. Once a year, at a minimum, internal reviews are conducted for each FAA-staffed facility. Facility evaluations of FAA's federal contract staffed towers are conducted biennially. The review criteria are defined in FAA's Air Traffic Control Quality Assurance and Air Traffic Facility Evaluation orders.

Why Do We Want/Need To Fund The Program At The Requested Level?

The Federal Government continues to explore ways to reduce costs and maximize efficiency. The FY 2014 request incorporates required reduction at lower traffic ATC towers in order to generate cost savings. While pursuing costs savings, En Route and Oceanic/Terminal Services endeavors to maintain its same standards for safety.

FY 2014 funding levels will support 19,856 FTPs in the En Route and Oceanic/Terminal Services whose primary function is to ensure the safe and efficient flow of ATC services throughout the NAS. In support of DOT's Safety, Economic Competitiveness, Organizational Excellence, and Strategic Plan's goals, this funding will:

- oversee ATC operations for aircraft operating under instrument flight rules between airport terminal areas, which is performed by air traffic controllers located in 402 service delivery points in the U.S., Puerto Rico, and Guam;
- reduce the number and rate of Category A and B (most serious) runway incursions; and
- achieve the specified average daily airport capacity at the Nation's Core Airports and the NAS on-time arrival rate.

For controllers in en route and oceanic, their primary function is to keep track of the progress of all instrument flights within the center's airspace, which typically extends over a number of states and covers more than 100,000 square miles. Terminal ATC specialists at FAA towers transfer control of aircraft on instrument flights to our en route controllers when aircraft leave the terminal's airspace. The en route controllers transfer control of aircraft back to terminal ATC specialist as they return to a terminal's airspace.

Through innovative training techniques and efficient database tracking, we are also ensuring that a consistent progression of air traffic controllers is available to staff our facilities now and in the future.

Terminal controllers are responsible for directing the movement of aircraft on and in the vicinity of airports, usually within a radius of 5 to 35 miles, using visual or instrument flight rules. Terminal controllers provide separation between landing and departing aircraft, transfer control of aircraft on instrument flight to en route controllers when aircraft leave the terminal airspace, and receive control of aircraft coming into the terminal's airspace from controllers at air route traffic control centers.

Detailed Justification for the – Vice President Technical Operations, AJW-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – Technical Operations Services – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Technical Operations Services	$1,702,209	$1,709,769	$1,716,181	$13,972

The FY 2014 budget request for Technical Operations Services is $1,716,181,000 and 7,915 FTP / 7,923 FTE. This request provides an adjustment to base of $7,817,000 for pay inflation and other changes of $76,000 for the Working Capital Fund.

This budget request has a base transfer of $7,849,000 and 19 FTP / 20 FTE from the Office of the Assistant Administrator of Finance and Management (ARC) regarding Hangar 6 located at Ronald Reagan Washington National Airport. Hangar 6 provides aviation support for senior government official including the Secretary of Transportation, FAA Administrator and Deputy Administrator, NASA, the Federal Emergency Management Agency, Presidential Cabinet members, members of Congress, and other Federal government organizations. Hangar 6 is responsible for operating and maintaining three aircraft: two leased Cessna Citation Excels and one Gulfstream IV aircraft which is owned by the FAA.

This request includes a combined base transfer from ATO Technical Operations and Mission Support of -$1,770,000 to the Assistant Administrator Office of Finance and Management for Personal Property Management Realignment. The Technical Operations portion of the base transfer is -$2,800,000.

Funding the FY 2014 request at this level will allow Technical Operations to achieve these initiatives:

- Evaluate and deploy runway status lights at Airport Movement Area Safety System (AMASS) and Airport Surface Detection Equipment – Model X (ASDE-X) airports.
- Continue development and implementation of policies/procedures and technology, coupled with strategic investment in the current NAS infrastructure, to grow NAS capacity and improve services safely and efficiently.
- Develop and implement NAS technology, policies, and procedures. Invest in the current NAS infrastructure to sustain services, increase capacity, and enhance safety.
- Increase capacity by evaluating and certifying modified and/or augmented procedures, implementing new technology, and increasing service efficiency for all users.
- Sustain increased capacity by evaluating and certifying modified and/or augmented procedures, implementing new technology, and increasing service efficiency for all users.
- Follow policies and procedures to monitor, control, maintain, and restore NAS equipment.
- Provide technical support to the Integrated Display System (IDS4) Replacement Program in site planning and coordination for systems installations.
- Provide economies of scale with national contracts that will include small business provisions. FAA security requirements, as well as those recommendations from the Inter-Agency Security Councils, will be incorporated into the draft Statement of Work released in advance of the procurement so that the requirements are widely known and more companies will have an opportunity to prepare for the competitive procurement.
- Conduct accurate inventory of the real property assets for ATO facilities.
- Implement an efficient and effective cyber security program by protecting FAA-sensitive and individual privacy information from unauthorized disclosure.
- Improve the functionality of Computer Aided Engineering Design (CAEG) software and investigate methods for reducing CAEG operating costs.
- Perform Configuration Management for the Air Traffic Control (ATC) Facilities Directorate.

- Support Real Property Asset Management Inventory by utilizing efficient methodologies to determine existence and condition of real property. Methodology will utilize reliable data, replacement and repair request data, statistical sampling, and limited physical testing.
- Develop and manage an ATC facilities evolution plan that maps future and planned future sustainment of infrastructure to the evolving NAS.
- Conduct periodic Seismic Risk Mitigation Assessments of facilities in support of Public Laws and Executive Orders.
- Sustain unstaffed infrastructure in accordance with International Agreements and sound business practices.
- Standardize requirements and performance standards across all facilities to improve the quality and effectiveness of the guard services.
- Maintain and sustain the Weather and Radar Processor (WARP) service in accordance with the program specification and requirements.
- Award contract to vendor/vendors for Low-Level Wind Shear Alert System (LLWAS) spares.

Key outputs expected to be achieved in the budget year with the requested resources:

- Provide navigation systems for commercial and private aviation pilots by maintaining the existing ground-based equipment.
- Ensure that the Runway Template Action Plan (RTAP) schedules, milestones, and completion dates for commissioning new Next Generation Air Transportation System (NextGen) runway/extensions are met.
- Provide Environmental and Occupational Safety & Health (EOSH) training and personal protective clothing and equipment to personnel, obtain regulatory permits, e.g. (air, water, fuel storage tanks (FST)) to ensure operation of FST, conduct compliance inspections, materials testing, and pollution prevention to support NAS operations.
- Sustain operational availability of all facilities at 99 percent by sustaining power systems; evaluating system operations; and implementing deficit solutions to increase operational readiness. In addition, complete scheduled activities of preventive maintenance, equipment modifications, service certifications, and restoration activities.
- Implement key work plans in support of delivering the NextGen mid-term operational vision for flexible terminals and airports.
- Improved professionalism in the facility security officers through the use of standardization and oversight that ensure that qualification and certification requirements are being met.

Key outcomes expected to be achieved in the budget year with the requested resources:

- Reduce the commercial air carrier fatalities per 100 million persons on board by 24 percent over a 9-year period (2010-2018). No more than 6.2 in 2018.
- Reduce the general aviation fatal accident rate to no more than 1 fatal accident per 100,000 flight hours by 2018.
- Decrease in the number of site physical security discrepancies, including guard services that would lead to an increase in the number of accreditations.
- Sustain adjusted operational availability of 99.7 percent for the reportable facilities that support the Nation's Core Airports through FY 2014.
- Reduce the U. S. population exposed to significant aircraft noise around airports to less than 300,000 persons.
- Continue small business involvement through the National Guard Services Contract.
- Achieve zero cyber-security events that disable or significantly degrade FAA services.
- Achieve a 90 percent success rate in the areas of financial management and human resources management.

What Is This Program?

The purpose of the Technical Operations Service Unit is to:

- improve situational awareness for pilots, controllers and airfield operators by providing them with additional information concerning potential conflicts and offering possible resolutions;

- increase NAS capacity for all users through changes in technology;
- maintain NAS services for all users by strategically investing in the current infrastructure; and
- ensure efficient delivery of all NAS services for all stakeholders by effectively managing the Technical Operations Services Unit.

Technical Operations supports the delivery of safe and efficient flight services to customers through responsive and cost effective maintenance of the NAS facilities, systems, and equipment. The work consists of:

- system design, development, acquisition, installation, maintenance, restoration, modification, and certification;
- Flight Inspection to support restorations and periodic inspection of NAVAIDs and the certification of amended instrument flight procedures;
- commissioning and periodic flight inspection;
- facilities maintenance;
- engineering and assignment of aeronautical frequency spectrum;
- safety integration;
- information and physical security management; and
- administrative and business support functions.

The Technical Operations Services Unit supports DOT Strategic Plan's Economic Competitiveness goal to maximize economic returns on transportation policies and investments through its support to achieve FAA's annual targets for average daily airport capacity at the Nation's Core Airports and adjusted operational availability.

Our core work is performed by the System Support Centers and Flight Inspection Field Offices. These professionals focus daily on optimizing NAS performance through prioritization of response based on factors such as importance of the airport or ATC facility that is directly or indirectly affected by the equipment or service outage. This core work includes certification, logging, maintenance, modifications, and technical documentation.

Strategic efforts and related program management is primarily provided by headquarters organizations. Technical Operations strategic activities supporting the FAA goals include NextGen development and implementation. Funding the Wide Area Augmentation System (WAAS) approaches contributes toward this effort.

The Technical Operations Service Unit is made up of the following directorates:

Safety and Operations Support provides technical support to ATO's service units, through a strategy of focused engineering, policy, data, and in-service management by providing the support structure, methodology, tools, procedures, performance monitoring and assurance, necessary for the proper operation and maintenance of the NAS.

The ATC Facilities Office provides safe and effective lifecycle management of the NAS and facilities infrastructure. They also provide policy and guidance, programming, requirements, engineering, integration and implementation support, service life extension, and maintenance support.

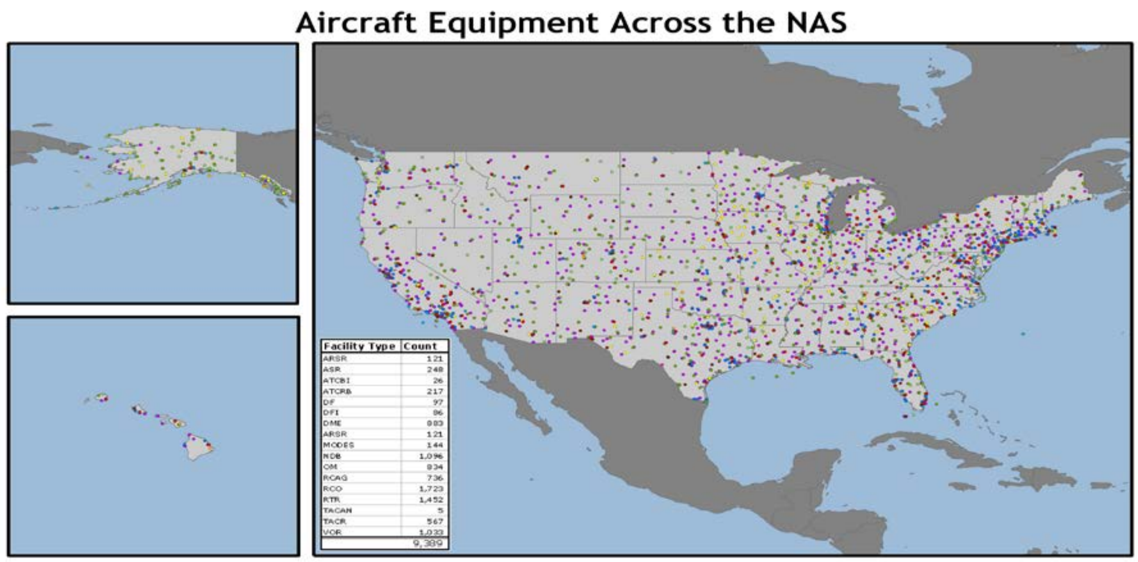
The Flight Inspection Services' mission is to ensure the evaluation and certification of NAVAIDS and airspace systems, instrument flight procedures, and equipment for customers worldwide. The organization operates aircraft for the purpose of flight inspection.

Spectrum Engineering Services obtains, assigns, and protects radio frequencies for the FAA's communication, navigation, and surveillance programs. This includes resolving Radio Frequency Interference (RFI) events that affect the NAS as well as developing and coordinating the civil aviation radio frequency standards and protection criteria to support future NAS systems.

The Air Traffic Control Facilities Directorate's, Facilities Security Risk Management Office provides guard services for Security Level (S/L) 3 and 4 facilities. This designation is given to facilities because of the size and scope of the operation and criticality of the mission they are assigned to perform. Additionally, FAA

Order 1600.69B change 1 identifies the need for guards and the functions they are expected to perform at S/L 3 and 4 facilities in the FAA Guard Staffing Standard. In light of the constantly changing threat to Government facilities, it is imperative that the guard services at high visibility installations be trained to provide the most cost effective protection to the facilities and its employees. The development of an FAA Headquarters administered national contract for guard services will ensure the standardization of requirements for all guards.

The Telecommunications Services Group (TSG) also manages the Network Enterprise Management Centers in Atlanta and Salt Lake City.



Facility Type	Count
ARSR	121
ASR	248
ATCBI	26
ATCRB	217
DF	97
DFI	86
DME	883
ARSR	121
MODES	144
NDB	1,096
OM	834
RCAG	736
RCO	1,723
RTR	1,452
TACAN	5
TACR	567
VOR	1,033
	9,389

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

Our partners and stakeholders include:

- Commercial Aviation Safety Team (CAST)
- International Civil Aviation Organization (ICAO)
- International Telecommunication Union – Radio Communications (ITU-R)
- National Telecommunication and Information Administration (NTIA)
- Department of Defense (DOD)
- Federal Communications Commission (FCC)
- Joint Planning and Development Office (JPDO)
- National Transportation Safety Board (NTSB)
- Department of Homeland Security (DHS)
- Radio Technical Commission for Aeronautics
- The Airline community
- RTCA, Inc.
- Academia
- FAA lines of business (other ATO Service Units, AVS, AFN, ARP, ASH)
- Industry and state/local governments
- Inter-Agency Security Council

By the end of FY 2013, accomplishments for Technical Operations include:

- Increasing capacity by evaluating and certifying modified and/or augmented procedures, implementing new technology and increasing service efficiency for all users, including new runway commissioning.
- Conduct accurate inventory of the real property assets for ATO facilities.
- Implement an efficient and effective cyber security program.
- Prevent unauthorized disclosure of FAA-sensitive and individual privacy information.

- Award three Headquarters contracts, one per service area, for security officer services at 72 sites where existing security officer services are provided by local guard service contracts. This will achieve economies of scale and standardization.

By the end of FY 2014, anticipated accomplishments for Technical Operations include:

- Increase capacity by evaluating and certifying modified and/or augmented procedures, implementing new technology and increasing service efficiency for all users, including new runway commissioning.
- Conduct accurate inventory of the real property assets for ATO facilities.
- Implement an efficient and effective cyber security program.
- Prevent unauthorized disclosure of FAA-sensitive and individual privacy information.
- Complete 106 engine generator sustainment projects.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

The safety of air travelers and the ability to get them to their destination on-time is dependent on the availability of navigational and communications equipment and redundant back-up systems. The availability of the equipment necessary to provide service directly affects the performance of the NAS. Loss of radar or communications equipment will affect the speed and number of aircraft that can be handled. The ability of the NAS to continually provide guidance is crucial and affects both safety and capacity.

The target performance level is met by adherence to FAA maintenance policies and procedures for NAS monitoring, control, maintenance, and restoration. This strict adherence optimizes service availability for the Nation's Core Airports. Most of the unscheduled downtime for the fiscal year was due to equipment and power outages.

The goal for Adjusted Operational Availability is expected to remain at 99.7 percent. ATO analyzes various performance data to increase or maintain targeted level of performance and determine metric goal in order to provide appropriate Safety and Economic Competitiveness outcomes for the flying public.

Complementing the safety of air travelers is the security of the FAA facilities and employees whose job it is to ensure the safe and efficient control of flight operations. The provisioning of high quality, professional guard services at staffed FAA facilities ensures that the work of controlling flight operations can proceed without interruption.

How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule and performance.

The NAS is an inherently complex system, with multiple levels of redundancy to assure availability of key services. We have adjusted response time at low-level facilities to ensure service is restored first to the most critical facilities. The Technical Operations Services Unit has established the following target for this performance goal: "Sustain Adjusted Operational Availability at 99 percent for reportable facilities that support the NAS."

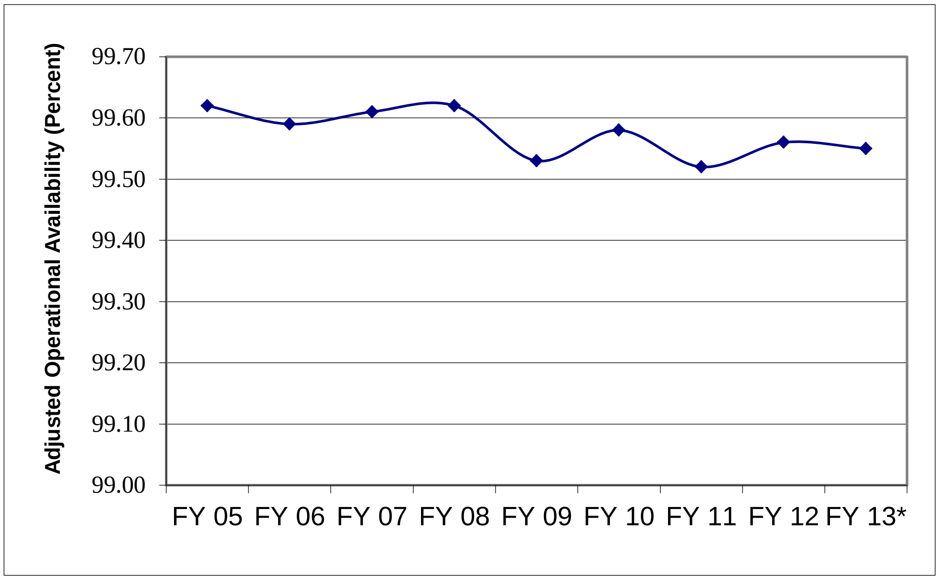


Figure 7: Adjusted Operational Availability of NAS Capabilities
Note: *FY 2013 data thru 12/31/12 (December data is preliminary)

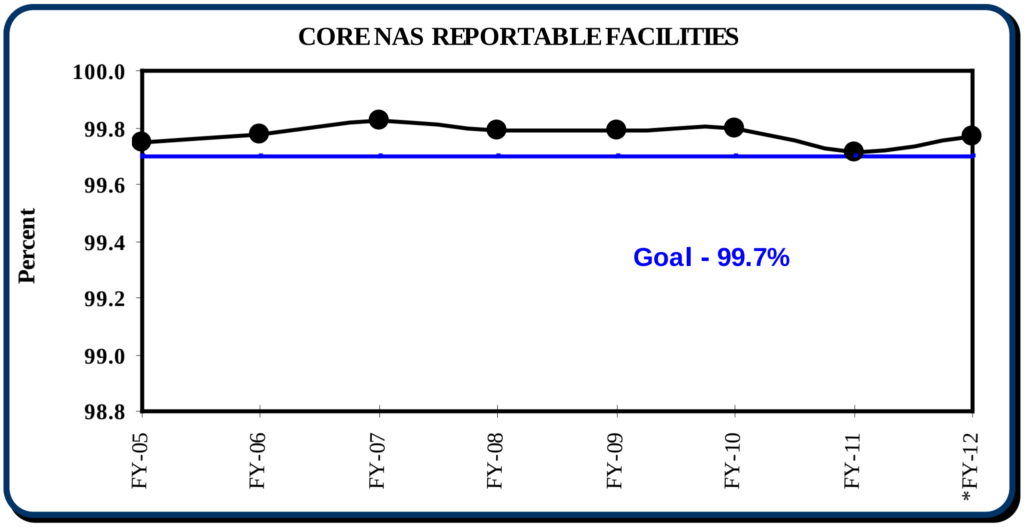
Systems Maintenance Field Maintenance Performance Indicators

Fiscal Year	Number of Facilities**	Adjusted Operational Availability	Reliability
2005	22,792	99.62%	99.90%
2006	22,860	99.59%	99.85%
2007	22,637	99.62%	99.84%
2008	22,611	99.62%	99.84%
2009	22,804	99.53%	99.85%
2010	22,419	99.58%	99.85%
2011	22,451	99.52%	99.85%
2012	22,023	99.56%	99.86%
2013*	20,551	99.55%	99.86%

*FY 2013 data thru 12/31/12 (December data is preliminary)
**Operational facilities deemed reportable in FAA Order 6040.15, "National Airspace Performance Reporting System."

Adjusted Availability for Nation's Core Airports
(Reportable Facilities)
FY 2012 Goal (Maintain adjusted availability of Nation's Core Airports
NAS reportable facilities at 99.70%)

Target: 99.70%
FYTD: 99.77%
Mar 12: 99.76%
Apr 12: 99.72%
Apr 11: 99.77%



Preliminary numbers show, for the month of April 2012, we are above the goal for adjusted operational availability. Compared to March 2012, the adjusted operational availability for the Nation's Core Airports (reportable facilities) decreased by 0.042 percent with an approximate increase of **9,000 hours in scheduled downtime (mainly due to code 60 Periodic Maintenance, code 64 Administrative, code 65 Corrective Maintenance and code 68 Related outages). Compared to April 2011, the adjusted operational availability for the Nation's Core Airports (reportable facilities) decreased by 0.055 percent.

**Scheduled downtime value excludes improvement outages

Note: Data Source – NAS Performance Analysis System (NASPAS) ***(The NASPAS database is validated continuously)***
Official data through March 2012; Preliminary data – April 2012

Why Do We Want/Need To Fund The Program At The Requested Level?

Technical Operations ensures that thousands of systems, facilities, and pieces of equipment are operationally ready to manage our Nation's air traffic control system. Without system specialists and management teams working to complete preventive maintenance and repair equipment, unscheduled outages can result in delays in the system, negatively impacting the flying public.

Another component of the Technical Operations organization that serves as a vital link in delivering air traffic control services is Flight Inspection Services. Technical Operations employees conduct airborne inspection of electronic signals from ground-based NAVAIDS to support aircraft departure, en route, and arrival procedures. This group evaluates flight procedures for accuracy, human factors fly-ability, and obstacle clearance. Without this "check," the NAS would not be as safe as it is today.

Technical Operations manages their operations by measuring performance of the NAS based on what systems or services are available for air traffic control operations (Adjusted Operational Availability). However, this metric directly impacts FAA's airport capacity metric (Average Daily Airport Capacity) as noted above, as well as our safety reduction goals (Commercial and General Aviation Fatal Accident Rates). Technical Operations ensures that terminal and en route controllers have all critical parts of the NAS infrastructure available for the safety and efficient delivery of air traffic services.

Technical Operations manages and protects all civil aviation radio frequencies used by NAS communication, navigation, and surveillance systems. We resolve RFI that disrupt NAS operations and promote U.S. radio frequency spectrum positions and initiatives in the International Telecommunications Union Radio communication study groups and related World Radio Communication Conference activities. The management of radio frequency spectrum resources is vital to efficient operation of the NAS.

The provisioning of guards at Security Level 3 and 4 facilities fills a critical role in the safe operation of the NAS. If one of these facilities is adversely affected by an intrusion or other disruptive event, the ability to safely control flight operations may be in jeopardy. The use of a highly trained, professional security force will act as a deterrent to those who would attempt to disrupt the operation of the NAS.

Detailed Justification for the - Vice President System Operations, AJR-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – System Operations Services – Budget Request
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
System Operations Services	$287,535	$297,131	$288,104	$569

The FY 2014 budget request for System Operations Services is $288,104,000 and 448 FTP / 452 FTE. This request provides an adjustment to base of $568,876 for pay inflation.

Funding the FY 2014 request at this level will allow System Operations to maintain the NAS by accomplishing the following:

- The Air Traffic Control Systems Command Center (ATCSCC) Directorate will:
  - continue to execute the real-time management of the National Airspace System (NAS) to ensure safe and efficient use of available airspace, equipment, and workforce resources through planning, directing, implementing, overseeing, and continuously regulating the flow of air traffic to minimize delays and congestion while maximizing the overall operation of the NAS throughout the United States;
  - continue to support a customer-focused, safe, efficient, and affordable air transportation system that is environmentally responsible that through International leadership and coordination promotes global understanding and acceptance of the FAA mission, operations, and ATO modernization efforts;
  - oversee and manage the establishment of program directives, policies, standards, strategies, plans, and management methods to support the operational requirements of national and international flight operation, worldwide contingency planning, promoting flight data exchange programs, and establishing traffic flow management standards and technologies that harmonize ATM operations and develop a seamless and fully interoperable global ATM system;
  - will continue long-term planning, development, and analysis of the FAA system of air traffic management, manage new technologies, apply and test new tools and concepts, enhance current system tools, develop traffic management processes and procedures, examine current methods and implementation of solutions to improve efficiency within the NAS;
  - continue to use the Integrated Collaborative Routing (ICR) process during weather events;
  - enhance, expand, and train employees on the ICR process for use during the severe weather season;
  - adjust traffic demands to meet system capacity when a significant weather event impacts an airport or portion of airspace;
  - continue to develop the Collaborative Decision Making (CDM) process model and share airport surface data with stakeholders;
  - develop an airport CDM process model at a target airport in the NAS;
  - continue to collaborate with aviation stakeholders in support of a seamless, safe, and efficient air traffic operation, emphasizing a system focus, and conduct stakeholder forums and meetings to address concerns and follow-up on operational and procedural issues across organizational boundaries and to jointly create technological and procedural solutions to traffic flow problems that face the NAS; and
  - continue to incorporate commercial space launches into the NAS while ensuring maximum capacity and efficiency through coordination with multiple lines of business to develop and implement training, notification processes, decision authority processes, airspace management, and traffic flow management procedures.
- The Flight Services Directorate will:
  - continue to provide flight services in the contiguous (CONSUS) U.S. via the Automated Flight Service Stations (AFSS) contract (FAA will continue to provide Flight Services in Alaska); and

- continue to manage the AFSS contract to provide quality flight services to the CONUS, Puerto Rico, and Hawaii. Flight Services will work with the Programs Management Organization to continue to modernize Flight Services through the Flight Services Modernization program in order to standardize and improve service delivery to pilots.
- The Surface Operations Directorate will integrate Surface CDM initiatives, RTCA recommendations, data and data management strategies, facilitate changes to operations and operational systems, and policies/procedures to produce measureable NAS efficiency performance improvement in surface occupancy time, reduced surface delay, noise, and emissions.
- The System Operations Security Directorate will:
    - continue to collaborate with Department of Homeland Security (DHS), Department of Defense (DOD), and other security stakeholders to protect the country and its interest from threats involving the air domain;
    - continue to use Air Traffic Management (ATM) related capabilities to directly protect the NAS from attack or exploitation by terrorists and other hostile actors in partnership with the DOD, DHS, and other key stakeholders;
    - continue to use ATM-related capabilities to mitigate the impact of security threats and Government responses to those threats on the safety and efficiency of the NAS; and
    - continue to lead ATO's crisis management efforts to sustain the continuity of NAS operations and to support National Response Framework driven disaster response efforts in the face of critical events such as catastrophic hurricanes or large scale terrorist attacks.
- The ATO International Office will continue to coordinate ATO international activities, create annual strategic visions, and facilitate execution of the ATO International Strategic Plan and provide leadership, to the core business of supporting the safe, secure, and efficient operation of the NAS.
- The Performance Analysis Directorate will:
    - track average flight and surface times within the NAS by including Airport Surface Detection Equipment (ASDE-X) data in the Performance Data and Analysis Reporting System (PDARS) data set and integrating that data with the Terminal and En Route data already available to provide a consolidated gate-to-gate measurement and analysis capability;
    - provide oversight and expertise for the development of metrics used to report FAA performance;
    - serve as ATO's principal contact for coordinating approval of metrics for FAA and is responsible for developing, enhancing, and maintaining FAA's performance metrics website;
    - serve as the official source for domestic and international performance metrics and analysis for ATO;
    - support international initiatives on performance analysis through ICAO and CANSO;
    - analyze data to determine the key drivers of NAS-wide performance and operations;
    - support agency investment and shortfall analysis by producing standard operational traffic schedule;
    - evaluate airline schedules and behavior to determine their effect on NAS performance; and
    - support the agency's research needs by sponsoring the NEXTOR II Center of Excellence in Aviation Operations Research.

Key outputs expected to be achieved in budget year with the requested resources:

- The ATCSCC will:
    - continue to manage the establishment of policies, standards, and procedures covering air traffic flow management and airspace management, to support the safe, secure, and efficient use of navigable airspace;
    - develop tools, guidance, and procedures that match system capacity, efficiency and predictability to user demands while improving access to, and increasing the capacity of the nation's aviation system;
    - continue to coordinate traffic flow to assure efficient movement of air traffic; and
    - use the following targets to measure its performance:
        - Average Daily Airport Capacity (Nation's Core Airports) – Achieve an average daily airport capacity for the Nation's Core Airports of 86,606 arrival and departures per day by FY 2011 and maintain that level through FY 2014
        - Average Daily Airport Capacity (metropolitan areas) – achieve an average daily airport capacity for the seven metropolitan areas of 39,484 arrivals and departures per day by FY 2009 and maintain that level through FY 2014. The ATCSCC will continue to improve critical information-sharing and incorporate aviation stakeholder recommendations to help guide

decision-making that will more effectively manage flight diversions during severe weather events.

- The System Operation Security's Directorate will:
  - provide specialized ATM-related measures (e.g., security driven Temporary Flight Restrictions) to continue to protect sensitive activities, locations, and events, such as Presidential movements, from aviation-related threats while minimizing safety and efficiency effects on civil aviation; and
  - provide crisis management efforts to continue to strengthen the preparedness and consequence management capabilities used to sustain NAS operations and to support disaster response air missions in the face of critical events, including natural disasters and large scale terrorist attacks.
- Flight Services will continue to manage the AFSS contract to provide quality flight services to the CONUS, Puerto Rico, and Hawaii. Flight Services will work with the Program Management Organization Directorate to continue to modernize Flight Services through the Future Flight Services Program (FFSP) in order to standardize and improve service delivery to pilots.
- The ATO International Office will coordinate ATO's international activities, create annual strategic visions, and facilitate execution of the ATO International Strategic Plan. The office will also provide effective, consistent, and well-coordinated strategic leadership, products, and services to ensure harmonization of domestic U.S. air traffic operations and Next Generation Air Transportation System (NextGen) technologies, procedures and standards with the global civil aviation community, international organizations, and user groups. Additionally, it will provide direct technical support and strategic guidance to support daily requirements of operational facilities to interface with foreign air navigation service providers. Outputs for the fiscal year include: coordinate and facilitate the ATO strategic vision and supporting activities in the Europe, Africa, and Middle East regions, as well as Global Forums dealing with cross-regional air traffic initiatives; coordinate and facilitate the ATO strategic vision and supporting activities in the Asia and Pacific Region, as well as U.S.-controlled international airspace in the Pacific Ocean; and coordinate and facilitate the ATO strategic vision and supporting activities in North, Central, and South America and the Caribbean, as well as air traffic support to the International Civil Aviation Organization (ICAO) global policy and standards initiatives.
- The Performance Analysis Directorate will:
  - provide a consolidated gate-to-gate measurement and analysis capability (PDARS);
  - assist in providing accurate and consistent workload planning and NAS modeling for investment analysis by delivering detailed demand forecasts at the service delivery point (SDP) level.
  - collaborate with international organizations to produce ICAO and CANSO documents recommending improved operational practices and analyzing operational performance;
  - provide a monthly report projecting the effect of airline schedules on NAS delays at the core airports; and
  - provide simulation and modeling support to airport and airspace improvement projects, including the Future Airport Capacity Task (FACT 3) and SFO and JFK construction projects.

What Is This Program?

This program supports DOT's goals of Safety: Reduction in transportation-related fatalities and injuries and Economic Competitiveness: Maximum economic returns on transportation policies and investments.

The System Operations Service Unit consists of several directorates that perform essential functions in the daily operation of the NAS. These directorates are:

- Air Traffic Control System Command Center (ATCSCC);
- Security;
- Flight Services;
- Data Management;
- Surface Operations;
- International; and
- Performance Analysis.

The ATCSCC coordinates air traffic flow. System demand frequently exceeds system capacity due to weather, airport delays, special use restrictions, and security restrictions. The ATCSCC regulates the flow of air traffic to minimize delays and congestion while maximizing the overall operation of the NAS. Traffic

Management Specialists adjust traffic demands to meet system capacity utilizing traffic flow management tools such as Traffic Management Advisor (TMA), Ground Delay Programs (GDP), Airspace Flow Programs (AFP), Severe Weather Avoidance Programs (SWAP), Miles-in-Trail (MIT), and others.

The Security Directorate orchestrates ATO's efforts to protect the U.S. and its interests from national defense, homeland security, and law enforcement-related threats and natural hazards involving the air domain. This is accomplished by using ATO's air navigation services capabilities, particularly ATM. The Security Directorate leads ATO's efforts to mitigate the impact of those threats, hazards, and Government responses on the safety and efficiency of the NAS. System Operations Security comprises a small headquarters command and support component and Air Traffic Security Control (ATSC) watch-standing teams and operations liaisons at key air defense and homeland security nodes, including a national watch cell at FAA Headquarters in Washington, DC; the Freedom Center in Herndon, Virginia; the North American Aerospace Defense Command (NORAD) facilities in Colorado Springs, CO; Tyndall Air Force Base, FL; Rome, NY; McChord Air Force Base, WA; and the Air Marine Operations Center in Riverside, CA. The Directorate actively participates in various international forums, including ICAO working groups, to advance ATM Security and Civil-Military cooperation on ATM-related matters globally.

The Flight Services Directorate collects and disseminates aeronautical and meteorological information, providing customized pre-flight and in-flight briefings to the domestic and international general aviation (GA) communities, as well as to military, air carriers, and federal and local law enforcement. In FY 2006, Lockheed Martin began providing flight services under the AFSS contract to the continental U.S., Hawaii, and Puerto Rico. FAA expects to achieve $2.001 billion in total savings and cost avoidance (capital and labor) over the 13 years of this program.

The Data Management Directorate is responsible for four primary functional program areas: Data Release Process, NAS Data Repository, ATO Data and Information Sharing Policy and Standards, and ATO Block Aircraft Registration Request (BARR).

- **Data Release Process**: The Director of Data Management chairs the NAS Data Release Board and provides guidance for the NAS Data Release Process for the Vice President of Systems Operations. The NAS Data Release Board has members from various Service Units in ATO. The NAS Data Release Board evaluates all applicable NAS Data Release requests for FAA to determine if they are eligible for approval by the Data Management Director. The FAA may only release NAS data to external organizations identified in a Memorandum of Agreement (MOA). All data releases must be approved by the Data Management Director pursuant to guidelines set forth in Order 1200.22E. Data recipients must submit a new data release request if they wish to provide NAS data to any third party not listed in an existing MOA. This is intended to prohibit further release of NAS data without FAA approval. Aircraft Situational Display to Industry (ASDI) data must be filtered for all sensitive data by the FAA prior to release. Due to increasing concern for security, new security screening procedures are needed to reduce the risk of NAS data being used for unlawful purposes or in a manner that could harm National Security.
- **NAS Data Repository**: The program maintains relational databases on aeronautical data; performs safety data analyses; and develops user applications for approximately 250 customers. The program also maintains aeronautical data in support of FAA's Freedom of Information Act (FOIA) program, ATO litigation, accident investigations, and other FAA organizational safety programs. This program's effort includes the statutorily required (49 USC §45301 et seq) Overflight Fee for Service Program that generates approximately $75 million in NAS user fees annually.
- **ATO Data and Information Sharing Policies and Standards**: The program develops policies, standards, and technology approaches to support complex information exchange environments to support internal and external stakeholders such as Collaborative Decision Making (CDM), Joint Planning and Development Office (JPDO), and NextGen. The program coordinates policies and standards for enterprise-wide use with the Chief Information Officer (CIO), the Office of Aviation Policy and Plans (APO), and security stakeholders.
- **ATO Block Aircraft Registration Request (BARR) Program**: The BARR program protects the legitimate privacy and security interests of General Aviation (GA) aircraft owners, operators, and their passengers. The program is the single point of contact for individuals and groups who want to block the display of their flight information in ASDI. The program develops and maintains MOAs with data users to accomplish data sharing in accordance with the agency's mandate to protect their privacy. The BARR program ensures release of flight information and data from the ASDI

feed is not comprised and that the availability of the information to the FAA and law enforcement agencies is not diminished.

In Alaska, three AFSS and 14 satellite Flight Service Stations (FSS) remain government-operated. The legacy automation systems in Alaska were replaced by the Operational and Supportability Implementation System (OASIS) in FY 2007 to mitigate information security and data integrity issues. OASIS will continue in Alaska through 2014. OASIS will provide a bridge to the FFSP, which is planned to include the next flight services automation system. FFSP is nearing completion of the concept and requirements definition phase of the Acquisition Management System (AMS). The Direct User Access Terminal (DUATS) service is an internet capability that provides flight planning and weather briefings to authorized users on a 24/7 basis. This DUATS contract will be expiring September 2013 and the Flight Service Program Operations (FSPO) is planning to re-compete the contract services.

ATO International is focused on the harmonization of international standards for Air Traffic Management (ATM) services. This requires extensive multilateral and bilateral consultation in international forums with global partners, civil aviation authorities, and air navigation service providers.

The Performance Analysis Directorate monitors the operational performance of the NAS and provides guidance to decision makers through detailed analysis. Performance Analysis is responsible for developing and coordinating FAA operational metrics. The Directorate also maintains an analytical tool, PDARS, which provides operational facilities with gate-to-gate flight and operational data. As part of its performance analysis role, the Directorate monitors airline schedules and behavior, reporting monthly on the likely impact of schedules on performance. Performance Analysis supports long-range workforce and capital planning by providing detailed future airline schedules based on FAA forecasts of aviation demand. In addition, the Directorate provides simulation and modeling support to a large number of different airport and airspace improvement projects, such as the Future Airport Capacity Task (FACT 3) effort. Performance Analysis also leads international efforts to produce recommended practices on analyzing operational performance.

System Operations coordinates with representatives from all groups when building new products or establishing policies and procedures.

Our partners and stakeholders include:

- Airline Operations Centers for the Commercial Airlines
- GA Community
- Department Of Homeland Security, including the Transportation Security Administration, U.S. Secret Service, Customs and Border Protection, U.S. Coast Guard, and Federal Emergency Management Agency
- Port Authority of New York
- Metropolitan Airport Authority of Washington
- Aircraft Owners and Pilots Association
- National Business Aviation Association
- Airlines for America (A4A)
- Department of Defense/Military services, including all services and many of the combatant commands
- Department of Justice, to include the Federal Bureau of Investigation
- Foreign Civil Aviation Authorities and Air Navigation Service Providers
- International Civil Aviation Organization
- Civil Air Navigation Service Organization
- International Air Transport Association
- EUROCONTROL
- European Commission

By the end of FY 2013, the accomplishments for System Operations include:

<u>Safety:</u>

- Implement Safety Management System (SMS) for the FAA. Manage and oversee implementation of FAA Order 1100.61, Air Traffic Safety Oversight and ATO Order JO 1000.37, Air Traffic Organization

Safety Management System to ensure compliance with Safety Standards and Safety Management System.
- Manage the AFSS contract to provide quality flight services to the contiguous U.S., Puerto Rico, and Hawaii.
- Sustain Flight Services and continue preparation for modernizing Alaska Flight Service in order to identify efficiencies and improvements in the service delivery. Provide support to other service units and Federal agencies.
- Enhance system security through collaboration with DOD and DHS, providing air traffic operations-related support to national defense and homeland security missions. Collaborate with DHS and other security stakeholders to protect national special security events. Coordinate with Department of State and other stakeholders on special air traffic secure routing of flights by countries of special security interest to the U.S. in order to mitigate potential security threats.

<u>Economic Competitiveness:</u>

- Use CDM to enhance traffic management tools, net-centric information sharing vehicles and processes to yield the most effective NAS decisions through the CDM process.
- Achieve a NAS on-time arrival rate of 88 percent at the Nation's Core Airports and maintain through FY 2014.
- In accordance with Destination 2025, achieve a 5 percent reduction in average taxi-time at the Nation's Core Airports, identified by the Future Airport Capacity Task 3 (FACT 3) for surface traffic management, a surface management system will be operational by 2016.
- Reduce the impact of security-related activities on the efficiency and performance of the NAS through planning, engaging with interagency partners, and mitigating consequences using technology and advanced operational procedures.
- Detailed operational schedules at the SDP level to assure accurate and consistent workload planning and NAS modeling for investment analysis.
- A consolidated gate-to-gate measurement and analysis capability.
- A detailed analysis of the operations of 12 percent of the ticketing carriers; trending the directional changes in delays and total operations.

By the end of FY 2014, the anticipated accomplishments for Systems Operations include:

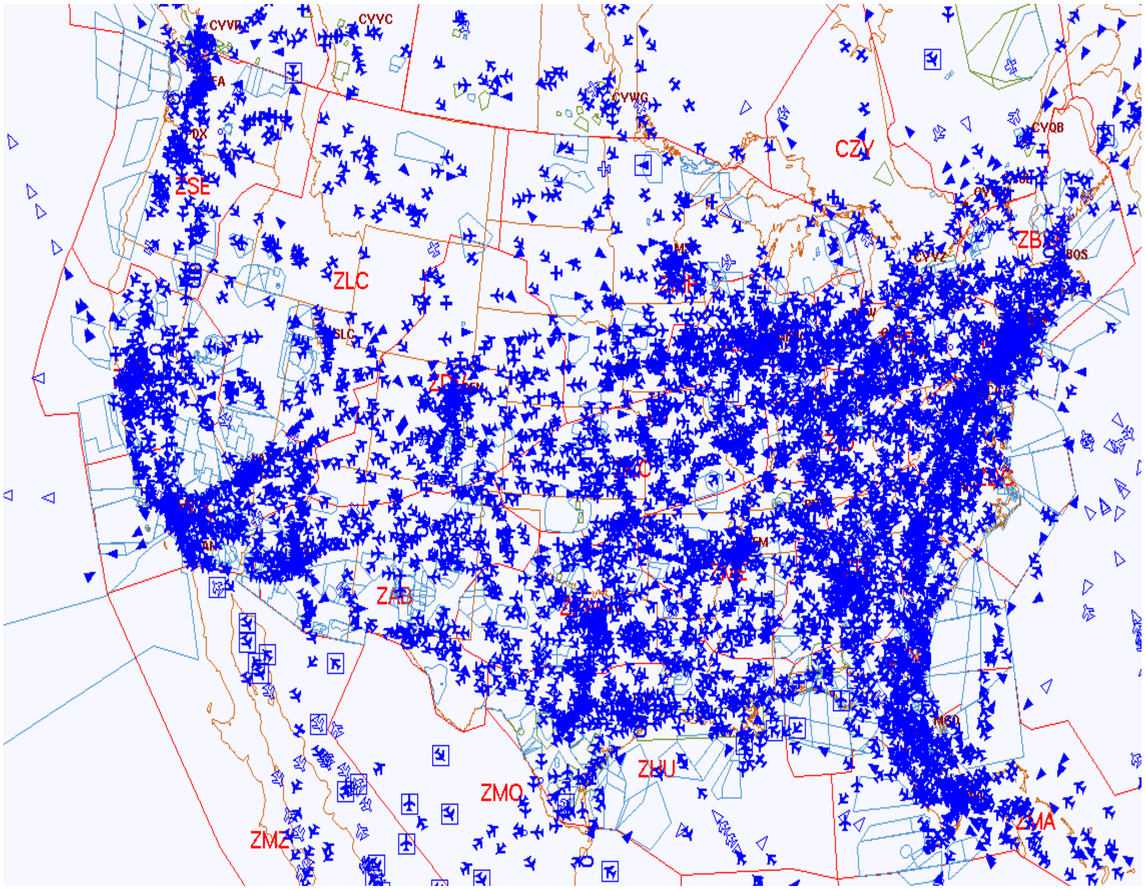
<u>Safety</u>:

- Continue to manage the AFSS contract to provide quality flight services to the continental U.S., Puerto Rico, and Hawaii.
- Provide high quality flight services to our customers in Alaska.
- Promote a positive safety culture by ensuring that our service complies with FAA Order 1100.161 and ATO Order JO 1000.37. We will educate all employees in all aspects of safety management.
- Continue to protect the NAS from attack or exploitation from hostile actors, in partnership with interagency and other stakeholders.

<u>Economic Competitiveness</u>:

- Achieve an average daily airport capacity for the Nation's Core Airports of 59,062 arrivals and departures by FY 2013 and maintain that level through FY 2014.
- Achieve a NAS on-time arrival rate of 88 percent at the Nation's Core Airports and maintain that level through FY 2014. Provide daily improvements to traffic flow by routing around obstacles such as weather, congested airports, and equipment outages. Short-term benefits realized include reduced congestion and delays, making the flying experience more desirable for the general public.
- Detailed operational schedules at the SDP level to assure accurate and consistent workload planning and NAS modeling for investment analysis.
- An enhanced consolidated gate-to-gate measurement and analysis capability.
- A detailed analysis of the operations of 12 percent of the ticketing carriers; trending the directional changes in delays and total operations.
- A 5-year operational outlook of aviation demand based on industry trends.
- Manage the AFSS contract to provide quality flight services to the contiguous U.S., Puerto Rico, and Hawaii. .

- Continue to sustain efficient NAS operations for critical events, natural disasters, and human-caused disasters.



Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

The Systems Operations Service Unit provides services that are critical in the operation of the NAS:

- ATCSCC personnel optimize the capacity of the NAS. The ATCSCC coordinates streams of aircraft over and around constraints and provides traffic flow management information to FAA facilities, while also coordinating their actions and recommendations with the airline home offices. ATCSCC communicates airport and system capacity information factors that influence aviation stakeholder flight decisions. During severe weather and irregular operation situations this information assists airlines in making fully informed decisions to effectively manage schedules and flight diversions.
- The System Operations Security Directorate mitigates the impact of aviation-related threats to national defense, homeland security, natural disasters, and disruptions to air commerce and the associated response measures (i.e., airport terminal shutdowns) on the safety and efficiency of the country's aviation system. We use a broad range of air traffic management tools (e.g., temporary flight restrictions) to carry out this mission using air traffic controllers that are dedicated to security functions to help quickly resolve potential airborne and other threats involving the NAS.
- The System Operations Security Directorate is instrumental in working with DHS, DOD, and other partners as well as the private sector, to enable security solutions that meet the country's national defense, homeland security, law enforcement, and emergency operations demands while mitigating

undesirable impacts on the safety and efficiency of the NAS and air commerce. The Directorate also serves as a key factor in working with ICAO and other international partners to ensure that ATM-related capabilities are used by foreign Civil Aviation Authorities (CAA)/Air Navigation Services Providers (ANSP) in a manner that the aforementioned objectives globally, particularly including airspace affecting the NAS and airspace in which U.S. operators and residents regularly fly.

- Flight Services is the primary interface for general aviation, some corporate and military customers using the NAS. Flight Services collects and disseminates 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 by telephone, radio, the Internet, and face-to-face meetings. Flight Services provides the primary support to Search and Rescue for both the general aviation and military users of the NAS.
- The Data Management Directorate ensures that NAS data is properly released to external entities; manages the Overflight Fee Program to ensure that flights that neither take off nor land in the U.S. are charged for using FAA air traffic services while in the U.S. airspace; executes the Block Aircraft Registration Request Program; and assists in the development of ATO data policies.
- The Surface Operations Directorate is responding to industry expectations for improved airport operations efficiencies and associated cost reductions. The improved surface efficiencies contribute to the airport community's interest in reducing noise and emissions. In addition, the Surface Operations Directorate will expand on the customer rights in the Tarmac rule by improving predictability of service through airport efficiency.
- ATO International continues its active leadership in diverse international forums towards the goal of harmonizing and integrating foreign air navigation services with those being planned and implemented in the United States NAS and to accomplish this in the most effective and efficient manner possible. ATO International is also committed to leading global and regional efforts to foster air navigation solutions that result not only in operational efficiency gains for providers, but reduced fuel consumption and carbon emissions for operators and an overall decrease in civil aviation's carbon footprint. The leadership continues to be showcased in regional partnerships such as the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) and the Asia and Pacific Initiative to Reduce Emissions (ASPIRE).
- The Performance Analysis Directorate provides the operational analysis that is needed to make informed decisions to improve the current operational performance of the NAS, and the understanding of the key drivers of operational performance that allows the ATO to plan strategically for the future. FAA management requires a single focal point for performance analysis and metrics to ensure that the agency can execute its mission. Performance Analysis also has the expertise in and historical knowledge of AA metrics to help the ATO to both monitor performance and communicate this performance to all aviation stakeholders. The Directorate also serves as the agency's principal liaison for international performance benchmarking, metrics, and economic analysis. Performance Analysis provides an analytical tool (PDARS) to operational facilities such as air traffic control towers, terminal radar approach controls and air route traffic control centers.

How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance.

The Flight Services AFSS contract is on schedule to reach its expected savings and cost avoidance of $2.001 billion in capital and labor over the 13-year period of the contract. Additionally, the AFSS contract has continued to reduce leased space for automated flight service stations when opportunities occurred and exceeding their goal of 150,000 square feet to approximately 77,105 square feet. We continue to meet annual capacity targets for air traffic management, showing the System Operation Service Unit's emphasis on measuring the effectiveness of operations. The service unit's Flight Services Directorate continues to provide pre-flight, in-flight, and post-flight services while meeting budget estimates for the AFSS contract, showing awareness of cost management. Likewise, the service unit's Safety Directorate has met the guidelines recognized in private industry for quality control, by achieving certification with the International Organization for Standardization (ISO) 9001:2008 Certificate of Conformance. The Directorate adopted and integrated the Quality Management System into their SMA, assuring documented, repeatable, and standardized processes to manage safety risk.

Systems Operations' management of air traffic was reviewed by DOT's Inspector General (IG) and found to be effective. As described in DOT IG Report Progress and Remaining Challenges in Reducing Flight Delays and Improving Airline Customer Service, May 20, 2009, Project ID: CC-2009-067 (http://www.oig.dot.gov/library-item/4965), the Systems Operations Service's processes are effective in reducing air traffic delays. The report concluded that delays in 2008 were down from 2007 and that current delay statistics and customer service trends looked favorable. We continue to focus on the issue of delays at the New York/New Jersey/Philadelphia airports described in the report.

The need for some of the processes and measures used by System Operations were initially identified in DOT IG Report: Actions to Improve the Performance of the National Aviation System, May 3, 2001, Project ID: CC-2001-171 (http://www.oig.dot.gov/library-item/4098). FAA established the ATCSCC to coordinate air traffic issues with centers, terminal facilities, and commercial Airline Operations Centers. On a daily basis, the ATCSCC coordinates operational problems caused by equipment outages, weather, or VIP movement. As recommended in the report, we established extensive data collection to track the cause of delays at the Nation's Core Airports.

Another operational area of System Operations, the management of flight services, has also been reviewed and found to be effective by DOT IG. The System Operations AFSS contract was reviewed in DOT IG Report Interim Report on Controls Over the Federal Aviation Administration's Conversion of Flight Service Stations to Contract Operations**,** Report Number: AV-2007-048, May 18, 2007 (http://www.oig.dot.gov/library-item/4500). The report found that the transition from FSS to contract operations was effective. The System Operations Service Unit has implemented effective controls over the transition of FSS to contract operations.

Systems Operations Directorate has demonstrated sound operational performance and adherence to national security guidance in a number of real-world and exercise scenarios. The directorate's response and performance during the 2010 earthquake in Haiti, 2010 Deep Water Horizon oil spill, and Hurricanes Katrina, Ike, and Gustav validated the ATO's operational actions and processes were sound in protecting lives and resources and in maintaining economic stability for aviation.

System Operations develops annual targets to measure how effectively the service unit manages traffic flow capacity. The service unit collects and reviews data to determine whether performance targets are being met. Cost targets for the AFSS contract are used as performance metrics for Flight Services.

The Performance Analysis Directorate demonstrates success by the continued growth in users of the future schedules, which ensure accuracy and consistency of major investment decisions across FAA. The NEXTOR II program demonstrates success by the generation of actionable studies from the partner universities, and by the large number of STEM (Science, Technical, Engineering, and Math) graduate degrees funded by the research, resulting in improved human capital in the aviation industry, academia, and government. Improved operational metrics and analysis lead to management actions which result in significant operational improvements.

Why Do We Want/Need To Fund The Program At The Requested Level?

The ATCSCC Directorate optimizes the capacity of the NAS by coordinating the daily air traffic flow, assuring on-time departures and arrivals for the flying public. ATCSCC Traffic Management Specialists plan and regulate the flow of air traffic to minimize delays and congestions while maximizing the overall operation of the NAS. When significant events, such as adverse weather, equipment outages, runway closures, and national emergencies impact an airport or portion of airspace, the Traffic Management Specialists adjust traffic demands to meet system capacity. The output of the ATCSCC is maximum airport capacity and minimum flight delay.

The System Operations Security directorate orchestrates air navigation services related operational efforts, particularly ATM focused activities, that provide an integral part of the Government's ability to protect the

U.S. and its interests from air domain related threats and natural hazards in the national defense, homeland security, law enforcement, and emergency operations arenas. This Directorate is the critical tool used to mitigate the immediate impact of security threats, natural disasters, and Government responses to threats on the safety and efficiency of the NAS. Without the requested level of funding, the Government's capabilities in these mission areas will be degraded, including a decreased ability to quickly identify and effectively counter airborne threats while minimizing impacts on legitimate air traffic; a reduced ability to support life-saving and other critical flight operations during disasters; and a diminished ability to protect high value targets such as Presidential movements and the Nation's Capital from terrorists and other hostile actors exploiting the NAS as a means of attack.

The Flight Services Directorate provides flight planning, advisory, operations, and search and rescue coordination services in the continental U.S., Puerto Rico, Alaska, and Hawaii. AFSS primarily provides weather and aeronautical briefings and flight planning services to pilots ensuring pilots have all the necessary information to make safe decisions associated with their flight. Flight Services also coordinates visual flight rules search and rescue services, provide orientation service to lost or disoriented aircraft, maintain continuous weather broadcasts on selected Navigational Aids, and coordinate and disseminate Notice to Airmen (NOTAM). While flight service functions in Alaska are provided by Government personnel, flight service functions in the lower 48 states are provided through a contract with Lockheed Martin managed by the Flight Services Program Operations Directorate. Without the requested level of funding, flight services provided by the Flight Services Program Operations Directorate (i.e., flight planning services, NOTAM data, search and rescue, and weather and aeronautical briefings to pilots) would be reduced, thus impacting safety.

The Data Management Directorate is required to ensure that NAS data is properly released to external entities; manage the Overflight Fee Program to ensure that flights that neither take off nor land in the U.S. are charged for using FAA air traffic services while in the U.S. airspace; execute the Block Aircraft Registration Request Program; and assist in the development of ATO data policies.

The Surface Operations Directorate will address the recommendations identified in the RTCA Task Force 5 report. The agency has committed to implement select recommendations under the "Improved Surface Operations" section.

The ATO International office provides effective, consistent and well-coordinated leadership, strategic guidance and support to achieve ATO and FAA international leadership goals. The office also provides institutional knowledge of issues, organizations, and contacts in preparation for international meetings. The office helps to ensure the harmonization of domestic U.S. air traffic operations, including NextGen, with the global civil aviation community.

The Performance Analysis Directorate provides critical analytical and metrics support to a wide variety of programs in the ATO and FAA. Operational facilities need access to critical analytical tools which are used to monitor and improve the safety and efficiency of the NAS. In addition, many airport and airspace projects need modeling and simulation support, to avert an increase in costs and programmatic delays. FAA metrics activities ensure the ATO meets its statutory obligations to report on performance. The FAA will continue to support its goal of international leadership through work with ICAO and CANSO on optimizing operational performance. The FAA will have a required capability to anticipate future changes in airline demand and the resulting impact on operations.

Detailed Justification for the - Vice President Safety and Technical Training, AJI-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – Safety and Technical Training Services – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
ATO Safety and Technical Training	$270,572	$260,541	$271,146	$574

The FY 2014 budget request for Safety and Technical Training is requesting $271,146,000 and 517 FTP / 519 FTE. This request provides an adjustment to base of $573,820 for pay inflation.

Key outcomes expected to be achieved in the budget year with the requested resources:

- Conduct analysis and disseminate findings of Risk Analysis Events (loss of less than 66 percent required radar separation) on a quarterly basis which supports the identification of ATO system issues hazards.
- Improved identification of system risk for surface safety occurrences which support the development and implementation of corrective actions to mitigate hazards associated with identified risk. This will mitigate risk associated with runway incursions (total and A&B (most serious)).
- Annual development (by fiscal year) of identified ATO system hazards and associated corrective actions for airborne operations in the National Airspace System (NAS).
- Improved safety data collection and analysis through enhanced reporting processes, tools, and policies.
- Improved integrated safety management through enhanced safety risk analytics.
- Risk-based integrated assessment methodologies to support the safety analysis of NextGen Solution Sets.
- An improved safety culture that promotes a non-punitive, voluntary reporting environment that encourages employees at all levels to report safety issues and concerns without fear of reprisal.
- Better trained workforce.
- Assurance that new and maintained systems in the NAS have been analyzed for risk.
- Safer, more efficient U.S. and international air navigational services.
- Safety Management System (SMS) Continuous Improvement Plan that continues to evolve as recommended improvements are implemented.
- Develop the Safety Analysis System that will integrate and fuse air traffic control (ATC) safety data sources, current and future, to support the safety data analysis for prognostic safety risk management.
- Coordinate ATO Safety and Technical Training international activities to ensure global harmonization of safety management in the provision of air navigation services.
- Improve workforce knowledge and skills.
- Provide sufficient numbers of trained/qualified individuals to meet the needs of the operation.
- Reduce training development, management, and maintenance costs.
- Expand technology for training development and delivery.
- Reduce travel costs related to training for field personnel.
- Improve training life-cycle management.
- Transition from information-based training to performance-based training.
- Update systems (i.e., Learning Management System, Learning Content Management System, Blackboard, Connect) required to design, develop, and manage training/proficiency.
- Comprehensive job task analysis for controllers and technicians aligned with operational performance needs to ensure validity of learning objectives, assessments, and curriculum footprint.
- Improve the technical requirements for air traffic controller training to standardize training across the NAS.
- Provide maximum training content reusability enabling content for flexible publishing (e.g., web, instructor-led, mobile, student guides, instructor guides, books, etc.).
- Conduct annual and recurrent training along with SMS workshops.

- Continue to manage risk, assure quality standards, instill open disclosure, and educate and promote continuous improvement.
- Develop Simulation and Technology Strategy.
- Implement action plan from Independent Review Panel recommendations.

Key outputs expected to be achieved in budget year with the requested resources:

- 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 individuals conducting aircraft taxi operations.
- Reduce risks in-flight by limiting the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) losses of standard separation within the NAS.
- Implement 80 percent of approved interventions to mitigate hazards associated with airborne losses of separation.
- Continue to develop the Safety Analysis System which will provide a forward-looking approach to analyze trends, data, and systems to manage risk before it leads to a future incident or accident.
- Continued identification and analysis of significant events, reports on risks, compliance, and safety in air traffic management.
- Design and establish NAS safety and policies to support the mission and safety objectives of ATO.
- Accurate data collection, reporting, and categorization of safety occurrences, accidents, equipment failures, and other events that may affect NAS safety.
- Establish and manage safety and technical training audits and assessments to ensure that ATO complies with requirements to ensure the integrity of technical training curriculum and courses.
- Completed independent safety reviews and assessments of NAS systems, processes, and procedures, including NextGen operational concept demonstrations and prototyping, to identify safety risk.
- Ensure the implementation of the Deployment Planning Process and In-Service Decision as governed by the FAA Acquisition Management System policy.
- Ensure seamless support to Operational Units through the training and certification of proficient air traffic controllers and technicians at the lowest possible cost, in adequate quantity, with a focus on field customers.
- Ensures continuity with mission and curriculum in the delivery of technical training at the Aeronautical Center in Oklahoma City.

What Is This Program?

Safety and Technical Training supports the Department of Transportation's (DOT) goal of reducing transportation-related injuries and fatalities, the Workplace of Choice goal, and is also the lead for two of FAA's Priority Goals – Runway Incursion Rate and Hazards Mitigation.

Safety and Technical Training is moving from an events-based, reactive approach to safety analysis to a risk-based proactive approach. Data is reviewed to predict and prevent risk situations. As a result, we have implemented a SMS-based approach to loss mitigation, incorporating risk analysis that will increase our ability to mitigate risk associated with losses of separation. The agency will use analytics to identify the top hazards in the NAS. Corrective action plans are identified for each risk to modify policies, procedures, and training.

Safety and Technical Training consolidated seven major contracts into one support contract, the Electronic Federal Aviation Administration Accelerated and Simplified Tasks (eFAST). eFAST provides a broad range of comprehensive professional, technical, and support services including, but not limited to, air transportation support and engineering services. Our safety programs use these available services to: support the validation and categorization of airborne and surface safety occurrence's; conduct in-depth analysis of airborne and surface events to identify hazards (determine casual factors and root causes); and implement corrective actions to mitigate identified hazards. In addition, this contract supports: assisting in managing policy development; improving fatigue risks through reduction strategies; and implementing a safety culture transformation process to enhance all safety programs, leading to improved safety performance. Finally, this contract supports: collection, analyzes, and reporting of aviation and management data; development of safety performance metrics for future systems; providing data, trend analyses and reports to support NAS risk identification and mitigation in ATO; developing requirements and designing systems to implement safety tools for ATO.

Safety and Technical Training provides comprehensive safety and training services for ATO. Our safety programs are an integrated collection of processes, policies, procedures, and programs that are used to assess, define, and manage risk associated with the provision of ATC and navigational services. Our training programs develop and deliver technical training programs for a workforce of 14,895 air traffic controllers, more than 6,100 Airway Transportation Systems Specialist (ATSS), and 1,800 engineers to effectively deliver state-of-the-art training solutions to meet our ever-changing employee demographics and operational requirements both today and throughout the transition to NextGen.

Safety and Technical Training provides and maintains a world class level of air traffic workforce competency and performance by providing the right training to the right people at the right time. As we leverage people, processes, tools, and technology to optimize operational performance, we also measure our success through robust and concrete data.

This transformation requires FAA to take advantage of the latest techniques and technology as well as the resources of both government and industry to become more efficient and effective in training. Through the Air Traffic Control Optimum Training Solution (ATCOTS) program, FAA provides a single performance-based contract that uses quality processes, methodologies, and cost-reduction strategies for air traffic controller training leading to certification. The contract provides a seamless, streamlined approach to training, supporting all aspects of the curriculum from new hires entering the FAA Academy through proficiency training for Certified Professional Controllers (CPCs).

Utilizing support contracts, with close supervision and guidance from FAA, we are undertaking major course redesign work, augmenting field training, and providing a high-level of service and customer support to our facilities.

Safety and Technical Training support operational leadership by:

- Improving measurement and analysis of safety performance including identifying areas of non-compliance and ensuring ATO's leadership is informed of significant events in the NAS.
- Reducing risks in-flight and on the surface by identifying hazards, and developing, deploying, and monitoring corrective actions.
- Supporting SMS policy.
- Ensuring that the agency's In-Service Decision process is effectively applied across NAS system acquisitions.
- Maintaining a non-punitive, voluntary safety reporting system.
- Identifying and prioritizing operational risks due to fatigue and human factors.
- Communicating and disseminating safety information to further strengthen ATO safety culture.
- Designing, developing, and establishing policies, plans, processes, and training requirements to implement NextGen SMS requirements.
- Promoting international activities with the International Civil Aviation Organization (ICAO), Civil Air Navigation Service Organization (CANSO), EUROCONTROL, and other international bodies.
- Provide a rapid deployment capability for training operational personnel on an ad hoc basis (changes to policies, procedures, processes, etc.) to meet the needs of a rapidly changing operational environment.
- Deliver state-of-the-art training solutions to meet our ever-changing employee demographics and operational requirements.
- Provide a single performance-based contract that uses quality processes, methodologies, and cost-reduction strategies for air traffic controller training leading to certification.
- Undertaking major course redesign work, augmenting field training, and providing a high-level of service and customer support to our facilities.

With our people, our processes, and our tools, we are increasingly integrating reactive and proactive actions to materially enhance our ability to manage risk and significantly improve the safety and efficiency of the NAS.

Our partners and stakeholders include:

- Other ATO Business Units, Service Units, and Offices
- Other FAA Offices and Lines of Business (LOBs)
- Employee unions
- Chief Learning Officer (CLO)
- Information Technology Executive Board (ITEB)
- Learning Enterprise Architecture (LEA) Steering Committee
- Learning Development Council
- eLearning Training Architecture Group (eLTAG)
- AVS Training Council
- ATO Training Council
- FAA CIO Council
- Office of Inspector General (OIG)
- Office of Management and Budget (OMB)
- Office of the Secretary of Transportation (OST)
- General Accountability Office (GAO)
- Congress
- Aircraft Owners and Pilots Association (AOPA)
- American Association of Airport Executives (AAAE)
- Civil Air Navigation Services Organization (CANSO)
- Air Line Pilots Association (ALPA)
- International Civil Aviation Organization (ICAO)
- National Business Aviation Association (NBAA)
- FAA Air Traffic Collegiate Training Initiative (CTI) partner institutions
- FAA Technical Operations CTI partner institutions
- University Aviation Association
- EUROCONTROl
- European Aviation Safety Agency (EASA)

By the end of FY 2013, the accomplishments for Safety and Technical Training include:

- Implementing interventions developed by ATO to address the top hazards in the NAS.
- Evolving our comprehensive event reporting (new Air Traffic Occurrence Reporting Order, JO 7210.632), as well as our risk reduction (new Quality Assurance (QA) Order, JO 7210.633), and investigation (new Quality Control (QC) Order, JO 7210.634) processes to help us measure the effectiveness of our SMS.
- Continuing development of technology to support enhanced reporting and analysis requirements. The Comprehensive Electronic Data Analysis and Reporting (CEDAR) system enables ATO to develop significant improvements to measuring system safety performance and risk evaluation.
- Use the best analytical tools, Traffic Analysis Review Program (TARP) to not only measure compliance with safety standards but to also enable digital analysis of radar data throughout the NAS. This sophisticated tool will enable management at all levels to identify safety issues, determine the likelihood of occurrence, target correction, and establish monitoring systems to evaluate the effectiveness of mitigations implemented.
- Continuing to target efforts to significantly remove risk from the NAS with new risk analysis processes, new safety performance metrics (i.e., System Risk Event Rate (SRER), Performance Data Analysis and Reporting System (PDARS)) and tools (i.e., Risk Analysis Process (RAP), Event Review Committee (ERC), Corrective Action Requests (CAR), Partnership for Safety (PFS), and Safety Analysis System (SAS)).
- Ensuring integration of safety initiatives at all levels of the ATO.
- Enhancing coordination of safety initiatives with interagency and industry stakeholders.
- Promoting safety programs through effective communications.
- Implementing safety culture principles that address human behavior and the tools to improve such behaviors.
- Limiting the rate of serious losses of standard separation by implementing intervention developed through risk analysis of airborne losses of separation.
- Expanding the scope of safety occurrences to include runway excursions and runway confusion.
- Obtaining an ISO 9001-2008 certificate and implementing a Quality Management System to support improved product, services, and continuous improvement.

- Attain at least 650 new hire air traffic controller training completions.
- Develop specific guidance and standards for ATO technical training.
- Provide a map of technology options to competencies, skills, and objectives.
- Develop requirements for 100 percent of approved and validated technical training requirements.
- Improve metrics tracking hire success rate and total cost to train.
- Develop standardized guidance for the development and delivery of ATO technical training.
- Align technology options with competencies, skills, and objectives.
- Job task analysis mapping of current ATC and Technical Operations curriculum objectives to job tasks aligned with NextGen drivers.
- Assess training progress at challenged ATC facilities.
- Improve student throughput while reducing cost.

By the end of FY 2014, anticipated accomplishments for Safety and Technical Training include:

- Integrating SMS and Risk Management philosophies, processes, and tools throughout ATO.
- Reducing the risk associated with the total number of runway incursions, specifically the number of Category A&B (most serious).
- Maintaining a National Runway Safety Plan.
- Conducting analysis and disseminate findings on incidents and provide recommended mitigations to identified causal factors.
- Maintaining and analyzing the System Risk Event Rate to reduce risks in-flight by limiting the rate of most serious losses of standard separation.
- Completing initial Air Traffic Safety Action Program (ATSAP) training to all new air traffic control personnel.
- Continuing to implement voluntary safety reporting programs (VSRPs) of safety-related events and issues from controllers and other employees providing air traffic services.
- Expanding ATO knowledge of safety events through confidential reporting and requests.
- Improving safety performance capabilities and analysis of events through TARP and PDARS.
- Improving safety performance measures and risk evaluation using CEDAR.
- Supporting harmonization of International Runway Safety process and procedures based on research and analysis of emerging technologies.
- Continuing to identify operational fatigue risks and develop and recommend fatigue risk mitigations.
- Increasing awareness throughout ATO on fatigue risks and mitigation approaches.
- Implementing policies, plans, processes, and training requirements to implement NextGen Integrated Safety Risk Management (SRM) requirements for ATO.
- Providing tools used to identify safety issues, principles, and methods to improve team and individual performance via recurrent training.
- Establish methodologies and guidance to assess safety risk during the concept validation phase of NextGen products.
- Expanding the role of System Safety Working Group to include integrated safety management.
- Developing and validating risk-based assessment methodology to support integrated safety risk management.
- Modify current controller hiring and assignment to a system based on predictive success models.
- Implement Virtual Classroom Training (VCT) in partnership with the FAA Academy.
- Implement simulation standards for training in the field.
- Make adaptive learning available for a large percentage of technical operations courses.
- Implement ATO instructional design and development guidance/standards.
- Implement guidance on the standardization of all facility training.
- Complete the full implementation and integration of the Learning Content Management System (LCMS).
- Implement the legacy computer-based instruction conversion plan.
- Complete the integration of ATO Content Management System (CMS).
- Deploy annual controller and technician recurrent training while incorporating ATO professional standards.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

Safety and Technical Training ensures the safety and success of ATO by managing risks, assuring quality standards, instilling an open culture of disclosure, educating employees, and promoting continuous improvement. We identify and mitigate aircraft collision risks during the delivery of air traffic separation services. We are the focal point for auditing safety, quality assurance, and risk identification in ATO, and reporting findings to improve safety performance. Our office integrates the functions of data and information from investigations, evaluations, independent assessment, 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 within the NAS. The risk associated with runway incursions, loss incidents, failure to report incidents, lack of training, fatigue, human factors, and lack of communication make it imperative we maintain a proactive approach for preventing serious incidents.

The benefits of our program will be manifested in risk reduction. Through risk mitigation, risk management, SMS, and the voluntary reporting system, we will help FAA accomplish its commitment to the flying public to provide the safest aviation system in the world. The work of ATO Safety benefits DOT's goal of Safety and will assist in preventing the loss of human life. Additionally, the benefits will result in a reduction of near misses, collisions, and associated costs.

Safety and Technical Training is the only organization within FAA that provides the technical training to CPCs, ATSS, and engineers required to perform their duties to the prescribed standards in a safe and efficient manner. Safety and Technical Training provides technical training solutions, applications and infrastructure development, and implementation. This training enables the technical workforce to effectively perform their duties and provide for the safe operation of the NAS.

We are expanding our technological base to meet the growing needs of FAA. Innovative training technology solutions will provide an effective method for improving technical training programs, incorporating existing and emerging learning technologies, and identifying future training technology options.

We ensure the technical competency (knowledge and skills) of the workforce, and ensure that we create enough of the right workers to meet operational needs. We also tightly manage costs (expenditures and productivity), and manage partner and stakeholder relationships to support the mission of ATO.

How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a robust set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance. A new safety metric, SRER, was developed that highlights incidents where the risk is high and measures the rate at which the event occurs. Safety and Technical Training is also measured on the Runway Incursion Rate and Hazards Mitigation. These three measurements are reported on monthly to FAA Leadership, DOT, and OMB.

The structure of Safety and Technical Training is designed to enhance organizational performance. The realignment of Safety and Technical Training into one robust organization provides an environment where issues identified through analysis can influence the course design for the workforce. Safety and Technical Training is expanding an evaluation and reporting toolset (i.e., monthly metrics reporting and drill down data) to measure organizational training performance.

We have completed certification of nearly 3,500 new professional controllers in a time frame that meets agency Destination 2025 goals and with a failure rate that meets acceptable parameters. The FAA Academy offers initial training and contract instructor-led training while on-the-job training is offered at FAA facilities.

In the past, typical training time for en route and terminal controllers has ranged from 3 to 5 years. However, by adopting improved training and scheduling processes, and increasing the use of simulators, we are successfully training controllers within 2 to 4 years. Over the past 3 years, we have achieved all of our FAA strategic plan goals and we anticipate meeting our FY 2013 goals as well.

In the last 12 months, we have made tremendous progress. Some of our accomplishments include:

- Training over 1,200 controllers at a higher success rate of completion over a shorter period of time.
- Evaluating all 37 of the Technical Operations CTI schools and reviewing their curriculum to ensure they meet FAA requirements for participation.
- Implementing resource allocation and surveillance tools to control expenditures and optimize budgeting for air traffic controller training.
- Completing the redesign of the en route initial training course at the Academy to incorporate training on the new En Route Automation Modernization (ERAM) system.
- Designing and delivering a new TRACON supplemental workshop at the Academy to better prepare new terminal controller developmentals.
- Incorporating additional Tower Simulation Systems into training programs at field locations and the Academy.
- Fully training the technician workforce responsible for maintaining NextGen deployment of ADS-B at Houston Center and the Louisville Air Traffic Control Tower.
- Establishing training partnerships with ATO business units, including the bargaining units, to enhance communications on training initiatives throughout the training community.
- Technical Training has undergone an organizational re-alignment to meet the growing training needs of FAA's technical employees to further enhance the safety of the NAS.
- Establishing the program office to manage the Independent Review Panel (IRP) recommendations.
- Completion of the preliminary analysis of ATC and ATSS Training programs.
- Held Best Practices and Academy Open House for FAA AT-CTI institutional partners to improve the candidates' knowledge of ATO expectations.
- Continued evaluation of the Technical Operations CTI schools while reviewing their curriculum to ensure they meet FAA requirements for participations.
- Determine method and process to assess training progress at ATC facilities.
- Full-scale realignment of contract personnel (ATCOTS).
- Baseline current state of NAS simulation configuration.
- Successful implementation of ATO's Flight Deck Training Program.

Safety and Technical Training continues to provide the flying public with the safest aviation system, by continuing to focus on safety culture, outreach, awareness, improved procedures and infrastructure, and technology. Additionally, it ensures all technical employees in every FAA facility are educationally equipped to perform their duties in the NAS. We have become more efficient not only within our office, but our outreach activities and technological advances have also helped improve the way FAA conducts safety as a whole. Further, new groups have been established to help improve technical training programs by exploring new emerging learning technologies, provide future training technology options, and revise existing courses and development.

We have made the NAS safer as follows:

- Incorporation of our safety-related data requirements into ATO's Business Intelligence software, "Business Objects," to perform trend analysis, report back to the field, assist in the development of metrics, and verify safety concerns. This had reduced the time needed to gather, analyze, and report safety information.
- Airport Surface Detection Equipment (ASDE-X) systems are currently installed at 34 of the 35 designated airports.
- We reach out to thousands of pilots, airport vehicle drivers, and air traffic controllers every year while conducting/participating in at least 22 of the following: Pilot Seminars, Flight Instructor Refresher Courses (FIRC), Commercial Flight Instructor (CFI)/Designated Pilot Examiner (DPE) refresher courses, Airport Safety Meetings (ASM), ATC Safety Awareness Initiatives, and major industry conferences or fly-in events.
- We have trained senior leadership, General Counsel's Office representatives, a facility management team, all ATSAP ERC members, the System Operations Flight Services Safety Summit on Just Culture;

briefed SMS classes, Supervisor's Committee (SUPCOM) classes, FAA Managers Association on safety culture leadership classes, and new employees on safety culture, creating a demand throughout the agency for more training to achieve a positive safety culture. The ultimate outcome of this training is the organizational change needed to create an "informed culture" where risks are identified early and accidents and incidents are prevented.

- We have established a process for conducting risk analysis of losses of radar separation in the NAS, allowing FAA to identify risks in the system and implement mitigations. We have identified several suspected risk trends for mitigation to date.
- Additionally, Technical Training has undergone an organizational re-alignment to meet the growing training needs of the FAA's technical employees to further enhance the safety of the NAS.
- We are working with Flight Standards to improve the quality of the guidance, training, checking, and compliance and enforcement to improve runway safety;
- We presented ATO's Fatigue Risk Management program to the Aerospace Medical Association, a gathering of clinical health care directors, physicians, scientists, and nurses from the armed services, civil and military aviation, and industry, which care for the total civilian flying population on a daily basis. Many in attendance benefited from the increased awareness and understanding of fatigue risk.

<u>Continuous Safety Improvement</u>

In an effort to maintain and improve safety performance, ATO Safety and Technical Training realigned its resources and talent to support new priority programs. We estimate improved efficiencies in the following areas based on the realignment:

- programs to increase safety culture and engage the workforce in developing and suggesting safety improvement;
- better analyses to support Quality Assurance/Quality Control – our critical function of measuring and trending safety performance;
- integration of the SMS into a Safety Promotion Campaign that incorporates all safety principles and policies;
- reduced risk of runway incursions through partnerships between FAA and stakeholders, enhanced root cause analysis of incidents, investing and implementing new technologies, and seeking international harmonization of standards for NextGen transformation;
- increased ability to ensure internal/external coordination and effective SMS integration and review of safety products; and
- studies in human error and establishing improvements to identify causes and contributing factors of errors.

Why Do We Want / Need To Fund The Program At The Requested Level?

Safety and Technical Training is responsible for providing comprehensive safety and training services for ATO. We provide overall safety services within ATO by providing services that allow ATO to identify and manage risk, assure quality standards, instill an open culture of disclosure, educate employees, and promote continuous improvement. Safety and Technical Training provides overall training services within ATO that ensure the agency efficiently recruits, hires, and trains operational personnel to match the needs of the organization. In addition, Safety and Technical Training is applying new learning principles and advanced learning technologies to enhance the delivery and effectiveness of recurrent training. The provision of services by Safety and Technical Training includes support provided by staff embedded within the operational service units in ATO. These embedded personnel are now joined into a larger safety and training organization. This reduces duplication of work and takes full advantage of greater resources at reduced costs thus more efficiently providing services to ATO. The combination of safety and training into one organization creates the ability to match training solutions to identified learning gaps thus more effectively addressing system issues in the delivery of air navigation services by ATO.

Funding of Safety and Technical Training programs at the requested level will provide the necessary resources to ensure that risk in the delivery of air navigation services is effectively managed, operational personnel understand and participate in disclosing and addressing safety issues, air traffic facilities are properly staffed with the optimum number of qualified individuals, and that personnel receive timely training directly tied to addressing safety concerns in the NAS.

Funding of Safety and Technical Training programs impact the development and implementation of NextGen. Controllers and technicians need significant training to operate and maintain NextGen systems. Safety and Technical Training are working in partnership with the NextGen program office to ensure that training is an integral part of the transformation of the NAS and in the development and implementation of NextGen systems.

Safety and Technical Training has already undertaken measures to reduce costs through more effective contract management and will continue to work toward maximizing available resources. In order to fulfill our core responsibilities and to deploy new technologies, process, and policies in support of these efforts, the requested level of funding is necessary to fully realize the capabilities of a realigned organization that provides safety and technical training services for the entire ATO.

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Detailed Justification for the - Vice President for Mission Support Services, AJV-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – Mission Support Services – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Mission Support Services	$283,484	$280,111	$284,821	$1,337

The FY 2014 budget request for Mission Support Services is $284,821,000 and 1,289 FTP / 1,363 FTE. Mission Support Services is comprised of three service centers (Eastern, Central, and Western), Airspace Services, Aeronautical Information Management, AeroNav Products, Litigation Liaison, ATO Operational Concepts, Validation, and Requirements. This request provides an adjustment to base of $1,337,000 for pay inflation. This request includes a combined base transfer from ATO Technical Operations and Mission Support of -$1,770,000 to the Assistant Administrator Office of Finance and Management for Personal Property Management Realignment. The Mission Support portion of the base transfer is $1,030,000 and 3 FTP / FTE.

Funding the FY 2014 request at this level will allow Mission Support Services to support FAA's transformation of the NAS under the Next Generation Air Transportation System (NextGen) by accomplishing the following objectives:

- Continue to develop and implement integrated procedures for Performance Based Navigation (PBN), incorporating airspace redesign, and environmental analysis, with the goal of meeting Radio Technical Commission for Aeronautics (RTCA) Taskforce 5 recommendations and expediting Optimization of Airspace and Procedures in the Metroplex (OAPM) NextGen capabilities.
- Continue implementation of the Navigation Procedures Implementation Plan (NAV Lean) to streamline and accelerate the internal processes necessary to implement Instrument Flight Procedures (IFP) requests.
- Conduct design and modeling for Stage 3 of the New York/New Jersey/Philadelphia (NY/NJ/PHL) Airspace Redesign Project and implement initial portions of Stage 3 of the Chicago Airspace Project, changing westbound departure routes.
- Implement PBN by continuously developing and implementing beneficial Area Navigation (RNAV) Q, Tango (T) and TK routes, Standard Instrument Departures (SIDs), and Standard Terminal Arrivals (STARs), and RNAV/Required Navigation Performance (RNP) instrument approach procedures.
- Continue to develop policies, procedures, safety studies, and research and development to meet congressional language of the integration of Unmanned Aircraft Systems (UAS) into the NAS.
- Complete the aeronautical information enhancements to improve the accuracy and timeliness of information on Special Activity Airspace and Airport data. Complete the Aeronautical Information Exchange Model (AIXM) for Special Activity Airspace management of digital information for efficiency of air traffic management and scheduling automation as part of the NextGen technologies.
- Demonstrate capture and dissemination capabilities for digital aeronautical information, which will result in relevant information being integrated into the common operating picture of the NAS.
- Provide AeroNav Products to pilots, air traffic controllers, and aviation planners with a myriad of products and services to promote safe and efficient aeronautical navigation.
- Develop and maintenance of IFP's and aeronautical charts and publications in support of the public, military, and air traffic control.
- Create and provide high quality, accurate, and useful Instrument Flight Rule (IFR) chart products, evaluates and develops airways, and provides en route airway and fix in support of all AeroNav Products.
- Litigation Liaison Office assists FAA's Office of Chief Counsel, Enforcement Division and the Regional Counsel offices on pilot enforcement cases by coordinating with the air traffic facilities for access to air traffic witnesses and the collection of evidence. Also provides expert consultation regarding all air traffic matters.

- Receives, manages, and coordinates incoming Freedom of Information Act (FOIA) requests for ATO.
- Publish the NextGen Implementation Plan reflecting the agency and aviation community priorities.
- Develop requirements for existing technology to transition into the NAS for NextGen.
- Operational Concepts, Validation, & Requirements works through the cross-agency workgroup to develop key messages and annotated outline for incorporation into the NextGen Implementation Plan.
- Complete deployment of the Notices to Airmen (NOTAM) Manager, Aeronautical Information Management Modernization, to public use airports.

Key outputs and outcomes expected to be achieved in the budget year with the requested resources:

- Achieve an average daily airport capacity for the seven metropolitan areas of 39,484 arrivals and departures by FY 2009 and maintain through FY 2014.
- Finalize stakeholder scope agreements for all new Operational Initiatives.
- Sustain adjusted operational availability of select terminal equipment at 99.7 percent for reportable facilities. Provide technical and scheduling support for air traffic control towers (ATCT) and terminal radar approach control (TRACON) sustainment and/or modernization and for initiation of two construction awards.
- Modernize Aeronautical Information Management (AIM) services to deliver accurate and timely digital aeronautical information, products and services to customers, including Notice to Airmen (NOTAM), improved information on restricted and regulated airspace, and special activity airspace information collection and management capabilities.
- Provide guidance, oversight, and coordination in the development and implementation of RNAV helicopter routes.
- Reduce the number of aviation related accidents through collection, dissemination, and aggressive management of NAS Information.
- Reduce risks in-flight by limiting the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) loss of standard separation within the NAS.
- Respond to inquiries and establish data trends to target areas for process quality and quantity improvement and improve lines of communications between service center points of contact and headquarters.
- Support the Director of Operations through the application of the Safety Risk Management (SRM) Program, conducting management evaluations, and serving as the service area coordinator for Unsatisfactory Condition Report (UCR) tracking.
- Support service unit initiatives to sustain and improve the NAS by implementing the Corporate Work Plan and related service center tools.
- Establish processes necessary to develop concepts and requirements on behalf of ATO Operational Service Units within the I2I process with NextGen and the Program Management Organization.
- Develop a strategy to implement transformational technologies demonstrating the benefits of "most capable, best served."
- Create airspace and related policies and procedures to facilitate integration of unmanned aircraft into the NAS.
- Complete airspace and related safety studies and research to assist in the integration of unmanned aircraft into the NAS.
- Improve headquarter ATO on-time FOIA responses by 10 percent.
- Provide all final comments and clearances necessary for the NextGen Organization to publish the NextGen Implementation Plan.

What Is This Program?

Mission Support Services is comprised of a number of subordinate directorates (Airspace Services, Aeronautical Information Management, AeroNav Products, Litigation Liaison, and ATO Operational Concepts, Validation & Requirements) that provide shared services which promote standardization of processes, efficiency, and effectiveness while achieving results for the following Service Units: En Route and Oceanic – Terminal Services, Technical Operations, and System Operations. This includes FAA headquarters programs for air traffic rules, policies, and standards for airspace structure, design and allocation; obstruction evaluation; air traffic environmental policy; expediting the implementation of optimized airspace and procedures; the management of UAS operating authorizations; the design and implementation of RNAV/RNP procedures; air traffic procedures development; instrument flight procedures production/charting; support for litigation and enforcement activities; and aeronautical information management.

Mission Support Services is also responsible for three service centers located in Atlanta, Fort Worth, and Seattle that provide support to the Director of Operations in matters concerning airspace and procedures, quality assurance, equipment installation, hiring, and training. Each service center is comprised of five groups: Administrative Services, Business Services, Planning and Requirements, Operations Support, and Quality Control. The shared services model brings people together with similar expertise, allows sharing of ideas and resources, fosters collaboration to promote standardization of processes, improves efficiency and effectiveness, and enhances communication to achieve results among service units.

Airspace and procedure integration provides an important systems view that utilizes additional transition access/egress points not tied to ground-based navigation aids; considers concurrent development and implementation of arrivals and departures, ensuring an integrated approach to procedural optimization; decouples operations between primary and secondary/satellite airports serviced by complex terminal airspace; and develops high altitude routes through congested airspace better connecting major metropolitan areas.

The FAA will also focus on tools acceleration to include additional applications of existing specialized tools and improved obstacle evaluations. Training development efforts will focus on Flight Standards and air traffic control (ATC) workforce training on the application of new routes and procedures.

AIM is developing an integrated aeronautical information management system by creating mechanisms for aeronautical exchange between providers, stewards, and distributors within the aviation authority and external aviation data users. Our FY 2014 efforts will deliver global digital aeronautical information and manage the information for increased capacity, efficiency, and predictability in the airspace, routes, and airports of the NAS.

Aeronautical information services must evolve at an accelerated pace to meet air transportation demands to capture and disseminate digital aeronautical information. The AIM Modernization Program has been created to advance the collection and dissemination of aeronautical information through the development of near real-time processing and data exchange methods.

At the end of April 2012, the new NOTAM manager was activated in 57 Core and Metroplex Airports, which has significantly improved the accuracy and timeliness of the information on temporary changes to the airspace, such as hazards, restrictions, and obstructions, for pilots and air traffic control. Enhancements have been implemented for the Centralized Altitude Reservations Function for military airspace scheduling.

The Common Status and Structure Data Program has been initiated as a NextGen program to provide the integration of comprehensive flight planning and pilot briefing services, on-demand NAS operational performance information, and integrated airspace management for shared situational awareness and trajectory based operations. The initial Common Status and Structure Data services are being demonstrated with digital airport data in 2012. As NextGen programs, AIM Segment 2 will automate the coordination of Special Activity Airspace and airport data, and AIM Segment 3 will provide for collection of digital aeronautical information to be converged into a common operating picture of the NAS.

The Weather Camera Program in Alaska provides near real-time camera images, updated every 10 minutes to pilots for situational awareness, pre-flight planning, and en route weather briefings for reduction of weather-related accidents. In FY 2012, 24 additional weather cameras were installed and services made available to the public. In FY 2013, 25 additional weather cameras will be installed and in FY 2014, 6 additional weather cameras will be installed and the technical refresh of existing sites will begin.

AeroNav Products serves as the FAA's aeronautical charting authority to ensure the publication of aeronautical charts and maps necessary for the safe and efficient movement of aircraft in the NAS. AeroNav Products:

- collects and verifies aeronautical information;
- plans and directs the construction and maintenance of aeronautical charts and publications to meet the operational requirements of civil/military aviation and FAA NAS management;

- operates an integrated production facility for the reproduction of aeronautical, nautical, and miscellaneous maps, charts, and publications; and
- manages the sale and distribution of and revenue collection for military charts and related publications for FAA and the National Oceanic and Atmospheric Administration (NOAA).

Litigation Liaison Office provides logistical support and subject matter expertise in enforcement actions for litigation where allegations of negligence are made, in whole or part, involving ATO employees. Such allegations may arise from personal injury and/or wrongful death in aircraft accidents/incidents where air traffic services may have been provided. The mission is to retrieve and preserve records that will enable the FAA to defend or prosecute cases in the most cost efficient way, allowing for the earliest possible resolution and the least amount of disruption to the operation.

Operational Concepts, Validation, & Requirements develops, reviews, and provides comments on the NextGen Implementation Plan and develops requirements for existing technology to transition into the NAS for NextGen. Operational Concepts, Validation, & Requirements provide well defined and well understood methodologies to enhance Traffic Flow Management (TFM) capabilities and also provide project management and operational perspectives supporting Wake Turbulence Mitigation and Re-Cat strategies.

Our partners and stakeholders include:

- Department of Defense (DOD)
- Department of Homeland Security (DHS)
- National Aeronautics and Space Administration (NASA)
- Joint Planning and Development Office (JPDO)
- Aviation industry
- Aviation community
- State and municipal governments
- National Transportation Safety Board (NTSB)
- International Civil Aviation Organization (ICAO)
- EUROCONTROL
- Academia
- Department of Commerce – NOAA
- Department of Justice (DOJ)
- Environmental Protection Agency (EPA)
- Department of Energy (DOE)

By the end of FY 2013, the accomplishments for Mission Support Services will include the following:

- Complete NOTAM Search ATC (baseline) Safety Case for the NAS.
- Complete development of the NOTAM Manager to public use airports.
- Continue implementation of flight plan update and graphics enhancement for new ICAO flight plan requirements.
- Implement the AIM developed interface between the Air Force Central Scheduling Enterprise (CSE) and the FAA Special Use Airspace Management System (SAMS) for the coordination of dynamic Special Use Airspace (SUA) schedule data between the two systems.
- Ensure the FAA participates in at least 75 percent of ICAO Aeronautical Information Service (AIS) to AIM working group meetings.
- Demonstrate the initial Common Status and Structure Data services with digital airport data.
- Deliver screening information request (SIR) for AIM Segment 2 development contract for final investment decision.
- Conduct design and modeling for Stage 3 of the NY/NJ/PHL Airspace Redesign Project.
- Continue design of Q-routes between Metroplex areas.
- Assess new Westgate routes for New York metro area implemented as part of the NY/NJ/PHL Airspace Redesign.
- Complete installation and make services available to the public for 25 additional weather camera sites.
- The Terminal Procedures Publications Group will develop and publish 500 Wide WAAS LPV/LP procedures.
- Provide technical and scheduling support for ATCT/TRACON sustainment and/or modernization.

- Develop Surface Errors Reduction plans.
- Develop Certificate of Waiver or Authorization (COA) compliance policy for UAS flight in the NAS.
- Update policies to be placed in JO 8020.16C according to Federal Rules of Civil Procedure mandates.
- Develop and maintenance of Instrument Flight Procedures (IFPs) and Aeronautical Charts and Publications in support of the public, military, and ATC.
- Creates and provides high quality, accurate, and useful Instrument Flight Rule (IFR) chart products, evaluates and develops airways, and provides en route airway and fix in support of all aeronautical navigation products.
- Compiles and publishes the FAA's IFR and Visual Flight Rule (VFR) aeronautical chart products to support civilian and military pilots, and produces specialized aeronautical products to support terminal and en route ATC.
- Complete obstacle review and analysis of proposed constructions to determine possible impact on IFPs.
- Complete Minimum Safe Altitude Warning (MSAW) maps, Radar Video Maps (RVM), Sector Design and Analysis Tool (SDAT) Review, hardcopy and electronic dissemination of air traffic publications, and the maintenance of these digital/electronic products and publications.
- Provides replication and dissemination services for FAA aeronautical charts and publications and NOAA nautical charts and maps.

By the end of FY 2014, the anticipated accomplishments for Mission Support Services will include the following:

- Coordinate required ATO support to the New York Area Program Integration Office for ATO Matrix team representation. Assist development of stakeholder scope agreements and further develop the Delay Reduction Plan.
- Meet 90 percent of the NextGen critical milestones for implementation of near- and mid-term capabilities on schedule and on budget.
- Capitalize new assets within 65 days of being placed in service 95 percent of the time and support a review and validation of certain FAA capitalized personal property assets.
- Support ATO service units managing hiring plans, personnel and position movements, strategic planning, and analysis of staffing requirements, objectives, and programs.
- Meet technical and administrative discipline needs with customer-defined learning plans.
- Use trending data to target areas for process, quality, and quantity improvement.
- Support service unit initiatives to sustain and improve the NAS by implementing projects as scheduled via the Corporate Work Plan and related service center tools.
- Formalize a proactive approach to system safety for all NAS changes, ensuring the mitigation and acceptance of identified hazards and unacceptable risks prior to making changes.
- Implementation of integrated airspace and efficient PBN procedures, including Optimized Profile Descents (OPDs) in the DC Metro, North Texas, and Houston metroplexes.
- Transition of the aircraft accident generator software program to a web-based interface or revised stand-alone generator, which allows multiple employees in multiple locations to track and manage the production of the accident files.
- Final phase of Wake Turbulence Mitigation for Departures (WTMD) development and implementation will be complete.

Safety:

- Develop and implement aeronautical information enhancements for Special Activity Airspace management and airport data.
- Complete AIXM enhancements for Special Activity Airspace management and airport data.
- Provide for digital NOTAMs and Airports Geographic Information Systems (GIS) harmonization.
- Complete installation and make operational an additional 6 weather camera sites for a total of 221 sites in Alaska.
- Complete development and deliver operational system of NOTAM Search ATC.
- Achieve and implement International Standards Organization (ISO) for digital NOTAM services.
- Complete SRMD on unmanned aircraft operating in Class G and A airspace.

Economic Competitiveness:

- In order to address RTCA Taskforce 5 recommendations, the FAA will develop and implement PBN routes and procedures, including RNP, RNAV, and OPD to expand development, based on targeted benefits.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

The Mission Support Services mission is to achieve results for ATO's Service Units by promoting standard processes, efficiency, and effectiveness through shared services. Core competencies support the following activities:

- standardized administrative services;
- financial, material, procurement, and logistics;
- integrated planning, requirements, and program implementation management;
- oversight of NAS procedures and changes affecting NAS operations and special activities; and
- inspections, evaluations, safety risk management, accident and incident information gathering, and reporting services.

The Mission Support Services organization:

- Authorizes UAS operations in the NAS and to ensure that UAS flights do not compromise the high level of safety for other aviation, the public, and people and property on the ground.
- Conducts aeronautical studies to evaluate the effect of the construction or alteration on air traffic operating procedures; determine the potential hazardous effect of the proposed construction on air navigation; identify mitigating measures to enhance the safe and efficient use of the navigable airspace; and recommend marking and lighting configurations as well as charting of new objects to enhance pilot conspicuity.
- Develops and implements PBN routes and procedures that leverage emerging technologies and aircraft navigation capabilities. PBN is comprised of RNAV and RNP and describes an aircraft's capability to navigate using performance standards. RNAV enables aircraft to fly on any desired flight path within the coverage of ground- or spaced-based navigation aids, within the limits of the capability of the self-contained systems, or a combination of both capabilities. As such, RNAV aircraft have better access and flexibility for point-to-point operations.
- Redesigns airspace to improve flight efficiency. Airspace redesign and procedure development are targeting congested airspace areas such as Chicago, North Texas, Houston, Las Vegas, Southern California, and New York. Development efforts will include analysis and simulations, assessments of alternatives, and modeling of projected airspace and procedures.
- Develop an integrated aeronautical information system for digital data exchange that provides a common source of information of international standards supporting NexGen's tactical and strategic situational awareness.
- Reduce the number of aviation accidents through collection, dissemination, and aggressive management of NAS information.
- Provide AeroNav Products to pilots, air traffic controllers, and aviation planners with a myriad of products and services to promote safe and efficient aeronautical navigation.
- Develop and maintain IFPs and aeronautical charts and publications in support of the public, military, and air traffic control.
- Create and provide high quality, accurate, and useful IFR chart products, evaluates and develops airways, and provides en route airway and fixes in support of all aeronautical navigation products.
- Compile and publish the FAA's IFR and VFR Aeronautical Chart Products to support civilian and military pilots, and produce specialized aeronautical products to support terminal and en route air traffic control.
- Complete obstacle review and analysis of proposed construction to determine possible impact on IFP.
- Complete MSAW maps, RVM SDAT Review, hardcopy of electronic dissemination of air traffic publication and the maintenance of these digital/electronic products and publications.

- Provide replication and dissemination services for FAA aeronautical charts and publications and NOAA's nautical charts and maps.
- Wake Turbulence Mitigation project will evaluate air traffic control decision support tool concept feasibility prototypes as possible enablers to safely meet the predicted NextGen demand for additional flights in the Nation's air transportation system.

How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance.

The "shared services environment" concept, under which many ATO processes have been standardized and regional resources consolidated, was the primary driver behind creating the service centers. As a result, we anticipate considerable cost savings over time. Pre-deployment estimates suggested an estimated savings of $360 million over a 10-year period. The service center roll-out took place in FY 2006; to date, a net savings of approximately $225 million has been realized.

The Mission Support Services' Airspace Management Program (AMP) provides a list of contributions to air traffic redesign to improve traffic flow. AMP completed an airspace study for the proposed Southern Nevada Supplement Airport including analysis, modeling and simulation, quantifying capacity, throughput, and delay; the initial report released in FY 2010 was adjusted due to operational concerns and finalized in February 2011. AMP designed routes and procedures supporting near-term enhancements at Las Vegas (LAS), referred to as LAS Optimization. Airspace sector modifications (for LAS Optimization) have been evaluated and modified by AMP and the environmental assessment was completed by the end of FY 2012.

AMP also delivered the Chicago Airspace Project facility design. Collaboration with industry via simulation resulted in a design with associated "profile descent" from Flight Level (FL)270 to Chicago Center's entry point at 12,000 feet. The designs of West departure routes off of Chicago O'Hare (ORD), and Midway (MDW) have been completed. The designs allow ORD and MDW departures to file any of the four initial routes instead of mandatory planned departure routes (PDRs) or "city pairs" assignments, letting users file for routes that will reap the benefit of "favorable winds" and fuel savings.

Other accomplishments made by AMP include: the completion of stakeholder meetings and the issuance of an airspace analysis for North Texas Airspace Review; completion of the Nevada Supplemental Airport (SNSA) airspace study and technical report; and finalization of LAS Optimization design and airspace agreements.

AMP also delivered the Houston Area Air Traffic System (HAATS) project on September 23, 2010. The HAATS airspace project, chartered in January 2000, is a result of the Houston Gulf Coast Airspace Project, which came into being because of the city of Houston's plan to build new runways at Bush Intercontinental, and make runway improvements at Houston Hobby Airport, thus increasing capacity. The design consisted of additional arrival and departure routes in and out of the Houston metropolitan area. To support this, additional infrastructure was required to include new radar and additional air traffic control positions, sectors, and resectorization for the Houston TRACON, Houston ARTCC, and Fort Worth ARTCC.

The FAA, in its firm commitment to provide end-to-end PBN capabilities in the NAS, has already developed and implemented 508 RNAV SIDs/STARs; 299 RNAV routes; and 305 RNP Authorization Required (AR) instrument approach procedures. The use of these procedures has already provided significant financial benefits to the airlines while enhancing navigational safety and efficiency.

In the fall of 2010, the FAA initiated two "prototype" OAPM study teams for the Washington, DC, and North Texas metropolitan areas. The prototype study teams were used to verify team approach and provide lessons learned to be applied at other sites. In FY 2011, five additional OAPM study teams completed studies at Charlotte, Northern California, Houston, Atlanta, and Southern California. Two additional sites will be studied in FY 2013. Design and implementation efforts are underway at six sites and four additional sites are set to begin in FY 2013. The OAPM initiative is expected to be a multi-year activity that will bring PBN-based airspace and procedure solutions to many major airports by 2017.

In FY 2014, funding is requested to support the following OAPM activities:

- Complete analysis and studies, through established OAPM Study Team processes, at three Metroplex locations (Memphis, Cleveland/Detroit, and Boston) focusing on expedited integrated PBN procedure development coupled with airspace design to optimize benefits.
- Based on the output of the earlier analysis and study stage, begin OAPM design work at two Metroplex locations (Memphis and Cleveland/Detroit).
- Begin OAPM pre-implementation/evaluation activities at three Metroplex locations (South/Central Florida, Chicago, and Phoenix).

Mission Support continues to participate in the UAS Executive Committee (EXCOM), an interagency group consisting of the Department of Defense, Department of Homeland Security, FAA, and National Aeronautical Space Administration (NASA) that focuses on the safe and efficient integration of UAS into the NAS. The service unit also completed four UAS international meetings working towards global harmonization of UAS operations criteria and procedures.

The Aeronautical Information Management Modernization Segment 1 Program implemented the digital NOTAM System at Atlantic City (ACY). ACY, located at FAA's William J. Hughes Technical Center, is the first in the NAS to deliver digital NOTAMs, which provide computer-generated safety information to pilots and air traffic controllers about conditions at an airport such as construction and hazards. As of January 1, 2012, 57 airports are using the NOTAM Manager. The initial Centralized Altitude Reservations Functions capability and integration was completed for military airspace.

In Alaska, Aeronautical Information Management's Weather Camera Program is installing and making services available to the public for 24 additional weather camera sites in FY 2012. In FY 2013, 25 additional weather camera sites are being installed, continuing efforts to supply visual meteorological information to pilots to reduce weather-related accidents from a baseline level of 0.28 to no more than 0.15 accidents per 100,000 operations within the State of Alaska. In FY 2014, six additional weather cameras will be installed for a total of 221 sites.

AeroNav Products:

- Completes all required amendments, obstacle evaluations, issuance of NOTAMs, period reviews, and non-procedural chart changes/revisions in support of all the IFP in the NAS.
- Completes all required revisions on all High En Route, Low En Route, Controller, and IFR/VFR Planning Aeronautical Charts.
- Completes all required revisions on 200 Visual Aeronautical Charts.
- Completes all required Airport/Facility Directory (A/FD) maintenance revisions on all 54 books, 800 airport diagrams, and 3,300 airport sketches in the A/FD and Terminal Procedures Publication (TPP).
- Complete all required obstacle evaluations for IFP impact.
- Create/build new MSAW maps; maintain all existing MSAW sites; create all requested RVM; complete all RVM revisions and maintain electronic product editions. Review/Approve SDAT files. Complete production/dissemination/web posting of air traffic publications in accordance with established target dates.
- Complete all revisions to the 9,800 ARINC coded instrument procedures contained in the Coded Instrument Flight Procedures (CIFP) file. Complete all required revisions to the 5,700 units of domestic and foreign airspace maintained in support of the CIFP and charting.
- Print over 2,000,000 aeronautical/nautical product copies as requested and distribute over 11,000,000 products as required annually.

In FY 2012, the Litigation Liaison Office supported 43 tort cases where claims of negligence by air traffic controllers contributed to death, injury, or property damage. The total of these claims was $1.2 billion. Of these cases, 9 were closed through settlement or trials and had a total of $158 million against the FAA. Of this $158 million, only $6.2 million was paid out.

In FY 2011, a claim against the FAA in the amount of $483 million for a crash involving Hendrick Motorsports in Stuart, VA, went to trial and the FAA was found not negligent resulting in $0 being paid out.

Wake Turbulence Mitigation project developed the operational demonstration prototype at Houston George Bush International Airport. In FY 2012, the demonstration prototype will be installed at Memphis International Airport and at San Francisco International Airport ATCTs for a minimum of 1 year at each airport.

Why Do We Want / Need To Fund The Program At The Requested Level?

The Mission Support Services mission is to promote the standardization of processes, efficiency, and effectiveness among ATO service units in En Route and Oceanic Services, Terminal Services, Technical Operations, and System Operations through shared services. The service unit's core work is performed at the three service center locations (Western, Eastern, and Central). Core work includes providing:

- standardized administrative support services;
- financial, material, procurement, and logistical support services;
- integrated planning, requirements management and program implementation management support services;
- oversight and support for NAS procedures and changes which affect operations and special activities with the NAS; and
- inspections, evaluations, safety risk management, accident and incident information gathering and reporting services, and support for NAS procedures and changes which affect operations and special activities with the NAS.

Funding requested in the FY 2014 submission will fund continued Mission Support Services contributions in the transition to NextGen. Funding will allow for continued development of PBN criteria and procedures.

Funding will facilitate implementation of the NAV Lean recommendations to include a streamlined version of the current core process (request, design and development, approval, implementation, and maintenance). Additionally, auxiliary processes, such as Safety Management System (SMS), environmental, and operational approval have recommendations aligned with this effort. The overall process will be better managed by having all IFP requests submitted through an authorized Web-based portal established as the entry point into a system for processing, tracking, and managing the IFP development life cycle.

Funding will allow continued development of cornerstone documents and research needed for the integration of UAS into the NAS. A reduction in requested funding will delay execution and development of required research and documents to enable progress from accommodation to integration of UAS into the NAS.

The funding requested in FY 2014 in Aeronautical Information Management is to support two NextGen initiatives:

- automating the coordination of Special Activity Airspace information and airport data, and
- providing integrated pilot briefings, on-demand NAS operational performance information, and airspace management for situational awareness and trajectory based operations.

Aeronautical Information Management (AIM) is the authoritative government source for collecting, validating, storing, maintaining, and disseminating aeronautical data concerning the United States and its territories to support real-time aviation activities. AIM meets air transportation's demand for increased capacity, efficiency, and predictability in the airspace, routes, and airports of the NAS while ensuring that safety factors and environmental regulations are satisfied diligently.

Special Activity Airspace (SAA) is defined as any airspace with defined dimensions within the NAS wherein limitations may be imposed upon aircraft operations. SAA may be restricted areas, prohibited areas, military operations areas, ATC assigned airspace, and any other designated airspace areas.

A reduction in requested funding would delay the development of an intrinsic component, integrated aeronautical information, which provides the information and service foundation to deliver NextGen operational capabilities.

FY 2014 requested funding for the Weather Camera Program is to complete the 221 camera sites for service to the public, which would otherwise be delayed until funding could be obtained.

Funding is required to sustain the ability to provide Aeronautical Navigation Products to pilots, air traffic controllers, and aviation planners with a myriad of products and services to promote safe and efficient aeronautical navigation.

Judgments against the government come out of the Department of Treasury Judgment Fund so the cost savings to the government is significant. The most significant cost saving is prevention of costly hearings and trials and our ability to settle cases in summary judgment or settlements.

Should the evaluations of the Wake Turbulence Mitigation project in Houston, Memphis, and San Francisco indicate that the Wake Turbulence Mitigation project delivers the expected departure capacity increase for these airports, development and implementation will be done for six additional candidate airports.

The requested levels of FY 2014 operations funding will pay the salaries of those personnel assigned to the three service centers. This will allow continued work to more efficiently support air traffic operational service units.

Detailed Justification for the - Vice President Management Services, AJG-0

What Is The Request And What Will We Get For The Funds:

FY 2014 – Management Services – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Management Services	$315,324	$286,045	$170,355	-$144,969

The FY 2014 budget request for Management Services is $170,355,000 and 230 FTP / 239 FTE. This request provides an adjustment to base of $1,262,000 for pay inflation.

This request includes several base transfers:

Labor Technical Realignment: This base transfer request consists of two sets of transfers between the Office of Human Resources (AHR) and ATO. The net change of these transfers will be a decrease of $1,893,000 and 14 FTP / FTE.

Civil Rights Realignment: ATO will transfer $1,499,000 and 4 FTP / FTE to the Office of the Assistant Administrator for Civil Rights.

Intervention Program Establishment: ATO will transfer $290,000 and 1 FTP / FTE to the Office of Audit and Evaluations.

Information Technology Resource Reprogramming: ATO will transfer $141,020,000 and 331 FTP / 332 FTE to the Assistant Administrator, Office of Finance and Management.

Training Resources Realignment: ATO will transfer $1,529,000 and 11 FTP / FTE to the Assistant Administrator, Human Resources.

ATO is a performance-based organization and Management Services delivers the core business and administrative services foundational to the daily operation of ATO. Management Services ensures that performance, resources, contracts, strategic plans, programs, and activities stay on target and are fully aligned with agency level goals and objectives.

Funding the FY 2014 request at this level will allow Management Services to:

- Lead the process for strategic and business planning and integration of the ATO Business Plan with FAA's Destination 2025 Strategic Plan. Leads the Budget and Performance Integration Initiative including oversight of performance measures to be used by ATO service units.
- Coordinate Capital Investment Plan submission to Congress.
- Coordinate Operations Budget prioritization, allocation, and tracking for the entire ATO,
- Allocate and manage resources to meet financial performance target and provides support to FAA and ATO with financial, business, and planning services.
- Manage and direct ATO internal and external communications. Develop and implement strategy and plans to communicate ATO internal and external messages.
- Coordinate and integrate ATO operations and programs communications messages across lines of business. Advise ATO on the best business practices for communications.
- Lead the development and execution of a 3-5 year organizational development strategy for ATO to integrate organizational development with performance management, succession management, and leadership development; create a culture of collaboration and continuous learning; and institutionalize collaborative work habits throughout the entire ATO workforce. As an internal consultant to ATO, utilize consistent frameworks such as change management, process improvement, and facilitation to foster increased efficiency and effectiveness of the organization.

- Develop and implement an integrated strategy in managing labor relationships and liaison activities across ATO organizations and bargaining units. Provide AHR with a centralized and focused point of contact for technical information.
- Establishment of leadership assessment process based on the leadership competency model and conduct a pilot for a feedback mechanism to the organization for 10 percent of management in the ATO.
- Ensure ATO Career Progression Plan tools are accessible to 40 percent of ATO's population.
- Manage ATO human capital and ensure the implementation of standardized administrative processes and policies for ATO including position management and classification, career paths and succession management, workforce planning, professional training, leadership development and performance management and recognition which all support long-term ATO talent management and business goals.
- Develop and provide oversight for the implementation of ATO administrative policies, processes, and guidance to ensure uniform application and standardization.
- Implement ATO Leadership Development Plan to enable achievement of business goals.
- Identify, acquire, deliver, and evaluate non-operational training in support of ATO requirements.
- Develop, implement, communicate, and validate ATO performance management policies and tools.
- Manage and implement FAA telework within ATO. Establish baseline of participation to monitor increases and reductions.
- Provide policy, guidance, training, and tools for managing directives/records in ATO.
- Monitor reports, and make recommendations to ATO senior management on issues of diversity, including demographics, employment trends, and recruitment strategies.
- Develop and facilitate delivery of outreach strategies and major initiatives to promote education and public awareness of aviation occupations and other critical hiring opportunities within ATO to establish broad-based diversity pipeline.

Key outputs and outcomes expected to be achieved in budget year with the requested resources:

- A collaborative process in 65 percent of our facilities that engages our employees and unions in technical, procedural, and airspace changes in their work environment.
- An integrated strategy in managing labor relationships and liaison activities across ATO organizations and bargaining units.
- The accurate number of controllers and technicians hired and trained needed to operate and maintain the NAS.
- Outreach strategies and major initiatives to promote education and public awareness of aviation occupations and other critical hiring opportunities within ATO to establish broad-based diversity pipeline.
- Improved customer service.
- A fully engaged ATO workforce that practices collaboration in all facets of daily business, and models that behavior in leadership development, succession planning, and performance management.
- Improve personnel quality through more upstream recruitment, better training, succession planning, and more diligent performance management.
- A contracts system of records to provide information to better manage contract resources and maximize the best value for our investment.
- Redesigned ATO metrics in the four key areas of safety, efficiency, cost effectiveness, and community and fully integrated ATO processes to manage to the numbers.
- Evaluation of legacy activities to maximize the value across ATO.

What Is This Program?

Management Services supports DOT's Strategic Plan's Organizational Excellence: Financial Performance goals. We recruit, develop, and retain a diverse and collaborative workforce by providing an all-encompassing career progression plan and leadership development program along with personnel and organizational policies that meet the needs of our highly skilled workforce. We ensure that performance stays on track by providing the framework to integrate ATO's plans, programs, and activities.

We work with aviation stakeholders to develop strategies for implementing solutions and to continue coordination with FAA offices.

Our partners and stakeholders include:

- Office of the Inspector General (OIG)
- Congress
- Congressional Oversight Committees
- Local, county and state authorities
- Other Federal agencies
- Office of Management & Budget (OMB)
- Government Accountability Office (GAO)

By the end of FY 2013, the accomplishments for Management Services include:

- A cadre of highly trained and experienced internal facilitation resources for field and headquarters ATO service units for meeting facilitation, team building support, workplace conflict resolution, and organizational development activities. The facilitation services will be provided at lower cost than hiring external facilitators.
- Ensure that 70 percent of all eligible ATO management workforces attend at least one training in the following training areas: Model Work Place (MWP); Equal Employment Opportunity (EEO); or Diversity Workshop training. Ensure 90 percent of all eligible ATO management workforce completes the required Accountability Board Training.
- A Recruitment and Outreach Program to attract a diverse applicant pool for ATO mission-critical occupations in FY 2013.
- A national program to prepare air traffic controllers for success in their next level of leadership responsibility as Frontline Managers (FLM), and pilot a similar program for Frontline Managers aspiring to be Operations Managers (OM).
- A resource/clearinghouse to address ATO leaders' needs for coaching and developmental workshops, targeted at both individual and team level.
- Standardized processes and tools to support employee career progression throughout ATO.
- A reduced number of employees on Office of Workers' Compensation Programs roles and associated compensation costs.
- An air traffic controller workforce that supports the operational demand of the U.S. National Airspace System (NAS) and that is in support of the agency.
- Significant improvement and success in ATO workforce collaboration initiatives and programs.
- A contracts system of records to provide information to better manage contract resources and maximize the best value for our investment.
- A more cost effective organization with less legacy activities to maximize value.

By the end of FY 2014, anticipated accomplishments for Management Services include:

- A collaborative process in 65 percent of our facilities that engages our employees and unions in technical, procedural, and airspace changes in their work environment.
- Standardized policy processes for ATO labor strategies.
- ATO Career Progression Plan tools will be accessible to 40 percent of the ATO population.
- National ATO hiring programs and processes to ensure that FAA has the controllers and technicians needed to operate and maintain the NAS including leading the Centralized Selection Process.
- An integrated strategy in managing labor relationships and liaison activities across ATO organizations and bargaining units.
- The accurate number of controllers and technicians hired and trained needed to operate and maintain the NAS.
- An ATO Leadership Development Plan to enable achievement of business goals.
- Outreach strategies and major initiatives to promote education and public awareness of aviation occupations and other critical hiring opportunities within the ATO to establish broad-based diversity pipeline.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

Management Services ensures that performance stays on track by providing the framework to integrate ATO's plans, programs, and activities. We provide a wide variety of administrative services that support the overall operation of ATO and help plan for a successful future. By providing performance measures, a foundation for administration, and communication of key goals and information to ATO, we support ATO in its core functions in accomplishing the organization's mission.

How Do You Know The Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance. Selected programs are reviewed under the FAA's Post Implementation Review process to determine overall performance of the program against its metrics and the extent of operational benefits achieved.

Why Do We Want/Need To Fund The Program At The Requested Level?

ATO is a performance-based organization, and Management Services ensures that performance stays on track by providing the framework to integrate ATO's plans, programs, and activities. The organization is diverse and works together to provide a wide variety of administrative type services that support the overall operation and inter-workings of ATO and help plan for a successful future.

Management Services organization also supports the Workplace of Choice initiatives in a number of ways. For example, ATO's Community Enterprise Office provides training, development, and certification programs to ATO leaders, and other professionals across ATO. Our goal is to ensure that ATO has the skills it needs to meet current and future mission business strategies and help employees find training for their organizational needs, whether it is offered in-house, on-line, or through external providers. Human capital planning services, which support ATO's organizational change strategies, are also provided.

Management Services organization provides leadership and guidance to ATO in creating and maintaining a diverse, productive, professional workplace that enhances all ATO operations. The Management Services organization develops diversity and inclusion strategies and serves as ATO's center of expertise for resources, training, knowledge and best practices for all diversity and inclusion efforts.

Management Services organization is responsible for identification and management of strategic internal and external communications messages and programs to connect ATO with its employee base. The organization measures the effectiveness of ATO communications through research, analysis, and direct customer engagement and feedback loops.

Appropriate funding allows Management Services to support key initiatives such as meeting Office of Personnel Management Hiring Standards and maintaining the air traffic controller workforce at optimum levels. Appropriate funding also allows Management Services to provide training services, consultations, and interventions to ATO service units to identify and reduce or eliminate barriers to maintaining a professional, model workplace.

The services provided by this organization are integral to the support and operation of the entire FAA and as such, the work being done by this organization to some extent supports all of DOT Strategic and FAA goals. However, there are several goals that are heavily supported by the Office of Finance and Management: Critical Acquisitions on Budget, Critical Acquisitions on Schedule, Unqualified Audit Opinion, Air Traffic Controller Workforce Plan, Continuity of Operations and Cost Control, which tie to DOT's goals of Organizational Excellence.

Detailed Justification for the - Vice President Program Management Organization, AJM-0

What Is The Request And What Will We Get For The Funds?

FY 2014 – Program Management Organization – Budget Request ($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Program Management Organization	$624,724	$604,604	$655,675	$30,951

FAA's Program Management Organization (PMO) request is $655,675,000 and 566 FTP / 575 FTE. This request provides an adjustment to base of $700,650 for pay inflation. This request also includes a base transfer of $250,000 from the Assistant Administrator for NextGen to ATO for the Traffic Alert and Collision Avoidance System (TCAS). This budget request also provides for a discretionary adjustment of $30,000,000 for En Route Automation Modernization (ERAM) Transition to Operations Maintenance (TOM).

Transition to Operations Maintenance requirements of $30,000,000 include:

En Route Automation Modernization (ERAM):

ERAM System replaces the 40-year-old En Route HOST Computer System used at 20 FAA air route traffic control centers around the country. This is the main computer system air traffic controllers use to guide airplanes flying at high altitudes. The revised deployment for ERAM, as documented in the ERAM Improvement Plan, is to complete all site Initial Operating Capability (IOC) milestones by the end of FY 2013. Last site Operational Readiness Demonstration (ORD) would occur in FY 2014. Program costs related to system analysis, system maintenance, and software field support are directly attributed to operational activities. This work ensures that ERAM capability can be maintained and improved throughout its operational life. A $30.0 million increase is needed for second-level engineering support for continuous operations and maintenance at the ERAM engaged sites.

Funding the FY 2014 request at this level will allow the PMO to support FAA's strategic plan initiatives for:

- Focusing on the continued production of Wide Area Augmentation System (WAAS)/Localizer Performance with Vertical (LPV) Guidance or Localizer Performance (LP) Instrument Approach Procedures. Activities include: funding and delivering airport surveys to Mission Support Services and funding associated for flight inspection services provided by Aviation System Standards.
- Conducting procedures development and charting services to Mission Support Services and funding for flight inspection services to Aviation System Standards. Provide for production of Area Navigation (RNAV) Global Positioning System (GPS) LPV/LP procedures and RNAV GPS instrument approach procedures with LPV/LP/lateral navigation (LNAV) minimums, RNAV GPS instrument approach procedures with LPV/LP/LNAV minimums to runways in Alaska, and RNAV GPS WAAS Route Structures.
- Improving services at Commercial Aviation Safety Team (CAST) and non-CAST locations by ensuring service availability for Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), High Intensity Approach Lighting System With Sequenced Flashing Lights (ALSF-2), Runway End Identifier Lights (REIL), Runway Visual Range (RVR) systems, upgrading Alaskan Satellite Telecommunications Infrastructure, National Engineering Support to assist with system optimization, engineering services to complete engineering at selected Airport Surface Detection Equipment-Model X (ASDE-X) sites, and improving all Runway Safety Area (RSA) Navigation Aids (NAVAIDs) at certified airports. Assist in establishing/enhancing infrastructure in support of National Airspace System (NAS)-wide common platform for the detection and reporting of suspected loss of standard separation events in the En Route, Terminal, and surface environments.

- Continuing acquisition and deployment of WAAS, NAS Voice System (NVS), System Wide Information Management (SWIM), Data Communication System (DataComm), and Next Generation Distance Measuring Equipment (DME) programs.
- Developing Security Certification and Accreditation Packages (SCAPs), manage contracts, and maintain the Federal Telecommunications Infrastructure (FTI).
- Continuing development and deployment of new Collaborative Air Traffic Management Technologies (CATMT) capabilities in support of Collaborative Decision Making (CDM). These capabilities reduce traffic delays associated with disruptive events in the NAS, such as severe weather, NAS equipment outages, and excessive traffic volume.
- Continuing the Flight Service directorate in executing the future flight service concept of operations in the CONUS, Hawaii, and Puerto Rico. Enhancing automation through a web based self-service system mitigating loss of human delivery of preflight functions currently provided through the AFSS contract. Providing Alaska flight services with an automation system, all leading to future cost savings and increased efficiency.

Key outputs expected to be achieved in the budget year with the requested resources:

- Fund the production of 500 WAAS approaches and formulate two lists of 400 runway ends each requiring new airport obstruction surveys.
- Support achieving full operational capability of WAAS by completing all hardware and software changes needed to complete WAAS operational capability.
- Continue development of CATMT Work Package (WP) 2 and CATMT WP3 enhancement capabilities. CATMT WP2 will develop Collaborative Airspace Constraint Resolution (CACR), provide increased automation support to identify and resolve airspace congestion with increased planning capabilities and allowance of user preferences. CATMT WP2 will also initiate design of Airborne Reroute Execution (ABRR), which provides the ability to electronically send traffic flow management (TFM) generated airborne reroutes to en route control facility automation for air traffic control (ATC) execution. CATMT WP3 will make software infrastructure changes which will allow airlines to switch to the FAA's Traffic Situation Display. The enhancement will provide improved performance, collaboration and decision support capability, and shared situational awareness to the user community.
- The TFM System Technical Refresh program will procure and install replacement hardware at the Traffic Flow Management Production Center (TPC) at the William J. Hughes Technical Center (WJHTC). In November 2012 the refresh was completed for the hardware replacement of the Traffic Flow Management System (TFMS) legacy application National Traffic Management Log (NTML).
- Implement modifications to HOST and En Route Automation Modernization (ERAM) systems to establish a common platform for the detection and reporting of suspected loss of standard separation events.
- Maintain service availability of automation platforms by providing sufficient second-level engineering and supply support for critical operational systems, such as: En Route Communications Gateway (ECG), ERAM, User Request Evaluation Tool (URET), Advanced Technologies and Oceanic Procedures (ATOP), En Route Information Display (ERIDS), Display System Replacement (DSR), Enhanced Back-Up Surveillance (EBUS), Micro En Route Automated Radar Tracking System (MEART), and HOST.
- Improve oceanic fuel efficiency per passenger seat for select city pairs and similar fleet by an average savings of 1 percent compared to the previous fiscal year's 2 year rolling average.
- Develop oceanic fuel burn performance metric for FY 2014 and beyond.

Key outcomes expected to be achieved in budget year with the requested resources:

- Sustain adjusted operational availability of en route equipment at 99.7 percent for the reportable facilities that support the Nation's Core Airports Economic Competitiveness.
- Meet 90 percent of all Next Generation Air Transportation System (NextGen) acquisition milestones on schedule and at or below original budget while continuing to expand FAA's NextGen Implementation Plan to incorporate critical path decisions and milestones necessary to accomplish the mid-term commitments.
- Continue to sustain the adjusted operational availability of select terminal equipment at 99.7 percent for the reportable facilities that support the Nation's Core Airports through FY 2014. Accomplish this by maintaining the operation of the NAS Terminal environment by sustaining the terminal automation systems of towers and Terminal Radar Approach Controls (TRACONs) to meet target levels of performance.

- Lead the evaluation and expansion of the use of Converging Runway Display Aids (CRDAs) at airports with intersecting runways.

What Is This Program?

The PMO supports the Department of Transportation's (DOT) Strategic Plan's: Provide full-life cycle program management capability across all of ATO from initial definition, through design, development, and effective deployment of both NAS sustainment and NextGen modernization systems.

The PMO is made up of the following directorates:

- System Integration and Requirements Analysis Directorate;
- Air Traffic Systems Directorate; and
- Enterprise Services Directorate.

The System Integration and Requirements Directorate analyzes NextGen operation capabilities, along with shortfalls and needs as stated by operations in order to define system alternatives and assist in prioritizing potential implementations. Systems Integration and Requirements Analysis (SIRA) acts as the front end integrator for the programs directorates and defines system portfolios consistent with NextGen Operational portfolios. These portfolios define inter-related investments targeted at operational capabilities that improve, extend, and replace existing systems in order to increase safety, efficiency, and capacity of the NAS.

The Air Traffic Systems Directorate develops, acquires, deploys, maintains, sustains, and improves automation, surveillance, and decision support systems that provide aircraft separation assurance and system-wide efficiency through flow control. We have approximately 12,000 pieces of equipment to maintain air traffic control operations utilizing complex voice- and data-switching equipment, radio and microwave transmission systems, local and remotely-located radio, and radar systems. Headquarters and Technical Center employees are responsible for sustainment management, engineering, production, logistics, testing, training, and systems and procedures implementation. Since the mid-1990s, we have fielded modern air traffic control, communications, display, and weather systems for controller use. Major acquisition programs such as ERAM and Automatic Dependent Surveillance-Broadcast (ADS-B) are replacing yesterday's equipment with flexible, resilient, scalable, and adaptive systems that will provide the platform for NextGen. In addition, new en route separation standards, navigation procedures, and innovative routing are reducing flight time and saving fuel. Our efforts are also reducing airspace congestion. We are saving money for air carriers and general aviation, reducing delays for passengers, and decreasing airplane emissions.

Enterprise Services Directorate develops, acquires, deploys, maintains, sustains, and improves navigation, communications, weather, and aeronautical information products and services for the NAS. Navigation Services covers projects in the following areas: GPS Satellite-Based Augmentation, GPS Ground-Based Augmentation, Ground Systems, Lighting Systems, and Technical Support. Communications Services provides communications and telecommunications services consistent with International Civil Aviation Organization (ICAO) standards required for air traffic control within the NAS. It provides communications infrastructure and services for DOD to ensure interoperability with the NAS. Weather services provide sensor, processor and distribution systems required to provide accurate forecasts for timely air traffic decisions. Through unique customer/client relationships and customer-derived requirements, our full life-cycle service has the capability to define, design, build, deploy, commission, operate, support, and decommission communications, navigation, and weather services.

Our partners and stakeholders include:

- Other ATO Business Units, Service Units, and Offices
- Other FAA Offices and Lines of Business
- Department of Defense (DOD)
- International Civil Aviation Organization (ICAO)
- Airlines

- Business Aviation
- General Aviation

By the end of FY 2013, the accomplishments for the PMO include:

- Implement key work plans in support of delivering the NextGen mid-term operational vision for collaborative air traffic management. This solution set provides capabilities to improve traffic flow management system-wide as well as at the tactical or location-based level. Key work plans include:
  - Strategic Flow Management Integration (execution of flow strategies into controller tools). The program provides for the implementation of ERAM modifications needed to receive/process the Traffic Management Initiatives (TMI) in the ERAM baseline timeframe.
  - Flow Control – Strategic Flow Enhancement. This program will analyze the mid-term (FY 2012-2018) air traffic management (ATM) building blocks needed for the transition to the future NextGen system and the capability to improve the predictions for both capacity and demand.
- Improve on-time performance and operator and passenger access to information by using TFM, Traffic Management Advisor (TMA), and CATMT, such as Airspace Flow Programs.
- Design and develop CATMT WP2 enhancements by deploying Phase 1 of Corridor Integrated Weather System (CIWS) integration onto TFMS.
- Fund the production of WAAS/LPV Guidance or LP Instrument Approach Procedures.
- Funding and delivering airport surveys to Mission Support Services and funding associated flight inspection services to Aviation System Standards.
- Flight inspection of RNAV GPA WAAS Route Structures.
- On-going efforts are focused on improving services at CAST and non-CAST locations by ensuring service availability for MALSR, ALSF-2, REIL, RVR systems, upgrading Alaskan Satellite Telecommunications Infrastructure, National Engineering Support to assist with system optimization, engineering services to complete engineering at selected ASDE-X sites, and improving all RSA NAVAIDs at certified airports.
- Acquisition and deployment of WAAS, NVS, SWIM, DataComm, and DME programs.
- Went operational with 271 new automated traffic counting platforms for managing daily and monthly facility traffic count reporting at terminal facilities across the NAS.

By the end of FY 2014, anticipated accomplishments for the PMO include:

- Deploy over 1,000 new Digital Multimode Radios.
- Continue the acquisition and deployment of WAAS, NVS, SWIM, DataComm, and DME programs.
- Complete documentation in support of NextGen Network Enabled Weather (NNEW) Segment 1 Final Investment Decision.
- Attain service availability for five Instrument Landing System (ILS) locations.
- Continue to develop CATMT WP2 and CATMT WP3 which provide six additional capability suites to improve the congestion management tools available to the Traffic Management Unit.
- Continue the TFMS Technology Refresh which replaces the hardware of the TPC at FAA's WJHTC.
- Maintain the system hardware and software which includes developing software corrections, testing, and implementing them for a safer and more efficient air traffic control system. It also provides for the on-site corrective and preventive maintenance and depot repair parts system. Modernizing and sustaining physical plant infrastructure is a long-term priority with remediation efforts planned across multiple fiscal years. We must maintain service availability of the en route and oceanic platforms by providing adequate second-level engineering and supply support as well.
- Continue to improve the safety, capacity, and efficiency of the NAS by strengthening our efforts to reduce the number of operational errors in the en route environment. In the Oceanic airspace, we plan to reduce separation minima, thereby improving NAS on-time arrival percentages and increasing fuel efficiency.
- Continue air traffic operations at 21 ARTCC and two CERAP control facilities.
- Continue to provide the support and technology to enable the safe increase in En Route and Oceanic capacity.
- Continue efforts in support of NextGen that include technical development activities for Collaborative Pre-Departure OTM4D and a 5-Year En Route and Oceanic Research and Development Plan for NextGen Mid-term and beyond.

- Continue on-going efforts that support En Route Air Traffic Operations and Service Level Availability by providing Life-Cycle Management of the physical plant infrastructure at the 21 ARTCCs and 2 CERAP facilities.
- Maintain En Route and Oceanic air traffic systems in a state which will not degrade the services provided to the flying public.

Why Is This Particular Program Necessary?

FAA's ATO handles 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. economy. ATO relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

The PMO centralizes program offices that manage NextGen initiatives and the majority of other ATO programs under one organization that will specialize in program management. The PMO has expertise and responsibility to manage program cost, schedule, and scope. The PMO plays a critical role in the success of NextGen by acting as the bridge between strategic requirements and tactical program implementation to improve the safety and efficiency of the NAS. The PMO ensures tighter alignment and closer integration of NextGen initiatives and elevate visibility and consistency. The PMO clarifies program management career paths, and helps us attract and retain the most highly skilled and motivated individuals on program management teams. This organization boosts key individual and organizational capabilities, such as program management, systems integration, software engineering, and communication, which are necessary to fully support and develop NextGen.

The PMO defines, designs, develops, and deploys ATC systems, equipment, and other services necessary to operate, maintain, and improve the NAS. It provides the critical infrastructure and first phase of NextGen with ERAM and ADS-B Systems implementation. This organization continues to provide its owners, customers, and system operators the highest degree of safety and service in the most efficient manner.

How Do You Know This Program Works?

ATO sets annual performance goals in key categories including safety, capacity, efficiency, finance, international leadership, and organizational excellence, including hiring and training. To measure our progress, we employ a set of metrics. The success of a particular program is determined by assessing its cost, schedule, and performance. Selected programs are reviewed under the FAA's Post Implementation Review process to determine overall performance of the program against its metrics and the extent of operational benefits achieved. The PMO, through its second-level engineering function, also supports several operational metrics including:

- Sustain Adjusted Operational Availability at 99 percent for reportable facilities that support the NAS.
- Continue to sustain the adjusted operational availability of select terminal equipment at 99.7 percent for the reportable facilities that support the Nation's Core Airports through FY 2014. Accomplish this by maintaining the operation of the NAS Terminal environment by sustaining the terminal automation systems of towers and TRACONs to meet target levels of performance.

Why Do We Want/Need To Fund The Program At The Requested Level?

The PMO plays a significant role associated with transition to NextGen. Controllers currently communicate with pilots using voice where revisions to aircraft flight paths are made through multiple instructions or lengthy verbal exchange. Many of the transformational improvements associated with NextGen including trajectory-based flight and net-centric operations cannot be achieved using the present automation, decision support, or voice-based communications system.

Funding requested in the FY 2014 submission will continue the transition to NextGen. In addition to en route automation modernization, supported by ADS-B, we are modernizing and providing commonality in terminal automation, coupling it with ADS-B and providing upgrades to Collaborative Air Traffic Management

Tools to support NextGen operations. Connecting all of the automation to and through a flexible digital communications infrastructure, and feeding it with spaced-based navigation will provide the information to both controllers, flow managers, dispatchers, and pilots necessary for the efficient and responsive NAS envisioned by NextGen.

Additional funding is requested to allow for second-level engineering support for the transition of the ERAM program. ERAM replaces the 40-year old En Route HOST Computer System used at 20 FAA ARTCCs around the country. This is the main computer system air traffic controllers use to guide airplanes flying at high altitudes.

Program costs related to system analysis, system maintenance, and software field support are directly attributed to operational activities. This work ensures that the ERAM capability can be maintained and improved throughout its operational life.

Explanation of Funding Changes

	Dollars ($000)	FTE
Air Traffic Organization	**-$130,948**	**-734**
Overview: For FY 2014, ATO requests $7,311,790,000 and 31,017 FTE to meet its mission of moving air traffic safely and efficiently. The FY 2014 request corresponds to a decrease of $130,948,000 and 734 FTE from the FY 2012 Enacted. This request provides an adjustment to base of $40,796,000 for pay inflation and other changes of $156,000 for contract pay raises associated with the National Air Traffic controllers Association (NATCA) Multi-Unit employees and $76,000 for the Working Capital Fund. It provides for a discretionary adjustment of $30,000,000 for En Route Automation Modernization (ERAM) Transition to Operations Maintenance. This request also provides for several base transfers for a net total of -$139,902,000 and -339 FTP / FTE. This budget includes program adjustments of -$62,074,000. To achieve this level of savings, ATO will be evaluating cost savings and efficiency gains in the following areas: Contract Weather Observations, Facility Realignments and Consolidations, and Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON).		
Adjustments to Base	**$40,796**	**-395**
FY 2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels.		-395
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September). The factor used is 1.7 percent.	$40,796	
Other Changes	**$232**	
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. The contract covers about 1,700 employees across six FAA offices (AVS, ATO, ARC, ARP, AGC, and ABA) and includes engineers, computer specialists, program analysts, budget analysts, and other professionals. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes pay inflation, Organizational Success Increase (OSI), and Superior Contribution Increase (SCI).	$156	
Working Capital Fund: The request includes an increase of $76,000 in anticipated Department of Transportation's (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $7,677,713, except for fee-for-services printing and conference center usage.	+76	
Discretionary Adjustments	**$30,000**	
En Route Automation Modernization (ERAM) Transition to Operations Maintenance: This $30.0 million request consists of the following component: <u>Second-Level Field Maintenance Support</u>: $30.0 million for 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, service, 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.	$30,000	
Base Transfers	**-$139,902**	**-339**
Hangar 6: The base transfer of $7,849,000 and 19 FTP / 20 FTE from the	$7,849	20

	Dollars ($000)	FTE
Office of the Assistant Administrator of Finance and Management (ARC) regarding Hangar 6 located at Ronald Reagan Washington National Airport. Hangar 6 provides aviation support for senior government official including the Secretary of Transportation, FAA Administrator and Deputy Administrator, NASA, the Federal Emergency Management Agency, Presidential Cabinet members, members of Congress, and other Federal government organizations. Hangar 6 is responsible for operating and maintaining three aircraft: two leased Cessna Citation Excels and one Gulfstream IV aircraft which is owned by FAA.		
Labor Technical Realignment: This base transfer request consists of two sets of transfers between the Office of Human Resources (AHR) and ATO. The transfer of labor relations resources between the two Lines of Business will better align resources with the appropriate organization and eliminate redundancy.	-$1,893	-14
Civil Rights Realignment: The base transfer of staff support and funding from ATO to Office of Civil Rights (ACR) will eliminate redundancy in corporate focus functions and align resources with the appropriate organizations.	-$1,499	-4
Property Management Realignment: This base transfer request consists of two sets of transfers between ATO and the Office of Finance and Management and supports further refinement of the original Shared Services reprogramming in FY 2012. The functions associated with this transfer includes: Fleet Management, Re-utilization and Disposal, In-Use Personal Property and Reports of Survey, and the AITS and MVS200 information systems.	-$1,770	3
Intervention Program Establishment: The base transfer of staff support and funding from ATO to the Office of Audit and Evaluation (AAE) will support the implementation of the intervention program and better align resources with the appropriate staff office. The intervention program offers an effective, alternative way of identifying and handling disclosures early in the process before they evolve into matters that are more costly to resolve. The implementation of the intervention program is a requirement of FAA Order 1100.167 and will benefit FAA organizations.	-$290	-1
Traffic Alert Collision and Avoidance System (TCAS): The base transfer of funding from the Office of Next Generational Air Transportation System (ANG) to ATO will better align resources to the appropriate organization in support of FAA's Safety Management System (SMS) and the future of NAS surveillance technologies and operational procedures.	$250	
Information Technology Resource Consolidation: This base transfer represents the transformation of multiple IT units aligned with FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support.	-141,020	-332
Training Resources Realignment: The base transfer of staff support and funding from ATO to the Office of Finance and Management will support training requirements agency-wide and will better align resources with the appropriate organization.	-1,529	-11
Program Adjustments	**-$62,074**	
ATO Program Adjustments: This budget includes program adjustments of -$62,074,000. To achieve this level of savings, ATO will be evaluating cost savings and efficiency gains in the following areas: Contract Weather	-$62,074	

	Dollars ($000)	FTE
Observations, Facility Realignments and Consolidations, and Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON).		

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Traditional Tables for Air Traffic Organization

The following pages represent information traditionally provided to the Committees on Appropriation for the FAA's air traffic control functions.

Controller Workforce FY 1981 through FY 2013

FY 1981	6,578	FY 1993	14,970	FY 2005	14,540
FY 1982	11,290	FY 1994	14,953	FY 2006	14,618
FY 1983	11,980	FY 1995	14,614	FY 2007	14,874
FY 1984	12,213	FY 1996	14,360	FY 2008	15,381
FY 1985	12,968	FY 1997	14,588	FY 2009	15,770
FY 1986	12,615	FY 1998	14,966	FY 2010	15,696
FY 1987	13,007	FY 1999	15,096	FY 2011	15,418
FY 1988	13,960	FY 2000	15,153	FY 2012	15,211
FY 1989	14,340	FY 2001	15,233	FY 2013 Est.	15,047
FY 1990	14,645	FY 2002	15,478	FY 2014 Req.	14,895
FY 1991	14,976	FY 2003	15,691		
FY 1992	15,147	FY 2004	14,934		

System Maintenance Overtime

	FY 2012 Actual	FY 2013 Enacted	FY 2014 Request
Field Maintenance			
Hours	333	316	326
Amount	19,998	18,518	19,220
Program and Technical Support			
Hours	26	25	26
Amount	1,738	1,675	1,742
Total			
Hours	359	341	354
Amount	21,736	20,193	20,962

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Aviation Safety Organization (AVS)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$1,252,991**	**7,455**	**128**	**7,470**
Adjustments to Base	**$7,630**			**-7**
FY 2012 Internal Adjustments				
FY 2013 Adjustments				-7
Pay Inflation	$7,630			
Other Changes	**$7,304**			
NATCA Multi Unit Pay Raise	$641			
Working Capital Fund	$104			
Annualization of FY 2012 Hiring	$3,430			
PASS Contract	$3,129			
Discretionary Adjustments	**$0**			
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$63,148**	**-217**	**-3**	**-217**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$63,148	-217	-3	-217
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$1,204,777**	**7,238**	**125**	**7,246**

Executive Summary: Aviation Safety (AVS)

What Is The Request And What Will We Get For The Funds?

The request of $1,204,777,000 and 7,246 full-time equivalents (FTEs) allows AVS to promote aviation safety by regulating and overseeing the civil aviation industry and continued airworthiness of aircraft, as well as certification of pilots, mechanics, and others in safety-related positions.

The request includes a base transfer reduction of $63,148,000 for Information Technology (IT) centralized agency service, "Adjustments to Base" and "Other Adjustments". The AVS submission maintains the number of safety inspectors, engineers and other non-IT safety critical positions.

What Is The Program?

The AVS organization is responsible for setting the safety standards for every product, person and organization that produces and operates aircraft in the national airspace system (NAS). AVS employees determine compliance with those standards and issue certificates to demonstrate compliance. AVS employees provide oversight and surveillance to ensure certificate holders continue to comply with the standards.

Why Is This Particular Program Necessary?

The AVS organization is responsible for:

- Providing surveillance and oversight of existing certificate holders.
- Developing and establishing the safety and certification standards for the civil aviation industry.
- Determining compliance with certification standards.
- Issuing or denying certifications.
- Ongoing and wide-ranging transformation of the United States NAS encompassed by NextGen.

These essential activities contribute to the Department of Transportation's safety goal, which is the FAA's highest priority.

How Do You Know The Program Works?

In three of the last four calendar years, U.S. airlines have not had a fatal accident, and the U.S. airlines fatal accident rate has decreased by 82 percent since the late 1990's. The standards set by AVS, as well as the continued oversight and surveillance to assure compliance with those standards, are key contributors to this outstanding safety record.

AVS programs continue to contribute to the unparalleled safety of American aviation. The commercial air carriers' fatality rates per 100 million persons on board were not to exceed 8.1 for FY 2010. The FAA exceeded the goal by achieving a rate of 0.3 fatalities.

Why Do We Want/Need To Fund The Program At The Requested Level?

The public expects the FAA to continually reduce the risk of flying while improving the efficiency of the system. This funding level will enable AVS to maintain continued operational safety services; however, if FAA employment levels are reduced, certification services for new operators and manufacturers may take longer.

Detailed Justification for – Aviation Safety (AVS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aviation Safety
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Total	**$1,252,991**	**$1,260,659**	**$1,204,777**	**-$48,214**
Flight Standards Service	830,778	838,746	841,106	10,328
Aircraft Certification Service	209,269	209,969	212,981	3,712
Office of Aerospace Medicine	55,352	55,352	56,103	751
Office of Rulemaking	6,111	6,111	6,195	84
Air Traffic Safety Oversight Service	22,619	22,619	23,248	629
Accident Investigation and Prevention Service	20,319	20,319	21,545	1,226
Office of Quality, Integration and Executive Service	108,543	107,543	43,599	-64,944

The request of $1,204,777,000 and 7,246 FTEs will provide resources for aviation safety regulation and oversight of the civil aviation industry. The request reflects a transfer of $63,148,000 and 217 FTEs from AVS to the Office of Finance and Management (AFN) for the Information Technology resources consolidation. The request includes an increase adjustment of $104,406 in anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $2,722,837 except for fee-for-services printing and conference center usage.

The budget submission maintains the number of safety inspectors, engineers and other non-IT safety critical positions. The request will provide resources for continued operational oversight, rulemaking, certification and program management services. If FAA employment levels are reduced, certification services for new operators and manufacturers may take longer.

<u>NextGen:</u>
AVS will be able to provide support for NextGen initiatives at the requested level. NextGen is a wide ranging transformation of the entire national air transportation system - not just certain pieces of it - to meet future demands and avoid gridlock in the sky and in the airports. Within AVS, Flight Standards (AFS) and Aircraft Certification Services (AIR) are responsible for setting, overseeing and enforcing safety standards for all parts of the aviation industry.

<u>Air Operator Certification:</u>
The FY 2014 budget request allows AVS maintain service to air operator certification services for new Part 121, 125, 129 and 133. AFS resources will support new certification requests, assisting applicants across Federal Aviation Regulations (FAR) Parts. AFS uses the Certification Services Oversight Process (CSOP) as the single authorized method for accepting, sequencing, and reporting original organizational certification activities. The resources request does not address certifications contained in CSOP. AFS will maintain the number of positions that support activities such as Unmanned Aerial Systems, NextGen implementation, and air operation certification.

<u>Type and Production Certification:</u>
AVS will maintain resources for type and production certification services based on available engineering and inspector resources. AIR will continue allocate resources to applicants for certification projects. This requested would allow applicants (e.g., Gulfstream Aerospace Corporation, Boeing, Cessna, Honeywell, General Electric, Pratt and Whitney, Honda) to receive the a continued level of certification services and not move resources to continued operational oversight initiatives. AIR will also provide positions for activities such as NextGen implementation and type and production certification.

AVS FY 2014 key initiatives include:

- Supporting Agency emerging technology initiatives by developing standards, policy, and guidance needed to transition and operate in the NextGen environment.
- Establishing regulations and standards, conducting inspections, audits, surveillance, investigations, enforcement and certification activities related to operators, airmen and designees, aircraft manufacturers and suppliers. AFS, AIR, AAM and AVP partner with other AVS organizations, other FAA lines of business and other aviation agencies to assist with NextGen implementation. AVS also promotes safety of flight for civil aircraft and air commerce.
- Providing project management and analytical support to FAA teams on all agency rules as well as safety critical data analysis of the aviation industry. ARM and AQS work with other AVS organizations, FAA lines of business and other aviation agencies to help support system safety.
- Establishing, approving and accepting safety standards in providing independent oversight of the ATO through safety surveillance, audits, and targeted inspections; monitoring ATC procedures and operations, technical operations and facilities, personnel certification criteria.
- Establishing standards and managing the credentialing of ATO safety personnel, including air traffic controllers and airway transportation specialists, executing approvals, acceptances, or updates of new ATO safety standards, waivers, or modifications and monitoring the daily operations of the NAS.
- Supporting a proactive approach to safety by leading the agency efforts to adopt a Safety Management System.
- Increasing capabilities and expansion of ASIAS to provide better access and more effectively monitor safety data.
- Providing accident and incident investigation services, as well as safety critical data analysis of the aviation industry: working closely with the NTSB for appropriate aviation-related matters.
- Directing and managing the maintenance and improvement of the International Organization Standardization (ISO) 9001:2008-based QMS. The AVS QMS ensures AVS meets its safety requirements and continuously improves its processes for safety systems.
- Supporting the implementation of an enhanced AVS telework program by conducting research and performing other executive services.

What Is This Program?

AVS consists of seven distinct organizational elements. Of the seven AVS organizational elements two – the Office of Rulemaking (ARM) and the Accident Investigation and Prevention Service (AVP) are solely Washington Headquarters elements. The other five – Flight Standards Service (AFS), Aircraft Certification Service (AIR), the Office of Aerospace Medicine (AAM), the Air Traffic Safety Oversight Service (AOV), and the Office of Quality, Integration, and Executive Services (AQS) – have field structures (including some overseas offices). The resource request would require AVS staffing of approximately 7,238 personnel.

The seven AVS organizations perform the following activities:

Flight Standards (AFS) promotes aviation safety by establishing and overseeing operations, maintenance and certification standards for air carriers, commercial operators, air agencies, airmen, and civil aircraft, including aircraft registration.

Anticipated FY 2014 accomplishments include:

- Conducting and participating in Pilot Seminars and Flight Instructor Refresher Courses and Commercial Flight Instructor/Designated Pilot Examiner refresher courses at towered and non-towered airports.
- Developing appropriate policy, procedural guidance, and aircraft certification programs for the emerging technologies needed to transition and operate in the NextGen environment.
- Validating effectiveness of initiatives, interventions, and recommendations, implemented by the GA loss of control workgroup and the amateur-built flight standardization board to mitigate loss of control causes in GA.

- Establishing the infrastructure necessary to oversee the implementation of SMS by 14 CFR Part 121 Air Carriers.
- Implementing new safety standards required in Public Law 111.216, Airline Safety and Federal Aviation Administration Extension Act of 2010 and Public Law 112.95, FAA Modernization and Reform Act of 2012.
- Developing a secure FAA airman test delivery system that incorporates new technology and is supported by training and testing documents, which embraces Next Gen concepts.

Aircraft Certification (AIR) 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.

Anticipated FY 2014 accomplishments include:

- Working toward the availability of an unleaded Avgas.
- Initiating rulemaking projects for rotorcraft bird strikes.
- Initiating part 23 rulemaking to improve the certification standards of small airplanes leading to improved safety and reduced cost.

Office of Aerospace Medicine (AAM) promotes aviation safety by developing safety standards for the medical certification of airmen and medical clearance of ATCSs, surveillance of industry drug and alcohol testing programs, implementing substance abuse testing for FAA personnel in testing-designated positions, and aerospace medicine and human factors research.

Anticipated FY 2014 accomplishments include:

- Continuing development and establishment of medical standards for pilots and ATCSs.
- Continuing to determine eligibility and issue medical certificates to qualified airmen.
- Continuing to issue medical clearances to ATCSs.
- Continuing conducting compliance and enforcement surveillance inspections of aviation industry employers that have required employee drug and alcohol testing programs.
- Managing the FAA "internal" substance abuse testing program.
- Overseeing the Aviation Medical Examiner (AME) Training and Oversight program for designees.
- Continuing to provide physiological and survival training to airmen.

Office of Rulemaking (ARM) directs and manages FAA's rulemaking program and supports the agency's regulatory priorities.

Anticipated FY 2014 accomplishments include:

- Sending critical safety rules to the Office of the Secretary of Transportation within 90 days of planned date.
- Continuing to process 85 percent of exemption requests within 120 days.
- Continuing improvements in FAA's rulemaking program.

Accident Investigation and Prevention Service (AVP) investigates aviation accidents and incidents to identify unsafe conditions and trends in the NAS and coordinates the corrective action process. The organization also provides analytical capabilities based on SMS principles and sound safety data analysis and process sharing, incorporating future hazardous/emerging risk assessments affecting the entire air transportation system and industry.

Anticipated FY 2014 accomplishments include:

- Leading agency efforts to effectively address NTSB recommendations issued to the FAA.
- Leading agency efforts to effectively address FAA Safety recommendations.
- Collecting and analyzing aviation safety data at a national level and consolidate the data under ASIAS.

- Facilitating the FAA's implementation of SMS focusing on the effective use of safety risk management and safety assurance processes.
- Advancing accident investigation by using root cause analysis techniques in analyzing data in conjunction with activity surrounding major accident investigations.
- Leading government/industry efforts for the Commercial Aviation Safety Team and the General Aviation Joint Steering Committee.

Air Traffic Safety Oversight Service (AOV) provides safety oversight of the Air Traffic Organization (ATO), including oversight of SMS, new acquisitions, ATC procedures and operations, technical operations, and personnel certification criteria.

Anticipated FY 2014 AOV accomplishments include:

- Conducting risk-based audits of 60 facilities.
- Conducting risk-based audits of 15 Technical Operations facilities/locations.

Office of Quality, Integration, and Executive Services (AQS) provides overall planning, direction, management, and evaluation of AVS programs. This office also directs and manages the maintenance and improvement of the ISO-9001:2008-based QMS for all AVS services and offices, and establishes integration policy and processes for safety systems.

Anticipated FY 2014 accomplishments include: *Note: Starting in FY 2014, all IT-related activities and staff will migrate to Shared Services (AFN).*

- Supporting AVS delegation management, including the migration of the designee data from the current systems.
- Continuing efforts to maintain the AVS ISO Certification.
- Meeting the National Archives and Records Administration (NARA) annual requirements for Records Management.
- Supporting the Government-wide initiative on Teleworking
- Implementing the engineering portion of the AVS Staffing Tool and Reporting System (ASTARS).
- Developing and implementing AVS-wide Leadership Development Programs in support of agency programs.

AVS supports the Department of Transportation Strategic Plan Safety Goal – specifically contributing toward the outcome of reducing transportation related injuries and fatalities. AVS activities in support of the safety strategic plan safety goal include:

- Establishing regulations and standards, conducting inspections, audits, surveillance, investigations, enforcement and certification activities related to operators, airmen and designees, aircraft manufacturers and suppliers. AFS, AIR, AAM and AVP partner with other AVS organizations, other FAA lines of business and other aviation agencies to assist with NextGen implementation. AVS also promotes safety of flight for civil aircraft and air commerce.
- Providing project management and analytical support to FAA teams on all agency rules as well as safety critical data analysis of the aviation industry. ARM and AQS work with other AVS organizations, FAA lines of business and other aviation agencies to help support system safety.
- Establishing, approving and accepting safety standards in providing independent oversight of the ATO through safety surveillance, audits, and targeted inspections; monitoring ATC procedures and operations, technical operations and facilities, personnel certification criteria; establishing standards and managing the credentialing of ATO safety personnel, including air traffic controllers and airway transportation specialists, executing approvals, acceptances, or updates of new ATO safety standards, waivers, or modifications and monitoring the daily operations of the NAS.
- Providing accident and incident investigation services, as well as safety critical data analysis of the aviation industry. We work closely with the NTSB for appropriate aviation-related matters.
- Directing and managing the maintenance and improvement of the ISO-9001:2008-based QMS for all AVS services and offices and establishing integration policy and processes for safety systems.

Why Is This Particular Program Necessary?

Most AVS responsibilities are based on statutes, regulations, orders and policy. AVS personnel establish safety standards, ensure compliance with those standards, and provide ongoing oversight of FAA approval/certificate holders. We certify pilots, mechanics and others in key aviation positions and provide oversight of the Air Traffic Organization. These efforts have enabled us to achieve the safest period of civil aviation in aviation history. Without these necessary and essential services, the potential for aircraft accidents would dramatically increase.

The AVS organization is necessary to continue safe aircraft operations and maintenance for commercial and general aviation operators. Without these essential services:

- Continued operational safety of air carriers and air agencies would be jeopardized and the potential for aircraft accidents would dramatically increase, resulting in loss of property and/or life.
- Activities involving certification programs would decline significantly and limit airlines' ability to grow and to adapt to changing economic conditions, negatively impacting the national economy.
- Our ability to investigate accidents and incidents would be diminished. These investigations are necessary to find and fix safety problems before they become major deficiencies in the National Airspace System

The AVS organization is responsible for approving the design and manufacture of aeronautical products and parts (including replacement parts to maintain the operation and safety of the existing fleet). Without these functions, there would be no safety system governing aircraft design, manufacture, and oversight and the flying public would encounter unsafe aircraft. Similarly, AVS has the responsibility of determining if a person is medically qualified to operate an aircraft. If the organization did not determine if the pilot was medically competent to operate an aircraft, individuals with debilitating medical conditions could attempt to fly and cause an accident with potentially disastrous consequences. AAM's Air Traffic Controller Specialist (ATCS) Health Program protects public safety by ensuring that ATCS are medically fit to perform their duties. AAM leverages resources through Aviation Medical Examiner (AME) who ensure ATCS are medically fit to control air traffic operations within the NAS.

The AVS mission is carried out by seven organizational units, each having a responsibility for providing safety services for the National Airspace System (NAS). The following paragraphs identify specific programs and responsibilities within the AVS services and offices that support safety:

AFS is responsible for certification and surveillance of U.S. air carriers and foreign air carriers operating in and over the U.S. through the establishment and oversight of safety requirements, standards and regulations. AFS operations vital to aviation safety include:

- Promoting the flight safety of civil aircraft in air commerce by setting certification standards for air carriers, commercial operators, air agencies, and airmen (except ATC operators).
- Directing, managing, and executing certification, inspection, and surveillance activities to ensure the adequacy of flight procedures, operating methods, airman qualification and proficiency, aircraft maintenance, and maintenance aspects of continued airworthiness programs.
- Managing systems for the registry of domestic civil aircraft and official airman records and supporting law enforcement agencies responsible for drug interdiction.
- Supporting strategic partnership efforts within the FAA and other aviation agencies.
- Providing regulatory and technical assistance to international civil aviation authorities.
- Performing surveillance and certification of foreign repair stations.
- Providing certification and operation policy recommendations governing foreign air operators operating within the United States.

AIR has the regulatory responsibility for type, production, and airworthiness certification of civil aeronautical products and parts. AIR's functions which are essential to ensure the safety of the NAS include the following:

- Establishing safety standards and procedures governing the design, production, and continued airworthiness of aircraft and aircraft parts.
- Approving aircraft design, aircraft engines, propellers, and parts.
- Issuing approvals to manufacturing facilities upon showing compliance to the applicable safety standards.
- Determining whether aircraft meet applicable standards and are safe to fly.
- Providing oversight and surveillance of approval holders to ensure continued compliance to safety standards
- Collecting and reviewing safety data, performing trend analysis, and taking the appropriate actions to ensure continued operational safety of the existing fleet.
- Managing designee qualifications, appointments and oversight.
- Investigating possible violations and initiating compliance and enforcement actions.
- Partnering with other AVS organizations, FAA lines of business and other aviation agencies to equip aircraft with technology to support NextGen.

AOV has the regulatory responsibility to provide independent safety oversight of the ATO and monitor ATO's compliance with safety standards and the SMS. AOV accomplishes its safety oversight functions by:

- Executing investigations of ATO accidents, incidents, and other occurrences that happen within the NAS.
- Approving changes to separation standards, procedures, new systems, hardware, and automation modifications and upgrades.
- Conducting system audits based on risk factors for accidents, incidents, Operational Errors, Operational Deviations, Runway Incursions, or significant non-compliance with approved safety standards in over 600 Air Traffic facilities.
- Analyzing the causes of Operational Errors to enable development and implementation of safety critical corrective actions.

AAM is responsible for a broad range of external and internal aviation safety programs related to medicine. These safety critical programs include:

- Developing and maintaining medical standards for pilots and ATCSs.
- Implementing and managing systems to medically certify commercial and GA pilots.
- Processing pilot medical certification and appeal cases.
- Managing medical clearance of air traffic controller specialists.
- Designating and overseeing AMEs.
- Conducting compliance and enforcement inspections of aviation industry drug and alcohol testing programs.
- Implementing and overseeing drug and alcohol testing of FAA employees in safety critical and security jobs.

ARM is responsible for ensuring FAA regulations are developed to improve safety levels and are developed according to approved processes and are completed within mandated timelines. ARM accomplishes its rulemaking functions by:

- Developing, with the assistance of other internal stakeholders, FAA's rulemaking priorities for the current year and out-years.
- Coordinating the development of rules with all internal and external stakeholders.
- Processing petitions for rulemaking and petitions for exemption received from the aviation community.
- Developing and implementing improvements to critical FAA rulemaking and exemption processes and systems, and facilitates the ability of internal stakeholders to support such processes and systems.

AFS, AIR, AAM, and AOV will partner with other AVS organizations, FAA lines of business and other aviation agencies to implement NextGen. Additional specific skill sets are needed to develop standards, rulemaking and policy for flight technologies and procedures supporting safe flight using Enhanced Flight Vision System, Synthetic Vision systems, Area Navigation/Required Navigation Performance procedures, ADS-B and NextGen weather in the cockpit initiatives. ADS-B represents the foundation of the NextGen air traffic system. Unmanned aircraft systems are playing an increased role in daily operations in the NAS and must be safely integrated.

The implementation of Performance-Based Navigation within the NextGen framework requires changes in the character and manner by which instrument procedure standards and criteria are developed. Certification and Flight Standardization Boards of New Aircraft provide risk assessments and safety analyses and are required to prepare the NAS for the introduction of new aircraft. This includes international introduction of new aircraft as well. AVS is responsible for delivering new training on the certification, installation and operation of the new NextGen equipment to inspectors in multiple NextGen technologies.

The requested funding level will enable AVS to maintain resources for surveillance and oversight of the existing aviation fleet and production manufactures. The request will also enable AVS to accomplish NextGen implementation and certification services.

How Do You Know The Program Works?

Our effectiveness is acknowledged by stakeholders who continue to operate in a safe aviation system. As regulators, we are unique by the nature of what we do. Our work typically receives public attention only following an accident, incident, or other unwished-for circumstances, while our successes often go unnoticed. AVS is moving from diagnostic to prognostic identification of risk factors that are causal factors of accidents or incidents to learn and find ways to enhance aviation safety.

Although AVS continues to meet performance goals, the increased introduction of new aircraft technologies (both commercial and GA,) and the longer life expectancy of the current fleet has heightened public, Congressional and DOT-Office of Inspector General inquiries regarding aviation safety concerns. This requires AVS to increase its focus on risk-based analysis, information technology and designee management to mitigate these concerns.

AVS programs continue to contribute to the unparalleled safety of American aviation. The commercial air carriers' fatality rates per 100 million persons on board were not to exceed 8.1 for FY 2010. The FAA exceeded the goal by achieving a rate of 0.3 fatalities.

Why Do We Want/Need To Fund The Program At The Requested Level?

The requested funding level will enable AVS to maintain surveillance and certification services. Our strategic goal for staffing is to have the right number of safety critical and support employees in the right locations thereby providing the aviation community with surveillance and oversight of air carriers, GA operations, repair stations and manufacturers. This request will enable oversight, audit activities and certification activities for FAR Parts 121, 135, and 145 and manufactures to be maintained.

The request enables AVS to provide oversight and surveillance, rulemaking and certification services for existing and new operators and manufacturers. As the number of aircraft flying in the NAS grows, and new aircraft models and technologies are introduced, they will be sequenced for certification services based on available resources. This resource request will require continued sequencing time for operator and production certification services.

The market segment will receive certification and operation services for operators, manufacturers and air traffic controllers based on available AVS resources to assist in the introduction of new technologies that will identify precisely where an aircraft is at any given moment, and how long it's going to take to reach its destination. NextGen satellite technologies will make this information available to both pilots and controllers, with levels of accuracy and precision unattainable by radar. Even though planes will be flying closer together, the precise information provided by NextGen will increase safety by allowing pilots to know exactly where their aircraft is located in relation to other aircraft throughout all phases of flight. AVS will continue to balance certification resources against the need to maintain safety operations for the existing fleet and manufacturers. AVS will maintain current levels of service without additional resources to mitigate some of the unfilled requests for safety services.

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Explanation of Funding Changes	Dollars ($000)	FTE
Aviation Safety	**-$48,214**	**-224**
Overview: For FY 2014, the Associate Administrator for Aviation Safety requests $1,204,777,000 and 7,246 FTEs to meet its safety mission. The FY 2014 request level reflects adjustments to base, other adjustments, and one base transfer.		
Adjustments to Base	**+$7,630**	**-7**
FY2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels.		-7
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September). The factor used is 1.0 percent.	+7,630	
Other Adjustments	**+$7,304**	
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. The contract covers about 1,700 employees across six FAA offices (AVS, ATO, ARC, ARP, AGC, and ABA) and includes engineers, computer specialists, program analysts, budget analysts and other professionals. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes, pay inflation, Organizational Success Increase (OSI) and Superior Contribution Increase (SCI)	+641	
Working Capital Fund: This adjustment is an internal realignment of funds to cover the projected Working Capital Fund (WCF) charges. Realignment reflects the FY 2014 WCF profile. These adjustments are being made to best align each office's resources with their expected WCF costs.	+104	
Annualization of FY 2012 Hiring: This adjustment represents the annualized cost of the FY 2012 new hires and attrition.	3,430	
PASS Contract: This adjustment in cost is related to the PASS contract agreement.	3,129	
Base Transfers	**-$63,148**	**-217**
Information Technology Resource Consolidation: This base transfer represents the transformation of multiple IT units aligned with the FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support.	-63,148	

AVS Primary Stakeholders
(General Public is our Ultimate Customer)

Air Operator Certificates: 5,458	**Active Pilots: 747,959**
89 Major Air Carriers – (e.g. United Airlines)	145,994 ATP
2,174 Commuter Air Carriers/On Demand Air Taxis	136,790 Commercial
99 Commercial Operators (e.g. Baltimore Orioles)	213,044 Private
496 Foreign air carriers (e.g. Lufthansa)	225 Recreational
324 External Load (Logging/Oil Platform)	4,044 Sport
1,884 Agricultural Operators	119,239 Student
392 Public Use Authorities (State/City/Police)	128,623 Foreign Pilot
Air Agency Certificates: 5,912	**Non-Pilot Air Personnel: 737,192**
663 Pilot Training Schools	378,561 Mechanics & Repairmen
4,852 Repair stations	39,517 control Tower Operators
166 Maintenance Training Schools	166,636 flight Attendants
258 Pilot Training Centers	74,664 Ground Instructors
	77,814 Other (Dispatchers/Flight Navigators/Parachute Riggers/Flight Engineers
Aircraft: 210,463	
7,279 Air Carrier Aircraft	**Flight Instructors: 97,398**
471 Commuter Air carrier Aircraft	
10,420 On-Demand Air Taxi Aircraft	**Airmen Medical Examinations: 379,358**
181,782 General Aviation Aircraft	29,396 Special Issuances
10,511 Inactive Aircraft	349,962 Special Issuances
Aviation Authorities – Other Countries: 414	**Approved Manufacturers: 1,619**
36 Bilateral Agreements	
190 Foreign Carrier Aviation Authorities	**Aviation Industry Entities Covered by Anti-Drug & Alcohol Programs: 7,200**
188 Accident Investigation Authorities	
Check Airmen: 7,747	**National Transportation Safety Board**
4,453 Part 121	96 Safety Recommendations (5-year average)
167 Parts 121/135	32 Major Investigations (avg/yr)(new)
3,127 Part 135	
	ATCS Medical Clearance Exams: 14,747
Designees: 10,629	13,745 Controller Workforce
3,447 Aircraft Certification	107 Flight Service Station Workforce
3,689 Flight Standards	
3,493 Aerospace Medicine	
Mechanics with Inspection Authority: 21,740	
As of May, 2012	

Staffing Information

	FY 2012 Actual	FY 2013 CR Annualized	Proposed Change	FY 2014 Request
Direct Full Time Equivalents (FTEs)	**7,470**	**7,463**	**-224**	**7,246**
Flight Standards	5,256	5,258	2	5,258
Aircraft Certification	1,321	1,321	0	1,321
Aerospace Medicine	382	380	-2	380
Rulemaking	35	34	-1	34
Air Traffic Safety Oversight	128	126	-2	126
Accident Investigation and Prevention	66	65	-1	65
Quality, Integration and Executive Services	282	279	-220	62
End of Year Employment (FTP)	**7,455**	**7,455**	**-217**	**7,238**
Flight Standards	5,254	5,254	0	5,254
Aircraft Certification	1,319	1,319	0	1,319
Aerospace Medicine	369	369	0	369
Rulemaking	36	36	0	36
Air Traffic Safety Oversight	133	133	0	133
Accident Investigation and Prevention	67	67	0	67
Quality, Integration and Executive Services	277	277	-217	60

As of March 8, 2013

Safety Critical/Operational Support Staffing
End of Year Employment, Full Time Permanent

	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request
Flight Standards	**5,254**	**5,254**	**5,254**
Engineers	12	12	12
Aviation Safety Inspectors	4,104	4,104	4,104
Safety Technical Specialists	448	448	448
Operational Support	690	690	690
Aircraft Certification	**1,319**	**1,319**	**1,319**
Manufacturing Safety Inspectors	258	258	258
Pilots, Engineers and CSTAs	734	734	734
Safety Technical Specialist	170	170	170
Operational Support	157	157	157
Aerospace Medicine	**369**	**369**	**369**
Physicians, Physician Assistants, Nurses	55	55	55
Alcohol/Drug Abatement Inspectors	68	68	68
Safety Technical Specialist	206	206	206
Operational Support	40	40	40
Air Traffic Safety Oversight	**133**	**133**	**133**
Air Traffic Safety Inspectors	58	58	58
Safety Technical Specialist	68	68	68
Operational Support	7	7	7
Rulemaking	**36**	**36**	**36**
Safety Technical Specialist	33	33	33
Operational Support	3	3	3
Accident Investigation and Prevention Service	**67**	**67**	**67**
Air Safety Inspectors	10	10	10
Safety Technical Specialist	48	48	48
Operational Support	9	9	9
Quality, Integration and Executive Services	**277**	**277**	**60**
Safety Critical Staff	126	126	12
Operational Support	151	151	48
Total	**7,455**	**7,455**	**7,238**
Safety Critical Staff	6,398	6,398	6,283
Operational Support	1,057	1,057	955

As of March 8, 2013

Note II: In FY 2014, AVS IT staffing and funding within the Quality, Integration and Executive Service was transferred to AFN.

Workload Indicators

	FY 2012 Actual	Estimated Change	FY 2013 Estimate	Estimated Change	FY 2014 Estimate
Flight Standards					
Airmen Certification Activities	117,867	-8.5%	107,840	20.5%	129,905
Operator Certification/Certificate Management Activities	93,444	1.2%	94,564	9.1%	103,179
Investigation Activities	36,070	-1.7%	35,440	7.2%	37,929
Non-ATOS Air Operator/Air Agency Surveillance Activities [Includes other than Part 121 Carriers]*	203,534	-3.5%	196,466	10.5%	217,159
ATOS Operator Surveillance Activities	96,002	4.7%	100,509	-4.5%	96,003
Enforcement and Investigation Activities	11,921	-3.1%	11,546	4.9%	12,115
Education and Safety	10,650	0.0%	10,650	0.0%	10,650
Aircraft Registration Examinations	200,357	12.2%	224,882	6.2%	238,801
Airmen Certification Examinations	232,635	3.0%	239,614	4.6%	250,560
Aircraft Certification					
TC/STCs Issued	1,020	0.0%	1,020	0.7%	1,027
Other Design Approvals Issued	3,106	0.0%	3,106	0.5%	3,120
Production Approvals Issued	65	0.0%	65	0.0%	65
Airworthiness Directives Issued	355	0.0%	355	0.9%	358
Certificate Management Audits	2,378	0.0%	2,378	1.5%	2,766
Aerospace Medicine					
Applications Processed/Received	378,187	0.0%	378,187	0.0%	378,187
DWI/NDR Recommendations Processed	7,099	0.0%	7,099	-16.7%	5,916
Number of AMEs	3,515	0.0%	3,515	-5.2%	3,333
Anti-Drug and Alcohol Registrations Completed	175	0.0%	175	14.3%	200
Anti-Drug and Alcohol MIS Annual Reports	3,250	0.0%	3,250	-16.2%	2,724
Compliance and Enforcement Inspections	1,750	0.0%	1,750	1.4%	1,774
Number of Drug Tests	11,027	0.0%	11,027	0.0%	11,027
Number of Alcohol Tests	3,711	0.0%	3,711	0.0%	3,711
Accident Investigation and Prevention					
NTSB Recommendations Received	105	0.0%	105	0.0%	105
Accidents/Incidents Investigated	30	0.0%	30	2.7%	31
Follow-up Investigations	300	0.0%	300	1.0%	303
Special Accidents/Incidents Investigated	250	0.0%	250	0.0%	250
NTSB Hearings Participated In	3	0.0%	3	0.0%	3
FAA Recommendations Received	325	0.0%	325	0.0%	325
NTSB Requests Received	650	0.0%	650	0.0%	650
Rulemaking					
Exemptions	420	0.0%	420	1.2%	425
Petitions for Rulemaking	20	0.0%	20	25.0%	25
Rulemaking Projects	30	0.0%	30	0.0%	30
Aviation Rulemaking Advisory Committee					
Tasks	2	0.0%	2	0.0%	2
Recommendations	2	0.0%	2	0.0%	2
Air Traffic Safety Oversight					
Safety Analysis and Audits	168,500	0.0%	168,500	7.4%	180,980
Safety Incident Investigations	12,569	0.0%	12,569	0.0%	12,569
Air Traffic Change Approvals	10,400	0.0%	10,400	0.0%	10,400
Safety Report Reviews	24,599	0.0%	24,599	0.0%	24,599
Airmen Credentialing/Examination	27,899	0.0%	27,899	0.0%	27,899
Education and Safety	52,500	0.0%	52,500	0.0%	52,500

As of March 8, 2013

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Commercial Space Organization (AST)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$16,271**	**75**	**1**	**73**
Adjustments to Base	**$86**			
FY 2012 Internal Adjustments				
FY 2013 Adjustments				
Pay Inflation	$86			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments		**4**	**1**	**3**
Safety Oversight		4	1	3
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$346**			
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$346			
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$16,011**	**79**	**2**	**76**

Executive Summary: Commercial Space Transportation (AST)

What Is The Request And What Will We Get For The Funds?

The request of $16,011,000 and 76 FTE allows AST to ensure protection of the public, property, and the national security and foreign policy interests of the United States (U.S.) during commercial space launch or reentry activities, as well as encourage, facilitate and promote U.S. commercial space transportation. Key outputs of the request include issuing licenses and permits to support a significant number of space launch or reentry activities, plus conduct a corresponding number of inspections, continuing operational safety oversight related to commercial human spaceflight activities, continuing basic and applied research, and cooperative planning and oversight of commercial space transportation activities with the United States Air Force (USAF) and the National Aeronautics and Space Administration (NASA).

What Is The Program?

AST's primary mission is to regulate commercial space launch and reentry operations, only to the extent necessary to ensure compliance with international obligations of the U.S. and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States. Additionally, AST encourages, facilitates, and promotes commercial space launches and re-entries by the private sector. Safety, however, is clearly AST's top priority. Our specific actions to ensure safe operations include developing and publishing regulations; conducting environmental assessments; granting licenses, experimental permits, and safety approvals; conducting safety inspections; and supporting range operations and traffic management activities.

Why Is This Particular Program Necessary?

AST was established in 1984 by Executive Order to provide a one-stop-shop in overseeing commercial space transportation activities. A key challenge we face today involves the beginning of a new era in commercial human spaceflight: suborbital human spaceflight (space tourism) plus orbital cargo and crew transportation to the International Space Station. Publication of the National Space Policy signals an even greater role for the commercial space industry in America's overall space strategy and utilization of space-based systems. AST's activities support this growing commercial space industry and the country's increasing reliance on the industry's success.

How Do You Know The Program Works?

AST's safety record to date has been excellent: since 1989, we have licensed 215 commercial space launches without any loss of life, serious injuries, or significant property damage to the general public. This record has been maintained while experiencing significant growth in the number of space launch systems, operators, and spaceports.

Why Do We Want/Need To Fund The Program At The Requested Level?

The U.S. commercial space launch industry is expected to expand as space tourism develops and NASA starts to rely on the commercial sector for space transportation requirements (Report GAO-10-286T available at *http://www.gao.gov/new.items/d10286t.pdf*). NASA's Commercial Cargo Resupply Services Program, Suborbital Flight Opportunities Program, and the Commercial Crew Program all require direct AST coordination and engagement with NASA preparatory to the actual AST licensing activities.

Detailed Justification for – Commercial Space Transportation (AST)

What Do I Need To Know Before Reading This Justification?

AST regulates all commercial space transportation activity. In the National Space Policy released June 28, 2010, the U.S. "is committed to encouraging and facilitating the growth of a U.S. commercial space sector that supports U.S. needs, is globally competitive, and advances U.S. leadership in the generation of new markets and innovation-driven entrepreneurship." NASA's retirement of the Space Shuttle Program in 2011 shifted responsibility for International Space Station cargo delivery from NASA's Space Shuttle launches to commercial space launches, and thus into the AST licensing regimen.

What Is The Request And What Will We Get For The Funds?

FY 2014 – Commercial Space Transportation
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Core Business Operations	$16,271	$16,371	$16,011	-$260

FAA's Commercial Space Transportation Program requests $16,011,000 and 76 FTE for FY 2014. The request reflects a base transfer of $346,000 from AST to the Office of Finance and Management (AFN) for the Information Technology resources consolidation. This funding will allow AST to ensure the protection of the public, property, and the national security and foreign policy interests of the United States during commercial space launch or reentry activities and to encourage, facilitate and promote U.S. commercial space transportation. All space launches and reentries by U.S. citizens except those "by and for the U.S. Government" require a license from FAA. AST currently is administering 11 active launch licenses for launches of Pegasus, Taurus, Atlas V, Delta IV, Delta II, and Falcon 9. There are currently eight licenses for launch site operations and in the future there may be two license amendment requests for significant launch site license modifications.

The FY 2014 budget request provides the resources necessary for AST to meet a significant increase in commercial space launch and reentry operations in 2014. Based on industry provided launch manifests and planned flight test programs, AST forecasts more than 40 launch and reentry operations in 2014, a tenfold increase from 2011 operations. This increased commercial launch rate reflects a higher flight rate by experienced launch operators under multi-launch operator's licenses from existing spaceports, as well as new launch licenses and permits for newly developed launch systems and spaceports which are the direct result from current NASA and USAF investments in the commercial space launch industry. AST is already performing initial safety analyses for some of the new launch systems and spaceports forecast to be operating in 2014.

The increased activity levels in the commercial space industry create a factor of six increase in the corresponding number of licenses evaluated and issued, environmental assessments, safety analyses, and safety inspections for AST staff. To assist with the increasing operational safety oversight workload, AST plans to contract approximately seven safety experts with FY 2013 funding. The contractors' initial activities will include conducting safety analyses, developing safety tools, program support scheduling, developing commercial human space flight requirements, and supporting licensing analyses and inspections. In FY 2014, AST is requesting additional FTE to convert those contractors to federal employees so they can expand their workload to include responsibilities that are inherently governmental. These additional duties would include safety inspections, compliance assessment, regulatory activity support, and inter-agency coordination efforts for the creation of common safety standards and method of verification. AST expects continued development of new rulemaking projects (or revising existing regulations) to keep regulations current with the increasing complexity and diversity of new manned space launch and reentry systems, including the new hybrid launch systems which blend aircraft and rocket systems to operate at the edge of space.

The request also allows us to actively and continuously participate in joint USAF/FAA Common Standards Working Groups and in the USAF Range Commanders Council to maintain common launch safety requirements at Air Force launch sites. Additionally, we aid the Department of Defense (DoD) in understanding commercial space entrepreneurial capabilities and their potential to fulfill military requirements. Increasingly, more commercial operations are utilizing government-owned launch facilities in Florida and California. To support these range activities, AST has employees located at Patrick AFB and Vandenberg AFB with direct input provided from other AST staff as required. AST also maintains engineering staff at NASA facilities in Texas, Florida, and California to jointly develop plans for regulatory oversight of commercial space transportation of U.S. government and private crews to and from orbit. Our collaboration extends within FAA as well, to ensure commercial space transportation requirements and operating characteristics are effectively captured within the evolving Next Generation Airspace System (NextGen) requirements and that commercial spaceflight operations are safely integrated within the NAS.

AST is committed to industry-based Research and Development (R&D) and Science, Technology, Engineering and Math (STEM) education through its Center of Excellence (COE). In 2010, the formal COE organizational structure was established to encourage the teaming of resources and capabilities of academia, industry, and government to focus on research areas of primary interest to AST and the U.S. commercial space transportation industry as a whole. In 2014, FAA is funding the COE at a program level of $1M.

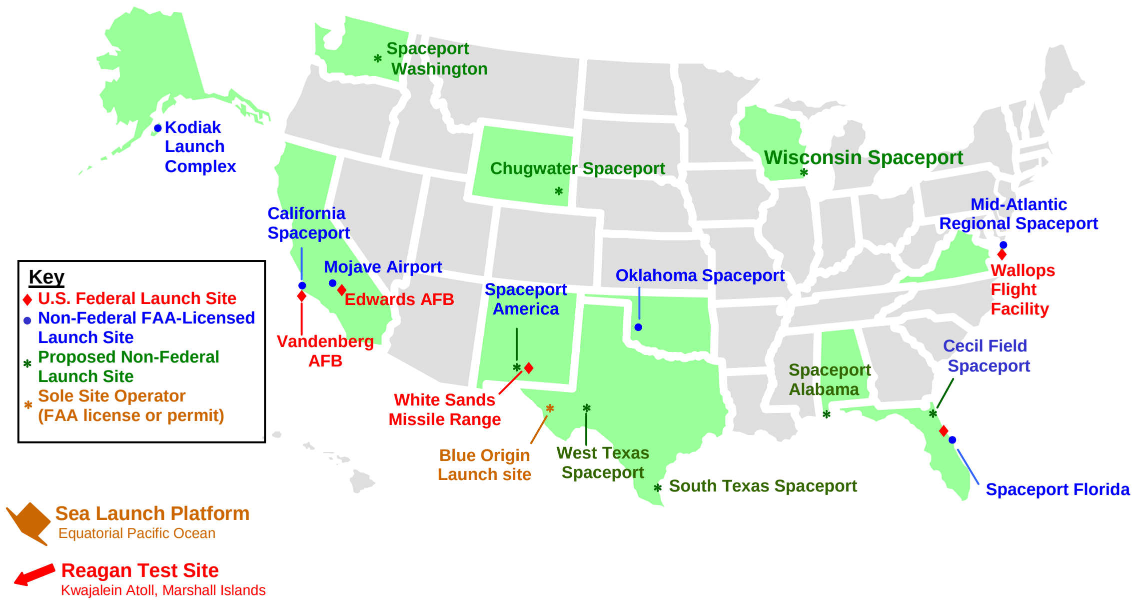
The distribution of FY 2014 resources among AST's core business operations is illustrated in the table below, identifying both manpower and total funds allocations to the core business functions.

			(Dollars in Thousands)			
FY 2014 Program/Function	FTE	%	PC&B	Non-PCB	Total	%
Core Programs Total	**76**	**100%**	**$11,586**	**$4,425**	**$16,011**	**100%**
Licenses, Permits, Safety Approvals	12	14%	1,855	82	1,936	12%
Regulations and Analyses	10	13%	1,570	780	2,350	15%
Range and Field Operations	10	13%	1,570	99	1,669	10%
Resource Management and Administration	9	12%	1,427	579	2,006	13%
Safety Inspections	12	16%	1,881	104	1,985	12%
Space Transportation Integration	8	11%	1,142	13	1,155	7%
Industry Viability	5	7%	714	718	1,432	9%
Safety Research	5	7%	714	1,327	2,041	13%
Environmental Analyses	2	3%	285	650	935	6%
International Policy and Outreach	3	4%	428	73	501	3%

SAFETY – FY 2014 Key Outputs and Outcomes:

- Execute the licensing process for reusable launch vehicles that will carry people on suborbital trajectories.
- Process a license application for Falcon 9 launches from Vandenberg AFB.
- Inspect and monitor licensed operations to ensure the license holder is in compliance with all terms and conditions of the license during launch and reentry operations.
- Make experimental permit determinations within 120 days of receiving an acceptable application, make license determinations within 180 days of receiving an acceptable application, and make safety approval determinations within 180 days of receiving a complete application.
- Develop analysis tools and models to improve the safety of commercial space transportation.
- Collect and analyze launch and reentry vehicle anomaly and failure data to track trends and monitor safety indicators.
- Continue rulemaking efforts for clarifying part 420 (License to Operate a Launch Site), parts 431 and 435 (Launch and Reentry of Reusable Launch Vehicle), part 417 (Launch Safety), and part 437 (Experimental Permit).
- Develop advisory circulars and guidance materials for commercial space transportation.

U.S. Spaceports
Commercial and Government Active and Proposed Launch Sites



ECONOMIC COMPETITIVENESS – FY 2014 Key Outputs and Outcomes:

- Manage research and development projects awarded to the Center of Excellence for Commercial Space Transportation.
- Provide for comprehensive environmental analyses and compliance during the development and operation of space launch sites, spaceflight preparation, and space launch and reentry activities, consistent with the National Environmental Protection Act.

What Is This Program?

FAA's Office of Commercial Space Transportation (AST) was established by Executive Order in 1984. Our mission is to ensure protection of the public, property, and the national security and foreign policy interests of the United States during commercial launch or reentry activities, and to encourage, facilitate, and promote U.S. commercial space transportation. Safety is our highest priority. The National Space Policy and current NASA direction reflect a greater reliance by the Federal Government on the commercial space industry to accomplish national objectives. We support the Department of Transportation's (DOT) Strategic Goals for Safety and Economic Competitiveness.

Safety

AST has an outstanding safety record. Since 1989, we have licensed 215 commercial launches without any loss of life, serious injuries, or significant property damage to the general public. We conduct safety inspections to ensure license and permit holders adhere to regulatory requirements. Inspections include at least one annual inspection at commercial launch site operations and at least one inspection of launch operations at time of flight.

AST activities in the support of the DOT Strategic Plan's Safety Goal include:

- Conducting inspections,
- Granting licenses, experimental permits, and safety approvals,
- Developing and issuing regulations,

- Performing accident investigation and prevention activities, and
- Supporting federal range operations and related aircraft traffic management.

Safety inspection is an AST core function that directs the monitoring of all licensed and permitted commercial space transportation activities. These activities include those conducted by the licensee/permitee, its contractors and subcontractors. All AST safety inspectors are credentialed and carry their credentials during inspections. They use approved safety inspection plans, templates, and checklists to conduct and document inspections. A safety inspection encompasses more than flight activities alone. Inspectors also monitor and participate in mission dress rehearsals, safe and arm checks, flight termination system installation and checkout, accident investigation, and other activities related to public safety. The program is built upon a firm foundation comprised of written documentation including "Safety Inspection Process and Procedures (P008)," "Safety Inspector Training & Certification Program (P008A)," "Safety Inspector Roles & Responsibilities (P008B)," and the AST qualification matrix which denotes minimum safety inspector training requirements.

Licensing is an AST core function that fulfills statutory mandates and regulatory requirements that are designed to insure public health and safety, safety of property, and compliance with U.S. foreign policy and national security requirements. Licensing includes policy and payload reviews to determine that the proposed activity does not adversely affect U.S. foreign policy or national security interests.

AST is also responsible for licensing the operation of launch sites or "spaceports." Since 1996 we have licensed the operation of California Spaceport at Vandenberg Air Force Base; Spaceport Florida at Cape Canaveral Air Force Station; Mid-Atlantic Regional Spaceport at Wallops Flight Facility in Virginia; Mojave Air and Space Port in California; Kodiak Launch Complex on Kodiak Island, Alaska; Oklahoma Spaceport in Burns Flat, Oklahoma; Spaceport America near Las Cruces, New Mexico; and Cecil Field in Jacksonville, Florida.

Organizational Excellence

AST has reorganized and continues to improve our effectiveness and efficiency by examining our staff assignments and focusing work into new functional organizations. For example, we consolidated the Licensing, Permitting & Safety Approval functions into one organization and reassigned our staff to become specialists in AST's core operations disciplines (Safety Inspectors do only that). We are also deploying more staff to work at launch site locations to provide continuous and direct oversight of spaceport and launch operator operations.

<u>Response to GAO Recommendation</u>: The FAA Office of Commercial Space Transportation (AST) will take action to implement a GAO recommendation calling for external review of AST's Maximum Probable Loss (MPL) methodology. The GAO recommendation was recently stated in the GAO-12-899 report titled "Commercial Space Launches - FAA Should Update How It Assesses Federal Liability Risk." MPL is used to determine the financial responsibility requirement of a launch license holder, by estimating the most probable cost of damage to life and property, in the event of a launch-related mishap. While AST believes the current methodology is effective, GAO's recommendation to conduct a review of the methodology is prudent given the growth of industry and the amount of time that has passed since modification. Given current budget constraints, AST is studying means to engage external experts that can review and assess the FAA MPL methodology. The Office will enlist the support of the Business/Legal Working Group of the Commercial Space Transportation Advisory Committee (COMSTAC) to recommend a plan to accomplish this review by the end of CY 2014.

Economic Competitiveness:

AST supports the DOT's Economic Competitiveness Goal by:

- <u>Operating a Center of Excellence for Commercial Space Transportation (COE-CST).</u> The goal of this endeavor is to create a cost sharing partnership of academia, industry, and government that will focus on research areas of primary interest to AST and the U.S. commercial space transportation industry as a whole. Our purpose is to forge a union of public sector (FAA, spaceport authorities, state/local governments, etc.), private sector, and academic institutions to create a world class consortium. This union results in a dollar-for-dollar match of funds invested by the FAA. The COE-CST will foster research leading to the development of effective policies, procedures, and support technologies for the advancement of safe, efficient commercial space transportation in accordance with national policies and Congressional direction. The COE-CST performs basic and applied research through a variety of analytical, developmental, and prototyping activities.

- Management of the Spaceport Matching Grants Program. AST continues supporting the development of a safe operating infrastructure that is necessary for a robust commercial space transportation industry and judiciously manages federal funds that were provided under Title 51, Subtitle V, Chapter 511, the Space Transportation Infrastructure Matching Grants (STIM) program. This effort is consistent with federal law and national policy, National Space Policy (June 2010) and National Space Transportation Policy (Summer 2012).
- Publishing Research and Development Projects. We publish several annual and quarterly reports to provide information about significant capabilities and developments in the commercial space transportation industry. We also maintain the STAR database, considered the "gold standard" for commercial space transportation information.
- Maintaining Frequent Communication with Industry and Stakeholders. Our Commercial Space Transportation Advisory Committee provides guidance in identifying and determining activities that will help us keep pace with emerging space industry developments so we can appropriately regulate and support the industry. Our partners and stakeholders include the U.S. Air Force Space Command (AFSPC), specifically AFSPC Headquarters (Peterson AFB, CO), the 14th Air Force, 30th and 45th Space Wings of the U.S. Air Force, NASA, Department of State, Department of Commerce, Department of Energy, the Federal Communications Commission, other FAA lines of business, the National Transportation Safety Board, Academia (COE-CST), plus industry and state/local governments (COE-CST).

Anticipated accomplishments in FY 2014 for the Office of Commercial Space Transportation include:

- Complete evaluations for one modified launch site operator license (VAFB).
- Make determinations on five launch operator licenses and three reentry operator licenses to support NASA's Commercial Resupply Services Contract. In addition, at least two other companies have informed AST they will apply for commercial satellite launch licenses.
- Conduct commercial space transportation research studies, safety analyses, and safety tools development.
- Manage the execution of all research projects conducted by the COE-CST.
- Make determinations related to the issuance of launch licenses for suborbital spaceflight to conduct human spaceflight and research missions.
- Continue Rulemaking efforts on part 420 (License to Operate a Launch Site), parts 431 and 435 (Launch and Reentry of Reusable Launch Vehicle), part 417 (Launch Safety), and part 437 (Experimental Permit).
- Issue safety approvals to suppliers of space transportation components or services.

Why Is This Particular Program Necessary?

The X-Prize winning flight of Spaceship One in 2004 awakened the nation and the world to the potential for both a new space-related market and a new way of doing space business. Today our office is working with a number of different companies, each of which is in the process of designing, building, and testing rocket-powered vehicles capable of carrying people to the edge of space, where they will be able to look out at the black sky above, see the curvature of the Earth below, and experience the magic of weightlessness. We anticipate that not all of the companies engaged in this effort will be successful. Some will likely encounter technical difficulties. Others may have financial challenges. But AST has already issued permits for test flights and operations involving a variety of reusable launch vehicle concepts.

As compared to suborbital missions, orbital flights include a number of additional challenges. For example, the mission durations of orbital flights will be significantly greater than those for suborbital flights. While a suborbital flight will most likely be measured in minutes, orbital operations are typically measured in days. As a result, extended reliable system performance and more complex systems are required for orbital flights.

Commercial space transportation, licensed and regulated by the FAA, is an essential element of our nation's space transportation policy. Utilizing commercial services for space transportation has been a national policy item for many years, but due to high capital investment barriers and significant technical challenges, the commercial industry has made slow progress. Now, the commercial space entrepreneur has achieved financial and technical sophistication that allows commercial space transportation to assume in practice what has been promised in policy.

How Do You Know The Program Works?

The effectiveness of the U.S. approach to commercial space transportation is evident both by the successes to date of the U.S.-based industry and by the increasing number of foreign space agencies seeking AST advice and guidance on how to replicate these successes in their own countries.

AST issues licenses for commercial launches of both orbital and suborbital rockets, and our stewardship and regulation has been highly effective. The first AST licensed launch was the suborbital launch of a Star fire vehicle on March 29, 1989. Since then, AST has licensed 215 launches, with no fatalities, serious injuries, or significant property damage to the uninvolved public.

Maintaining this outstanding record is our highest priority. As we gain experience with an increased number of commercial launches, we will be establishing new metrics to measure the success of our program. Current indicators of our success to date include:

- Rendering a license in every case within the congressionally mandated 180 day time limit following receipt of a complete application.
- Meeting the congressional standard of 120 days to issue a permit in every case upon receipt of a complete application.
- Licensing eight commercial spaceports in six states within the congressional timelines in every instance upon receipt of a complete application.
- Passing every internal and external audit of our Environmental Management System.
- Establishing the Center of Excellence for Commercial Space Transportation, a world-class consortium of nine universities across the nation that conducts research to address the future challenges of commercial space transportation.
- Identifying safety issues early so that no major public safety related non-compliances have occurred and no resulting enforcement actions have been necessary.
- Awarding three Safety Approvals (to NASTAR, Zero G Corp, and Space TEC) for their unique commercial training facilities and technician education programs.
- Creating the world's first international Human Spaceflight Safety committee, co-chaired by the Government of Sweden and Virgin Galactic Corporation.
- Actively exploring opportunities to increase international leadership in spaceflight safety, and based on our successful program, we have been asked by representatives of several foreign governments for advice on establishing spaceflight regulatory regimes.

Why Do We Want / Need To Fund The Program At The Requested Level?

The nation's space program is undergoing very significant changes. With the retirement of the Space Shuttle Program, NASA must rely on private industry to launch cargo, supplies, and astronauts to the International Space Station. Because those missions will involve commercial launches, the FAA will be responsible for issuing the necessary licenses. This is a challenging new responsibility, but we continue our civil partnership with NASA on this effort.

The U.S. commercial space launch industry is expanding as space tourism develops and NASA starts to rely on the commercial sector for space transportation requirements (Report GAO-10-286T available at *http://www.gao.gov/new.items/d10286t.pdf*). This expansion will directly affect AST's licensing and regulatory workload. AST also faces policy and procedural issues as it integrates the operations of spacecraft into NextGen and the international space traffic architecture. AST continues to take measured steps to ensure it has adequate resources to fulfill its safety oversight role.

Reductions to the requested level would necessitate reducing essential support services related to air traffic integration and future regulatory development, as well as reducing selected industry-related outreach and intergovernmental coordination. These reductions would increase the difficulty of coordinating space safety with other government and commercial assets and operations.

All commercial space transportation activities rely on FAA's licensing and permitting for safety oversight.

Explanation of Funding Changes

	Dollars ($000)	FTE
Commercial Space Transportation	**-$260**	**+3**
For FY 2014, the Associate Administrator for Commercial Space Transportation requests $16,011,000 and 76 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.		
Adjustments to Base	**+$86**	
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September). The factor used is 1.0 percent.	+86	
Discretionary Adjustments		**+3**
Operational Safety Oversight: To assist with the increasing operational safety oversight workload, AST plans to contract approximately five safety experts with FY 2013 funding. The contractors' initial activities will include conducting safety analyses, developing safety tools, program support scheduling, developing commercial human space flight requirements, and supporting licensing analyses and inspections. In FY 2014, AST is requesting additional FTE to convert those contractors to federal employees so they can expand their workload to include responsibilities that are inherently governmental. These additional duties would include safety inspections, compliance assessment, regulatory activity support, and inter-agency coordination efforts for the creation of common safety standards and method of verification.		**+3**
Base Transfers	**-$346**	
Information Technology Resource Consolidation: This base transfer consolidates multiple IT units aligned within FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support.	-346	

Finance and Management (AFN)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$582,117**	**1,327**	**36**	**1,322**
Adjustments to Base	**$1,298**	**-5**	**-18**	**-53**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-5	-18	-53
Pay Inflation	$1,298			
Other Changes	**-$259**			
NATCA Multi Unit Pay Raise	$324			
Working Capital Fund	-$583			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments	**$24,700**			
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases	$5,400			
Service Center / Regional Buildings	$19,300			
Base Transfers	**$199,790**	**565**	**3**	**565**
Hangar 6	-$7,849	-19	-1	-20
Administrative Support	-$72	-1		-1
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment	$1,770	-3		-3
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	$212,532	577	4	578
Training Resources Realignment	$1,529	11		11
Center for Management and Executive Leadership (CMEL)	-$8,120			
Program Adjustments				
FY 2014 Request	**$807,646**	**1,887**	**21**	**1,834**

Executive Summary: Finance and Management (AFN)

What Do I Need To Know Before Reading This Justification?

In September 2011, Congress approved the Federal Aviation Administration's (FAA) request to create a new shared services organization, the Office of Finance and Management (AFN). Today, AFN oversees the consistent delivery of finance, acquisitions, information technology and regional operations services across the agency, providing efficient and effective business solutions and services in support of the FAA mission.

As with any change of this size and scope, AFN faced significant challenges in bringing together four very distinct, accomplished organizations under a shared services provider. The primary driver for these phased transitions in FY 2012 was to ensure AFN brought value to the agency by providing the highest quality, most reliable services to its customers while also serving as responsible stewards of the taxpayers' dollars by streamlining functions, eliminating duplication of efforts, and improving efficiencies. By collaborating with its customers to fully understand what they need, when they need it, and how AFN can best deliver it, a strong foundation was built for an agile, efficient, capable, reliable shared services organization.

With this foundation in place, AFN has shifted its focus to accelerating cross-functional integration, identifying and eliminating gaps, embracing innovation, improving efficiencies, ensuring accountability and continuously improving the customer services it provides. While still in its infancy, the Shared Services organization is already providing a return on the agency's investment.

AFN is leading the ongoing deployment of a new FAA cloud-based email system that will increase mobility and productivity by providing secure employee access to agency data—anywhere, anytime—using any web-enabled device. Ongoing improvements, like this, as well as realignments across Information Technology services have put the agency on track to save $36M in IT savings in FY 2013.

AFN implemented cost control measures that has helped the FAA achieve a documented cost savings and cost avoidance, including $93.8 million in FY 2012. It also deployed a cost control tracking system to monitor 36 process improvement efforts across the FAA that are being deployed to eliminate waste, duplication, and inefficiencies.

By consolidating the management and oversight of agency strategic sourcing and acquisition savings initiatives, AFN has already saved the FAA more than $17 million through strategic sourcing. In addition, the Electronic FAA Accelerated and Simplified Tasks (eFAST) team has achieved $45 million in cost savings through discounts on memorandum of agreement holder ceiling rates, negotiation of delayed escalation over fiscal years, and elimination of subcontractor pass-through costs.

To reduce its footprint and real estate costs, build the workforce of the future, and ensure continuity of operations, AFN is leading the agency-wide effort to expand the use of mobile work and telework across the FAA.

Looking toward the future, AFN will continue to create and track meaningful, customer-driven metrics that enable the organization to continually measure its progress, identify opportunities for improvement, and ensure it is providing quality service to customers and achieving results.

Performance Measures. Through regular meetings with customers and stakeholders, AFN continues to refine and report on its performance measures to assess the quality and timeliness of the services provided. AFN created a customer-accessible dashboard to promote transparency and accountability while tracking the achievement of these measures. Service Level Agreements (SLAs) remain in place for the critical information technology function. In response to customer requests, AFN replaced SLAs for the other functional areas with a streamlined Customer Commitment, which is AFN's ongoing pledge to meet its customer needs, gauge success in accordance with the agreed upon performance measures, live the values enumerated and provide communications to ensure the agency's needs are met.

AFN Efficient Spending Efforts. In response to an Executive Order, and the Budget Enforcement Act, FAA is reporting progress on spending reductions to OMB. FAA will realize 20 percent spending reductions from FY

2010 to FY 2013 level in the areas of travel, communications, printing, advisory contracts, supplies and fleet management. Specific efforts are underway in contract management, purchase card management, videoconferencing, national wireless program and motor vehicle fuel reduction.

International Organization for Standardization (ISO) 9001 Certification – Regions and Centers Operations (ARC) Headquarters. ARC earned this prestigious designation by demonstrating its ability to consistently provide products or services to meet customer requirements, enhance customer satisfaction, and provide a framework for continual improvement. ARC developed Standardized Operating Procedures (SOPs) for all 11 Divisions and Branches within the ARC HQ Organization, a Quality Manual for the implementation of a business management system, a document control and central filing system using KSN and the ability to track procedures back to the FAA Destination 2025 business plan.

Customer Outreach. In early FY 2013, AFN deployed its first annual Customer Satisfaction Survey to more than 10,000 randomly selected FAA employees to assess customer satisfaction and to identify and address areas of improvement. The AFN Stakeholder Alliance continues to meet to promote information sharing between AFN and its customers, and to leverage the best practices and processes from each member organization. In addition, AFN senior leadership holds one-on-one Customer Forum meetings with each customer organization to review and evaluate AFN services and to identify opportunities for improvement. Through another engagement initiative, the Information Technology Shared Services Committee solicits feedback from IT customers for ways to improve and streamline products and services in their portfolio.

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What Is The Request And What Will We Get For The Funds?

FY 2014 – Finance and Management (AFN)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012-2014
Finance and Management (AFN)	**$582,117**	**$585,607**	**$807,646**	**$225,529**
Financial Services (ABA)	$118,236	$119,053	$118,476	$240
Acquisition and Business Services (ACQ)	$45,058	$45,339	$46,862	$1,804
Information Services (AIO)	$96,766	$97,087	$309,567	$212,801
Regions and Center Operations (ARC)	$322,057	$324,128	$332,741	$10,684

Finance and Management (AFN)

In FY 2012 and FY 2013, AFN made significant progress in consolidating four different functional services – ABA, ACQ, AIO, and ARC into one shared services organization. Internal resources continue to be realigned as the multi-layered organizations are combined and streamlined. In FY 2014, AFN is expecting that additional changes to the organization will continue as areas are identified for consolidation or business process improvements. Over the next three years, the focus will be improving customer service and adding value to the agency to ensure FAA is profiting from the reorganization efforts. The focus of AFN's attention is on four strategic themes:

- Customer Focus –Build and maintain strong partnerships with our customers;
- Operation Excellence – Deliver value-added products and services to meet customer needs and support FAA mission accomplishment;
- Innovation – Deliver planned improvements in products, services, and processes to better serve AFN customers and position FAA for the future; and
- Organization Excellence – to attract and retain the right talent, effectively engage employees, build a unified culture, and develop leaders at all levels.

Incorporated into this submission is a budget-neutral request to consolidate non-NAS IT services from across the FAA into the AIO organization, ensuring that the organization delivers on promises made when the Foundation for Success request was proposed. The expected outcome is to streamline information technology services and, once complete, allow the agency to realize costs savings and provide better IT security and services.

For FY 2014, $807,646,000, 1,887 FTPs, and 1,834 FTEs are requested for FAA's Assistant Administrator for Finance and Management. The request provides for salaries, benefits, annualized pay, and inflation. Realignment of internal resources is reflected in the movement of funding and FTEs across the service organizations that comprise AFN. Details of all movements are provided in each subordinate organization's narrative.

Within this consolidation all efficiency efforts will continue. AFN will manage the SAVES program in which trends will be identified in FAA's procurement of supplies and services and all opportunities for savings will be realized. Detailed explanations of the four organizations comprising AFN are shown below:

Office of Financial Services (ABA).
ABA's mission is to provide timely business consulting, products, and services that promote the achievement of FAA performance goals, Cost Efficient Operations, and FAA Leadership in Global Aviation. Under the new AFN organization, ABA has centralized agency-level financial functions to facilitate improved accountability and enhance operational efficiency in the usage of FAA resources.

Function	Functional Description	Key Actions
Financial Services (ABA)	Budget formulation; budget execution; oversight; workforce planning; and financial planning and analysis.	▪ Serves as the Agency's Chief Financial Officer; ▪ Provides accounting, and financial advisory services; ▪ Serves as audit liaison; ▪ Provides investment planning and analysis; ▪ Forms and executes budgets; ▪ Provides/analyzes pricing associated with labor negotiations; ▪ Establishes financial policy, guidance and internal controls; ▪ Develops financial training; ▪ Oversees travel card policy and management; ▪ Provides workforce planning models/staffing standards; and ▪ Manages financial and accounting system processes, data standardization, and requirements.

Office of Acquisition and Business Services (ACQ).
ACQ chairs FAA's investment review board (the Joint Resources Council) and manages FAA's investment management process for capital investments and other major systems, including Next Generation Air Transportation System (NextGen). Among many other things, ACQ is responsible for the award and administration of all types of contracts, purchase orders, delivery orders, agreements, and aviation research grants for customers in FAA Headquarters, Technical Center, Service Centers, and other external customers.

Function	Functional Description	Key Actions
Acquisition and Business Services (ACQ)	Centralized acquisition and contracting support (excluding real estate, property, and transportation); acquisition policy, guidance and oversight; and acquisition workforce development, planning, and training	▪ Contract award and administration; ▪ Small business development; ▪ Cost/price analysis and audits; ▪ Acquisition policy, guidance, and tools; ▪ Acquisition oversight and evaluation; ▪ Administration of the FAA Purchase Card Program; ▪ Investment decision and acquisition program governance; ▪ Earned value management; ▪ Post implementation acquisition review; ▪ Streamline and automate procurement processes; ▪ Acquisition workforce planning; and ▪ Acquisition career management and workforce training.

Office of Information Services (AIO).
AIO is the organizational component of AFN responsible for the leadership and delivery of FAA non-NAS Information Technology (IT) solutions, services, and products. In FY 2014, AIO's continuing focus is on the transformation of multiple IT units aligned with the FAA Lines of Business and Staff Offices into a single centralized IT shared services organization (ITSSO). Concurrently, AIO will continue to deliver IT services with no loss of quality, while maintaining operational excellence. In FY 2014, AIO anticipates completion of the integration of the 11 separate legacy FAA IT organizations into one IT shared services organization.

Function	Functional Description	Key Actions
Information Services (AIO)	Information technology (IT) policy and strategy, protection of agency IT assets from cyber-attacks, ensure alignment between IT investment and agency business needs, and provide cost	▪ Serves as the agency's Chief Information Officer (CIO); ▪ Develops and maintain the IT strategic plan for the FAA; ▪ Directs the operations for FAA-wide IT

Function	Functional Description	Key Actions
	effective enterprise-wide shared IT services.	resources for the shared services organization; ▪ Manages and provide centralized governance for FAA enterprise-wide IT functions; ▪ Provides IT-focused process engineering, training, consultation, evaluation, and support to FAA; ▪ Maintains an information management program; ▪ Manages and directs the Information Systems Security Program; ▪ Ensures future IT requirements are satisfied; ▪ Provides IT services and local area network administration; and ▪ Manages the FAA Enterprise Architecture for National Airspace (NAS) and non-NAS systems.

Office of Regions and Center Operations (ARC).
Under the shared services concept ARC provides ongoing regional facility emergency operations, training, logistics support, and other critical services to both internal and external customers of the FAA. Prior to the creation of AFN, FAA real property management, logistics/materiel management, and personal property management functions resided among multiple FAA organizations. With this consolidation, FAA is maximizing its staff to ensure that services are provided with enhanced efficiency.

Function	Functional Description	Key Actions
Regions and Center Operations (ARC)	Provides oversight and management of internal and external corporate matters within the nine FAA regions and the Aeronautical Center.	▪ Provides leadership for critical FAA and NextGen initiatives; ▪ Provides command, control, communication support, and emergency planning; ▪ Provides national policy, training, and oversight for life-cycle accountability for real, personal and government furnished property; ▪ Manages FAA administrative office space; ▪ Manages the national FOIA program; and ▪ Administrative services.

In addition, a budgetary increase of $24,700,000 is requested to meet mandatory requirements and improve support for the following areas: facility rents and leases, operating and maintenance costs; and continued construction activities associated with the new Service Center facility in Ft. Worth, TX. These increases are discussed in detail in the narratives for the individual organizations.

What Is the Program?

AFN provides a shared services environment for the FAA, established to consolidate common support services and provide a centralized and strategic focus for finance, acquisition, and information services as well as the regions and center operations. AFN provides these core services in support of the FAA goal of continuing to provide the safest, most efficient aerospace system in the world and to optimally position ourselves to provide the next generation of air traffic management.

Anticipated FY 2014 Accomplishments - Summary

Function	Anticipated FY 2014 Accomplishments
Financial Services (ABA)	• Present effective budget requests; and • Develop and enhance Agency-wide training in

Function	Anticipated FY 2014 Accomplishments
	financial management and financial systems.
Acquisition and Business Services (ACQ)	• Evaluate compliance with published AMS standards; and • Complete implementation of an electronic document management system for all newly-created procurement documents; and Publish annual update of FAA's Acquisition Workforce Plan.
Information Services (AIO)	• Provide post implementation support to the new cloud-based Enterprise Messaging System (EMS36), including implementation of additional collaboration services and decommissioning of the legacy email solution. • Implement cloud computing solutions allowing us to deliver "IT as a Service" ; • Transform the legacy IT organizations into one IT Shared Services Organization (ITSSO) according to the plan developed in FY 2012; • Enable Business Partnership Management strategies to improve customer service and customer relationships; and • Improve overall efficiency of the ITSSO by realizing additional cost savings from data center consolidation.
Regions and Center Operations (ARC)	• Ensure that all FAA employees engaged in real estate are trained in the latest real estate law; • Complete 95 percent of the annual real property inventory target; and • Manage overhead costs through establishment of targets and monitoring.

Why Is This Particular Program Necessary?

The FAA is a complex agency in that its responsibilities include not only the regulatory and oversight services provided to commercial and private aviation, but also the operational management of air traffic services to commercial, private, and military aviation.

Because of the intricacies and scope of that mission, the FAA is a large agency with more than 47,000 employees, an annual budget of more than $15 billion, and 63,000 facilities positioned around the world. The resource management needs for such an organization are, by the very nature of the complexity of the organization, tremendous. AFN was established to more effectively manage those resources. AFN will continue to drive desired behavior through the use of our values: integrity, teamwork and collaboration, efficiency, quality with speed, and innovation.

AFN was created to ensure that taxpayer funding is used in the most efficient manner possible. In order to do this, AFN consolidated duplicate work from across the agency. AFN continues identifying trends across procurements of all types, developing economies-of-scale, and centralizing efforts, while continuing to ensure the integrity, transparency, efficiency, and consistency of business, financial, information technology, acquisitions, and regions and center operations

How Do You Know the Program Works?

AFN sets annual performance goals centered on the FAA and DOT goals of Organizational Excellence and Corporate Support Services. For example, in the area of finance and acquisitions, we measure program performance using schedule and budget metrics and earned value management using industry techniques.

In addition, AFN has established quantitative and qualitative memorandums of agreement (MOAs), and service level agreements (SLAs), and Customer Commitments with its internal customers to ensure the support provided meets their needs and expectations. These agreements define and hold AFN accountable for these services. The target activities associated with these goals are monitored on a monthly basis.

Why Do We Want/Need to Fund the Program at the Requested Level?

The services provided by AFN are the backbone of support on which the operational and regulatory arms of the FAA rely. Space and property management, IT infrastructure, acquisition of goods and services, and payment for those goods and services are just a few examples of the types of support that the FAA must obtain in order for their employees to work effectively and safely.

Significant amounts of the AFN budgetary request is for payroll and rent. The vast majority of the remaining funding is slated for basic fixed operating expenses such as telecommunications, IT infrastructure and security, maintenance and operations of financial systems.

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Financial Services (ABA)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$118,236**	**222**	**1**	**242**
Adjustments to Base	**$245**	**4**	**1**	**-38**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		4	1	-38
Pay Inflation	$245			
Other Changes	**$67**			
NATCA Multi Unit Pay Raise	$97			
Working Capital Fund	-$30			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$72**	**-1**		**-1**
Hangar 6				
Administrative Support	-$72	-1		-1
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$118,476**	**225**	**2**	**203**

Detailed Justification for-Financial Services (ABA)

What Do I Need To Know Before Reading This Justification?

Financial Services (ABA) is one of the four main functional areas under the Assistant Administrator for Finance and Management (AFN). ABA's mission is to provide timely business consulting, products, and services that promote the achievement of FAA performance goals, Cost Efficient Operations, and FAA Leadership in Global Aviation. Under the new AFN organization, ABA has centralized Agency-level financial functions to facilitate improved accountability and enhance operational efficiency in the usage of FAA resources. ABA will continue to be responsible for overseeing FAA's financial systems and financial reporting, leading and implementing FAA's cost efficiency program, supporting FAA in labor negotiations, establishing staffing standards, enforcing government-wide reforms, and ensuring resources are managed in accordance with all laws, policies, directives, and procedures.

What Is The Request And What Will We Get For The Funds?

FY 2014 – Financial Services (ABA)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012-2014
Financial Services (ABA)	$118,236	$119,053	$118,476	$240

The FY 2014 budget request of $118,476,000, 225 FTPs, and 203 FTEs will support the ABA program. This will provide salaries, benefits, annualized pay, and non-pay ABA activities including ongoing program support costs to sustain continuing financial operations for the Agency as well as funding for AFN front office staffing and non-pay activities. The request includes a decrease adjustment of $30,000 in anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is zero, except for fee-for-services printing and conference center usage.

The request will cover the FY 2014 activities and acquisitions necessary to support ABA's centralized financial activities.

In the process of continuing to optimize AFN's resources, there has been a shift of some responsibilities across the four functional areas under AFN. These AFN sub-unit changes include the realignment of the Information Systems and Technology staff into Information Services (AIO), the realignment of financial management staffing into ABA, and the realignment of administrative services staffing into AFN-100. The FY 2014 budget request for ABA reflects these changes in budget and staffing. These changes are net zero (budget neutral) for AFN.

Our FY 2014 key outputs and outcomes include:

- Continue to improve and simplify business processes;
- Obtain unqualified audit opinion with no material or significant weakness in internal controls;
- Continue to improve the quality, timeliness, and usefulness of financial information for management decision-making;
- Implement an aggressive Agency-wide cost efficiency program;
- Continue to provide analytic, resource-based support to the Agency's financial decision-making processes and in Agency negotiations with our labor unions; and
- Continue to leverage newly centralized Agency-level functions including:
  - Investment and planning analysis;
  - Budget formulation and execution management and oversight for all FAA funding;
  - Pricing associated with labor negotiations and contracts;
  - Financial training development;
  - Travel card management; and
  - Workforce planning models/staffing standards development and oversight.

What Is This Program?

ABA serves as FAA's primary budget and financial management steward overseeing and maintaining financial systems, financial policy, financial reporting, and spearheading cost efficiency as well as Agency-wide management reforms to ensure resources are managed in accordance with all laws, policies, and procedures. Our program primarily supports the DOT goal of Organizational Excellence and the outcome of Improved Financial Performance.

The Office of Budget and Programs (ABP) develops the FAA budget requests and submits budget justifications to the Department of Transportation's Budget Office, OMB, and various committees of the House and Senate. ABP ensures budget needs are well justified and explained while managing Congressional activities with the appropriation committee/subcommittees including programmatic briefings, hearings, report preparations, and technical assistance. ABP leads the development and oversight of the FAA's performance budget ensuring that sufficient funding is available to support critical strategic plan activities and initiatives. ABP oversees the execution of the Agency's current and prior year appropriations, manage the Airport and Airway Trust Fund, and oversee the reimbursable program. This includes issuing guidance for spending, Lines of Business/Staff Office allowances, tracking obligations versus allowances throughout the year, as well as preparing and coordinating with external authorities regarding numerous apportionment requests for all FAA organizations. ABP issues and maintains funds control policies, systems, and processes for all budgetary activities, and procedures to ensure compliance with budget-related legislation, OMB circulars, and appropriation law. In dealing with the complexity of reimbursable agreements, ABP has established a multi-organizational workgroup to update national policy on the establishment and management of those agreements.

ABP also provides "end user" training on various financial management processes and procedures to employees across the FAA, such as funds certification, financial management, financial training, internal controls, and purchase card use. This training assists in our Agency-wide effort to ensure standardization of financial processes that are consistently compliant with the proper usage of appropriations, as well as increases our effort to reduce error-prone, redundant data entry workload. Financial policies are actively promoted through our FAA website. We have established the website as the "go to" hands-on tool to increase user compliance with FAA financial policies, directives, and standard operating procedures.

The Office of Financial Analysis (AFA) provides a variety of financial analyses required by the Administrator and other stakeholders. This office reviews all contracts above $10 million to ensure that cost estimates are reasonable, contract types are justified, and contracts are competitively bid. This office manages the Agency's Cost Control and Efficiency Measures programs and has a dedicated metrics team providing reports to AFN, Air Traffic Organization (ATO), and other audiences.

The Office of Investment Planning & Analysis (AFI) ensures proposed capital investments undergo a rigorous investment analysis process, resulting in business cases that support Joint Resource Council decisions. The office provides full-service business case support including cost estimating, benefits analysis and operations research, business case integration, and schedule assessment. AFI works closely with the Air Traffic Organization's (ATO) Program Management Organization and the NextGen Air Transportation System (NextGen) organization to advance major capital investment decisions.

The Office of Financial Operations (AFO) leads all accounting operations, including the processing of all financial transactions as well as the management of the DELPHI general ledger system and the Procurement Requisition Information System for Management (PRISM) system. AFO purchases the actual services for accounting data entry, billing, collection, payments, etc., and the management and operation of the DELPHI operating system from the Enterprise Services Center (ESC) in Oklahoma City, OK, through the DOT. AFO will continue to support the upgrade of the DOT core accounting system to Oracle release 12i as necessary to maintain software and system support. AFO routinely prepares a cost accounting report that determines the cost of providing FAA services. This data assists organizations in making educated business decisions. In doing this, AFO maintains and updates accounting policies and procedures and develops financial systems training so that procedures are understood and followed.

The Office of Financial Reporting and Accountability (AFR) has the key role of developing the consolidated financial statements of the Agency, quality assurance over the Agency's general ledger, and reconciling general ledger activity and balances. AFR provides internal control (internal audit) services including routinely examining key processes to prevent, identify, and correct potential fraud, waste and abuse, as well as opportunities for increased efficiency and, effectiveness and reliability of financial information – as directed by OMB Circular A-123 and other OMB guidance. AFR also issues and maintains all Agency financial policies and manages the government travel charge card program for over 35,000 cardholders.

The Office of Labor Analysis (ALA) supports FAA organizations in labor negotiations, staffing standards development, and resource optimization. ALA conducts and develop benchmarking, plans, analyses, and models for labor-related data, to support bargaining unit negotiations and cost efficiency in the FAA. ALA also leads in the development of the annual Controller Workforce Plan and provides increasing support for other FAA workforce plans. For the Controller Workforce Plan, ALA analyzes and refines the staffing standard models that are utilized in producing the Controller Workforce Plan each year for the Administrator and Congress. The plan is a key document that drives hiring, training, and staffing requirements, supports the FAA's safety mission, and meets external stakeholder requirements. ALA plays a pivotal role in advising Congress on the appropriate level of FAA controllers through publication and transmission of the annual Controller Workforce Plan. ALA has a structured approach for planning air traffic controller hiring, training, and placement across all FAA ATC facilities through use of the workforce plan as a business tool.

Anticipated FY 2014 Accomplishments:

Function	Anticipated FY 2014 Accomplishments
Office of Budget and Programs (ABP)	• Continue to present effective budget requests and conduct effective program oversight and maintain required funding needs for NextGen modernization activities; • Continue to ensure Agency funds and resources are utilized effectively and maintain compliance with the Anti-Deficiency Act; • Continue to implement and improve the centralized structure for oversight of well over $400 million in reimbursable work; • Continue to develop and enhance Agency-wide training in financial management and financial systems to ensure that executives and managers understand their fiscal roles and responsibilities and that employees are better equipped to meet increased efficiency and accountability objectives; and • Continue to conduct a suite of formal financial training classes hosted within the FAA to standardize operating procedures, internal controls, purchase card use, and fund certification.
Office of Financial Analysis (AFA)	• Serve as Lead for Agency-wide cost efficiency program. Continue to collect and analyze cost control efficiency data from multiple sources to identify trends in operational and overhead costs by facility such as cost per controlled flight and ATO overhead rates; and • Continue to review acquisitions of $10 million or more to ensure the procurement represents a good investment of taxpayer resources and that appropriate alternatives were considered; and • Continue to develop and establish, with program and management elements, numerical measures and indicators of financial performance, program performance, and the resulting public benefits achieved.
Office of Investment Planning and Analysis (AFI)	• Continue to perform analysis of Agency investments and monitor acquisition program baselines; • Continue to support a full range of FAA acquisition decisions for both NAS and non-NAS programs; • Continue to apply business case discipline to new investment categories (e.g., facilities and variable quantity investments); and • Continue to develop updated cost estimator training in support of the larger acquisition community.

Function	Anticipated FY 2014 Accomplishments
Office of Financial Operations (AFO)	• Continue to improve enhancements to DELPHI budget execution to better track approximately 10,000 capital project authorizations; • Monitor and test grant programs as required by the Improper Payments Information Act of 2002 and Executive Order 13520, Reducing Improper Payments of Nov. 2009; • Implement revised overflight fees to more accurately charge flights that use Agency services but neither take-off nor land in the United States; and • Continue to support the upgrade of the DOT core accounting system to Oracle release 12i in order to maintain software and system support.
Office of Financial Reporting and Accountability (AFR)	• Obtain an unqualified audit opinion on Agency financial statements with no material weaknesses; • Improve the Data Quality Framework surrounding Federal spending information—as required by the Open Government Directive, M-10-06, to ensure the ongoing quality of Federal spending information, the effectiveness and efficiency of operations producing and disseminating financial information, and the reliability of financial information reported to the public; and • Expand the internal controls function to more rigorously identify both financial and operational areas for improvement which promotes required transparent and detailed reporting to the public.
Office of Labor Analysis (ALA)	• Produce the Controller Workforce Plan for 2014 – 2023 which is a projection of changes in air traffic forecasts, controller retirements, and staffing requirement ranges for our air traffic control facilities to support FAA's safety mission to meet external stakeholder requirements; • Implement the new Operational Planning and Scheduling (OPAS) System in the majority of air traffic control facilities; and • Continue to expand the role if the Labor Analysis group to include workforce planning and labor cost analysis for the Office of Aviation Safety, (AVS) and other FAA business units.

Why Is This Particular Program Necessary?

ABA provides budget guidance and oversight for all appropriations, establishing and providing Agency-wide financial policy and reporting, establishing Agency staffing standards, and supporting labor negotiations, and analyzing Agency investments and acquisition program baselines. ABA also leads the Agency's efforts to achieve its Cost Control and Efficiency Measures and Unqualified Audit Opinion performance targets. In addition to ABA's strategic work linked to the DOT's Strategic Plan, the office has fundamental responsibilities to maintain a strong Agency-wide foundation of accountability and financial management. ABA continues to support the secure and efficient storage and exchange of critical financial information. The ability to capture this financial data ensures we achieve the President's goal of greater transparency in government. Our organizational financial management policies further the President's goals to encourage economic growth, invest in the future, and responsibly govern FAA resources.

The upgrade of the DOT core accounting system to Oracle release 12i is necessary to maintain software and system support. As a result of the core accounting system upgrade, ABA must train over 5,000 users on the upgraded system and have more than 100 program management systems that must be re-engineered in connection with the upgrade. Training is critical to the successful implementation of the new core accounting system to ensure our managers and employees are able to use and interpret timely and accurate financial data while making program management decisions. The office's internal controls activities, such as testing under OMB Circular A-123, are also necessary to provide management with assurance that our financial and Federal spending data being disseminated to the public are reliable and that our operations are effective and efficient.

Partners and stakeholders include:

- FAA's Line of Business/Staff Offices;
- Department of Transportation;
- Office of the Inspector General (OIG);
- Other Federal agencies;
- Office of Management and Budget (OMB);
- Congress/Congressional oversight committees;
- Government Accountability Office (GAO);
- Local, county, and state authorities; and
- Airlines and equipment manufacturers.

How Do You Know The Program Works?

In recent years, there has been an increasing recognition of the need for effective oversight of financial decision-making processes. The Agency has implemented oversight of proposed acquisitions, travel, and conferences, as well as new procedures to provide executive oversight over administrative information technology investments. This added oversight demonstrates how serious the Agency's commitment is to ensuring that we manage the taxpayer's resources effectively.

ABA's contributions to the Agency's success have been measured by how well cost and financial information are integrated into the Agency's business processes and by the analytical contribution that ABA-generated information makes to data-based decision-making at the Agency and Lines of Business levels. ABA's highest priorities include: improving business processes and resolving issues related to the DOT core accounting system (DELPHI); our acquisition system (PRISM, or replacement system); or Cost Accounting System, (CAS); and the Labor Distribution Reporting (LDR) system; maintaining an "unqualified audit opinion" with no material weaknesses in internal controls with a focus on managing Agency assets; and, continuing to implement and improve the Cost Control Program in support of DOT and FAA's strategic goals and objectives.

While ABA seeks the resources to continue to improve the quality, timeliness, and usefulness of our financial data, the program works through several indicators:

- As external recognition of our transparency and accountability, the Association of Government Accountants recently awarded FAA its Certificate of Excellence in Accountability Reporting (CEAR) for our FY 2011 Performance and Accountability Report. ABA continuously strives to clearly and simply present its performance against its performance targets and link expenses to strategic goals so the American people can understand how the organization is using tax dollars to serve them. The recently awarded CEAR marks the eighth time we have received this award.
- Because of rigorous internal controls and carefully monitored financial processes, we have received unqualified audit opinions since FY 2007 and no material weaknesses since FY 2008. A recent external review did identify a significant deficiency in FY 2012 but it is already being addressed with robust corrective actions. We expect another unqualified audit in FY 2013 with no material or significant deficiencies. This trend shows substantial improvement over time.
- We continue to improve the use of cost and program management data for effective decision-making decisions about the implementation of Agency programs and resources.
- We are held accountable for meeting performance objectives, such as capitalization of assets, through the agreed upon measures outlined in the AFN Customer Commitment.

Why Do We Want/Need To Fund The Program At The Requested Level?

The funding request of $118,950,000 is essential for ABA to continue to reinforce financial management knowledge base with the improvement of DELPHI, PRISM (or replacement system), CAS, and LDR data.

This funding will allow us to provide configuration management and other policies, procedures, and security for FAA financial management systems thus assuring that Agency executives and managers are aware of the financial information available for their use in program analysis and decision-making.

The requested funding also supports the continued evaluation of FAA capital and operational business cases for thoroughness and accuracy in preparation for investment decisions, and to ensure investments meet established business case criteria. Investment planning and analysis plays a significant role in the development and analysis of program requirements for the NextGen programs. Funding below the requested level would not allow the FAA to complete its analysis and evaluation of many FAA capital and operational business cases, including many NextGen related investments.

Funding below the requested level would not allow FAA to support the required upgrade to the DOT core accounting system. ABA will not be able to adequately provide Agency-wide financial support for the accounting system, and there would be potential risks in delayed and /or inaccurate reporting if we are not be able to code, generate, and interpret financial management data that ensures proper management of the Agency's resources.

If FAA's mixed financial and program management systems are not re-engineered to comply with the upgrade to the DOT core accounting system, we would not be able to:

- Interface procurement transactions with the core accounting system; which would result in manual processing which would delay Agency procurement actions;
- Develop the allocation and reporting of Agency cost accounting data to program managers;
- Provide financial data to the Agency's Corporate Work Plan which is used to manage FAA project implementations and reimbursable project management;
- Train over 5,000 employees on the new standardized accounting code structure. This will result in the delay of processing and impact the accuracy of FAA's accounting transactions;
- Re-engineer our financial and program systems which allow the Agency to manage its programs and financial resources;
- Maintain our unqualified audit opinion with no material weakness since the Agency will not be able to track and manage its program transactions in a timely and accurate manner and on a platform that continues to be supported by Oracle; and
- Maintain our LDR system which is a key component of cost accounting data, representing labor costs which comprise about 45 percent of our total appropriated costs

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Acquisition and Business Services (ACQ)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$45,058**	**248**	**2**	**256**
Adjustments to Base	**$229**	**-2**	**-1**	**-21**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-2	-1	-21
Pay Inflation	$229			
Other Changes	**$46**			
NATCA Multi Unit Pay Raise	$46			
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$1,529**	**11**		**11**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment	$1,529	11		11
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$46,862**	**257**	**1**	**246**

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Detailed Justification for Acquisition and Business Services (ACQ)

What Is The Request And What Will We Get For The Funds?

FY 2014 –Acquisition and Business Services (ACQ)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012-2014
Acquisition and Business Services (ACQ)	$45,058	$45,339	$46,862	+$1,804

The FY 2014 budget request for Acquisition and Business Services (ACQ) is $46,862,000, 257 FTPs, and 246 FTEs. This request will provide for salaries, benefits, annualized pay, and non-pay inflation. This request includes a base transfer of $1,529,000 and 11 FTEs from Air Traffic Organization (ATO) to support training requirements agency-wide.

ACQ is led by FAA's Chief Acquisition Officer and serves as the executive agent for FAA's Acquisition Management System (AMS). It is one of the four pillars within the Office of Assistant Administrator for Finance and Management (AFN) shared services organization. ACQ chairs FAA's investment review board (the Joint Resources Council) and manages FAA's investment management process for capital investments including Next Generation Air Transportation System (NextGen) and other major systems acquisitions. ACQ is responsible for the award and administration of all types of contracts, purchase orders, delivery orders, agreements, and aviation research grants for customers in FAA Headquarters, Technical Center, Service Centers, and other external customers. ACQ monitors contractors' quality assurance systems and accepts or rejects systems, equipment, and materials. ACQ manages the FAA acquisition policy and the investment decision process. ACQ manages FAA's Small Business Program and the achievement of small business contract goals. ACQ manages all training, certification, and workforce planning for FAA's acquisition workforce. The organization includes program managers, systems engineers, contracting officers, cost estimators, test and evaluation specialists, and other core acquisition disciplines. ACQ conducts oversight and review of Agency acquisitions. ACQ also manages FAA's Strategic Sourcing program, which delivers cost savings and efficiencies in procurement of commodities such as office supplies, equipment, delivery services, and IT hardware.

In the process of continuing to optimize AFN's resources, there has been a shift of some responsibilities across the four functional areas under AFN. These AFN sub-unit changes include the realignment of the Information Systems and Technology staff into Information Services (AIO), the realignment of financial management staffing into ABA, and the realignment of administrative services staffing into AFN-100. The FY 2014 budget request for ACQ reflects these changes in budget and staffing. These changes are net zero (budget neutral) for AFN.

Funding at the requested level will allow ACQ to accomplish/manage:

Award of Contracts, Orders, Agreements and Grants	• Advise, plan, negotiate and award all types of contracts, purchase orders, delivery orders, agreements, and aviation research grants for FAA headquarters, Technical Center, and Service Areas including NextGen, transformational technologies, all major acquisition programs, and other National Airspace System (NAS) system procurements.
Contract Administration	• Ensure contractor performance in accordance with the contract; issue contract modifications, and monitor contract deliverables; • Assure that subcontracting policies and requirements are followed; and • Review contractor invoices for payment and close out completed contracts.
Small Business Development	• Manage small business policy, guidance. and tools, to meet agency, department, and administration goals; and • Target the award of at least 25 percent of total direct procurement dollars to Small Businesses.

Cost/Price Analysis & Audits	• Provide expert-level cost/price analysis tools, training, advice, and assistance to FAA contracting and program personnel; • Strengthen price negotiation to ensure that FAA pays fair and reasonable rates for the products and services it procures; • Manage agreements with Defense Contract Audit Agency (DCAA) to perform audits of cost reimbursable, time, material, and labor hour contracts with an estimated value of $100 million or more; and • Request audits of cost reimbursable and time, material, and labor hour contracts under $100 million using non-DCAA sources.
Acquisition Policy	• Manage, update, and strengthen FAA's AMS to ensure FAA's acquisition policy and guidance is compliant with applicable laws and regulations; • Provide clear direction to Agency personnel; and • Support timely, proper, and best-value acquisition of the goods and services that support the safe and efficient operation of the NAS.
Strategic Sourcing	• Implement strategic sourcing contracts and other strategic acquisition initiatives to realize cost control.
Acquisition Oversight	• Perform nationwide contract reviews for compliance with policies and procedures, and implement corrective actions where necessary; and • Track findings and recommendations to promote consistent implementation of FAA's process improvement, and procurement integrity policies.
FAA's Purchase Card Program	• Provide oversight of FAA's purchase card program to ensure compliance with regulation and policy; • Promote uniform standards and policy interpretation, and identify and take appropriate action against improper use; and • Increase usage of purchase cards to gain increased cost savings.
Investment Decision Process & Acquisition Program Governance	• Support informed investment decisions (e.g., NextGen and other major NAS system acquisitions) by managing FAA's investment decision-making process; • Ensure business cases, other documents, and reviews are completed prior to presenting before investment decision authorities; • Support on-going acquisition program oversight and reviews by serving as Secretariat for the Joint Resources Council; • Document and track decisions and action items and maintain the official repository of baseline documents and other records; and • Serve as provider of documentation for internal and external stakeholders, such as Office of the Inspector General (OIG), Office of Management and Budget (OMB), and Government Accountability Office (GAO).
Earned-Value Management	• Provide guidance, training, assistance, and reviews to support acquisition programs in applying Earned Value Management (EVM).
Post-Implementation Reviews	• Conduct post-implementation reviews of acquisition programs to assess attainment of benefits.
Streamline and Automate Procurement Processes	• Continue development of FAA's Unified Contracting System (UCS) which will be an electronic, secure, internet-based, contract lifecycle management system. UCS will automate what are currently paper-intensive manual processes; provide immediate access to procurement-related information leading to improved transparency, oversight, timely, and accurate

	reporting.
Acquisition Workforce Plan	• Manage annual updates of FAA's Acquisition Workforce Plan and implement Plan strategies and initiatives. This plan is a key document that drives staffing and training/development requirements, supports FAA's strategic initiatives related to NextGen and acquisitions, and meets external stakeholder requirements; and • Track gains, losses, and actual on-board data for personnel in the various acquisition professions, as well as tracking other workforce metrics, such as certification levels.
Acquisition Career Management	• Manage training and certification programs for acquisition personnel, including program/project managers, contracting officers/specialists, contracting officer's representative (CORs), systems engineers, test and evaluation specialists, and logistics specialists; and • Develop and maintain an acquisition workforce portal, automated certification process tool, career path guidance, and other tools and guidance to build FAA's acquisition and program management capabilities.

Key outputs expected to be achieved in budget year with the requested resources:

- Cost effective contract award decisions;
- Improved contract management through standardization of processes, process improvement, and operating efficiency;
- Iterative deployment of new automated contracting system (UCS);
- Sound Agency investment decisions and acquisition program oversight;
- Annual update of FAA's Acquisition Workforce Plan and implementation of initiatives; and
- Continued improvements resulting from oversight controls.

Key outcomes expected to be achieved in budget year with the requested resources:

- Measure and report the time-to-award defined classes of procurement actions in accordance with Customer Commitment Performance Measures;
- Increase the use of the eFAST procurement vehicles to streamline procurement lead times and deliver competitively-priced services;
- Increase the use of construction services Basic Ordering Agreement (BOA) vehicles by the Service Area Acquisition Offices and improve nationwide planning for construction contracts;
- Increase the use of the Acquisition Document Library in order to collect and make available best practice samples for use by all acquisition offices;
- Process invoices in a timely manner to ensure that 80 percent of invoices are paid on time;
- Close 85 percent of the number of cost reimbursable contracts eligible for close-out and report on these quarterly;
- Award 25 percent of the total direct procurement dollars to small businesses;
- Improve cost and pricing to receive the best price/value for goods and services;
- Deploy electronic procurement document management and enhanced analysis and reporting capabilities;
- Strengthen Agency capability and performance to effectively manage acquisitions through policy; processes, guidance, tools, workforce planning and development, evaluation, and performance support services; and
- Achieve cost savings through strategic acquisition/sourcing initiatives.

What is the Program?

Acquisition and Business Services acquires the goods and services to support the safe and efficient operation of the NAS. It supports the Department of Transportation's Organizational Excellence goal, contributing to the outcome of Improved Financial Performance.

The FAA contracted for more than $4.8 billion in goods and services in FY 2011. These procurement actions were for essential equipment, facilities, major systems, construction, research and development, supplies, and services needed to maintain FAA operations and programs, and for transition to NextGen.

ACQ provides policy, oversight, training, and services to the acquisition workforce.

ACQ serves as the executive agent for, 1) FAA's procurement policy (AMS), 2) investment decision process, 3) Acquisition Workforce Plan, 4) certification program for personnel in a broad range of acquisition-related professions, and 5) acquisition program evaluation and oversight. We also act as the Agency's small business advocate.

ACQ manages the investment decision-making process for all investment decision authorities, including the Joint Resources Council (JRC), which assists Agency executives in making timely and better-informed investment decisions. Additionally, we manage the EVM and post-implementation review processes on behalf of the Agency in accordance with OMB, GAO, and AMS policy requirements.

The UCS Program is being implemented in several phases. In FY 2014 UCS will automate our procurement processes. UCS will provide an end-to-end electronic contracting system to produce, route, manage, store, and retrieve the roughly 50,000 contractual documents that are produced yearly by the FAA. The UCS Program will be in the testing phase of the interface with the financial management system and we will also be testing the integration of the purchase card processing system 2 (PCPS2), which is contract payment through purchase card into UCS. UCS will improve oversight, standardization, management of information, and reporting capabilities. This is particularly important considering the growing complexity and volume of contracting actions.

The quality and effectiveness of the acquisition process depends on the development of a capable and competent acquisition workforce. Since FAA is exempt from the Federal Acquisition Regulation (FAR) and has its own Acquisition Management System (AMS), FAA provides AMS-specific training that builds upon federal acquisition training and certification standards. The Acquisition Career Management Program provides Agency contracting officers and specialists with competency-based training and certification, at progressive career levels, and continuous learning training that meets and/or exceeds government-wide standards.

Having a comprehensive Acquisition Workforce Plan is critically important as FAA transitions to NextGen while simultaneously maintaining the current system safely and effectively. Today, FAA's acquisitions are more complex than ever and require new approaches and skills to support NextGen acquisition work. The Acquisition Workforce Plan is integral to ensuring FAA's acquisition workforce staffing and professional development requirements are met in the coming years. The plan serves as FAA's guide for workforce staffing and development decisions and provides strategies for hiring, training, developing, and retaining acquisition employees.

By the end of FY 2014, the anticipated accomplishments for Acquisition and Business Services include:

- Implement process improvements and increase the use of best practices to streamline time to award, improve the overall business operation, and increase efficiency;
- Evaluate compliance with published AMS standards and implement corrective actions where required;
- Complete implementation of an electronic document management system for of all newly-created procurement documents;
- Publish annual update of FAA's Acquisition Workforce Plan and continue to build a high performing acquisition workforce capable of successfully supporting NextGen and the transformation of the NAS; and
- Develop/update Agency-wide acquisition policy, guidance, and tools to manage the AMS.

Why is this Particular Program Necessary?

FAA handles nearly 70,000 flights per day and helps transport over 730 million passengers per year, contributing to 5.2 percent of the total U.S. gross national product. FAA relies on numerous programs to maintain the safety and efficiency of the current system and ensure its viability well into the future.

Congress directed FAA to establish an acquisition system that would meet the unique needs of the Agency, and prohibited the Agency from applying the Federal Acquisition Regulation or any law authorizing implementation in the Federal Acquisition Regulation. It is critically important for us to establish and adhere to a strong acquisition policy to ensure the sustainability of the NAS and the agency as a whole. It ensures the proper use and control of federally-funded contracts for services and materials. We are responsible for establishing the FAA's AMS and overseeing policy adherence.

Contracting is an inherently governmental process. Contracting officers are warranted by the Federal Government as the only individuals who can obligate the government to pay for goods and services. Warrants are graduated by knowledge, ability, and experience. Contracting officers and other workforce personnel are trained not only in the Federal laws and policies surrounding procurement, but also in the specifics of the AMS. FAA issued over $4.8 billion in contract awards in FY 2011. The complexity of the contracts associated with the NextGen effort coupled with the need to find innovative methods of acquiring the goods and services needed by the Agency at less cost will substantially increase our workload in FY 2014. Until the transition to NextGen has been completed, we will also need to manage contracts associated with maintaining legacy systems until those systems have been decommissioned.

We are working to ensure that FAA's acquisition workforce has the right skill mix to ensure success. The acquisition workforce includes:

- Contracting Officers
- Contracts Specialist
- Acquisition Analysts
- Program Managers
- Project Managers
- Researchers
- Engineers
- Systems Engineers
- Contracting Officers Representatives
- Business and Financial Analysts
- Cost Analysts
- Logistics Specialists
- Test and Evaluation Specialists
- Procurement Attorneys
- Other specialized acquisition support personnel

Our partners and stakeholders include both internal and external customers. Internally, we provide agency-wide support on acquisition and contracts management as well as quality assurance on major NAS systems contract deliverables to FAA. We are an integral part of the NextGen development and support related changes to the NAS. We will also continue to support existing FAA programs. We lead the efforts in developing a competent and well-trained acquisition workforce.

Externally, we have a reporting relationship with the DOT, OIG, GAO, OMB, and Congress. Ultimately, we support the flying public as the services provided by this office are core to the maintenance of the NAS and the development of the next generation of aircraft control and safety. Finally, we support Federal taxpayers by enforcing a sound acquisition policy to deliver best value procurement actions and control of federally funded contracts for services and materials.

How Do You Know the Program Works?

FAA's strategic business plan, "Destination 2025", outlines FAA's performance goals, strategies, and associated metrics. Acquisitions and Business Services contributes in some way to each of FAA's strategic goals. For example, the acquisition of critical NextGen systems and technologies contributes to the goal of Delivering Aviation Access through Innovation; and the acquisition of other products, services, systems, and facility infrastructure programs support the goals of Moving to the Next Level of Safety, and Sustaining Our Future. Additionally, ACQ's acquisition workforce plan contributes directly to the goal of Creating Our Workplace of the Future, by developing a skilled acquisition workforce. Moreover, ACQ directly supports a variety of cost savings and efficiency targets and government-wide acquisition and procurement initiatives established by OMB, DOT, and FAA. We use metrics and performance measures to assess our progress.

For FY2012, 90% of our critical acquisitions were on budget and schedule.

In ACQ, we have undertaken initiatives that are intended to strengthen our capabilities in managing our systems acquisition programs. We have incorporated key practices into our investments and operational review processes.

We have established Performance Metrics to measure the length of time taken to award particular categories of contracts. These metrics will allow us to report progress over time.

Through our National Acquisition Evaluation Program, we conduct reviews of contract files to assess compliance with procurement laws, regulations, and agency policy. We share best practices and take actions to address areas requiring more focus.

We conduct customer satisfaction surveys as one means to assess quality and responsiveness in meeting Agency requirements, and we use employee attitude surveys to assess employee engagement.

We have established metrics to determine the success of the Acquisition Workforce Plan which will be used to report progress over time. The metrics include counts of on-board staff, including gains and losses, and training and certification data by discipline. As of a result of our improved acquisition record, FAA was removed from the GAO's High Risk List in 2009.

UCS will allow us to easily track and monitor contract data and contract processing time. Anticipated improvements from this system will streamline document processing and storage, converting a manual process into a more efficient automated process. This will avoid time and labor costs associated with manual contract management processes as a whole. Efficiencies generated by this program will be realized across all FAA Lines of Business and Staff Offices, including budget, finance, security, and program management offices. UCS will allow FAA to make process changes and managerial decisions to improve the acquisition processes. Given the increase in workload and complexity anticipated for the implementation of NextGen such efforts will be critically important.

Why do We Want/Need to Fund the Program at the Requested Level?

The development and implementation of NextGen is one of the most critical issues facing the FAA. The Agency must position itself to meet the increased acquisition workforce demands of NextGen through focused planning, competency development, and targeted recruiting and hiring. At the same time, Acquisition and Business Services must provide acquisition support to the existing NAS infrastructure and the FAA as a whole.

Acquisition of quality goods and services is a core service, integral to the support and operation of the entire FAA and as such, the work being done by this organization to a large extent supports all of the DOT and FAA Strategic Plan Goals. However, there are three goals that are specific to acquisition that are heavily supported by the Office of Acquisition and Business Services: Critical Acquisitions on Budget, Critical Acquisitions on Schedule, and Unqualified Audit Opinion which tie to the DOT goals of Organizational Excellence.

The funding in this request allows ACQ to execute contractual actions on behalf of the FAA and other external customers, conduct effective workforce planning and to train, develop, and certify personnel in key acquisition disciplines to ensure FAA has sufficient numbers of skilled acquisition professionals (current and pipeline) to successfully manage acquisitions. This funding will further allow ACQ to continue to strengthen and streamline acquisition policy and processes and provide adequate oversight of procurement actions throughout the Agency.

The FY 2014 budget request will allow us to perform our mission. Our current staff has already assumed a larger work load because of NextGen activities and increased support to the Program Management Office in the ATO. Reduction to the ACQ budget will result in: 1) bottlenecks and delays in providing procurement support to NextGen investments; 2) a corresponding increase in the cost of these programs; 3) a reduction in the training needed by the workforce; 4) a reduction of our over-all capability; 5) slowing the acquisition process, and (6) increasing the financial risk to the taxpayers.

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Information Services (AIO)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$96,766**	**210**	**5**	**117**
Adjustments to Base	**$240**	**6**		**79**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		6		79
Pay Inflation	$240			
Other Changes	**$29**			
NATCA Multi Unit Pay Raise	$53			
Working Capital Fund	-$24			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$212,532**	**577**	**4**	**578**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	$212,532	577	4	578
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$309,567**	**793**	**9**	**774**

Detailed Justification for –Information Services (AIO)

What Do I Need To Know Before Reading This Justification?

Information Services (AIO) is the organizational component of AFN responsible for the leadership and delivery of non-NAS Information Technology (IT) for the Agency. IT is the operational core of all FAA activities relating to the collection, generation, communication, analysis, management, and protection of information. IT has become an essential service which provides critical data accurately, quickly, and efficiently. This service is the cornerstone to the success of programs such as open government, and is the driver behind all major and forward-looking initiatives. FAA could not operate without IT; from day-to-day operations on desktop computers, to eGov, weather tracking and reporting, safety inspections data, risk analysis tools. IT touches every aspect of the FAA.
Over the past few years, internal and external initiatives influenced the FAA's transformation journey toward shared services. Those initiatives included:

- **25-Point Implementation Plan to Reform Federal IT Management**: In 2010, the Office of Management and Budget (OMB) identified the need for a shared services strategy. The primary driver: achieve operational efficiency.
- **Foundation for Success**: Also in 2010, the FAA Administrator initiated a comprehensive study, titled Foundation for Success, which resulted in recommendations to introduce shared services into the FAA. The primary driver: improve inefficient delivery of internal shared services.
- **Federal Information Technology Shared Services Strategy:** In 2010, OMB released the *Federal IT Shared Services Strategy*, which further emphasizes the need for agencies to use a "Shared-First" approach to IT service delivery. The primary drivers: increase return on investment, eliminate waste and duplication, and improve the effectiveness of IT solutions.

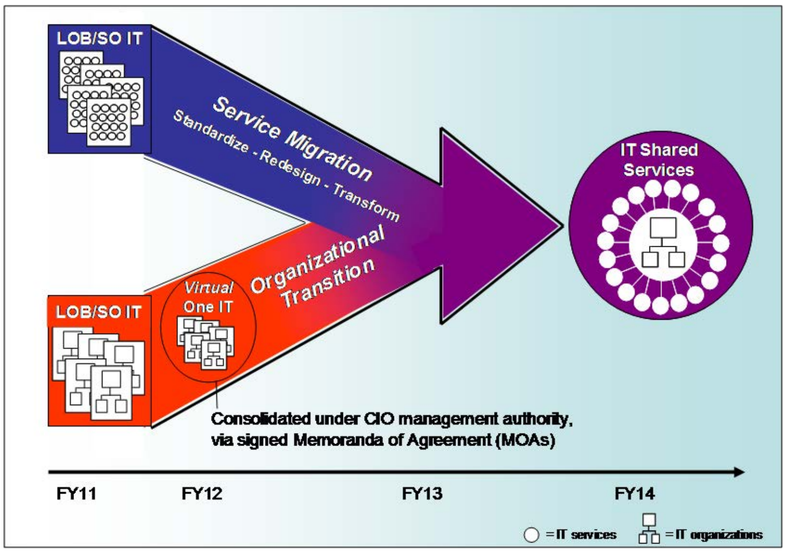
These three initiatives and their associated drivers led to the creation of the Office of Finance and Management (AFN), and more specifically, the beginning of FAA IT shared services.

Currently, FAA IT services and functions are primarily delivered by organizations residing within the Lines of Business and Staff Offices. While this model allows customers to maintain control of their IT resources, it does not allow the agency to benefit from the quality and efficiency typically provided by operating under an IT enterprise model.

In FY 2012, AIO developed an IT Shared Services Transformation Plan that describes the strategy and approach to migrate IT in the FAA to an IT Shared Services Organization (ITSSO). There are two key components to the establishment of the ITSSO: service delivery migration and organizational transition.

Following the OMB guidance in the "Federal Information Technology Shared Services Strategy" the transformation plan outlines how the FAA will:

- Transform IT service delivery from the current, line of business/staff office centric focus, to a customer driven, enterprise-centric, more efficient way of delivering services; and
- Plan and implement organizational realignment to bring together all IT resources into one IT Shared Services (ITSS) organization.



In FY 2012 and FY 2013 the IT resources, funding, decisions and delivery were managed by AIO via Service Level Agreements (SLAs) and Memorandum of Agreements (MOAs) with all the FAA Lines of Business and Staff Offices. Although the organizational realignment will not take place until FY 2014, FAA began the service delivery migration in FY 2012. This FY 2014 justification covers all resources and funds to support the ITSSO (both service delivery migration and organizational transition). The preceding graphic shows the service delivery migration and organizational transition converge in FY 2014.

What Is The Request And What Will We Get For The Funds?

FY 2014 – Information Services (AIO)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012-2014
Information Services (AIO)	$96,766	$97,087	$309,567	+$212,801

The FY 2014 budget request of $309,567,000 including 793 FTPs, with 774 FTEs will support all staff and funds for the ITSSO. The FY 2014 request includes increases associated with pay inflation, and base transfers totaling $212,532,000 related to the consolidation of IT functions from AVS, ATO, ASH, AHR, APL, AST, AGC, ARC and ABA into the ITSSO. This budget reflects a budgetary decrease of $36 million taken in FY13 as part of efficient spending reductions associated with the overall enterprise IT arena. This budget also reflects a budgetary decrease of $2,362,000 in administrative savings that will be achieved through data center consolidation efforts. In addition, resources are being internally realigned as the LOBs IT transition into the ITSSO. The organization will continue to evolve as IT areas are identified for the transition.

The consolidated ITSSO is an enterprise solution that will provide comprehensive IT support and services to the entire FAA; this budget request funds all costs associated with these services. Base funds cover federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools and infrastructure operations in Headquarters, Regions and field facilities.

The FY 2014 budget reflects the anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges to decrease $24.

The following chart shows the normalized budget for the FAA IT organizations moving into AIO in this transition.

Fiscal Year	IT Shared Services Budget
2012	$317,455
2013	$305,963
2014	$309,567

The ITSSO will be the single IT service provider to all organizations within the FAA. The ITSSO will realize efficiencies and cost savings through mission driven IT acquisitions, standardized and streamlined procedures, and consolidation of services to more effectively leverage organization expertise and resources.

The goals of the ITSSO are to:

- Increase customer satisfaction and become a trusted advisor;
- Improve operational and organizational efficiency;
- Allocate resources more efficiently;
- Provide consistent high-quality service; and
- Enable greater innovation.

We will meet these goals through consolidation of commodity IT , gaining efficiencies in IT contracts, expansion of our cloud offerings, eliminating duplication and reinvestment of savings to new IT services.

In FY 2012, we began the development of initial IT services to be delivered as a shared service to the FAA (messaging and mobility services). In FY 2013, we made great strides in standardizing major components of the FAA IT infrastructure including reducing the number of Active Directory Domains from 13 to 2 and centralizing Internet Access Point (IAP) management. We are on schedule to deliver cloud-based enterprise messaging services this summer, and we are also implementing secure mobile device management solutions.

In FY 2014, we will continue to expand the number of service offerings and deliver them to the FAA at a faster rate, since all the IT resources will be in the ITSSO. In our development of the initial services, we mapped current IT functions to services. Functions that were attached to multiple services and provided the greatest opportunity for efficiency gains and cost savings were prioritized and migrated first. Our initial prioritization of services is shown below.

FAA IT Service Migration Priorities

Phase 1 *Aug. 2012 – Sept. 2013*	Phase 2 *Mid FY13 – Mid FY14*	Phase 3 *Late FY13 – End FY14*
• Support High Priority IT Programs • Achieve Cost Savings • Deliver Customer Value **Planned in this phase:** • Messaging • Mobility Services • Desktop Support Services	• Deliver Customer Value • Support Major Organization Impacts • Achieve Cost Savings **Planned in this phase:** • Webcasting and Webinars • Security Services • Business Process Management	• Improve Operational Efficiency • Achieve Cost Savings • Standardize **Planned in this phase:** • IT Portals • Website Support Services • Print services

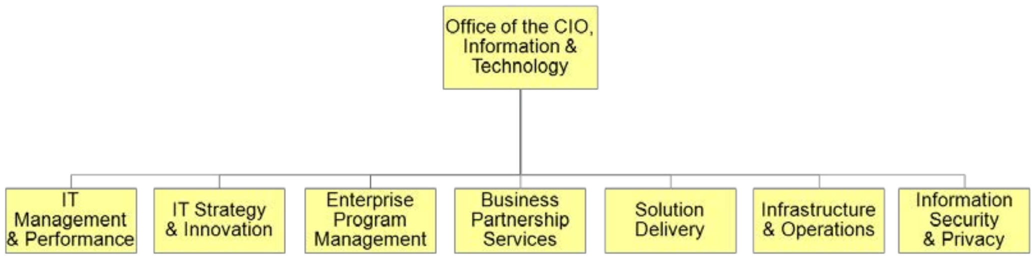
To optimize AFN's resources, there has been a shift of some responsibilities across the four functional areas under AFN. These AFN sub-unit changes include the realignment of the Information Systems and Technology staff into Information Services (AIO), the realignment of financial management staffing into ABA, and the realignment of administrative services staffing into AFN-100. The FY 2014 budget request for AIO reflects these changes in budget and staffing.

What Is This Program?

Prior to FY 2014, FAA IT services and functions were primarily delivered by organizations residing within the Lines of Business and Staff Offices. While this model allowed customers to control their own IT resources, it did not support efficiency which is often achieved by operating IT using an enterprise model. The previous model also placed the burden on customers to find the appropriate IT representative to fulfill their needs. FAA customers who were unfamiliar with IT operations often found it difficult to identify the right person in the IT organization, as points of entry were unclear and confusing. The IT transformation program will address these challenges and support improvements to the overall IT customer experience.

The IT transformation program was formed to support the transition to the ITSSO and to transform IT services and functions such that they can be delivered in an enterprise manner. The FAA's goal is to implement the formal organization of the ITSSO and migrate to enterprise services and functions in FY 2014. The draft organizational chart below depicts the highest level organizational structure as defined at the time of this submission.

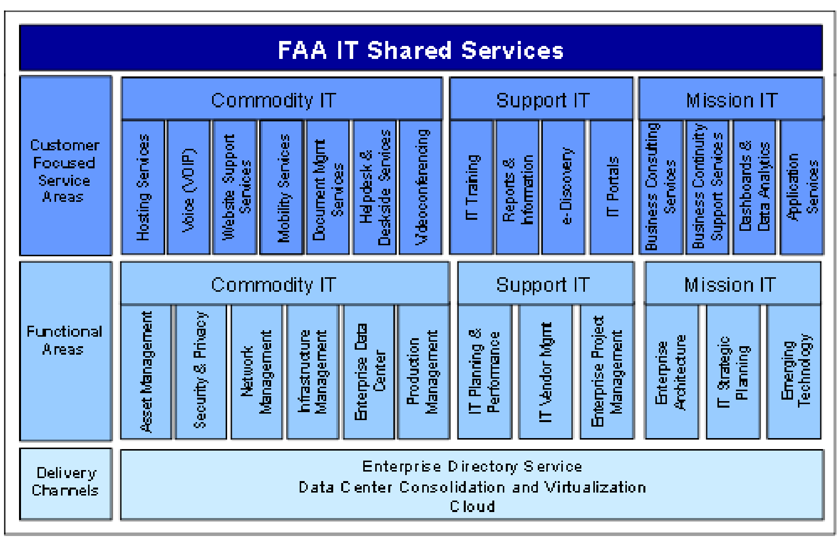
FAA IT Shared Services - Organizational Structure



The ITSSO will be the single IT service provider to all organizations within the FAA. The transformation to this enterprise model will include the removal of duplication, streamlining of services, functions, and business processes, and the formation of efficient organizational structures. The model will provide customers a single point of entry into the organization (Business Partnership Services), making it easy for customers to acquire support without having to understand how IT operates. Business portfolio managers within this organization will support customers throughout the experience and will ensure that IT services meet the customers need.

The ITSSO delivers shared services via three categories of IT services: mission, commodity and support. The FAA Shared Services model is aligned to OMB's Shared Services Concept Overview as depicted in OMB's Shared Services Strategy. The graphic below depicts our initial FAA IT Portfolio of Services and supporting IT functions aligned to the three categories of IT services. As we continue to realize cost efficiencies and savings, we will reinvest savings into mission IT services allowing IT to increase its contribution toward the FAA's overall aviation mission.

We have intentionally differentiated customer-focused IT services and functions within the FAA to assist in prioritization of shared services migration activities. Some services span all categories, as the service varies according to the needs of the organization. For instance, a portion of application services are considered "mission" as the activity requires in-depth and unique needs for the business unit's mission. A portion of this service area is also considered "commodity IT" when the application requirements and development activity can be applied to needs across business units.



This chart indicates our current conceptual distribution of services between Commodity, Support and Mission Services. As the ITSSO continues to evolve, this distribution may, naturally, adjust as services are consolidated and transitioned.

The transition to ITSSO necessitates the transformation of delivery channels. We will leverage cloud and enterprise directory service development efforts to support increased levels of efficiency and quality of service to our customers. For example, our Enterprise Messaging Service (currently under development) will be enabled by cloud infrastructure technology allowing our customers enhanced access to email and collaboration capabilities while delivering the service more efficiently.

Since the FAA ITSSO organization is new, we have summarized below the functions of the top level organization. In addition we have aligned our top level programs and anticipated FY 2014 accomplishments to the three categories of IT services.

Program Functions	**FY 2014 Anticipated Accomplishments**
Mission IT	
IT Strategy & Innovation • IT Strategy; • Enterprise Architecture; • Agency IT Standards; and • Evaluation of New and Emerging Technologies	• Implement IT Strategy and Plan; • Align National Airspace System (NAS) and non-NAS enterprise architects; and • Continue IPv6 implementation
Business Partnership Services • Customer Engagement; • Collect, Analyze and Coordinate Business Needs; • Business Partnership Management; • Training Services; • Service Desk; and • Desk side Services	• Manage Business partner relations through Service Level Agreements; • Implement an enterprise Customer Relationship Management Tool; • Improve customer communications and access to information; and • Meet agency performance metrics for service desk and desk side services
Solution Delivery • Application Development; and • Information Delivery	• Achieve and exceed cost and schedule targets; • Define Service Oriented Architecture (SOA) strategy assessment criteria for the enterprise; • Continue implementation of cloud-based messaging services (SharePoint, MS 365); and • Continue implementation of mobile services
Commodity IT	
Information Security and Privacy (IS&P) • IT Security Policies and Governance; • Privacy Management; • Security Compliance (FISMA and C&A); • Mitigation of Security Issues; and • Security Operations	• No cyber security events occur that significantly disable or degrade FAA mission critical services; • All mandatory statutory requirements for IT system authorizations and continuous monitoring met; • All high and moderate risk vulnerabilities due in FY 2014 resolved; and • Unnecessary Social Security Number use eliminated
Infrastructure and Operations • Maintain Operational Environments (backbone, networks, systems, data centers); • Recovery Operations; • Client Devices and Configuration Standards; • Mass Storage; and • Backup Services	• Operate local and wide area networks at 99% uptime; • Begin implementation of enterprise cloud solution; • Test IT continuity of operations plans; • Implement enterprise wide backup services; and • Implement standard client configuration enterprise wide
Support IT	
Enterprise Program Management • Program Management and Oversight; • Define Solution Delivery Life Cycle (SDLC); • Manage and Address Risk; and • Establish Standards	• Develop standards and guidelines for program management; • Provide coaching and mentoring services to project managers; and • Implement formal IT Portfolio Management across the ITSSO to rationalize and optimize the FAA application and solutions portfolio
IT Management and Performance • Define and Measure ITSSO performance; • Manage and Coordinate IT Audits; • IT Quality Management; • Records Management; • Union Collaboration; and • Hire IT Talent	• Improve IT policies, capital planning and investment control plans; • Develop independent verification & validation process; • Develop records management plan for the FAA; and • Improve consistency in response to external audits

Why Is This Particular Program Necessary?

The FAA is submitting this Base Transfer as it will support the FAA in its ability to achieve cost savings through shared services efficiencies, to improve existing customer services, and to provide the IT workforce better visibility into professional development opportunities. Although the FAA could consider maintaining its current structure and apply shared service principles, it is apparent that the desired results would not be fully achieved. By both consolidating and transforming IT services and functions, it will ensure that IT processes will be fully standardized, enterprise IT goals will be visible, organizational structures will be efficient and duplication of activities will be avoided. This will allow the FAA to do more with less, serving our FAA partners and providing information and accountability to the public.

This transformation process to an ITSSO is an investment. By FY 2014, the FAA hopes to see returns in terms of improved services and processes. In years that follow, the FAA will achieve measurable return on investment that will be reinvested into new innovative IT services.

It is also important to point out that the FAA's transition to an ITSSO is the enabler to achieving OMB's 25 Point Implementation Plan to Reform Federal IT Management and the Federal Information Technology Shared Services Strategy. The activities to be conducted within the ITSSO will also enhance the FAA's ability to:

- Continue alignment with the Federal Enterprise Architecture requirements through standard approaches driven by one primary Enterprise Architecture organization;
- Broaden application of cloud solutions by focusing priorities on enterprise-wide cloud IT initiatives; and
- Comply with presidential directives on digital government in the areas of mobility, security, and online resources, which are among the highest priority services included in the ITSSO transformation plan.

How Do You Know The Program Works?

The ITSSO will enable the FAA to achieve significant improvements in the efficiency of service delivery, cost savings, and rapid deployment of new services by leveraging access to centralized expertise and infrastructure. One of the key advantages is that it enables economies-of-scale within the function. Other advantages include standardization of processes and changes in work processes that reduce redundancy and a higher degree of transparency and accountability.
To ensure program success the FAA has incorporated the following core best practices to establish measures and evolve performance standards with real and measurable improvements:

<u>Service Level Agreements</u>
In order to ensure that IT services are meeting the needs of the internal users, the program has implemented Service Level Agreements (SLAs) that define expectations, roles and responsibilities, service level outcomes, performance metrics, and financial and staffing commitments. The SLAs provide clear, concise, and measurable descriptions of the technology services delivered by each program, and include specific performance measures, targets, and service commitments for the IT services procured and provided. Partners have specified what services they need, and expect the ITSSO to take responsibility for meeting those requirements. The ITSSO will have their performance evaluated objectively because the SLAs establish measurable criteria.

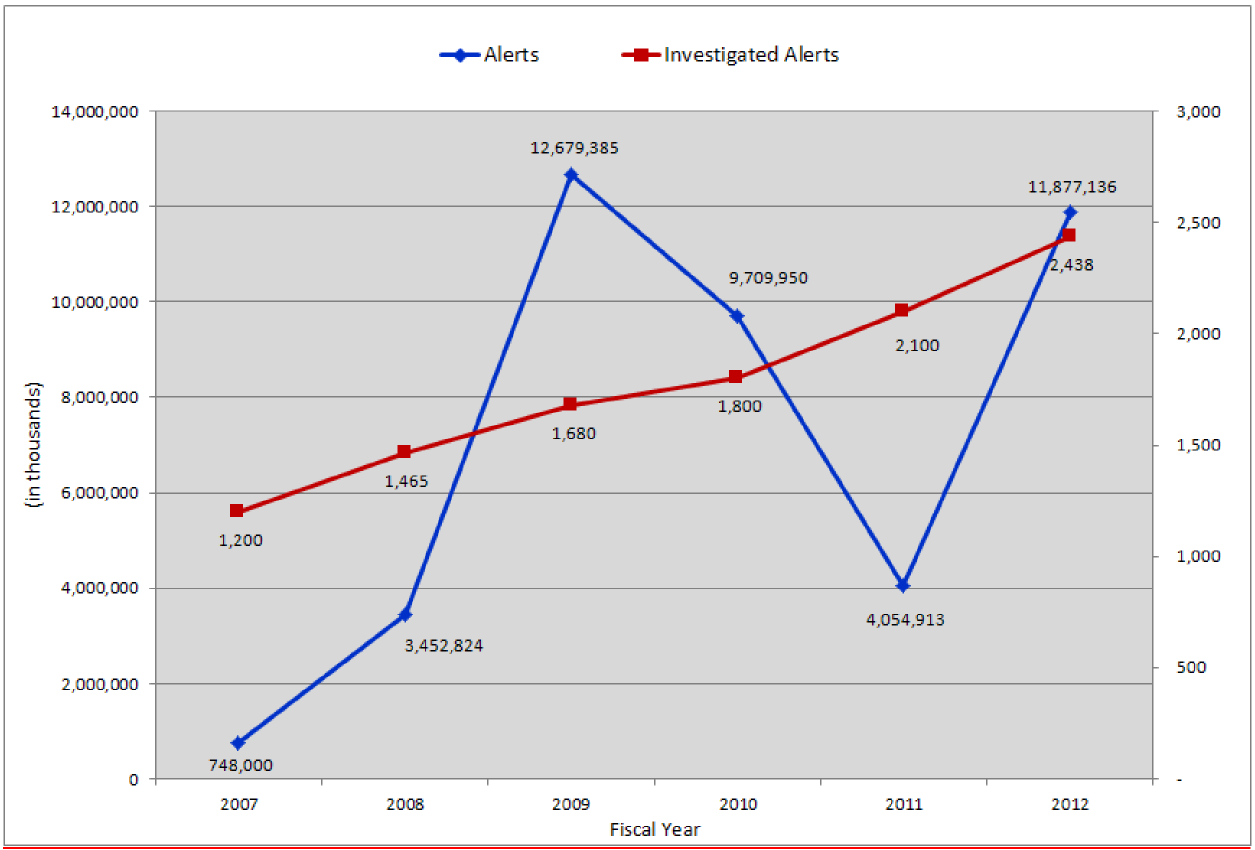
<u>Establishing Baseline and Performance Standards</u>
The SLAs establish standards set by current performance baselines, with an agreement that over the next few years, the service offered and performance standards will evolve to be comparable to industry standards. As technology changes, the performance measurements contained in each SLA will serve as an indicator of how well the service program is delivering on the promised services. Annual adjustments will allow the SLA to be a living, mutually agreed upon document which continuously meets the FAA's evolving IT requirements.

<u>FAA IT Enterprise Program Management Office (IT EPMO):</u>
The FAA has implemented IT enterprise program and project management oversight to lead and coordinate effective communication, standardization, and formal IT portfolio management. The IT EPMO is maturing,

and by FY 2014 will have instituted centralized and executive level IT risk management to manage risk at an enterprise level. The IT EPMO is responsible for SLA oversight and enforcement, and, in turn, will be responsible to external governing boards.

<u>ITSSO Performance Metrics</u>
The ITSSO has established performance metrics throughout several functional areas of IT. These metrics include: service desk, infrastructure availability, PIV card usage, reduced sign on, customer satisfaction, etc. These metrics drive further efficiency gains, increased cost savings and improved customer satisfaction.

<u>Cyber Security Management Center (CSMC):</u>
The Cyber Security Management Center (CSMC) has effectively tested this shared services model over the past six years. During that time, the CSMC has successfully consolidated cyber security services for multiple agencies, leveraging a closely monitored cost effective approach to achieve its mission of "No cyber security events that disable or degrade IT systems" while lowering overall and per-capita program costs. This is accomplished while protecting a growing number of systems, facing a greater number of attempted intrusions, and increasingly sophisticated threats. The chart below indicates the increasing number of alerts to which the CSMC must respond showing an upward trend from 2007 through 2011.



The FAA has incorporated the best practices of the CSMC and similarly positioned public and private industry leaders to implement a rigorous performance-based framework to test, monitor, and adapt the IT Shared Services programs to achieve measurable cost efficiencies and program effectiveness.
Additionally, the FAA is applying successful approaches and learning from the challenges of previous Government and private sector shared services transformations with the intent of achieving improvements in efficiency and quality of service.

Why Do We Want / Need To Fund The Program At The Requested Level?

AIO is leading the effort that began in FY 2012 and will continue into FY 2014 and beyond to establish an information technology environment that will respond faster and more cost effectively to the evolving nature and needs of the FAA. The ITSSO will enable an enterprise alignment and integration of IT business, and mission goals.

In order to achieve the goals set for the program, the FAA requires the funds defined within this request to invest in the formation of the ITSSO and the redesign of existing processes while also maintaining existing operations. Investments made in FY13 and FY14 will contribute to increased levels of efficiency and quality of service beginning in FY 2014.
Investments targeted toward efficiency that are already underway include: server consolidation, contract strategies, video conferencing, and energy management. Additional efficiency-focused investments to be pursued in FY13 and FY14 include: continued consolidation of IT systems (eliminating redundant and parallel systems), enterprise approach to procurement and software license consolidation, consolidation of asset and inventory systems, and improved process efficiencies gained by the "pooling" benefits of shared services.

The FAA's planned investments in IT will also provide service quality improvements to customers and better career opportunities for the IT workforce. Service quality improvements include: enhanced customer relationship management processes and improved information security capability. IT professional career enhancements will be provided through the reorganization to the ITSSO. FAA IT professionals will be afforded a clearer career path and have improved access to mentorship and peer learning opportunities.

The FAA is committed to making this IT transformation a success and has reinforced this commitment FAA senior leadership communications. The future of the ITSSO is dependent on this commitment from a cultural perspective and funding perspective. Without proper funding of this program, the FAA may not be able to achieve long-term cost savings and service quality improvements.

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Regions and Center Operations (ARC)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$322,057**	**647**	**28**	**707**
Adjustments to Base	**$584**	**-13**	**-18**	**-73**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-13	-18	-73
Pay Inflation	$584			
Other Changes	**-$401**			
NATCA Multi Unit Pay Raise	$128			
Working Capital Fund	-$529			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments	**$24,700**			
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases	$5,400			
Service Center / Regional Buildings	$19,300			
Base Transfers	**-$14,199**	**-22**	**-1**	**-23**
Hangar 6	-$7,849	-19	-1	-20
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment	$1,770	-3		-3
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)	-$8,120			
Program Adjustments				
FY 2014 Request	**$332,741**	**612**	**9**	**611**

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Detailed Justification for –Regions and Center Operations (ARC)

What Do I Need To Know Before Reading This Justification?

The Office of the Deputy Assistant Administrator for Regions and Center Operations (ARC) is one of the four pillars of the Office of the Assistant Administrator for Finance and Management (AFN). Under the shared services concept ARC provides ongoing regional facility emergency operations, training, logistics support, and other critical services to both internal and external customers for the FAA. Prior to the creation of AFN, FAA real property management, logistics/materiel management, and personal property management functions resided among multiple FAA organizations. In FY 2012, as part of the shared services organization realignment, these functions were consolidated under ARC. The Deputy Assistant Administrator for Regions and Center Operations assumed the role and responsibilities of Property Management Officer for FAA as currently defined in FAA Order 4600.27A "Personal Property Management."

What Is The Request And What Will We Get For The Funds?

FY 2014 – Regions and Center Operations (ARC)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012-2014
Regions and Center Operations (ARC)	$322,057	$324,128	$332,741	$10,684

For FY 2014, $332,741,000 612 FTPs, and 611 FTEs are requested for FAA's Deputy Assistant Administrator for Regions and Center Operations. The request provides for salaries and benefits, annualized pay, and non-pay inflation. The request includes a decrease of $529,000 for anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $5,954,145, except for fee-for-services printing and conference center usage. The request also includes adjustments as follows:

Discretionary increases in the amount of $24,700,000 comprised of $5,400,000 for increases in current rents, anticipated costs for renewing expiring leases, increases in operational costs and taxes, and the increases in costs for operating and maintaining the facilities; and $19,300,000 for continued construction activities associated with the new Service Center facility in Ft. Worth, TX. Funding would provide for interior facility modifications and equipment to make the facility ready for occupancy.

Base transfers to and from ARC's budget in the amount of $1,770,000 comprised of $2,800,000 to ARC for the property management and motor fleet program from ATO/AJW, and -$1,030,000 and 3 FTE's to the Air Traffic Organization (ATO)/Mission Support Services (AJV), that reconciles the overage in the FY 2012 reprogramming base transfer amount.

In the process of continuing to optimize AFN's resources, there has been a shift of some responsibilities across the four functional areas under AFN. These AFN sub-unit changes include the realignment of the Information Systems and Technology staff into Information Services (AIO), the realignment of financial management staffing into ABA, and the realignment of administrative services staffing into AFN-100. The FY 2014 budget request for ARC reflects these changes in budget and staffing. These changes are net zero (budget neutral) for AFN

In addition, the FAA requests support two base transfers: 1)-$8,120,000 to move the Center for Management and Executive Leadership from the Assistant Administrator for Finance and Management into AHR. This transfer will provide greater leverage of resources and a reduction in the duplication of similar management training and course development across separate lines of business. We expect increased efficiency and an increased return on investment by offering more courses that meet agency needs for less cost to the government; and 2) -$7,849,000 and 20 FTE's to move Hangar 6 to the Air Traffic Organization (ATO) for the operation of three jet aircraft (an FAA-owned Gulfstream G-IV and two leased Cessna Citations) housed at Ronald Reagan Washington National Airport.
Our key activities include:

Function	Functional Description	Key Actions
Facilities	Oversee and manage infrastructure operation and maintenance programs in Washington, DC, regional office facilities, and the MMAC	• Maintain a safe, secure, professional, and environmentally compliant work environment for FAA employees, contractors and tenant organizations.
Regional Operations Centers	Operate Regional/Center Operations Centers (ROCs)	• Provide 24/7, immediate command, control, and communications for all incidents related to National Airspace System (NAS) continuity.
Real Estate / Materiel Management / Personal Property	Provide real estate, materiel, and personal property management	• Manage a portfolio of real property assets exceeding $7 billion; • Manage FAA personal property assets valued at $11.4 billion from capitalization to disposal; and • Provide policy and oversight as the FAA Property Management Officer.
Horizontal Integration	Provide integration services for FAA-wide projects to address congestion and flight delays	• Identify and coordinate expert resources within the Agency; • Ensure successful, on-time completion of large-scale aviation projects; • Ensure compliance with Federal and State legislation, identify political impacts, recommend strategies for conflict resolution, manage FAA communications / expectations among aviation organizations, and develop collaborative internal and external partnerships.
Freedom of Information Act (FOIA) / Administrative Functions	Provide FOIA oversight for the Agency and AFN administrative functions	• Continue to improve the FOIA on-time response rate; • Coordinate and oversee AFN performance management.
Logistics	Provide parts and logistics services in support of the National Airspace System (NAS).	• Repair, modify, and overhaul quality products to meet NAS requirements; and manage all National Stock Numbers for NAS equipment from point of acquisition or repair through to customer use and return.
Training	Provide technical training at the FAA Academy for safety-related occupations.	• Conduct introductory resident training for all Air Traffic Control (ATC) new hires and follow-on courses at the FAA Academy consistent with the ATC Workforce Plan's projected increase in student numbers.
	Provide training for FAA supervisors, managers, and executives.	• Deliver managerial, executive and technical training and related support services for the agency and other aviation organizations.
Information Technology / Financial Services	Conduct financial operations and system support at MMAC	• Provide financial services processing and reporting of financial information, including accounting data, for FAA, DOT, and other federal government agencies.
Acquisition	Conduct MMAC acquisition activities	• Acquire service and construction contracts for NAS customers valued at approximately $1 billion annually.

What Is This Program?

As an integral part of AFN, the Office of the Deputy Assistant Administrator for Regions and Center Operations (ARC) provides critical business, aviation leadership, integration, and other services to internal and external customers.

ARC offices are located at the Washington headquarters, each of the nine regions, and the MMAC in Oklahoma City, Oklahoma, and we are responsible for:

- Overseeing and managing infrastructure operation and maintenance programs in Washington, D.C., nine regional office facilities, and the MMAC;
- Operating Regional/Center Operations Centers that provide around-the-clock, immediate command, control, and communications for all incidents related to NAS continuity;
- Conducting acquisition, real estate, materiel management activities, and identifying excess real property assets that are candidates for disposal, termination, replacement, renovation, or transfer;
- Managing payments on all General Services Administration (GSA), FAA Office of Security and Hazardous Materials (ASH), FAA Office of Aviation Safety (AVS) leases, including rent, operational costs, taxes, utilities, and guard services;
- Providing the architecture and design technical support to all HQ and Regional administrative facility projects. This office provides project management, architecture and design review, engineering, and oversight, including two new prospectus projects that once complete, will consolidate space used to house thousands of employees;
- Providing national coordination and oversight for the Agency's Freedom of Information Act (FOIA) program;
- Providing personal property policy and guidance as the Property Management Officer;
- Serving as the Agency focal point for the Chicago O'Hare International Airport Modernization Program;
- Providing national leadership for the Air Tour Management Plan (ATMP) program and supporting environmental streamlining efforts and noise issues;
- Supporting aviation safety services provided to the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau;
- Providing parts and logistics services in support of the National Airspace System (NAS);
- Conducting introductory resident training for all Air Traffic Control (ATC) new hires and follow-on courses at the FAA Academy consistent with the ATC Workforce Plan;
- Conducting financial operations and system support for FAA, the DOT, and other Federal Government agencies through the Enterprise Service Center; and
- Delivering technical training, and related support services for the agency and other aviation organizations.

We provide mission support to all DOT goals, specifically those supporting Organizational Excellence. ARC plays a critical role in FAA's overall emergency preparedness by coordinating programs and exercises aimed at increasing emergency response readiness and capability. The ROCs are 24/7 information and communications hubs that provide voice and data dissemination necessary to direct management and operation of the NAS. ROCs and Cornerstone Regional Operations Centers (C-ROCs) coordinate communications response for aircraft accidents, emergencies, missing aircraft, hijackings, security threats, facility and system outages, airport closures, severe weather impacts, earthquakes, and public information requests and complaints.

ARC facility and real estate offices are responsible for the acquisition of leases and operations and maintenance of 150+ administrative facilities that house all Lines of Business--safety, legal, contracting, human resource, operational, and regional personnel--throughout the NAS. The operation and maintenance of these facilities include rent and lease contracting, program oversight, guard services, utilities, environmental monitoring and occupational safety and compliance audits, sustainability (greening) efforts, emergency training and coordination, and ongoing repairs and renovations.

The Deputy Secretary designated the FAA as the lead for the Department of Transportation's efforts in support of the Presidential Initiative to improve the effectiveness and efficiency in managing real property assets. ARC is responsible for maintaining the DOT-wide real property asset portfolio and all data associated with approximately 61,761 buildings, structures, and land parcels encompassing over 26 million square feet of space. The entire DOT inventory of real property is tracked within ARC.

Regional Administrators and their staffs represent the Agency in regional contacts with military services, aviation industry, other government agencies, aviation organizations, elected officials, educational institutions, and civic and private groups. The Regional Administrators serve as the local corporate representatives for the FAA Administrator. Along with their staff, they are responsible for communicating with FAA's internal and external customers, disseminating information, and answering inquiries. ARC works closely with state and local aviation organizations, both public and private, on aviation topics of mutual interest and promotes aviation careers through relationships with educational institutions and development of aviation curriculum materials.

The Regional Administrators and Center Directors serve as the senior Agency aviation officials in the regions/centers, providing cross-functional oversight and integration for the Agency, relations with industry, the public, and various governmental organizations, as well as leadership for the Lines of Business support programs. ARC ensures Horizontal Integration for large-scale aviation projects that reduce congestion and flight delays. Our personnel provide leadership and coordination for teams from various FAA lines of business and external stakeholders on projects such as the New York Area Program Integration (LaGuardia, John F Kennedy International and Newark Liberty International airports), O'Hare Modernization Program, Philadelphia International Airport Capacity Enhancement Program, and Houston Airspace Expansion Plan. All of these projects directly relate to NextGen initiatives that will reduce flight delays and congestion in the National Airspace System.

The FAA Academy at the MMAC in Oklahoma City is the primary provider of technical training for the Agency and is the largest training facility within the DOT. The FAA Academy delivers training and related support services to the Agency and other aviation organizations, both domestic and international.

Anticipated FY 2014 Accomplishments;

Function	Anticipated FY 2014 Accomplishments
Facilities	• Integrate environmental, occupational safety and health requirements, minimize pollution and waste, conserve natural resources, and prevent injury and illness while at work through utilization of a Quality Management System with management reviews and internal and external audits.
Regional Operations Centers	• Conduct two 8-hour national C-ROC/ROC simultaneous transfer of operations exercises with all nine regions to maintain and enhance emergency preparedness; and • Test transferring DOT Crisis Management Center (CMC) system to the DOT alternate site as the Southern Region's C-ROC transfers its operations to another operations center.
Real Estate Management and Acquisition / Material Management	• Ensure that all FAA employees engaged in real estate are trained in the latest real estate law and policies throughout the real property lifecycle; • Realize savings of the annual real property lease and purchase costs through improved business processes; • Develop and deliver corporate materiel and personal property training to ensure competency of Logistics Management Specialists; • Standardize the knowledge and skills required to serve as a Personal Property Custodian or Delegate within the agency; • Complete 95 percent of the annual real property inventory target and report to DOT; and • Improve contract cycle time and quality of contracting office support.
Training	• Conduct 100 percent of planned, programmed, and funded ATO Technical Training courses (100 percent of Air Traffic initial qualification); and • Ensure training (ATO/AVS technical, and Agency

	leadership/management) continues to meet FAA requirements and is NAS-compliant.
Information Technology / Financial Services at MMAC	• Manage overhead costs through establishment of targets and monitoring; • Improve service provision through timely mitigation of audit findings focusing on strengthening processes and closing process gaps; and • Maintain 99.5 percent availability for IT systems as defined in service level agreements with customers.
Logistics	• Increase cumulative fill rate for stocked items (expendable items and repaired items); • Ensure full implementation of commercial-off-the-shelf software solution and integration with existing business applications; and • Use root cause analysis, trending, and action plan tools to decrease defective parts while improving quality of assets provided to technicians.

Why is this Particular Program Necessary?

We provide a variety of real estate and personal property management services in support of the FAA. As part of the shared services realignment, personal property, government furnished equipment, and logistics/materiel functions were consolidated under ARC from multiple organizations in order to gain efficiencies and reduce redundancies.

We also have lead responsibility for the Federal Real Property Asset Management throughout the life cycle process. ARC maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 61,761 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. We have made steady progress in disposing of assets that are surplus, in poor condition, or are under-utilized. These efforts have resulted in the removal of more than $495 million of real property assets from the FAA portfolio. As part of our real property management responsibilities, we establish service level agreements with our customers. This includes funding administrative space leases within each of the nine regions administered by the GSA and field facilities for the Agency's Office of Aviation Safety (AVS) and Office of Security and Hazardous Materials Safety (ASH) organizations creating an economy of scale.

Our facilities management staff provides administrative and operational support for FAA employees at Headquarters and at the regional level. This includes monitoring all GSA building operations activities; managing the nationwide rent, personal property, and government furnished property programs; and managing the motor vehicle program, parking, and transit benefits. We also manage the Agency's mail and printing program, the graphics department, the National Wireless Program, and the design and construction of all space occupied by the FAA. Additionally, ARC is responsible for the safety and well-being of FAA employees by providing building security, emergency evacuation plans, and monitoring and addressing safety and environmental issues in the buildings. Equally important, our management oversees the maintenance customer service desk, janitorial requirements, building repairs, and maintenance. The goal is to provide efficient, multifaceted facilities management services that are innovative, environmentally responsive, and cost effective in support of FAA's mission and goals.

For example, in FY 2012 we:

- Completed 85 percent of the personal property inventories for the cost centers due for triennial inventory;
- Capitalized 90 percent of assets within 65 days of date placed in service; and
- Ensured that all FAA employees engaged in Real Estate were trained in the latest real estate law and policies throughout the real property lifecycle.

FAA recognizes the austere budget environment and is supportive of OMB's TRIM initiative to reduce the Federal footprint. We have implemented space standards across the agency to minimize our occupancy and costs. We are also undertaking several major consolidations that have reduced our square footage, including:

- LAX Basin Consolidation – FAA consolidated two leases into the existing regional office, saving $690,000 per year in rent.
- DFW AVS Consolidation – FAA consolidated two leases into an existing leased location, saving $2.7 million per year in rent.
- Central Region Consolidation – FAA renegotiated the lease on the Regional Office and consolidated ATO into the office to save $782,000 per year in rent.

We are currently in process with similar consolidations in our Northwest, New England and Southern regions and are working collaboratively with GSA on a Client Portfolio Plan to identify additional areas for consolidation and savings.

Even with more efficient space utilization, our rent continues to increase from older leases that are expiring and annual escalation clauses to cover increases in the costs of taxes, security, cleaning, operations and utilities. The FAA is requesting an additional $5.4 million to cover theses costs for GSA rent and direct FAA lease. These are mandatory costs and covered by existing contracts with private sector landlords or rental agreements with GSA. These facilities, located throughout the nation, house 19,722 personnel in 5,226,429 square feet. Although designated as administrative space, these facilities are for personnel that directly support NAS safety and operations. There are 49 GSA leases in 18 states and the District of Columbia and 130 direct leases across the nine regions for safety, security, and airports personnel.

The prospectus project for the new Southwest Regional Office located in Fort Worth, TX is scheduled for completion and occupancy in FY 2016. FAA provided FY 2011 and FY 2012 funds to GSA to award the lease. Additional funding of $19,300,000 is being requested as part of the FY 2014 budget request. These funds are a critical component of our regional consolidation effort. GSA has already awarded a lease for the new building and is in design phase. The FAA needs these funds for build-out, furniture and equipment necessary to occupy the space. The government would risk double rent and claims from the landlord if FAA is unable to fund its portion of the project. The consolidation will improve the space utilization from almost 180 square feet per person to less than 150 square feet per person for 1,700+ FAA personnel in all lines of business .

The MMAC has constructed new buildings through multiple Capital Investment Programs (CIPs) (Facility and Equipment (F&E) appropriations). These buildings house technical personnel and training/test equipment. These buildings will add 62,207 square feet to the MMAC. Building costs, network devices, and the telecommunications infrastructure for these buildings plus two (2) years of utilities, facility services, and maintenance/support of the telecommunications infrastructure are covered with F&E appropriations. In FY 2014, the costs for facilities/telecommunications management, including utilities, operations and maintenance, janitorial, environment and occupational safety and health services, and maintaining/supporting the additional telecommunications infrastructure for these facilities become an operations Appropriation responsibility for ARC.

The FAA Logistics Center (FAALC), located at the Aeronautical Center, is the primary provider for parts and logistics services in support of the NAS. The FAALC manages the central NAS inventory warehouses and distribution facilities for FAA, providing routine and emergency logistics products and services to 8,000 FAA customers at 41,000 facilities and 28,000 sites, as well as to the Department of Defense (Air Force, Navy, and Army), state agencies, and foreign countries. The FAALC provides core logistics support functions to the NAS, including:

- Supply chain management, including inventory management, for approximately 62,000 National Stock Numbers (NSNs), with an inventory value of approximately $760 million;
- Centralized depot-level overhaul, maintenance and repair of NAS equipment, and on-site overhaul and maintenance for certain large systems such as towers and radar arrays;

- Storage and distribution management of NAS assets within a 725,000 square foot centralized warehouse;
- Depot-level engineering support; and
- Agency focal point for depot-level integrated logistics planning and implementation for NAS acquisition programs.

Air traffic control systems use the products managed and repaired by the FAALC to ensure the safe and effective movement of aircraft through the NAS. The Agency is continuously seeking to improve its core logistics support functions, striving to reduce NAS asset delivery times and improve repair item quality. Business management improvements and cost efficiencies will be achieved at the MMAC 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 visibility into vendor and parts performance. The FAALC is taking the lead in applying 2-D barcode technology to improve NAS asset visibility and tracking throughout the supply chain. Life-cycle logistics support is critical to the efficient, effective, and safe operation of the NAS. As the Agency moves toward NextGen technology, a fully-integrated logistics support approach is vital to ensure operational efficiency well into the future.

How Do You Know The Program Works?

A number of key performance measures, including those outlined in the AFN Customer Commitment, are used to determine if projects are helping achieve their objectives. Improvement projects are prioritized and selected based on their potential contribution to our objectives. Customer satisfaction surveys are routinely distributed and gathered for feedback, and we continue to act upon that feedback always looking for ways to proactively address our customers' mission needs. Several industry best practices provide a framework for monitoring process performance. Hundreds of process measures are captured and reviewed for trends to assess effectiveness. Quarterly management reviews are held to ensure policy and management systems remain suitable, adequate, and effective. Our challenge will be to maintain quality, service, schedule, and performance while managing an increasing workload with fewer resources.

The FAALC provides parts for the operation and maintenance of NAS equipment. This level of customer support is provided 365 days a year, 24 hours a day, 7 days a week to ensure that there are no NAS equipment outages. The FAALC strives to continually improve the quality and delivery of parts and reduce customer costs by improving processes and tracking performance. Not only are we looking for dollar savings, we want to improve our value by reducing the cycle times of our processes; this applies not only to industrial operations, but business operations as well. Our key performance indicators track customer satisfaction, parts quality, and effectiveness in getting the right part to customers at the right time. We have increased customer satisfaction and reduced parts delivery time while improving the quality of parts provided, operating a state-of-the-art warehouse management system that ensures inventory accuracy.

Our leadership and management are challenged to carry out the mission as resources continue to shrink. We are committed to providing employees and visitors with a safe work environment. Facility risk assessments and regular employee training all contribute to reducing and preventing workplace hazards. Facility-related services ensure employees, contractors, and students have the facilities needed to perform a multitude of functions to meet their mission and business demands on a daily basis.

Why Do We Want / Need To Fund The Program At The Requested Level?

Executive branch departments and agencies are required to establish clear goals and objectives to promote the efficient and economical use of America's real property assets and to assure management accountability for improving Federal real property management. The FAA has the lead responsibility for the DOT, and within the FAA, ARC leads the Federal Real Property Asset Management initiative. ARC maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 61,761 buildings, structures, and land parcels. Federal real property is tracked in FAA's Real Estate Management System (REMS) which also is the repository for DOT's entire real property inventory. Assets that are surplus, are not mission critical, are in poor condition, are under-utilized, and/or reflect high annual operation and maintenance costs are considered candidates for disposition. Since the start of the initiative in FY 2006 and as of FY 2012, the Agency has disposed of approximately 15,464 real property assets with an equivalent replacement value of $495 million and has reduced the Agency's operation and maintenance costs by $69.32 million. Savings resulting from the disposition of property have been applied toward updates, upgrades, repairs, and renovations of current assets. Funding reductions would jeopardize this effort's ongoing success.

ARC is also responsible for leading and integrating logistics initiatives and real property management in support of FAA and DOT. Consolidation of FAA real property, government furnished property, and logistics/materiel functions into ARC were completed in FY 2012. Analysis of the roles, responsibilities, and functions are continuing to ensure process efficiency. ARC's facility management responsibilities include planning, programming, policies, and processes associated with Washington DC Metropolitan Area FAA buildings and structures including building security, parking management, and space and property management. ARC is also responsible for funding administrative space leases within each of the nine regions administered by the GSA, in addition to field facilities for the Agency's AVS and ASH organizations. The continued expansion of the aviation safety workforce comes with a requirement for additional space. Most of the leases contain early termination penalties and escalation clauses placing additional financial pressure on the Agency.

ARC's role as the Horizontal Integrator provides the ability to move swiftly within the FAA's larger vertically integrated business units to identify and coordinate expert resources within the Agency to move large-scale aviation projects forward and facilitate communications across multiple government branches or with external stakeholders. This includes working cross-functionally and developing solutions to remove project roadblocks, ensuring compliance with Federal and State legislation, identifying political impacts, recommending strategies for conflict resolution, managing FAA communications/expectations among aviation organizations, and developing collaborative internal and external partnerships.

The request of $332.7 million supports $237 million in rental costs and operating expenses for existing space and leases, $19.3 million for funding for the Southwest Regional Office, and funding for on-board personnel expenses. The balance of our request funds the Enterprise Services Center IT Support, mail and printing services throughout the regions and Headquarters, and payments to the DOT working capital fund.

Explanation of Funding Changes	Dollars ($000)	FTE
Finance and Management	**$225,529**	**512**
Overview: For FY 2014, the Assistant Administrator for Finance and Management (AFN) requests $807,646 and 1,834 FTEs to meet its mission. The FY 2014 request level reflects funding for adjustment to base and other charges, discretionary adjustments and base transfers. In addition, AFN made significant gains in shaping the organization, optimizing the structure of each of its four functional areas. This internal structure optimization process resulted in AFN sub-unit changes to personnel and budgetary resources. For example, IT and financial management services that had been spread across the various AFN organizations were consolidated into the appropriate functional area. These changes resulted in a net zero budgetary change for the AFN organization		
Adjustment to Base	**$1,298**	**-53**
FY 2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels.		-53
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September) The factor used is 1.0 percent.	1,298	
Other Changes	**-$259**	
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. The contract covers about 1,700 employees across six FAA offices (AVS, ATO, ARC, ARP, AGC, and ABA) and includes engineers, computer specialists, program analysts, budget analysts and other professionals. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes pay inflation, Organizational Success Increase (OSI), and Superior Contribution Increase (SCI).	324	
Working Capital Fund: This cost adjustment is requested to support the Department of Transportation's (DOT) Working Capital Fund (WCF) profile. These adjustments are being made to best align each office's resources with their expected WCF costs.	-583	
Discretionary Adjustments	**$24,700**	
Rents and Leases Increases: Even with more efficient space utilization, our rent continues to increase from older leases that are expiring and annual escalation clauses to cover increases in the costs of taxes, security, cleaning, operations and utilities. The FAA is requesting an additional $5.4 million to cover these costs for GSA rent and direct FAA lease. These are mandatory costs and covered by existing contracts with private sector landlords or rental agreements with GSA. These facilities, located throughout the nation, house 19,722 personnel in 5,226,429 square feet. Although designated as administrative space, these facilities are for personnel that directly support NAS safety and operations. There are 49 GSA leases in 18 states and the District of Columbia and 130 direct leases across the nine regions for safety, security, and airports personnel.	5,400	
Service Center / Regional Buildings: The prospectus project for the new Southwest Regional Office located in Fort Worth, TX is scheduled for completion and occupancy in FY 2016. These funds are a critical component of our regional consolidation effort. GSA has already awarded a lease for the new building and is in design phase. The FAA needs these funds for build-out, furniture and equipment necessary to occupy the space. The government would risk double rent and claims from the landlord if FAA is unable to fund its portion of the project. The consolidation will improve the space utilization from almost 180 square feet per person to less than 150 square feet per person for 1,700+ FAA personnel in all lines of business.	19,300	

Explanation of Funding Changes	Dollars ($000)	FTE
Base Transfers	**$199,790**	**565**
Hangar 6: This request includes a base transfer of $7.849 million and 20 FTE from the Office of the Associate Administrator of Finance and Management regarding Hangar 6 located at Ronal Reagan Washington National Airport. Hangar 6 provides aviation support for senior government official including the Secretary of Transportation, FAA Administrator and Deputy Administrator, NASA, the Federal Emergency Management Agency, Presidential Cabinet members, members of Congress, and other Federal government organizations. Hangar 6 is responsible for operating and maintaining three aircraft: two leased Cessna Citation Excels and one Gulfstream IV aircraft which is owned by the FAA.	-7,849	-20
Administrative Support: This adjustment of resources (staff and funding) from the Office of Financial Services to the Office of Civil Rights provides administrative support on civil rights, diversity, and equal opportunity matters. This occurred during FY 2012 execution year as a with-in threshold reprogramming and is pending apportionment approval.	-72	-1
Property Management Realignment: This base transfer request consists of two sets of transfers between the Air Traffic Organization (ATO) and Finance and Management (AFN) and supports further refinement of the original Shared Services reprogramming in FY 2012. The functions associated with this transfer includes: Fleet Management, Re-utilization and Disposal, In-Use Personal Property and Reports of Survey, and the AITS and MVS200 information systems.	1,770	-3
Information Technology Resource Consolidation: This base transfer represents the transformation of multiple IT units aligned with the FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support. This transfer total reflects a budgetary decrease of $36 million taken in FY13 as part of efficient spending reductions associated with the overall enterprise IT arena.	212,532	578
Training Resources Realignment: The base transfer of staff support and funding from the Air Traffic Organization to the Office of Acquisition and Business Services, will support training requirements agency-wide and will better align resources with the appropriate organization.	1,529	11
Center for Management and Executive Leadership (CMEL) This base transfer requests concurrence to transfer the Center for Management and Executive Leadership (CMEL) from the Office of the Assistant Administrator for Finance and Management (Regions and Center Operations) to the Office of Human Resources. The CMEL transfer will align the requirements and performance organization to better enable the planning and execution of management training.	-8,120	

NextGen and Operations Planning (ANG)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$60,134**	**202**	**7**	**202**
Adjustments to Base	**$198**	**-8**		**-7**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-8		-7
Pay Inflation	$198			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$550**	**-1**		**-1**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment	-$300	-1		-1
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement	-$250			
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$59,782**	**193**	**7**	**194**

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Executive Summary: NextGen and Operations Planning (ANG)

What Do I Need To Know Before Reading This Justification?

On September 19, 2011 Congress approved FAA's request to create the Next Generation Air Transportation System (NextGen) Organization and move associated personnel and resources from the Air Traffic Organization (ATO) to the NextGen Organization. Subsequently, the FY 2012 appropriation (P.L. 112-55) was the first to fund ANG as a stand-alone office. In prior year budgets, NextGen funding requests were included in the ATO Operations appropriation budget submissions.

What Is The Request And What Will We Get For The Funds?

The Office of the Assistant Administrator for NextGen requests $59,782,000 and 193 FTP/194 FTE in FY 2014 to further the successful transition to NextGen.

What Is This Program?

Realizing the future vision of aviation through integrated strategies and solutions that achieve national and international goals encapsulates the mission of the ANG organization. The organization champions the evolution of NextGen through technical and integration expertise. The William J. Hughes Technical Center (WJHTC) is FAA's national scientific test base for the research, development, test, and evaluation of air transportation systems. The testing and prototype development conducted by WJHTC staff helps shape the future of our Nation's air transportation system and make NextGen a reality.

Why Is This Particular Program Necessary?

The WJHTC is the FAA's institution for the research, development, test, and evaluation of air transportation systems. As the Agency's Federal Laboratory it is the only viable source for conducting NextGen research, test, and evaluation. The anticipated benefits of NextGen cannot be realized without the comprehensive research conducted at the WJHTC.

How Do You Know The Program Works?

Conducting 100 percent of the required testing and evaluations for NextGen capabilities and systems is the primary mission of the WJHTC. The successful deployment of NextGen systems and capabilities is one measure that demonstrates that this program works. Other measures include Research and Development accomplishments indicated in the R&D Annual Review document published with the National Aviation Research Plan (NARP), 24x7x365 second level support of the National Airspace System (NAS), and Technology transfer of research to industry and academia via Cooperative Research and Development Agreements and Grants.

Why Do We Want/Need To Fund The Program At The Requested Level?

Nearly 44 percent of ANG's Operations budget is for payroll. The requested FY 2014 level for Operations funding covers the salaries of personnel assigned to NextGen. Non-pay costs are primarily for management of WJHTC properties that provide the necessary technical platforms for research, development, and testing of NextGen programs, as well as the around the clock operational support to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation.

Detailed Justification for – NextGen and Operations Planning (ANG)

What Do I Need To Know Before Reading This Justification?

On September 19, 2011 Congress approved FAA's request to create the Next Generation Air Transportation System (NextGen) Organization and move associated personnel and resources from the Air Traffic Organization (ATO) to the NextGen Organization. Subsequently, the FY 2012 appropriation (P.L. 112-55) was the first to fund ANG as a stand-alone office. In prior year budgets, NextGen funding requests were included in the ATO Operations appropriation budget submissions.

What Is The Request And What Will We Get For The Funds?

FY 2014 – NextGen and Operations Planning (ANG)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
NextGen and Operations Planning	$60,134	$60,502	$59,782	-$352

The NextGen Organization requests $59,782,000 and 193 FTP/194 FTE to further the successful transition to NextGen. This funding profile reflects the following adjustments:

- Unavoidable adjustments for pay and non-pay inflation ($198,000).
- Base transfer of the NextGen Global Outreach program (-$300,000 including 1 FTP/1 FTE) to the Office of Policy, International Affairs, and Environment (APL)
- Base transfer of the Traffic Alert and Collision Avoidance System (TCAS) Operational Performance Assessment (TOPA) program (-$250,000 non-pay) to the ATO Program Management Organization (AJM).

FY 2014 anticipated key outcomes:

- Provide the technical platform for research in aircraft safety (fire, structural, unmanned aircraft systems, etc.), airport technologies (safety, capacity), human factors, and weather.
- Provide laboratory systems for:
  - Conducting integrated concept evaluations, modeling and simulations, and test and evaluation for all NextGen technologies in the NAS.
  - 24x7x365 field support for all operational systems within the NAS.
- Provide analytical studies and related safety monitoring services in support of separation reductions in U.S. sovereign airspace, international airspace where FAA has delegated authority to provide air traffic services, and international airspace where the U.S. and its citizens have safety-related interests.
- Conduct the bi-annual review of the Performance of Reduced Vertical Separation Minimum Operations (RVSM) in North America (U.S., Canada, and Mexico) compared to International Civil Aviation Organization (ICAO) Recommended Requirements.
- Conduct maintenance and operations of independent performance based monitoring for Altimetry System Error (ASE), a key component to the implementation of RVSM.
- Provide facility operations and maintenance, environmental management and maintenance, and engineering support for all facilities located at the WJHTC.
- Safeguard both employees and campus infrastructure by ensuring compliance with environmental laws, policies, directives, and initiatives.

What Is This Program?

Realizing the future vision of aviation through integrated strategies and solutions that achieve national and international goals encapsulates the mission of the ANG organization. The organization champions the evolution of NextGen through technical and integration expertise. The William J. Hughes Technical Center (WJHTC) is FAA's national scientific test base for the research, development, test, and evaluation of air transportation systems. The testing and prototype development conducted by WJHTC staff helps shape the future of our Nation's air transportation system and make NextGen a reality.

The WJHTC owns and operates approximately 1.6 million square feet of test and evaluation facilities, NAS field support facilities, research and development facilities, administrative facilities and numerous project test sites. These sites and facilities provide the necessary technical platforms for research, development, and testing of NextGen programs as well as the around the clock operational support to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation.

This Program maintains facilities and support services for all properties at the William J. Hughes Technical Center including land, buildings and infrastructure. These facilities support:

- Providing operational test and evaluation, including flight testing, of all FAA systems prior to implementation in the NAS.
- Providing world class laboratories for research, engineering, development, test, evaluation, and maintenance of air navigation, air traffic management, and future air transportation system capabilities.
- Developing long-range innovative aviation systems and concepts, development of new air traffic control equipment and software, and modification of existing systems and procedures.
- Conducting, coordinating, and supporting domestic and international research and development of aviation-related products and services.
- Characterizing performance of current system and effects of proposed NextGen changes on pilots, controllers, aircraft, and related system components.
- Addressing and meeting the rapidly changing needs of the aviation industry by introducing innovative concepts and technologies in the air traffic system through extensive work in evaluations, concept development, and demonstrations in a real-time environment.

NextGen supports the Department of Transportation's (DOT) Economic Competitiveness Goal: Maximize economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

NextGen is our evolutionary blueprint for modernizing air transportation with revolutionary technologies. It represents a wide-ranging transformation of the entire NAS to meet future demand and support the economic viability of aviation, while improving safety and protecting the environment.

Aviation sustains millions of jobs each year and accounts for more than 5 percent of the gross domestic product. Aviation enables the economic benefits of tourism, shipping and travel for business or pleasure. Airports provide economic impact to large and small communities across this country. Continued economic growth in the aviation industry is supported through the ongoing implementation of NextGen technologies, policies and procedures.

Through a continuous roll-out of improvements and upgrades, NextGen builds the capability to more precisely and efficiently guide and track air traffic, while saving fuel and reducing noise and pollution. NextGen is better for our environment, and better for our economy.

We estimate NextGen improvements will reduce delays 38 percent by 2020, compared to what would happen were planned NextGen improvements not implemented. These delay reductions will provide an estimated $24 billion in cumulative benefits through 2020. NextGen delay reductions are in addition to any reduction from future runway construction or expansion. We estimate 14 million metric tons in cumulative reductions of carbon dioxide emissions through 2020. For the same period, we estimate 1.4 billion gallons in cumulative reductions of fuel use.

The WJHTC is the FAA's institution for the research, development, test, and evaluation of air transportation systems. As the Agency's Federal Laboratory it is the only viable source for conducting NextGen research, test, and evaluation. The anticipated benefits of NextGen cannot be realized without the comprehensive research conducted at the WJHTC.

How Do You Know The Program Works?

In March 2012, the Office of Assistant Administrator for NextGen published the NextGen Implementation Plan (http://www.faa.gov/nextgen/implementation/media/NextGen_Implementation_Plan_2012.pdf) This annual update provides an overview of the FAA's ongoing transition to NextGen and how it continues to transform the NAS, describing key benefits to airports, the environment, and international air transportation, and highlights critical milestones that have been achieved in this transition to NextGen. It also includes the status of transformational and implementation NextGen programs, as well as a comprehensive listing of the projects underway in FY 2013.

Conducting 100 percent of the required testing and evaluations for NextGen capabilities and systems is the primary mission of the WJHTC. The successful deployment of NextGen systems and capabilities is one measure that demonstrates that this program works. The deployment of several of NextGen's transformational programs is ongoing:

- ADS-B represents the move from a ground-based radar system to one based on a global positioning system. To date, ADS-B has been implemented in South Florida, Louisville, Philadelphia, the Gulf of Mexico, and Juneau.
- System Wide Information Management Segment 1 is in implementation with its second segment in the investment phase.
- Collaborative Air Traffic Management, Work Package 3, is also in implementation and will continue to improve the management of operations when there is disruption, especially due to weather.
- The latest implementation program, Optimization of the Airspace and Procedures in the Metroplexes (OAPM), is bringing new, near-term benefits by leveraging the increasing navigational capability of today's modern aircraft to fly more efficiently.

Other measures indicating this program works are:

- Research and Development accomplishments indicated in the R&D Annual Review document published with the National Aviation Research Plan (NARP)
- 24x7x365 second level support of the NAS
- Technology transfer of research to industry and academia via Cooperative Research and Development Agreements and Grants

Why Do We Want/Need To Fund The Program At The Requested Level?

Nearly 44 percent of ANG's Operations budget is for payroll. The requested FY 2014 level for Operations funding covers the salaries of personnel assigned to NextGen. Non-pay costs are primarily for management of facilities and properties located at the WJHTC and include operation and maintenance support services, custodial, security, and utilities. These facilities provide the necessary technical platforms for research, development, and testing of NextGen programs as well as the around the clock operational support to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation.

Without the requested level of funding, NextGen staffing will be impacted and non-pay reductions will be necessary resulting in the erosion of our physical infrastructure and WJHTC's ability to complete its mission.

Explanation of Funding Changes

	Dollars ($000)	FTE
NextGen and Operations Planning	**-$352**	**-8**
For FY 2014, the Office of the Assistant Administrator for NextGen requests $59,782,000 and 194 FTEs to meet its mission to realize the future vision of aviation by providing integrated strategies and solutions that achieve national and international goals.		
Adjustments to Base	**+$198**	**-7**
FY 2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels		-7
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September). The factor used is 1.0 percent.	+198	
Base Transfers	**-$550**	**-1**
NextGen Global Outreach Realignment: The base transfer of staff support and funding from the Office of Next Generational Air Transportation System (ANG) to the Office of Policy, International Affairs, and Environment (APL) will support the coordination of global outreach and better align resources with the appropriate staff office.	-300	-1
Traffic Alert Collision and Avoidance System (TCAS) The base transfer of funding from the Office of Next Generational Air Transportation System (ANG) to the Air Traffic Organization (ATO) will better align resources to the appropriate organization in support of the FAA Safety Management System (SMS) and the future of National Airspace System (NAS) surveillance technologies and operational procedures.	-250	

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Human Resource Management (AHR)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$98,858**	**599**	**32**	**620**
Adjustments to Base	**$548**	**2**		**-42**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		2		-42
Pay Inflation	$548			
Other Changes	**$2,570**			
NATCA Multi Unit Pay Raise	$2			
Working Capital Fund	$2,568			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$5,217**	**5**	**-1**	**4**
Hangar 6				
Administrative Support				
Labor Technical Realignment	$1,893	14		14
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment	-$198	-1		-1
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$4,598	-8	-1	-9
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)	$8,120			
Program Adjustments				
FY 2014 Request	**$107,193**	**606**	**31**	**582**

Executive Summary: Human Resource Management (AHR)

What Is The Request And What Will We Get For The Funds?

The FY 2014 budget request of $107,193,000 and 582 FTEs will support the Office of Human Resource Management program. This request provides for salaries and benefits as well as estimated non-pay AHR activities including implementing and maintaining the comprehensive system of policies, procedures and systems necessary for managing FAA's most important asset: its people. The request includes an increase adjustment of $2,568,000 in anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $23,097,390 except for fee-for-services printing and conference center usage. This request also includes a net increase of four FTEs with associated funding as a result of several base transfers. The FTEs and funding will also provide support for safety, policy and senior executive human resource support to the FAA lines of businesses and staff offices.

What Is This Program?

The Office of Human Resource Management supports the DOT Strategic Plan goal of Organizational Excellence, specifically contributing toward initiatives that result in a diverse and collaborative DOT workforce outcome. AHR provides funding for salaries and benefits, contractor support, and administrative funds to support staff located in FAA headquarters and 11 regional offices and centers throughout the United States. We manage a complex network of policies, programs, and systems designed to address all issues related to people such as compensation, hiring, performance management, safety, wellness, benefits, and training.

Why Is This Particular Program Necessary?

The AHR organization is responsible for the following:

- Guidance on strategically managing FAA's human capital.
- Administering an array of employee relations programs.
- Managing the relationships between FAA and its unions.
- Defining requirements, setting quality standards and training.
- Fostering a workplace free of harassment and inappropriate of employee misconduct.
- Overseeing and managing automation systems while meeting information security requirements.

How Do You Know The Program Works?

We are audited by OPM every two years to ensure our personnel system is a merit-based, legally defensible system. In FY 2011, we were successful in meeting all auditable requirements. In addition, AHR expanded FAA efforts to tap into the potential of our full performance, non-supervisory employees who seek managerial positions. To date, 1,172 applications have been submitted for the Program for Emerging Leaders (PEL) and of those, 370 participants received placement into seven PEL cohorts and 45 participants have received promotions to frontline managers. The FAA Office of Workers Compensation has achieved an estimated $881,000 in one year cost avoidance on claims from other DOT modes.

Why Do We Want/Need To Fund The Program At The Requested Level?

The AHR organization provides human resource services to all operating lines of business and staff offices (LOB/SOs) at the headquarters and to all the FAA regions including the two centers and overseas. The AHR program delivers the comprehensive system of policies, procedures and system necessary for managing FAA's most important asset: its people. Funding at the requested level is critical to continue providing basic personnel services to all FAA employees.

Detailed Justification for - Office of Human Resource Management

What Is The Request And What Will We Get For The Funds?

**FY 2014 – Office of Human Resource Management
($000)**

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Human Resource Management	$98,858	$99,463	$107,193	+$8,335

The FY 2014 budget request of $107,193,000 and 582 FTEs will support the Office of Human Resource Management (AHR) program. This request provides for salaries and benefits, and non-pay activities including implementing and maintaining the comprehensive system of policies, procedures and systems necessary for managing FAA's most important asset: its people. The request includes an increase adjustment of $2,568,000 in anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $23,097,390 except for fee-for-services printing and conference center usage. This request provides for several base transfers for a net total of $5,217,000 and 4 FTEs to support labor technical realignment of 14 FTE ($1,893,000), emergency operations coordinator -1 FTE (-$198,000), consolidation of Information Technology (IT) resources to Shared Services -9 FTE (-$4,598,000), and Center for Management and Executive Leadership (CMEL) ($8,120,000) to better realign resources to their respective line of business or staff office. The FTEs and funding will support safety, policy and senior executive human resource to the FAA lines of businesses and staff offices.

Funding at the requested level allows FAA to provide functional support to innovative, flexible and efficient personnel systems designed to acquire, develop and retain talented employees. The FAA workforce is the backbone of the agency's success in providing the safest, most efficient aerospace system in the world. Civil aviation contributes $1.2 trillion annually to our nation's economy and nearly 11 million jobs and our dedicated, talented workforce is fundamental to ensuring the safety of the flying public.

The AHR request covers our daily work in providing human resource services to the more than 48,000 FAA employees. We support five high priority objectives: hiring reform, human capital management, leadership development, employee engagement and labor management relations. AHR plans to continue implementing the current Administration's flagship personnel policy reform initiative. We continue to fund the strategic management of human capital, which helps FAA ensure they have the skilled workforce needed to transform to NextGen. In FY 2014, we will continue implementing leadership development programs to build a new generation of leaders and employees to achieve FAA's mission. We will develop and implement a series of immediate and long-term strategies to improve the engagement, commitment and satisfaction of FAA's workforce, which is a significant factor in enabling the Department of Transportation to advance the multi-modal transportation system of the future. Lastly, AHR will implement a corporate strategy that fosters effective, positive and collaborative labor management relations.

Funding in FY 2014 will support the following outputs:

- Ensuring the agency rates in the top 25 percent of places to work in the federal government by employees.
- Streamlining hiring practices to achieve the performance target set by DOT in meeting OPM's 80-day hiring standard.

Funding in FY 2014 will result in the following outcomes:

- Implementation of President Obama's hiring reform agenda. Social networking tools will be used to identify, connect and recruit top talent. Our streamlined end-to-end hiring process will allow us to select high-quality candidates efficiently and quickly, and comply with OPM's 80-day hiring model.

- Transition FAA successfully to NextGen. Effecting this transition will involve a systematic approach to getting the right number of people with the right skills, experience and competencies in the right jobs at the right time. AHR evaluates and identifies changes to the qualification requirements for air traffic controllers in the emerging NextGen system.
- Increased leadership competence within FAA. The development of our executive corps is grounded in creating a culture of accountability and making FAA more effective while the Senior Leadership Development Program enhances the pipeline of highly qualified FAA senior managers who can fill projected executive vacancies.
- Becoming an employer of choice. DOT and FAA consider improving the linkage of employee performance to strategic goals a critical step in improving employee satisfaction, reducing turnover and attracting a high performance workforce.
- Improved FAA's corporate labor-management relationships. AHR will provide advice and guidance to all FAA managers and labor relations practitioners about collaboration efforts and techniques as well as offer training that include approaches to building trust, effective communications and interest-based problem-solving techniques.
- Through May 2012, the FAA Office of Workers Compensation has achieved an estimated $881,000 in one year cost avoidance on claims from DOT modes, excluding FAA.

What Is This Program?

The Office of Human Resource supports the DOT Strategic Plan goal of Organizational Excellence, specifically contributing toward initiatives that result in a diverse and collaborative DOT workforce outcome. AHR provides funding for salaries and benefits, contractor support, and administrative funds to support staff located in FAA headquarters and 11 regional offices and centers throughout the United States. We manage a complex network of policies, programs, and systems designed to address all issues related to people such as compensation, hiring, performance management, safety, wellness, benefits, and training. Compensation alone requires skill in navigating the intricacies of 28 collective bargaining agreements.

Anticipated FY 2014 accomplishments include:

- Provide corporate agency guidance and consultation as necessary to monitor and assess the implementation of the agency Employee Engagement Action Plan.
- Provide oversight for ongoing workforce planning and annual plan updates by providing workforce data, updated guidance/requirements, tools and consultation to Lines of Business and Staff Offices.
- Manage the operation and maintenance within FAA of personnel and payroll automated processing by the Federal Personnel and Payroll System, and expand and enhance the Selections within Faster Times automated suite to all mission-critical positions and those positions that cross-organizational lines, i.e., finance, budget, human resources, and information technology.
- Provide day to day operational support and services to FAA managers on compensation, staffing, labor and employee relations, employee safety and workers' compensation programs, employee assistance program, benefits, awards, training and human resources automation.
- Manage oversight and compliance of all bargaining with FAA unions. AHR will monitor and ensure compliance of all bargaining with FAA unions in accordance with FAA Order 3710.18, Internal Coordination Requirements for Negotiating Term and Mid-Term Agreements with FAA Unions, and the Federal Service Labor-Management Statute.

The services AHR provides to FAA lines of business and staff offices include:

- Giving guidance on strategically managing FAA's human capital by analyzing and interpreting results of employee surveys, improving workforce planning processes, conducting competency assessments and skill gap analyses for mission critical occupations.
- Administering the broad array of employee relations programs related to conduct, benefits and work-life issues.
- Managing the relationships between FAA and its unions, representing the agency in all national and headquarters negotiations, unfair labor practices proceedings and arbitrations.
- Defining requirements, setting quality standards and monitoring the effectiveness of corporate training, addressing training and development needs of the full range of FAA employees.

- Fostering a workplace free of harassment and inappropriate behavior by investigating and adjudicating allegations of employee misconduct.
- Overseeing and managing automation systems regarding time collection, labor reporting, personnel and payroll for every agency employee while meeting all information systems security requirements.

Why Is This Particular Program Necessary?

Congress challenged FAA to meet the demanding productivity, service and efficiency expectations of the public and the aviation industry by designing and implementing independent human resources and acquisition systems. They later amended that authority to require that FAA follow the Federal Service Labor-Relations Statute with exception to impasse proceedings. Congress was clear that FAA's Personnel Management System would replace the former Title 5 system that governs most Federal agencies. The FAA Personnel Management System is an FAA-wide system. The FAA HR system by law, definition, rule, order and practice includes recruitment and placement, employee benefits, employee relations, labor relations, compensation, performance management, HR information systems, and the necessary policies that support the HR operational function. AHR's mandated responsibilities impact all FAA employees across all lines of business and staff offices, bargaining/non-bargaining units and geographic areas. Without the men and women of FAA, the agency cannot achieve its mission to provide a safe, efficient aerospace system for the American public. AHR is the office that manages the comprehensive system of policies, procedures and systems necessary for acquiring, developing, and retaining the right people for the right job at the right time.

Within FAA, AHR oversees and manages automation systems regarding time collection, labor reporting, personnel and payroll for every agency employee. Using an iterative approach enables efficient and cost-effective delivery of services and supports our hiring reform effort.

One of the key challenges facing FAA is building the workforce of the future to meet the transition to NextGen. Effecting this transition will involve a systematic approach to getting the right number of people with the right skills, experience and competencies in the right jobs at the right time. AHR evaluates and identifies changes to the qualification requirements for air traffic controllers in the emerging NextGen system. Workforce planning for mission critical and key occupations will benefit FAA managers as they make staffing decisions to achieve program goals based on a rigorous analysis of their organization's work, workforce and expected technological advances. AHR will supply workforce demographics and employment data, facilitating the identification of issues such as growing retirement eligibility and anticipated turnover. AHR will provide tools for identifying competencies needed in the future and solution analyses on recruiting, reassigning, retaining and retraining employees. State-of-the-art recruitment and marketing programs will be implemented to attract high performing and highly qualified candidates. The flying public will benefit from a better prepared, trained and safer workforce.

Another challenge is building leadership competence within FAA. AHR manages and delivers programs that build leadership capabilities, support professional development and promote continuous learning at executive, manager and employee levels. The development of our executive corps is grounded in creating a culture of accountability and making FAA more effective. Development activities feature the new executive orientation forum and on-boarding activities, as well as participation in agency and government-wide executive seminars on topical issues and current events. The Senior Leadership Development Program (SLDP) enhances the pipeline of highly qualified FAA senior managers who can fill projected executive vacancies. Our Program for Emerging Leaders (PEL), offers non-supervisory employees opportunities over an 18-month period for assessment, mentoring, formal online and classroom training, and developmental assignments. Building stronger leadership within the agency helps FAA achieve strategic goals and manage people and resources effectively while driving continuous improvement.

Becoming an employer of choice is a high priority objective for DOT and FAA. The Employee Engagement Steering Committee, spearheaded by HR, is charged with implementing strategies to get employees excited about working for FAA and strengthening their commitment to the mission and shared values of the agency. HR will update managerial and executive development and training to reflect emerging challenges and deliver activities designed to make the leadership team more visible to the workforce. Using the on-boarding process for new hires will build employees' affiliation and strengthen engagement and commitment to FAA and accelerate the time-to-productivity for new hires. AHR will market the value of using work plans to supplement generic performance standards, providing another opportunity to establish clear performance expectations and provide feedback and coaching. DOT and FAA consider linking employee performance to strategic goals a critical step in improving employee satisfaction, reducing turnover and attracting a high performance workforce.

AHR will implement FAA's corporate labor-management engagement plan. Transitioning to NextGen will pose challenges that, if not effectively managed, will result in strained labor-management relationships throughout FAA. AHR will provide advice and guidance to all FAA managers and labor relations practitioners about collaboration efforts and techniques as well as offer training that include approaches to building trust, effective communications and interest-based problem-solving techniques.

How Do You Know The Program Works?

We are audited by OPM every two years to ensure our personnel system is a merit-based, legally defensible system. We are successful in meeting all auditable requirements. Building on the success of the executive and senior leadership programs, AHR expanded FAA efforts to tap into the potential of our full performance, non-supervisory employees who seek managerial positions. To date, 1,172 applications have been submitted for the Program for Emerging Leaders and of those, 370 participants received placement into seven PEL cohorts and 45 participants have received promotions to frontline managers.

Anticipating a retirement bubble and addressing competition for attracting a skilled workforce, the FAA adopted the challenge of the Administration's end-to-end hiring initiative. Measuring hiring time remains a critical step in improving the efficiency in our hiring process. AHR has met the Department of Transportation's performance target of filling external hires within 120 days.

AHR has realized a cost avoidance of $6,900,000 through resolution of workers' compensation claims, a significant contribution to the agency's cost control effort. Because we have the subject matter experts, the FAA has the management of all Workers' Compensation payments for the Department of Transportation. This responsibility has already resulted in helping the other modes of the Department of Transportation realize a cost avoidance of over $880,000. We expect to accomplish more in the future.

Why Do We Want/Need To Fund The Program At The Requested Level?

Funding at the requested level is critical to continue providing basic personnel services to all FAA employees. For example, since FY 2011, the cost of receiving electronic leave and earnings statements through Employee Express doubled. Also, we received a 20 percent increase in the interface with USAJobs. While AHR has absorbed rising costs such as these examples, if this trend continues, we will be unable to meet future demands with stagnant funding.

Deeper cuts would result in losing our ability to maintain our employee engagement effort, which is critical to hiring and retaining the talent we need to manage the air transportation system of the future. We would be constrained in identifying skill sets and assess competencies (the first steps in developing career paths) as we prepare to hire the NextGen workforce.

We would reduce our participation in recruiting events, limiting our ability to support DOT and FAA's goals of maintaining a diverse workforce, and hiring veterans and persons with targeted disabilities. Also, we would be unable to develop and update information used for different types of recruiting media, limiting FAA's ability to reach candidates of all ages and hire the right person for the right job at the right time. As more federal employees become eligible to retire in FY 2014, the competition for talent will increase and the time to fill positions will lengthen.

Although employees look for ways to balance the increasing demands of work and personal time, we would reduce access to the online health and wellness program now available to every FAA employee and the suite of online services that assists employees with issues such as geriatric care and legal and financial concerns.

With reduced funding, we would be unable to implement enhancements to AVIATOR, the FAA's online application system, to include the FAA's interface with USAJobs. Also, although supporting the President's hiring reform agenda is mandated, all IT solutions will have to be deferred for improvements such as maintaining centralized pools of applicants for mission critical occupations.

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Explanation of Funding Changes

	Dollars ($000)	FTE
Human Resource Management	**+$8,335**	**-38**
Overview: For FY 2014, the Office of Human Resource Management requests $107,193,000 and 582 FTE to provide for salaries and benefits as well as estimated non-pay AHR activities including implementing and maintaining the comprehensive system of policies, procedures and systems necessary for managing FAA's personnel The FY 2014 request level reflects funding for unavoidable adjustments, uncontrollable adjustments, and base transfers.		
Adjustments to Base	**+$548**	**-42**
FY 2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels		-42
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September). The factor used is 1.0 percent.	+548	
Uncontrollable Adjustments	**+$2,570**	
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes pay inflation, Organizational Success Increase (OSI), and Superior Contribution Increase.	+2	
Working Capital Fund: This cost adjustment is requested to support the Department of Transportation's (DOT) Working Capital Fund (WCF) profile. These adjustments are being made to best align each office's resources with their expected WCF costs.	+2,568	
Base Transfers	**+$5,217**	**+4**
Labor Technical Realignment: This base transfer request consists of two sets of transfers between the Office of Human Resources (AHR) and the Air Traffic Organization (ATO). The transfer of labor relations resources between the two Lines of Business will better align resources with the appropriate organization and eliminate redundancy.	+1,893	+14
Emergency Operations Coordinator: The base transfer of staff support and funding from the Office of Human Resources (AHR) to the Office of Security of Hazardous Materials Safety (ASH) will support the FAA emergency operations planning as it relates to human behavior and performance. This will better align resources to the appropriate office and will help improve the FAA's emergency preparedness and response to national incidents.	-198	-1
Information Technology Resource Consolidation: This base transfer represents the transformation of multiple IT units aligned with the FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support.	-4,598	-9
Center for Management and Executive Leadership (CMEL) This budget submission requests concurrence to base transfer the Center for Management and Executive Leadership (CMEL) from the Office of the Assistant Administrator for Finance and Management (Regions and Center Operations) to the Office of Human Resource Management. The CMEL transfer will align the requirements and performance organization to better enable the planning and execution of management training.	+$8,120	

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Staff Offices
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$200,285**	**1,093**	**25**	**1,050**
Adjustments to Base	**$1,186**	**-2**		**-20**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-2		-20
Pay Inflation	$1,186			
Other Changes	**-$609**			
NATCA Multi Unit Pay Raise	$16			
Working Capital Fund	-$625			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$1,061**	**-13**		**-12**
Hangar 6				
Administrative Support	$72	1		1
Labor Technical Realignment				
Civil Rights Realignment	$1,499	4		4
Property Management Realignment				
NextGen Global Outreach Realignment	$300	1		1
Intervention Program Establishment	$290	1		1
Emergency Operations Coordinator Realignment	$198	1		1
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$3,420	-21		-20
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$199,801**	**1,078**	**25**	**1,018**

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Executive Summary: **Staff Offices**

What Is The Request And What Will We Get For The Funds?

The request of $199,801,000 and 1,018 FTEs allows FAA Staff Offices to provide executive leadership, policy and planning, legal counsel, security services, and other administrative services in support of FAA's mission. The request includes base funding of $200,285,000, pay and non-pay increases totaling $577,000, base transfers of $-1,061,000, to provide a greater level of support to the entire agency.

What Is The Program?

The Staff Offices of FAA include the Office of the Administrator, Chief Counsel and seven assistant administrators who provide mission support services to the four lines of business, including legal counsel, economic trend analysis, diversity leadership, government and industry liaisons, communications and public relations. A brief description of staff offices are outlined as follows:

- The Office of Audit and Evaluation performs audit and investigative review functions primarily for internal safety disclosures and concerns, including the FAA Whistleblower Protection Program.
- The Office of Civil Rights advises, represents, and assists the FAA Administrator on civil rights and equal opportunity matters.
- The Office of Government and Industry Affairs serves as the Administrator's principal adviser and representative on matters concerning relationships with the Congress, aviation industry groups, and other governmental organizations, developing and reviewing plans and strategies involving these groups to enhance aviation safety.
- The Office of Communications is responsible for the policy, direction, and management of the agency's communications programs for the news media and FAA's employees nationwide.
- The Office of the Chief Counsel provides legal support services providing legal advice, reviewing agency action for legal sufficiency and conformity, and representing agency interests in various administrative and court forums.
- The Office of Policy, International Affairs, and Environment serves as the principle advisor to the Administrator on international matters.
- The Office of Security & Hazardous Materials Safety develops and implements policy to protect FAA employees, contractors, facilities, and assets.

Why Is This Particular Program Necessary?

Staff Offices provide services and resources necessary for the operations of our business. Without these services, lines of business would not have the resources needed to meet their goals. From performing mission-critical services to receiving guidance and counsel on regulatory or legal issues, or managing annual appropriations, Staff Offices make a significant contribution to the mission of FAA.

How Do You Know The Program Works?

Through the leadership of the Administrator, FAA successfully manages the most complex and safest aviation system in the world. By executing their mission responsibilities and providing management, leadership, and oversight, the FAA's Staff Offices have contributed to the overall success of the FAA.

Why Do We Want / Need To Fund The Program At The Requested Level?

Reductions below the requested level would hinder our ability to provide key support services. Our request is the funding needed to continue supporting Agency lines of business.

Office of the Administrator (AOA)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$4,135**	**20**	**4**	**22**
Adjustments to Base	**$23**			**-2**
FY 2012 Internal Adjustments				
FY 2013 Adjustments				-2
Pay Inflation	$23			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$0**			
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$4,158**	**20**	**4**	**20**

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Detailed Justification for – Office of the Administrator (AOA)

What Is The Request And What Will We Get For The Funds?

FY 2014– Office of the Administrator
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Office of the Administrator	$4,135	$4,160	$4,158	+$23

In FY 2014, the Administrator's office requests $4,158,000 and 20 FTE to meet its mission. This increase consists of basic pay inflation. Throughout FY 2014, AOA will continue to lead FAA toward achieving the agency's performance goals and targets.

What Is This Program?

The office of the Administrator and Deputy Administrator leads the agency in its mission to provide the safest, most efficient aerospace in the world. This office leads the overall planning, direction, coordination, and control of agency programs, and represents FAA in its relations with the Department of Transportation, the White House, the Congress, other agencies, the aviation community, and the general public.

Why Is This Particular Program Necessary?

In leading FAA, the Administrator oversees the Agency's employees in maintaining, operating, and overseeing the largest and most complex aviation system in the world. The agency determines the regulatory and operational standards for the United States, and effectively sets the benchmark for aviation safety around the world

How Do You Know The Program Works?

The FAA has a strong track record of achieving the vast majority of the agency's performance goals and targets.

Why Do We Want / Need To Fund The Program At The Requested Level?

The requested funding level essentially maintains the status quo and only includes inflationary adjustments , and administrative savings. There are no discretionary increases in the FY 2014 budget request.

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Office of Audit and Evaluation (AAE)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$2,790**	**19**		**19**
Adjustments to Base	**$18**			
FY 2012 Internal Adjustments				
FY 2013 Adjustments				
Pay Inflation	$18			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$290**	**1**		**1**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment	$290	1		1
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$3,098**	**20**		**20**

Detailed Justification for – Office of Audit and Evaluation (AAE)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Audit and Evaluation (AAE)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Office of Audit and Evaluation (AAE)	$2,790	$2,807	$3,098	+$308

In FY 2014, the Office of Audit and Evaluation requests $3,098,000 and 20 FTE to meet its mission. This increase consists of a base transfer of 1 FTE position and contract funding, in addition to pay inflation. The base transfer is to implement the intervention staff office, and provide contract support to provide some minimal intervention services until the regional intervention *designees* are trained and mobilized. Contract support will also be utilized to develop and provide ongoing skill training for AAE intervention *designees*, as well as, for the development of agency-wide training and education materials.

The mission of the Office primarily and directly supports the Departmental goal of increased safety, but also supports in a more generalized way the goal of building and enhancing our high performance work place. The FY 2014 funding will support the operation and management of consolidated safety hotlines and provide a centralized focus for internally and externally generated safety-related complaints, critical audits and investigations, and intervention. Additionally, the Office provides an impartial agency venue for investigation and early resolution of safety disclosure.

What Is This Program?

The Office of Audit and Evaluation has three primary functions; safety audit and investigation review and analysis; intervention and evaluation; and hotline operations and reporting. The audit and analysis staff perform audit and investigative review functions primarily for internal safety disclosures and concerns, including the FAA Whistleblower Protection Program. It is also coordinates and evaluates for completeness FAA responses to DOT- OIG, GAO and OSC generated audits, investigations and evaluations. The second function is an intervention function: providing conflict mitigation services and training for FAA employees and managers to ensure that workplace conflicts are resolved in a manner beneficial to the organization and the employee. The final function is a reporting and data function that provides for analysis of hotline submissions, coordination of AAE investigations, and reviews for completeness investigations conducted by appropriate FAA organizations. The Office also operates and manages several administrative and safety hotlines. While AAE coordinates and provides independent quality control evaluations of certain investigations conducted by the lines of business, the Office does not determine the technical merits of safety-related issues or make recommendations for resolution of particular safety-related cases. Such determinations remain the ultimate responsibility of the appropriate safety office.

The direct beneficiaries of AAE's services are the agency and the flying public. AAE embodies FAA's commitment to a vibrant and evolving internal safety culture based on continuous review, evaluation, objective analysis and measured change. AAE provides agency employees and external stakeholders with an independent and highly visible forum to openly, safely and constructively raise, address and resolve safety complaints, concerns or whistleblower contributions. AAE critical supporting activities include:

- Operating and managing the agency's hotline system, including the Safety Hotline, the Administrator's Hotline, the Public Inquiry Hotline, and the Safety Issues Reporting System (SIRS), and other programs that offer employees and others avenues to report safety-related and other concerns and make safety contributions.
- Coordinating and providing independent quality control evaluations of certain investigations conducted by the lines of business and analyzes data from a broad range of sources.
- Providing intervention assistance to managers and employees.

- Serving as primary interface and maintain a continuous liaison with GAO, OSC, and the DOT OIG investigations/audit staffs concerning safety-related investigations.
- Recording, tracking, reviewing, and confirming implementation of FAA responses to DOT OIG, OSC, and GAO audits and investigations that are under the purview of AAE.
- Managing the Whistleblower Protection Program established under 49 U.S.C. § 42121.
- Analyze data from the Safety Hotline, the Administrator's Hotline, the Public Inquiry Hotline, the SIRS, whistleblower contributions to identify trends.
- Serving as an alternative point of contact for receipt of safety-related contributions or allegations of retaliation against whistleblowers in general.
- Conducting initial reviews of contributions and investigations received, including an immediate assessment (in consultation with appropriate parties), and review responses for accuracy, thoroughness and internal consistency of handling.
- Assessing and reviewing investigations and resolutions of matters that come under its purview for fairness, impartiality and conformance with established processes; providing guidance to lines of business and staff office on how to conduct investigations thoroughly and impartially.
- Serving as a new venue to receive disclosures from FAA employees or former employees, certificate holders, related to possible violation of the an FAA regulation or order, acts or omissions that pose a high level of risk to aviation safety, or gross misconduct of agency employees involving a matter of aviation safety.

Anticipated FY 2014 accomplishments include:

- Complete an analysis of FY2013 hotline data and whistleblower contributions by the end of the first quarter and prepare a report on significant items for the Administrator by the end of the second quarter.
- Monitor milestones so that 75% of corrective actions developed by agency offices in response to internal or external audits and investigations are met.
- Improve timeliness for FAA responses to GAO, OIG and OSC audits and investigations such that 90% are delivered in accordance with established schedules.
- Improve access portals for hotline call-in directly to provide more usable information and efficient processes for contributions and ensure that 90% of call-ins receive a "call-back" within 10 business days.
- Increase agency awareness of AAE's services and successfully provide a fair and impartial venue for investigation and early resolution of safety disclosures so that OSC investigations of FAA employee whistleblower disclosures are reduced by 20%.

Why Is This Particular Program Necessary?

Since its establishment in 2008, the AAE Office has become a vital and effective organization productively addressing and resolving safety-related whistleblower disclosures and employee workplace conflicts. Significantly, the visibility and accomplishments of the AAE Office have generated a critical awareness and recognition that employees can bring their safety sensitive disclosures to an internal organization and have them objectively reviewed by an unbiased entity.

AAE clearly demonstrates FAA's commitment to creating a strong internal safety culture firmly anchored in a robust, responsive, and formalized process for addressing safety issues raised by employees, conducting internal reviews, ensuring corrective action and protecting employees who report safety concerns. Although other organizations could be tasked to address such safety matters, an independent organization evokes the highest level of integrity and objectivity. Both are critical to the effectiveness of AAE.

The need for such an office within FAA was echoed in a Department of Transportation Inspector General's recommendation. In its June 30, 2008, report, *Review of FAA's Safety Oversight of Airlines and Use of Regulatory Partnership Programs*, the Inspector General recommended that the FAA "establish an independent organization (that reports directly to the FAA Administrator or Deputy Administrator) to investigate safety issues identified by FAA employees."

How Do You Know The Program Works?

AAE was established as an independent organization during the first quarter of FY2012. At that time it received its first full complement of staff and designated funding. While AAE had previously established itself as a viable forum for raising and addressing internal safety concerns, it is now positioned to start developing standards to measure its successes. Currently, the success of the program can be gauged by its ability to timely process hotline matters, complete investigations, validate the completeness of agency responses to identified safety concerns, and ensure agency compliance with corrective actions.

Why Do We Want / Need To Fund The Program At The Requested Level?

Congress directed that FAA realign AAE as an independent organization reporting to the Administrator and provided for a defined staffing and funding level. AAE enhances agency accountability for internally identified safety concerns by providing an independent, vital and effective mechanism for addressing and resolving safety-related employee disclosures, whistleblower contributions and employee workplace conflicts. Reductions to the requested funding level would significantly reduce its effectiveness and disrupt the progress the Office has made in generating awareness and recognition that employees can bring their safety sensitive disclosures to an internal entity and have them reviewed in an objective and non-threatening forum. The safety benefits of an effective internal reporting program are well-accepted. A disruption or reduction in funding would limit AAE's progress in developing this critical safety tool.

Office of Civil Rights (ACR)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$10,650**	**79**	**4**	**79**
Adjustments to Base	**$72**			**-3**
FY 2012 Internal Adjustments				
FY 2013 Adjustments				-3
Pay Inflation	$72			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**$1,571**	**5**		**5**
Hangar 6				
Administrative Support	$72	1		**1**
Labor Technical Realignment				
Civil Rights Realignment	$1,499	4		4
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$12,293**	**84**	**4**	**81**

Detailed Justification for – Office of Civil Rights (ACR)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Office of Civil Rights
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Office of Civil Rights	$10,650	$10,788	$12,293	+$1,643

The request of $12,293,000 and 81 FTE supports the FAA's Office of Civil Rights. The FY2014 request also reflects a base transfer from the Office of Financial Services of $72,000 and 1 FTE to ACR for administrative support.

ACR takes actions that challenge, assist, and support our customers to create an environment where all are able to contribute meaningfully to the mission. Additionally, ACR advises, represents, and assists the FAA Administrator on civil rights, diversity, and equal opportunity matters.

Funding in the FY 2014 request will allow us to meet these milestones:

- Assist agency efforts to become more effective with a stronger, more knowledgeable, more accountable leadership and a better prepared, better trained, diverse workforce in the area of EEO.
- Assist in the prevention of discrimination through the implementation of agency-wide EEO policies, practices, and procedures.
- Continue our efforts on the EEO Action Committee, which meets on a quarterly basis to identify innovative recommendations regarding EEO and diversity within the FAA workplace.
- Implement a Model EEO Program that stresses the prevention of discrimination before it occurs.
- Take proactive measures to provide EEO training to agency managers and employees.
- Increase the effectiveness of the EEO Outreach Program to minority groups with lower than expected employment rates in the agency.
- Assist agency efforts to address discrimination by addressing EEO complaints through the National Intake Unit, EEO counseling, and EEO consultation services.
- Provide oversight regarding civil rights laws and regulations by administering the agency's Internal Civil Rights and the External Civil Rights (Airports) Programs.

Anticipated outputs/outcomes:

- Develop the annual EEO Plan in conjunction with FAA lines of business and staff offices (LOB/SO) to identify and eliminate EEO barriers and agency deficiencies.
- Conduct evaluations to ensure that organizations are complying with EEO mandates.
- Establish standardized processes for EEO training design, evaluation, and delivery
- Deliver high quality EEO training sessions utilizing available technology.
- Augment agency recruitment efforts by reaching out to groups with lower than expected rates by attending career fairs and events tailored to targeted groups.
- Identify the best practices for the four focus areas of Leadership Commitment, Human Capital, Agency Communication, and Supplier/Diversity by consulting with federal agencies and private industry entities that have been recognized as top leaders in diversity.
- Ensure the highest level of EEO pre-complaint processing services by establishing an EEO Counselor Certification Program to increase subject matter proficiency for all full-time EEO Counselors.
- Issue revised ADA and Title VI Orders that will set forth the standards and operating procedures for FAA enforcement.
- Establish training programs to improve the travel experience for all people but especially those underserved, underrepresented, and historically underutilized.

What Is This Program?

The Office of Civil Rights supports the DOT Strategic Plan's Aviation Access and Workplace of Choice initiatives, providing services that develop a diverse and collaborative workforce. We advise, represent, and assist the FAA Administrator on civil rights and equal opportunity matters that ensure the elimination of unlawful discrimination on the basis of race, color, national origin, sex, age, religion, creed, sexual orientation, and individuals with disabilities in federally operated and federally assisted transportation programs. Further, we work to ensure a positive working environment in the FAA by valuing, using, and managing the differences that individuals bring to the workplace.

The Office of Civil Rights works in conjunction with FAA managers to ensure EEO awareness and adherence to EEO policies and guidelines. FAA employees are trained in respectful and equitable treatment of one another. Every FAA organization, in turn, plays a role in the implementation of an effective EEO program where individuals are treated with equity and respect regardless of differences.

The Civil Rights Program's key activities include:

- Conducting Disadvantaged Business Enterprise (DBE) compliance reviews and ensures that small and disadvantaged business enterprises are able to compete with larger companies for airport construction projects and concessions.
- Adjudicating external complaints from the public and other customers.
- Managing and ensuring compliance with Title VI, Limited English Proficiency (LEP), Environmental Justice (EJ) and other civil rights policy and regulations at airports
- Improving the timeliness of processing EEO pre-complaints unless the employee agrees to an extension or alternative dispute resolution is engaged.
- Ensuring airport compliance with the American Disabilities Act.
- Conducting trend analysis to determine if there is any evidence of disparate treatment of applicants or employees based on race, sex, national origin, or other protected categories.
- Managing the National Federal Women's Program, Hispanic Employment Program and the People with Disabilities Program to ensure equal opportunity.
- Ensuring strong leadership and a well-trained, efficient workforce to enhance ACR's ability to provide a full complement of EEO services for customers as well as increase the efficiency of ACR services through the use of information technology.
- Ensuring an EEO discrimination process that can process 100 percent of the allegations and inquiries regarding EEO complaints by having adequate counseling, mediation and consulting services.
- Managing the FAA EEO Pre-Complaint Process and ensure that the process is administered in accordance to policy and regulations by reviewing reports of investigations, providing consultation, and overseeing the alternative dispute resolution process.
- Providing leadership, policy and direction on EEO to the agency in the area of the alternate dispute resolution program and through EEO evaluations.

Anticipated accomplishments include:

- Provide consultations and training to 200 airport sponsors on the DBE program, Title VI of the Civil Rights Act of 1964, LEP, EJ, ADA, Section 504 of the Rehabilitation Act of 1973, and on other civil rights policies and regulations affecting airports. Maintain an online FAA DBE-connect system to allow DBEs to find relevant airport opportunities, and allow airports to find certified DBEs in areas of work needed to support their DBE goals. In order to increase the diversity in DBE participation, ACR will enhance the system with job opportunity and training functions.
- Ensure compliance with ADA/Section 504, Title VI, and Environmental Justice regulations by conducting a minimum of 20 reviews and consultations at various airports throughout the nation.
- Establish a partnership with at least two external organizations to enrich and market EEO efforts in various minority communities.
- Establish at least five educational partnership initiatives with colleges/universities, technical schools, and/or high schools as an outreach tool to build the FAA workforce of the future.
- Conduct a mission critical occupation barrier analyses and collaborate with the LOB/SO to provide recommendations and actions for improvement with regard to the barriers identified. ACR will also work

toward eliminating a minimum of two agency deficiencies identified in the agency self-assessment to ensure compliance with Management Directive 715.
- Visit 20 FAA facilities to offer EEO consultations, conduct training, and address workplace issues from managers and employees, the goal being to further establish FAA as a workplace of choice.
- Manage an EEO Discrimination Pre-Complaint Program that can process 100 percent of the allegations and inquiries regarding EEO complaints through counseling, mediation, and consulting services.

Why Is This Particular Program Necessary?

The FAA Office of Civil Rights (ACR) provides leadership and direction with regard to civil rights, diversity, and equal opportunity matters. Internally, the ACR mission is to aid in the prevention of unlawful discrimination on the basis of race, color, national origin, sex, age, religion, sexual orientation, and individuals with disabilities employed by the FAA. There are four major internal programs; EEO complaint services and Alternative Dispute Resolution services; Model EEO Program; EEO Outreach; and EEO Training.

Externally, the ACR mission is to provide airport oversight with regard to civil rights laws and regulations. ACR works to ensure that all beneficiaries of federally assisted transportation programs are offered equal opportunity for participation and are free from discrimination. There are three major external programs; Disability Airport Compliance; Airport Non-discrimination Compliance; and Disadvantaged Business Enterprise (DBE) Compliance. It includes airport compliance with the Americans with Disabilities Act, Title VI, Limited English Proficiency, Environmental Justice and other civil rights regulations.

Some of the yearly measurable benefits to our customers and beneficiaries include:

- Address all EEO complaints in a timely and professional manner.
- Provide quality EEO training to 8 percent of the FAA workforce to reduce EEO complaints.
- Execute a National External Training Conference for approximately 200 persons to address civil rights obligations and requirements

The FAA Office of Civil Rights has oversight of internal and external EEO policy, which if not properly funded or staffed, could cause serious dissatisfaction in the workplace. If FAA personnel are not properly trained on EEO matters and complaints are not addressed in a timely and effective way, there is a further risk of losing quality employees to other agencies that place an emphasis on EEO and diversity.

Without the requested level of funding, ACR will be ill-equipped to successfully execute our mission and support DOT's Workplace of Choice initiative. ACR needs adequate resources to further promote diversity and EEO within the agency and to improve employee morale for years to come.

How Do You Know The Program Works?

Over the past several years, ACR has made significant progress in numerous areas including:

- EEO Complaint Activity: ACR worked with LOB/SO to reduce the "FAA complainant to total FAA total employment" ratio of 0.58 percent to 0.54 percent by providing adequate counseling, facilitation, mediation, and consulting services. Additionally, the participation rate for mediations for informal EEO complaints was 30 percent in fiscal year 2011.
- DOT 3 percent Hiring Goal for People with Targeted Disabilities: FAA hired a total of 13 people with targeted disabilities (PWTD) in fiscal year 2011. This constitutes 0.61 percent of all new hires. Additionally, FAA increased the onboard rate of PWTD from 0.56 percent in fiscal year 2010 to 0.59 percent in fiscal year 2011. ACR also developed and presented numerous trainings for managers in HQ, Regional Offices, and Centers regarding disability related topics, including: How to hire and Accommodate PWTD; FAA On-the-Spot Hiring Authority for PWTD; Disability Sensitivity Training; Interacting with People with Disabilities.
- EEO Training Institute: The ACR EEO Training Institute, the Civil Rights Directors, and staff provided EEO training to 12.2 percent of the FAA workforce. Out of 1,079 Air Traffic Controllers and Technical

Operation students hired, the EEO Training Institute trained 1,013 or 93.8 percent. Additionally, the Institute created a video on "EEO Responsibilities and Accountability."

- EEO Outreach Plan: FAA participated in 114 outreach events, targeting minorities, women, and people with disabilities. During the events, ACR collected over 7500 signatures. The Outreach Program also developed and Outreach newsletter, as a "Special Outreach Edition" of the ACR Quarterly Bulletin. The bulletin included articles regarding EEO consultations, Speed Mentoring, Mentorship Programs, Hiring PWD, and the use of Video Teleconference Technology to conduct outreach.
- The EEO Action Committee continues to meet quarter with executives from each LOB/SO to strategically address challenges and work towards compliance in accordance with EEO Commission Management Directive 715.
- Consulted with 561 airport grant recipients on developing DBE goal methodologies under Part 26. ACR consulted with 81 airport sponsors on developing concession programs under Part 23. Additionally, ACR conducted seven (7) onsite reviews, which included: Tennessee DOT, Monroe Regional Airport, Paine Field Airport, Kahalui Airport, Teterboro Airport, Findlay Airport, and Nashua Airport.
- ACR assisted in the successful development of the ACDBE airport opportunity electronic information exchange system, also known as FAA dbE-Connect. The system currently includes: DBE/ACDBE directory, bid opportunities, FAA job opportunities, DBE and ACDBE training opportunities, listing of upcoming conferences, and useful links. FAA dbE-Connect continues to increase its current listing of over 11,000 DBE/ACDBE firms, 8 full UCP directories, and 6 partial UCP directories. Since its launch, there have been 840 directory searches, 180 bid postings and 3,160 bid posting searches.
- ACR continues to market and provide awareness to all FAA employees on the agency's EEO principles by: leading marketing campaigns to promote ACR programs and services; maintaining FAA managers and supervisor updated with the latest information through the Civil Rights Bulletin; and conducting the annual National EEO Awareness Day celebration.

Why Do We Want / Need To Fund The Program At The Requested Level?

The FAA Office of Civil Rights is committed to providing a workplace that promotes equal opportunity, is free of harassment, and is an environment where employees can focus on productivity, not conflict. ACR will be needed for advice, guidance, and problem-solving as the agency moves forward with this initiative. The funding that is requested will allow ACR to provide a well-trained, well-informed staff to assist FAA management with EEO matters.

ACR has received nominal increases in most fiscal years. The minimal budgetary increases have covered annual inflation and pay increases. Given the current budgetary environment, ACR is planning for minimal increases for the next several fiscal years to help offset inflation and potential pay increases.

Over the past several years, ACR has taken a very proactive approach to conflict management. Alternative dispute resolution is a means for employees and managers to resolve disputes before they become formal EEO complaints. Formal complaints cost the agency numerous resources in terms of employee productivity as well as funding. ACR will continue this proactive approach with the funds requested and increase the savings realized by the agency.

In order to do an effective job of marketing the use of ADR to employees and managers and to reduce the number of formal complaints in FY 2014, we need a major campaign of face-to-face training as well as a presence at major organizational conferences and meetings around the country reaching all levels within the FAA. We need to increase the use of media such as ATN broadcasts, teleconferencing, and brochures to educate managers and staff on the innovative techniques that are available to resolve workplace disputes. It is also imperative to have highly trained Civil Rights personnel who are able to conduct mediations around the country for difficult and highly visible cases. The use of ADR/mediation will result in dispute resolution in the early stages thus reducing the number of formal EEO complaints. This will be a tremendous cost savings to the FAA. ACR with the assistance of an Economist from the Office of Aviation Policy and Planning conducted a study on Labor Costs for Processing an EEO Complaint. The study concluded that the labor cost associated with a successful ADR at the informal stage is less costly than the labor cost associated with a formal complaint. By enhancing the ADR program, FAA management will gain an increased knowledge of the mediation process and the associated increase in participation will equate to agency-wide cost savings. Using the figures from the study, the labor costs associated with a formal complaint can run as high as

$18,300 per case while the labor costs associated with a successful mediation top out at approximately $5,000. Successful mediations represent a more than 70 percent cost savings per case to the FAA.

As mentioned above, ACR has shifted our focus from just processing EEO complaints to becoming involved in true conflict resolution and training. Without adequate funding, ACR will not be able to train and provide skilled mediators to resolve workplace issues. The result will be additional monetary costs to the agency if disputes are not settled before becoming formal complaints. Additionally, morale could suffer if FAA employees are not adequately trained on EEO issues.

In order to effectively perform barrier analysis to eliminate barriers to employment for minorities, women and people with disabilities and conduct successful outreach, ACR must have sufficient staff to perform these functions. ACR must conduct barrier analysis with regard to merit promotion, awards, and training to determine if there are barriers in these areas. In addition, FAA must identify where applicants are failing in the hiring process e.g. testing, medical, security, interview, etc. If adequate funding is not provided, we will have to decrease our barrier analysis efforts, possibly resulting in little or no change to the FAA demographics.

Other potential results of not funding the program at the requested level include:

- Congress and EEOC will continue to view our EEO efforts as ineffective.
- EEO Complaints will continue to rise.
- ADR will not be viewed as an effective tool for resolving complaints.
- Barriers to EEO will continue to go unnoticed.
- Reducing the amount of resources devoted to EEO Outreach activities potentially sending a negative message to women, minorities, and people with disabilities and causing a decrease in the diversity of the FAA applicant pool.

Government and Industry Affairs (AGI)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$1,573**	**12**		**11**
Adjustments to Base	**$12**	**-2**		**-1**
FY 2012 Internal Adjustments				
FY 2013 Adjustments		-2		-1
Pay Inflation	$12			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers				
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$1,585**	**10**		**10**

Detailed Justification for – Government and Industry Affairs (AGI)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Government and Industry Affairs
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Government and Industry Affairs	$1,573	$1,583	$1,585	+$12

The FY 2014 budget request of $1,585,000 and 10 FTEs will support the Office of Government and Industry Affairs program. The following core activities represent the FY 2014 budget request:

- Communicate to Congress on behalf of the Administrator and management board.
- Enhance AGI's daily interaction with LOB and SO, 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.

What Is This Program?

The Office of Government and Industry Affairs 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.

Why Is This Particular Program Necessary?

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.

How Do You Know The Program Works?

AGI office engages and fosters productive relationships with key Members of Congress and Congressional Committees of jurisdiction to further awareness about and manage expectations surrounding FAA's principal mission—safety.
While we seek the resources to continue to improve the quality, timeliness, and usefulness of our core business functions, we know the program works through several indicators:

- Ensured passage of FAA authorization after more than 20 extensions;
- Serves as FAA's focal point to coordinate agency actions relating to Congressional oversight of FAA programs;
- Manages the Reports to Congress program within the FAA. Serves as the FAA Reports Control Officer and is responsible for providing the DOT Congressional Reports Officer all information to disseminate to Congress and interested parties; approximately 30 reports were submitted to Congress in FY 2012;
- Coordinates with Departmental officials to ensure consistency in furthering policies relating to Congressional and intergovernmental relations issues;
- Keeps FAA Associate Administrators and the offices and services informed of Congressional and public concerns which may influence their operational responsibility;
- Coordinates all incoming Congressional Correspondence; and
- Coordinates Congressional Hearings and Briefings:
    - Ensures witnesses are well-prepared to answer questions at hearings

AGI solicits information from program offices within the Agency to better understand and communicate potential areas of interest or concern to the United States Congress. AGI strives for inter-agency coordination by providing Congress with timely and quality responses to all Congressional inquiries (i.e. briefings, calls, outreach events, etc.).

The work of this office enables the Administrator, Deputy Administrator, and Associate Administrators, etc. to effectively interact and communicate the policies and positions of the FAA before the United States Congress. Our established congressional relations are vital to advancing the aviation priorities of the Agency, Department, and the Administration.

Why Do We Want / Need To Fund The Program At The Requested Level?

FAA needs to have one office whose mission it is to provide high quality, timely communications to Congress. When we communicate well, the FAA gets heard. It is essential that public policy gets debated on its merits so that the best outcomes can result. Without this office, too much of the debate would be consumed by process instead of policy.

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Office of Communications (AOC)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$5,774**	**34**	**1**	**34**
Adjustments to Base	**$444**			**-3**
FY 2012 Internal Adjustments	$400			
FY 2013 Adjustments				-3
Pay Inflation	$44			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers				
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation				
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$6,218**	**34**	**1**	**31**

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Detailed Justification for -- Office of Communications (AOC)

What Is The Request And What Will We Get For The Funds?

FY 2014 - Office of Communications
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Office of Communications	$5,774	$6,209	$6,218	+$444

This request is for $6,218,000 and 31 FTE to support AOC's critical outreach to news media, FAA-licensed individuals, the flying public, and the FAA's more than 48,000-member workforce. The FY2014 request also reflects internal adjustments from FY2012 that are contained within FY2012 and the next fiscal year but are no longer obvious in the FY2014 President's Budget. AOC works with news media and stakeholders to provide the public with accurate, timely, useful and important information about the agency's goals, policies, activities and operations. AOC serves as the internal voice of the FAA, providing employees with daily, weekly, and periodic communication vehicles and news programs.

AOC manages an agency-wide employee collaboration program that enables employees to share ideas, participate in conversations, and support the FAA's safety mission through online communities that enable innovation and collaboration. AOC also oversees the FAA branding program, multimedia (broadcast and video) services and all web content for the agency at large.

Our FY2014 Key Outputs and Outcomes Include:

- Increase awareness and understanding of FAA safety, NextGen initiatives and National Airspace System efficiency and capacity enhancements through press conferences, media briefings, roundtables, direct outreach to reporters, press releases, websites, social media, and other communication channels.
- Increase awareness of the FAA's role as a world leader on aviation issues.
- Use multiple communications channels to promote key FAA safety initiatives (e.g. child safety, laser awareness, runway safety, etc).
- Respond to media calls about safety and other issues within 24 hours with accurate information and ensure the delivery of urgent, time sensitive information to key audiences.
- Continue improvements to FAA websites to increase online customer satisfaction.
- Ensure the efficient online delivery of aviation safety related regulatory documents including flight safety, airworthiness directives, and pilot and aircraft licensure.
- Support open government initiatives to make data available, improve online services, and increase collaboration with citizens, stakeholders and other government agencies.
- Improve frequently asked questions knowledge base to help public website customers find answers to common questions via a web self-service interface.
- Use external social media channels to engage with and educate the flying public and aviation industry professionals about key FAA safety initiatives (e.g. FAA official Facebook, Twitter, YouTube properties).
- Use new media technologies to extend the FAA's reach to delivery aviation safety information to targeted pubic audience.
- Increase employee understanding of agency programs and activities.
- Lead the DOT/FAA IdeaHub program to leverage employee ideas to help accomplish the FAA mission, make the organization a better place to work, and improve morale through engagement.
- Use a variety of internal communications vehicles to increase employee understanding of agency strategic goals, programs and activities. Obtain feedback that helps the FAA meet those goals.

What Is This Program?

The Office of Communications (AOC) is responsible for the policy, direction, and management of the agency's communications programs for the news media and FAA's employees nationwide. The Office of Communications is both the external and internal spokesperson for the FAA. The AOC mission is to disseminate accurate and timely aviation and aviation-related information affecting FAA licensed individuals, employees, and the flying public.

Media Relations

AOC works closely with FAA's lines of business and staff offices to provide timely, accurate information on FAA programs and activities under FAA's five strategic goals. AOC advises all agency officials on communication strategy and prepare them for media interviews and other public appearances. Office activities also support the Department of Transportation (DOT) goal of Organizational Excellence by facilitating clear, timely, consistent, and inclusive communications. AOC also coordinates the activities of the regional and center public affairs officers.

Employee Communications

AOC coordinates with the agency's lines of business and staff offices to provide more than 48,000 FAA employees with pertinent, accurate, and timely information on agency programs and activities. In addition, through FAA employee websites, AOC provides information and resources employees need to do their jobs. Through agency-wide employee engagement programs, AOC enable employees to share ideas, participate in conversations, collaborate together and support the FAA's safety mission through online communities that increase innovation, efficiency, and productivity. AOC manages the FAA's internal and external websites as well as internal web-based publications, social media platforms, video, audio and information-sharing programs. The FAA's external web pages inform FAA-licensed individuals and the flying public on issues involving aviation and aviation-related programs. Together these websites receive more than four million visits per month.

Anticipated Accomplishments Include:

- Increase positive coverage of FAA safety programs, NextGen initiatives, National Airspace System efficiency and capacity enhancements and reinforce FAA's role as a world leader on aviation issues.
- Ensure that at least seven articles, news stories or editorials appear in national publications or television coverage that positively highlight agency safety initiatives.
- Ensure that at least seven articles, news stories or editorials on NextGen appear in national publications or television coverage that positively highlights agency technology or procedural advances that will enable NextGen.
- Ensure at least four articles, news stories or editorials on separate topics appear in national publications or television coverage that positively highlight agency international leadership initiatives and when appropriate, communicate the FAA's role as a world leader on aviation issues in responses to day-to-day media inquiries.
- Ensure rapid response to media requests and provide critical information to the public in the event of an aviation emergency.
- Provide monthly web traffic, satisfaction, and usage reports including social media for FAA.gov and Employees.FAA.gov visitor usage, email subscriptions, and downloads.
- Achieve an average ACSI customer satisfaction score of 73 or better on the FAA public website for FY 2013 and FY2014.
- Deliver more than 6 million FAA safety and regulatory documents online instead distributing in print.
- Publish daily broadcast email messages to employees that promote FAA programs and HR information as well as raise awareness of coverage of FAA in the press.
- Welcome more than 4 million visitors to FAA public and employee websites every month.
- Launch mobile device optimized FAA public website.
- Publish more than 250 employee news articles in Focus FAA that increase employee understanding of agency programs and activities.
- Receive more than 500 comments from employees on employee ideas to improve the FAA.
- Promote at least 10 FAA leadership messages to the workforce.
- Provide audio/visual support for more than five FAA/DOT employee town hall events.

- Answer 98 percent of questions received through the FAA Frequently Asked Questions knowledge database on the FAA public website.
- Reach a total external social media audience of at least 300,000 on child restraint system safety awareness and an audience of at least 500,000 on the dangers of pointing lasers at airplanes.

Why Is This Particular Program Necessary?

The Office of Communications, as FAA's internal and external voice, is responsible for the policy, direction, and management of the agency's communications programs for the news media, FAA employees nationwide as well as the flying public and key stakeholders. These programs and services are vital to AOC's mission to drive communications in support of the FAA and the DOT.

AOC coordinates with lines of business and staff offices to provide employees with pertinent, accurate, and timely information on agency programs and activities using audio/video services, a web-based employee newsletter and other communication channels.

Benefits of these communication services - With more than 48,000 employees working in offices and in the field, around the country and abroad – the FAA intranet, employee news, daily broadcast, and audio/video production services are a vital part of ensuring employees are connected with the vision, mission and values of the agency. These vital communications vehicles ensure that employees get information about everything from HR benefits to changes in programs that may directly impact them. Strong internal communications generate a more engaged, productive, and loyal workforce. AOC measures the benefits of these programs through the direct feedback received from employees on a regular basis and measures effectiveness through the number of visits to the news sites and video products as well as the online engagement that these products is generate.

Readership and engagement have increased significantly through these communications channels. Employees have come to expect the information that AOC delivers via these services. Other offices have come to expect the communications services that AOC provides for them which help convey important information about the agency programs they are responsible for.

How Do You Know The Program Works?

AOC has a variety of tools that help it ensure that FAA communications are effective. Consistent high survey feedback from users indicates that AOC is meeting its goal to provide information that is readily available, timely, accurate, and is understandable by the traveling public. AOC's corporate web management program has increased its annual American Customer Satisfaction Survey (ASCI) score from a 66 to a 73 in the last three years. This puts the FAA above the Federal Government average and well above the regulatory agency average.

An internal communications e-newsletter called Focus FAA receives more than 60,000 visits per month, has high readership and enables robust employee interaction. AOC also monitors the number of visits and time spent reading newsletter content and audio video content. AOC receives positive feedback and a high-level of response via online feedback channels for these publications. AOC also holds frequent media training sessions for FAA Leadership and takes advantage of new media technologies to deliver its message to a wide-range of audiences.

Why Do We Want / Need To Fund The Program At The Requested Level?

In the last year, there were over 5 million regulatory documents downloads from FAA.gov related to pre-flight safety procedures and planning, airmen/aircraft certification, aircraft mechanical records, airport safety regulations, and accident/incident data. This AOC-led delivery of critical safety information to the right person at the right time in the right method is at the very core of FAA's mission to ensure safety in flight for citizens.

Requirements are growing - over the last year; AOC has received a 300 percent increase in demand for secure access to critical aviation safety information via mobile devices. FAA employees, external stakeholders and the flying public expect unprecedented access to information from the FAA and more interaction about that information. AOC must continue to accurately and in a timely fashion provide critical information about FAA operations, safety oversight, efficiency initiatives and other programs to the media, employees and the flying public, to effectively accomplish the FAA's mission.

AOC will use this funding to:

- Continue to accommodate the growth of FAA.gov Mobile and MyFAA Mobile to deliver more essential services and content for citizens and employees on small screen platforms.
- Improve "findability" of regulatory documents, online services and content by using a multi-faceted approach to searching for, navigating through, and locating information.
- "Open FAA Data" - standardize data to increase internal and external access to high value, machine readable datasets and applications to deliver more value to consumers of FAA content.
- Make improvements and upgrades to address web-based security and privacy.
- Implement new approaches to optimize the user experience via multiple types of mobile devices.

As a result, airline pilots, mechanics, the flying public, and FAA employees will continue to benefit from access to critical aviation safety and operational information.

Office of the Chief Counsel (AGC)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$47,005**	**262**	**9**	**252**
Adjustments to Base	**$312**			**-8**
FY 2012 Internal Adjustments				
FY 2013 Adjustments				-8
Pay Inflation	$312			
Other Changes	**-$658**			
NATCA Multi Unit Pay Raise	$16			
Working Capital Fund	-$674			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$888**	**-4**		**-4**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$888	-4		-4
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$45,771**	**258**	**9**	**240**

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Detailed Justification for – Chief Counsel (AGC)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Chief Counsel
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Chief Counsel	$47,005	$47,293	$45,771	-$1,234

The Office of the Chief Counsel requests $45,771,000 and 240 FTEs to enable AGC to provide necessary legal services to the FAA. The request includes a decrease of $674,000 in anticipated Department of Transportation (DOT) Working Capital Fund (WCF) charges. The WCF projected bill is $591,780 except for fee-for-services printing and conference center usage. Also, the request reflects a base transfer of -$888,000 and 4 FTE from AGC to the Office of Finance and Management (AFN) for the Information Technology resources consolidation. This funding will go towards ensuring the FAA meets its mission obligations consistent with legal requirements and that agency action and employees are vigorously represented in administrative and judicial forums. The request, which is an overall reduction in funding and FTE's, will be deployed in a manner calculated to best provide a timely and responsive legal services in support of FAA's most critical program responsibilities. .

Funding at the FY 2014 requested level will provide necessary legal services, including representation, in support of significant FAA program responsibilities and functions. Among the more significant are:

- Rulemaking, including critical safety rules and regulatory aspects of NextGen.
- Enforcement of safety regulations.
- Acquisition of operational safety systems and equipment, including acquisition aspects of NextGen development, and compliance with commercial and fiscal requirements.
- Airports capacity enhancement and grants, environmental streamlining for airport projects, and environmental aspects of NextGen development.
- Personnel and labor matters.
- Key international agreements, harmonization of safety requirements and safety assessments.
- International technical assistance agreements and safety assessments.
- Dispute resolution services and/or administrative adjudication of acquisition related disputes, and administration of the Civil Penalty Program; Representation of agency interests and choice of actions before United States federal courts and various administrative forums, including the National Transportation Safety Board (NTSB), the Merit Systems Protection Board, and the EEO Commission.

In order to advance the DOT goals of achieving the next level of safety, maximizing access to the aviation system, advancing global collaboration and building and enhancing our high performance workforce, the Office of the Chief Counsel, based on critical agency priorities and requirements, will assess and prioritize the following key outputs and outcomes in FY2014:

- Send 85 percent of significant critical safety rules approved by the Rulemaking Council to DOT within 90 days of the planned date and issue 85 percent of the non-significant rules approved by the Council within 90 days of the scheduled date.
- Provide regulated community with timely guidance in responses to public requests for interpretations of FAA regulations by responding to 60 percent of requests for interpretation within 120 days of receipt and provide timely legal review of grants and denials of exemptions generally within 30 days of receipt for 70 percent of the exemptions submitted.
- Prosecute enforcement actions timely and efficiently in support of agency safety activities by taking the first legal action on 80 percent of the number of cases received during 12 months; timely conducting 50 percent of informal conferences within 90 days of receipt of a respondent's request and 75 percent

within 180 days; avoid case backlog such that the percentage ratio of cases completed is at least 60 percent of the number of cases received.

- Provide representational legal services on all phases of tort litigation, investigations, claim processing and monitor and report on the agency's contingent liability.
- Provide timely draft civil penalty appeal decisions to the FAA Administrator by completing draft decisions in 60 percent of appeals within 180 days of the receipt of the last brief.
- Analyze capacity and congestion policy implications of NextGen near-term and mid-term improvements as required by program offices and provide legal drafting, analysis, and technical assistance in support of Agency initiatives to increase throughput at core airports by 12 percent in order to reduce delays, based on the 2009 operations baseline, by 27 percent.
- Conduct timely review of NEPA documents consistent with goals to facilitate implementation of NextGen and other Destination 2025 priorities by completing legal review of preliminary EISs for airport projects will be completed within 30 working days of receipt of a technically adequate and complete document. At least 60 percent of preliminary EISs for major projects (i.e. development projects at congested airports) submitted meeting this standard will be reviewed within 30 calendar days of receipt; For 70 percent of preliminary NEPA documents submitted for legal review for Optimization of Airspace at Metroplexes and proposed procedures under section 213 of the FAA Modernization and Reform Act of 2012, within 30 calendar days provide legal concurrence or return document to ATO with detailed explanation of why document is not legally sufficient.
- Support update of agency umbrella policies and procedures for complying with NEPA by prepare final FAA Order 1050.1F, Policies and Procedures for Considering Environmental Impacts, for publication. In FY2014.
- Complete legal sufficiency review of substantially complete draft Part 16 Final Agency Decisions within two weeks.
- Provide legal advice needed to avoid unanticipated cost growth on major system acquisitions such that 90 percent are within 10 percent variance of their current base-lined total budget estimate at completion (BAC); provide special focus and dedicate staff to facilitate agency initial operating capability (IOC) of ERAM functionality within 10 percent variance of current program baseline.
- Review all acquisition document son average within 10 calendar days of receipt.
- Support continued deployment of automatic dependent surveillance broadcast (ADS-B) to key sites in support of the Satellite and Broadcast Service (SBS) national program baseline by completing legal review necessary to complete future activity targets.
- Support agency real estate disposal efforts by retiring 75 percent of disposable assets within 30 days of receipt of forms.
- Actively seek to improve the acquisition processes, for example, by developing guidance on the use of interagency agreement to assure that the full cost of these agreements is compared to the cost of the FAA doing the acquisition to a best value determination of the better alternative; and providing training for designated acquisition professionals on legal aspects of acquisition.
- Provide an independent internal venue for adjudicating and deciding procurement and acquisition-related disputes, as well as, collaborative dispute avoidance and early resolution services to the Agency and its private sector contractors.
- Draft and negotiate international agreements as required by the agency on safety oversight, air traffic, airworthiness, technical assistance and other aviation issues; prepare agency position on matters before the International Civil Aviation Organization (ICAO); and provide legal guidance on registration and recordation of property rights in aircraft.
- Serve as legal counsel to the Crisis Response Working Group and Crisis Response Steering Group established for the purpose of responding to potentially hostile threat situations, natural or man-made disasters or crisis.
- Meet all EEOC, MSPB, and federal courts employment case deadlines. Respond to 80 percent of agency requests for opinions or advice within 10 working days.
- Actively support improvements in agency employment practices by participating in work groups designed to address issues related to overtime determinations and compliance with FLSA standards and Drug and Alcohol procedures.
- Provide general legal services in support of the Freedom of Information Act, Privacy Act, and Government Ethics.

What Is This Program?

The Office of the Chief Counsel provides mission critical legal support services across each of the Department of Transportation (DOT) goal areas. Within FAA, AGC is both a key partner to each line of business and staff office and an integral contributor to the success of every major agency program and function. Across every line of business and every agency program, AGC provides legal advice, reviews agency action for legal sufficiency and conformity, represents agency interests in various administrative and court forums, defends agency choice of action, and enhances risk management by proactively seeking to identify and mitigate risk. In addition, AGC is responsible for two distinct internal FAA adjudicative functions: the Office of Dispute Resolution for Acquisition serves as the Administrator's adjudicatory body in acquisition-related matters and provides alternative dispute resolution services; and, a discrete unit within the office supports the FAA's civil penalty adjudication function by serving as a confidential advisor to the FAA Administrator in his capacity as the Civil Penalty Program decision-maker.

AGC principle legal practice areas provide services in support of DOT goals in the following manner: 1) Enhancing Safety, through its activity in regulatory enforcement, rulemaking, acquisition and commercial law, aircraft and other tort litigation, and the Office of Audit and Evaluation; 2) maximizing Economic Competitiveness through its rulemaking activity, environmental legal services, airport legal services which support airport expansion and capacity, and acquisition of technologies that support increased capacity and efficiency; advancing global collaboration through international activity and harmonization of safety rules) enhancing Livable Communities and ensuring Environmental Sustainability through its rulemaking activity and environmental legal services; and) building Organizational Excellence by enhancing our high performing workforce, supporting numerous agency-wide strategic initiatives, and providing legal services in support of agency administrative functions including employment and labor law, ethics counsel, FOIA and Privacy Act services and legislative services.

The direct beneficiaries of our services are the agency organizations that have operational and programmatic responsibility for carrying out FAA's mission, and by extension, the goals of the Department of Transportation. More significantly, the flying public is the overarching beneficiary of increased safety and a modern and efficient air transportation system. AGC is a key partner supporting the agency's success in all of our various program areas. Our critical supporting activities include:

- Ensuring FAA's rules meet legal standards, assisting the agency in completing critical safety rules on schedule, and providing regulatory interpretations to internal staff, agency officials and member of the public.
- Prosecuting all manner of enforcement cases referred by the Flight Standards Service, Aircraft Certification Service, the Office of Aerospace Medicine, the Office of Security and Hazardous Materials, the Office of Airports and the Office of Commercial Space Transportation.
- Representing the FAA on safety matters before the NTSB, the FAA Decision-maker and the Federal courts.
- Advising agency employees and management during aircraft accident investigations and defending the agency in associated litigation; evaluating tort claims; assisting Department of Justice in defending wrongful death, personal injury and property damage lawsuits.
- Advising the FAA Administrator, in his capacity as decision-maker on cases appealed from decisions issued by Administrative Law Judges.
- Advising program offices on the legal and environmental implications of programs that enhance airport and airspace capacity and defending the agency's choice of action.
- Providing legal advice, litigation support, policy and regulatory guidance, and legal sufficiency reviews related to environmental review of airport capacity and capacity-related projects, administration of the airport improvement program, funding of runway expansion and safety projects, redesign of the airspace surrounding airports in major metropolitan areas and streamlined environmental review and compliance.
- Providing acquisition and commercial law expertise to assist clients in acquiring safety and capacity enhancing equipment and services.
- Ensuring legal sufficiency on all high value agency procurement activities; advising on grants, cooperative agreements, and other transaction agreements; and representing FAA in acquisition related litigation and disputes.

- Providing fiscal and commercial law services needed to support the agency's information security requirements, export control compliance, bankruptcy cases, antitrust issues, real estate activity and appropriations matters.
- Representing the agency before various administrative and federal courts on personnel, labor, civil rights and equal employment opportunity matters.
- Counseling how to minimize the legal risks relating to employment decisions and policy.
- Providing an administrative adjudicatory body in acquisition-related matters and ensuring acquisition conflicts are resolved through alternative dispute resolution processes or are promptly adjudicated.

Anticipated FY 2014 accomplishments include:

- Supporting timely and efficient agency rulemaking activities by submitting to DOT 80 percent of significant ("A") rules approved by the Rulemaking Council within 90 days of the scheduled date and issuing 80 percent of certain non-significant rules approved by the Rulemaking Council within 90 days of the scheduled date.
- Responding to 50 percent of public requests for interpretations of regulations within 120 days of receipt.
- Prioritizing and efficiently prosecuting legal enforcement cases by taking the first legal action on 80 percent of cases received during a 12 month period; monitoring and reducing the backlog of enforcment actions by maintaining a prescribed ratio of cases closed to cases received; conducting 50 percent of informal conferences in legal enforcement actions within 90 days of receipt of the respondent's request; and streamlining the coordination and approval of significant enforcement actions. .
- Completing legal review of all procurement documents within 10 days and ensuring that key procurements remain within a prescribed tolerance in terms of funding and schedule.
- Providing legal services relating to drafting and negotiation of international agreements and provide legal support for the Aviation Insurance Program.

Why Is This Particular Program Necessary?

AGC provides critical legal support to each and every key function and critical program within FAA's mission. Legal services are necessary to ensure: agency actions are consistent with legal requirements and within legal authorities; that government interests are vigorously advocated, represented and defended; and that government personnel is fairly represented and able to carry on the agency's mission; and, that program and decisions risks are soundly evaluated, assessed and mitigated where appropriate. The legal office both defends agency choice of action, as well as agency employees, and vigorously prosecutes regulatory violations that imperil safety. AGC is the singular authorized source of legal advice and review for the entire agency.

AGC's principal legal practice areas are integrally linked to the success of FAA's mission. AGC directly supports the agency's safety mission by: timely and efficiently prosecuting violations of the federal aviation regulations, as well as, providing legal support of voluntary compliance programs; ensuring that critical safety rules are both legally sufficient and completed timely; providing timely and accurate agency responses to public requests for interpretations of the regulations; assisting in FAA accident investigation activities; and vigorously representing the agency and agency personnel in air crash and other tort litigation. In support of economic competitiveness and enhancing access to aviation, AGC plays a significant role by providing critical legal advice so that program milestones are maintained and, providing legal sufficiency reviews and advice to bolster and sustain program office actions regarding the environmental implications of runway expansions, terminal improvements, and redesign of the national airspace. Our environmental legal work also supports the related goals of ensuring livable communities and enhancing environmental sustainability. Further, AGC legal advice, risk management expertise, and sufficiency reviews in the acquisition and commercial law practice areas are essential to development, acquisition and deployment of the safety and capacity enhancing equipment and technology needed to support the national airspace system. AGC advice and risk management efforts assisted the agency in keeping major acquisitions within acquisition cost and schedule baselines in most cases. Moreover, AGC supports the agency efforts pertaining to global collaboration by developing the agency position on international law issues and supporting FAA international aviation efforts. Finally, in support of the overall goal of organizational excellence and enhancing our high performance workplace, 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.

AGC's most visible contributions can be found in our timely and efficient support of safety and access:

- Complete 80 percent of critical safety rules within 90 days of DOT scheduled due date.
- Over 50 percent of public requests for interpretations are provided within 120 days.
- Regulatory exemptions are usually acted upon in 30 days.
- Legal enforcement cases are prosecuted such that initial legal action is taken on 80 percent of cases filed during a 12 month period, 75 percent of informal conferences are held within 180 days of request and caseload is monitored to avoid a backlog.
- Major acquisitions systems that support the safe and efficient air transportation system are completed within striking distance of their cost and schedule baseline over 80 percent time and contract document are cleared through the legal office within 10 days.

How Do You Know The Program Works?

AGC is a support organization that contributes to the overall success of FAA programs and functions that reside with the various lines of business and staff offices with programmatic responsibility. AGC is not a program in the traditional sense and our contribution cannot be assessed through a single measure. Rather AGC contributes on many fronts to many programs to ensure overall that FAA actions are consistent with legal requirements, risks are defined and managed to the extent practicable, and the interests of the government and the flying public are strongly represented.

The multi-faceted contribution made by AGC is apparent in the NextGen program. NextGen is the future of air transportation, designed to promote efficiencies in air transportation, promote safety, and reduce costs to carriers. Our acquisition attorneys provide key support in the development, acquisition, and deployment of satellite base systems and technologies. The rulemaking attorneys play a critical role in establishing regulatory requirements and certification of new avionics equipment. The environmental attorneys are critical to ensuring environmental assessments are timely completed for new systems and airspace redesigns. The employment lawyers have a significant role in addressing the staffing and labor implications of a system where air traffic is managed rather than controlled. There is no single measure to assess AGC's contribution to the NextGen program, but the contribution is significant. The same is true for the many FAA programs and functions that AGC supports.

While there is no single or overall measure to assess the legal program, it merits saying that over the years AGC has consistently met the specific performance measures for its key practice areas. Moreover, AGC has been a proactive and efficient partner significantly contributing to FAA's consistent success in meeting its programmatic and safety goals.

Why Do We Want/Need To Fund The Program At The Requested Level?

AGC's funding level is primarily consumed by personnel costs and our staffing level drives our service level. Reductions to the requested funding level would significantly affect our delivery of services and would have a compounding effect on the vast array of program offices that require legal services to meet agency mission critical programs and strategic initiatives. Essentially, every mission critical program and/or initiative requires, either by law, congressional mandate, agency policy and/or sound business judgment, a legal office sign off or review for legal sufficiency at prescribed stages. Any reduction in funding and/or FTEs directly affects AGC's staffing level and, hence service level. AGC's current funding and FTE level have reached the tipping point where the delivery of legal services likely will become a bottleneck for efficient completion of agency programs. This anticipated decline in our ability to provide timely legal services would ultimately slow down the entire office response time to regulatory issues, enforcement cases, and litigation and personnel cases and have an overall impact of the safety of the aviation community.

Additionally, AGC is concerned about a potential funding shortage in the amount of $674,000 based on the calculation for Docket Management Services (DMS) through DOT's WCF. The FY2014 estimated amount for

FAA's portion of DMS services is $592,000; 47 percent of the estimated DMS cost for the same service for the previous year and less than 50 percent of the actual DMS expenses for FY2009, FY2010, and FY2011. FAA anticipates greater DMS usage during FY14, and beyond, because of the increased number of Congressionally directed rules, generated in part by FAA's recent Reauthorization, that tend to be more controversial and generate more public comments. Funding for the DMS through the WCF should remain at least at the estimated FY 2012 level. This reduction is a concern and potential challenge to pay a higher bill once DMS is in execution.

A reduction in funding could also impair the agency ability to vigorously defend tort and personnel cases, thereby significantly increasing the government's exposure to loss. AGC litigation losses consistently have been small compared to its potential tort liability. Similarly, pending class action employment cases carry an exceeding large potential liability, but AGC attorneys have successfully defended the cases to date.

A reduction or disruption in AGC's ability to deliver timely legal services likely would impair efforts to accelerate development and implementation of the NextGen Air Traffic Control System and related safety enhancements, and would interfere with initiatives related to maintaining scheduled progress of environmental reviews for airport development projects and airspace redesign efforts. If these programs are delayed due to a bottleneck in AGC, the safety and efficiency improvements these programs hold for the traveling public will be similarly delayed.

Office of Policy, International Affairs, and Environment (APL)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$34,952**	**163**	**7**	**145**
Adjustments to Base	**$441**			**-5**
FY 2012 Internal Adjustments	$250			
FY 2013 Adjustments				-5
Pay Inflation	$191			
Other Changes				
NATCA Multi Unit Pay Raise				
Working Capital Fund				
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$560**	**-6**		**-5**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment	$300	1		1
Intervention Program Establishment				
Emergency Operations Coordinator Realignment				
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$860	-7		-6
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$34,833**	**157**	**7**	**135**

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Detailed Justification for – Office of Policy, International Affairs, and Environment (APL)

What is the Request and What Will We Get for the Funds?

FY 2014 – Office of Policy, International Affairs, and Environment (APL)
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Policy, International Affairs and Environment	$34,952	$34,556	$34,833	-$119

The FY 2014 budget request of $34,833,000 and 135 FTEs allows FAA to identify, develop and implement the domestic and international policy and environmental goals of the agency. The FY 2014 request also reflects internal adjustments from FY 2012 that are contained within FY2012 and the next fiscal year but are no longer obvious in the FY2014 President's budget. This funding reflects increases for personnel compensation and benefits and other objects that support program activities including program travel, training, communications, support services requirements, contract support, and supplies and equipment to support continuing operations. This funding level includes the base transfer of 1 FTP / 1 FTE for the NextGen Global Outreach Office along with $300,000 and 7 FTP/6 FTE for the Information Technology Resources Consolidation along with $1,672,000.

Funding in FY 2014 will support the following key outputs and outcomes:

<u>Policy and Plans</u>

- Identify and initiate resolution of policy issues associated with NextGen implementation that cut across traditional FAA lines-of-business and offices.
- As required by law, complete economic analyses of agency rulemaking and regulatory projects provide criteria and performance analysis of FAA investments in aviation infrastructure, update guidance materials for economic evaluation and investment, and evaluate airport benefit-cost analyses and competition plans.
- Implement congestion management solutions for the New York area while continually updating projections on which metropolitan areas will have the greatest impact on total system delays and developing options and recommendations to address.
- Develop and publish the annual FAA aerospace activity forecast and terminal area forecasts by March of each year.
- Support and advise the Air Traffic Organization in developing efficiency metrics and analyzing system delays, and tracking overall system performance.
- Work with the Administration, Congress, and stakeholders to develop and implement FAA reauthorization legislation and to develop and analyze forecasts of Aviation Trust Fund revenues and expenditures at least twice a year.
- Develop and manage a continuous, end-to-end strategic planning and performance process for the agency to include transparent reporting of performance outcomes via multiple web-based initiatives.
- Manage processes of the new Strategy, Budget and Performance Committee and its three subcommittees to support the Agency's new governance process.

<u>International Affairs</u>

- Enhance aviation safety through the promotion of proven safety programs and procedures with civil aviation authorities, regional organizations, industry and other stakeholders.
- Promote global interoperability by supporting research, validation and implementation of new concepts, systems, and procedures through maximizing resources to assist key countries and regional organizations to implement interoperable ATM technologies and procedures. Provide global strategic analysis and assist with the development of policies on international aviation issues.

- Advance efforts to reduce aviation's environmental footprint.

Environment and Energy

- Support activities to reduce aviation's environmental impacts, including reducing the number of people exposed to significant aircraft noise, health impacts associated with aviation emissions, and aviation's carbon dioxide (CO_2) emissions
- Support activities to improve aviation fuel efficiency and augment the use of sustainable aviation fuels
- Continue activities to support NextGen infrastructure and FAA Greening Initiative
- Implement policy for application of environmental analysis tools for screening and compliance needs
- Explore implications for potential revision of the threshold for community noise levels
- Implement FAA's revised National Environmental Policy Act (NEPA) implementation order 1050.F. Includes training and guidance to representatives across LOBs/SOs to facilitate FAA-wide implementation.
- Develop and coordinate policies, methods and guidance materials necessary for implementing the aircraft noise certification regulations and compliance oversight
- Provide policy and guidance support for aircraft engine emissions certification
- Coordinate tracking and reporting of FAA's environmental sustainability performance
- Review, refine and implement NextGen environmental policy
- Support activities to achieve U.S. environmental and energy objectives at ICAO.

What is the Program?

APL supports the Department of Transportation's (DOT) goals of Economic Competitiveness and Environmental Sustainability through multiple programs and projects designed to reduce aircraft noise and aviation emissions, minimize their impacts as well as increase fuel efficiency and to foster the continued development of competent civil aviation authorities worldwide to meet international standards. APL provides U.S. leadership on reducing global aviation's carbon footprint and working with the International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP) and international partners exploring options for a new carbon dioxide emissions standard for aircraft. As more Americans travel worldwide, the development of competent civil aviation authorities has become a cornerstone for providing technical assistance, building capacity and transferring technologies for public benefit.

All APL offices support FAA and DOT Organizational Excellence strategic goals, ensuring continuously-improving, secure, efficient, and transparent exchanges of critical information, organizational performance management including performance reporting, and maximizing output/outcome oriented efficient planning and business processes

APL serves multiple international functions: principle advisor to the Administrator on international matters; management of agency international outreach, cooperation, and technical exchanges with a view to enhanced safety, capacity, and sustainability; development and coordination of international civil aviation policies and positions; provision of support to the U.S. Mission at the International Civil Aviation Organization; and technical assistance (over 1.500 cooperative agreements with 150 countries).

DOT and FAA participate in international standards setting and harmonization activities in transportation, and engage in implementing programs that provide technical assistance for transportation capacity building to developing countries. DOT and FAA are engaged in advancing U.S. transportation policy and advocating worldwide adoption of harmonized standards and global technical regulations through participation in bilateral and regional forums or international organizations at the ministerial and working levels.

The FAA is also very active in working with ICAO, International Air Transport Association (IATA), the Joint Planning and Development Office (JPDO) and international partners to develop global and domestic standards and recommended practices as well as guidance materials that support implementation of harmonized aviation policies and programs such as NextGen and NextGen Technologies, by ICAO members worldwide and in setting global aircraft noise and engine emissions standards.

As FAA's policy office, APL is responsible for developing broad-based, novel, and crosscutting policy initiatives. The office works to identify, develop, and resolve policy issues related to increased safety, greater capacity, maintaining international leadership, and sustainability of the global and domestic civil aerospace system in an environmentally sound manner. This work requires outreach to domestic and international customers and stakeholders, extensive research and development efforts, data collection and analysis, economic analysis, and policy development It also provides leadership to the agency's strategic policy and planning efforts, coordinates the agency's reauthorization before Congress, and is responsible for national aviation policies and strategies in the environment and energy arenas, including aviation activity forecasts, economic analyses, aircraft noise and emissions analyses and mitigation, environmental policy, and aviation insurance.

In the area of environment, APL is responsible for improving environmental protection and addressing the energy and sustainability needs. APL is responsible for developing broad based approaches and coordinating agency responses to limit and reduce future aviation environmental impacts to levels that protect public health and welfare, ensure energy availability, and enhance sustainability of FAA operations. This work requires addressing environment, energy, and sustainability issues that will influence the future capacity and flexibility of the national airspace system (NAS), aircraft noise, air quality, global climate effects, energy availability and efficiency, water quality and sustainability of FAA operations.

The organization consists of the following offices:

Aviation Policy and Plans improves the FAA's effectiveness with strategic planning and management; makes coordinated and well-informed policy decisions for crosscutting and novel civil aerospace issues using independent economic, quantitative and qualitative analysis, information and tools; and positions the FAA for the future by identifying, researching, and projecting emerging issues and trends.
International Affairs is responsible for coordinating all of FAA's international efforts and advancing the nation's longstanding leadership on the international front including engaging in dialogue with counterparts across the world.
***Environment and* Energy** is responsible for developing, recommending, coordinating, and implementing national and international standards, policy and guidance, research and technology goals, and analytical capabilities on aviation environmental and energy matters.

The base budget request covers the following:

- Leading FAA's strategic planning effort that will impact NextGen implementation, future airport congestion and system delays, the ability of agency rulemaking to address future risks, and development of more robust forecasting products.
- Collaborating globally to advance harmonization of aviation standards and practices through representation in key international bodies and provision of training and technical assistance around the world.
- Leading or facilitating agency reauthorization efforts to include development of reauthorization proposals and implementation of enacted reauthorization initiatives.
- Aviation environment and energy policy, programs, and operational activities to:
  - Reduce aircraft noise.
  - Reduce aviation emissions and climate impacts.
  - Improve National Airspace System energy efficiency and develop sustainable alternative aviation fuels.
  - Integrate environmental considerations into NextGen through Environmental Management System Approach and National Environmental Policy Act compliance.
- Supporting FAA's strategic sustainability through cross cutting coordination and performance tracking activities.

Anticipated accomplishments for Policy, International Affairs, and Environment include:

<u>Policy and Plans</u>

- Identify and initiate resolution of novel and crosscutting NextGen policy issues as well as analyze capacity and congestion policy implications of NextGen near and mid-term improvements. Work across the agency to incorporate NextGen metrics and performance measures in the agency's strategic and business planning.

- Support the executive-level Strategy, Budget and Performance Committee and its three subcommittees as they work to identify, develop and resolve cross-Agency policy issues.
- Provide timely economic analysis to enable the agency to send critical safety rules to the Office of the Secretary of Transportation within 90 days of the planned date.
- Implement congestion management solutions for congested areas including the New York area with analysis of proposed infrastructure projects for air traffic and airport improvements.
- Lead development of agency reauthorization proposals, facilitate implementation of FAA reauthorization statutory provisions, and develop and analyze forecasts of Aviation Trust Fund.
- Support the Administrator by staffing the Management Advisory Council and other similar advisory bodies as directed by Congress.

International Affairs

- Provide services to support safety oversight activities in all regions and through ICAO, enhancing the capabilities of CAAs around the world.
- Support implementation of NextGen interoperable technologies and procedures working with other air traffic systems and regional efforts.
- Foster partnerships to maximize resources available to assist key countries and regional organizations to implement interoperable ATM technologies and procedures.
- Present the U.S. position on aviation environmental issues and encourage the adoption of U.S. aviation-related environmental policies and practices, including the development and deployment of sustainable alternative fuels for aviation.
- Manage agreements process. Prepare, negotiate, manage, and conclude international agreements for the FAA.
- Advance FAA policies and programs to international counterparts and industry around the world.
- Promote aviation leadership development in all regions.
- Coordinate FAA-wide efforts to support U.S. aims regarding ICAO global safety, efficiency, and environmental initiatives and programs.
- Serve as the Secretariat of the Interagency Group on International Aviation.

Environment and Energy

- Provide implementation guidance on the use of the Aviation Environmental Design Tool (AEDT) for demonstrating environmental compliance
- Conduct research and analysis and explore options for potential revisions in community noise threshold levels
- Coordinate U.S. positions to ICAO on more stringent aircraft noise and new aircraft CO_2 emissions standards
- Policies, methods and guidance materials for implementing the aircraft noise certification regulations and compliance oversight
- Support international activities to address aviation emissions influence on climate, through ICAO and other venues
- Develop and provide training and guidance to LOBs/SOs on FAA Order 1050.1F to improve our efficiency for meeting NEPA requirements and support NextGen implementation
- Coordinate an update to FAA's annual Strategic Sustainability Performance Plan and Greenhouse Gas Sustainability Data Report
- Track and report on FAA's sustainability performance
- Assess NAS-wide environmental performance for exposure to significant noise and improved fuel efficiency

Beneficiaries

As the number of international passengers and aviation activities across the globe increase every year, it becomes even more important for the U.S. to continue to be the gold standard for aviation safety. To make this happen, FAA builds partnerships and shares knowledge to create a safe, seamless, and efficient global aviation system. Our premise is simple: national boundary lines should not be impediments to safety. The global aviation system moves more than 7.7 million people and more than 130 thousand tons of cargo to their destinations every day. APL collaborates with our domestic and international partners to improve aviation safety, efficiency and the environment. The American traveling public and industry—and many others around the world—benefit from the work we do.

The aviation industry benefits because lower impacts reduce environmental constraints on aviation operation and growth. Improvements in fuel burn and energy efficiency improve emissions, including greenhouse gas emissions, reduce the economic burden imposed by high fuel costs, and contribute to U.S. energy conservation. Advancing sustainable alternative aviation fuels contributes to energy independence, which also benefits the public at large.

Work on critical safety rules directly contributes to aviation safety, which benefits the general public and the aviation industry. Economic analyses of investments helps ensure the best return to the taxpayers and flying public. The public and industry also benefit from APL's work to identify and resolve crosscutting policy issues affecting NextGen implementation. Improving and reducing delays will also benefit system congestion, the flying public, operators, and the U.S. economy in general, as air transportation can be operated more reliably and efficiently.

Role of partners in implementing this program

APL works closely with other Federal agencies on national and international policy, environmental and energy issues, as well as with industry partners, other civil aviation authorities, academia, non-governmental organizations, and community representatives. Our organization is also very active in working with ICAO, IATA, the JPDO, and international partners in supporting the implementation of global and domestic standards and recommended practices as well as guidance materials that support implementation of harmonized aviation policies and programs such as NextGen, by ICAO members worldwide and in setting global aircraft noise and emissions standards.

Why is this particular program necessary?

APL is responsible for leading the agency's domestic and international policy initiatives and strategic planning, facilitating reauthorization, and advancing an environmentally sustainable aviation system. APL plays a key role in ensuring that agency policies, forecasts, programs, and assistance support and improve national and international civil aviation, and that the U.S. continues to operate the world's safest and most efficient aviation system with adequate capacity and environmental integrity, and retains its leadership role around the world. We ensure that agency decisions are based on sound science and solid analysis and that we consider the views and needs of the many varied interests of stakeholders. Our work translates into a truly global and environmentally sustainable aviation system while meeting the needs of the U.S. aviation community.

Environmental and energy concerns are rising. Aircraft noise and emissions, including greenhouse gases, will grow and constrain the mobility and flexibility of NextGen unless they are adequately mitigated. Increased aviation noise and emissions would also undermine U.S. domestic and international environmental interests. Reducing aviation's environmental footprint will allow the achievement of both U.S. air transportation goals and environmental protection for improved public health and welfare. Measurable benefits and outcomes include:

- Reductions of significant aviation noise and air quality impacts below current levels, notwithstanding aviation growth.
- Limitations of the impact of aircraft CO_2 emissions on the global climate by achieving carbon neutral growth by 2020, compared to 2005 levels.
- Improvements in NAS energy efficiency by 2 percent annually, and development and deployment of sustainable alternative aviation fuels.
- Improvements in the environmental and energy performance of global aviation, including reducing greenhouse gases by applying an aircraft CO_2 standard and other measures.
- Integration of environmental and energy goals and targets into NextGen and FAA facilities through an Environmental Management System Approach and Greening Initiatives.

The U.S. has a tradition of global leadership in aviation. Our office works directly with ICAO and other international bodies to further global harmonization of aviation standards and practices focusing on economics, forecasting, environment, and technical assistance. The U.S. is the largest contributor of technical and financial support to ICAO, in which authorities from 190 countries participate. We lead international discussions on economic principles impacting how US carriers operate around the world. We play a key role in the development of international aviation forecasts used by many of ICAO's member states. We continue to be a driver in setting global environmental standards and practices through our leadership role in ICAO's Committee on Aviation Environmental Protection and other international bodies. Our office facilitates direct or indirect technical assistance to 150 countries around the world to help them improve their aviation systems. APL leads the expansion and coordination of all aspects of global outreach for the NextGen activities within FAA and around the world to harmonize standards and recommended practices for new technologies, enhanced procedures, safety and airport requirements, as well as environmental considerations.

Whether we are referring to regulatory oversight, the development of air commerce, the development and deployment of new technologies, or advancing aviation related environmental initiatives, we are ultimately concerned with promoting the safety, efficiency, and environmental integrity of U.S. aviation interests worldwide. Any failures or lapses in implementation of these programs will adversely impact U.S. interests domestically and abroad.

Our collaboration with other countries fulfills the President's commitment to bilateral and multilateral cooperation and maintains a robust international program which is too extensive and important to be omitted. When we promote U.S. best practices to further global transportation safety, we not only promote compliance with international safety standards but also foster multimode transportation practices that advance our mutual interest in a lasting economic recovery and a clean energy future.

How Do We Know the Program Works?

The measures of program effectiveness for the agency are laid out in the FAA and DOT Strategic Plans, as well as in individual business plans for each organization. This office directly influences how agency goals, targets, and initiatives are set in each, and directly influences the agency's success in meeting them through our direct support in the specific program areas. We literally work across the agency and provide the necessary "honest broker" aspect to policy decisions that impact everything the agency does.

This office has been instrumental in the agency's success in five DOT goal areas – Safety, State of Good Repair, Livable Communities, Environmental Sustainability, and Organizational and is instrumental in many aspects of NextGen implementation. These include its work in policy, forecasting, metrics, environmental, and international. Our programs in economic analysis, forecasting, and environmental modeling are recognized as contributors and standard-bearers with ICAO and technical workgroups through publishing and speaking at critical forums.

<u>APL Targets</u> – APL maintains four specific planning targets. These include:

- Noise Exposure: Improve aviation noise exposure to the U.S. population exposed to significant aircraft noise around airports) from 307,420 persons in 2011 by at least 2 percent per year to less than 328,000 persons in 2016.Aviation Fuel Efficiency: Improve National Airspace System (NAS) energy efficiency (fuel burned per distance flown) by at least by 2 percent per year, from 4.24 teragrams per billions of kilometers (Tg/Bkm) in 2010 to 3.73 Tg/Bkm in 2016.40 percent of all commercial aircraft from the top 25 aviation states are using fully interoperable NextGen technologies and capabilities by 2018.
- States representing 85 percent of international activity are taking actions to contribute to ICAO's 2 percent global annual fuel efficiency improvement goal by 2018.

Additional indicators of our success include:

- Implementation of FAA's Sustainability Policy and Strategic Sustainable Performance Plan In collaboration with LOBs/SOs.

- Reported FAA's energy management performance to DOT.
- Developed and provided NEPA policy and guidance to facilitate efficient environmental analysis of NextGen actions.
- Completing the Annual Aviation Commercial and General Aviation Forecast and ensuing conference.
- Conducting a successful Commercial Aviation Alternative Fuels Initiative (CAAFI) international conference
- Working directly with multiple international and domestic governing bodies including ICAO, IATA, JPDO to formalize and foster Green Aviation Practices.
- Supporting the approval of the first jet biofuel specification, working through the Commercial Aviation Alternative Fuels Initiative.
- Continuing the development of a certification framework for aircraft CO_2 emissions.
- Delivering cost-benefit analyses on FAA safety and operational rulemakings enabling the agency to meet its scheduled delivery dates to OST while supporting Congressional rulemaking mandates.
- Establishing the initial stages of FAA policies on financial and operational incentives for NextGen avionics equipage.
- Promoting runway safety activities in all regions and through ICAO.
- Providing services to support safety oversight activities in all regions and through ICAO, enhancing the capabilities of CAAs around the world.
- Providing aviation safety development assistance activities to the civil aviation authorities in Iraq and Afghanistan, through the Department of Transportation (DOT) Office of the Transportation Attaché (OTA).
- Assisting regional safety oversight organizations to build their capacities.
- Facilitating ongoing and developed new programs within the regions to enhance aviation safety and efficiency programs and policies.
- Working with the European Commission and European Agencies to expand cooperation under the existing Agreements.
- Assisting ICAO member states understand and implement processes that will improve compliance with the new Continuous Monitoring Approach program.
- Managing U.S. preparations for the evolution to Continuous Monitoring Approach program.
- Facilitating AVS efforts to establish or expand BASAs and IPs.
- Promoting regulatory oversight and operational roles for U.S.-registered aircraft operating outside the U.S.
- Working in partnership with ICAO, the Single European Sky Air Traffic Management Research (SESAR) Joint Undertaking, and the other international partners to further develop and promote ICAO's Aviation System Block Upgrade initiative.
- Engaging with international partners to coordinate and promote U.S. positions in support of ICAO's 12th Air Navigation Conference.
- Providing in-country air navigation safety projects through joint FAA-CAA cooperation including regional groups.
- Jointly identifying, coordinating, and implementing cooperative efforts with ATO.
- Working with U.S. industry, TDA, and other development organizations to encourage adoption of interoperable technologies and procedures in all regions.
- Promoting NextGen concepts, technologies, and procedures to other States through conferences, and coordinated outreach.
- Encouraging ICAO Contracting States to develop and submit action plans to ICAO in support of the aspirational goal of 2 percent global fuel efficiency improvement per year.

Why do we want/need to fund the program at the requested level?

To achieve the performance goals outlined in the FY 2014 as well as the long-term goals outlined in Destination 2025, we will depend on the maximization of resources through the leveraging of partnerships, technology, and expertise. We will continue to strive to meet the demands and requirements placed by the Administration and the Department in connection with various domestic and international initiatives. Reductions to the requested level will negatively impact NextGen implementation, the continued leadership of the United States in international aviation, advancement of critical environmental programs, and our ability to influence aviation policy both domestically and internationally.

Any reductions to APL's funding will have the following impact:

- It will limit our efforts on the Greening Initiative and energy conservation to focus on meeting only critical OMB and CEQ requirements, rather than all OMB/CEQ requirements and DOT's sustainability goals.
- We would be unable to develop and release refined policies and guidance that are critical towards meeting NEPA regulatory requirements.
- We would reduce our economic and policy efforts to find the most cost effective safety and operational regulations and policies.
- We would be unable to provide timely economic analyses as required by statute.
- We would be unable to properly assess NAS-wide aviation environmental performance
- A reduction in participation in ICAO environmental standard-setting and technical work, hindering our ability to provide U.S. leadership to harmonized worldwide environmental aviation standards.
- We would need to reduce our level of support to the aircraft certification offices (AVS) in implementing aircraft noise regulations, including reduced levels of oversight on compliance by applicants.
- A reduction in participation in ICAO runway safety programs around the world. Improving runway safety around the world is a key component of the FAA's goal to reduce the worldwide accident rate by 10 percent. Reducing our efforts in this area will hinder our ability to reach this goal.
- A decrease effort to promote NextGen adoption internationally. Decreasing NextGen adoption efforts works against our goal to have 40 percent of the fleets of top 25 most active states using NextGen-compatible technologies.
- Reduced initiatives to assist countries in developing aviation environmental capacities. Reducing our international environmental mitigation and capacity-building efforts will impact the likelihood of success in getting ICAO states representing 85 percent of international aviation emissions to develop action plans to meet global ICAO environmental goals.

Office of Security and Hazardous Materials Safety (ASH)
($000)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2012 Actual	**$93,406**	**504**		**488**
Adjustments to Base	**-$136**			**2**
FY 2012 Internal Adjustments	-$650			
FY 2013 Adjustments				2
Pay Inflation	$514			
Other Changes	**$49**			
NATCA Multi Unit Pay Raise				
Working Capital Fund	$49			
Annualization of FY 2012 Hiring				
PASS Contract				
Discretionary Adjustments				
Safety Oversight				
En Route Automation Modernization Maintenance (ERAM)				
Rent & Leases Increases				
Service Center / Regional Buildings				
Base Transfers	**-$1,474**	**-9**		**-9**
Hangar 6				
Administrative Support				
Labor Technical Realignment				
Civil Rights Realignment				
Property Management Realignment				
NextGen Global Outreach Realignment				
Intervention Program Establishment				
Emergency Operations Coordinator Realignment	$198	1		1
Traffic Alert Collision and Avoidance System (TCAS) Refinement				
Information Technology Resource Consolidation	-$1,672	-10		-10
Training Resources Realignment				
Center for Management and Executive Leadership (CMEL)				
Program Adjustments				
FY 2014 Request	**$91,845**	**495**		**481**

Detailed Justification for – Security and Hazardous Materials Safety

What Is The Request And What Will We Get For The Funds?

FY 2014 – Security and Hazardous Materials Safety
($000)

Program Activity	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2012 – FY 2014
Security and Hazardous Materials Safety	$93,406	$93,328	$91,845	-$1,561

The FY 2014 request of $91,845,000 and 481 FTEs will support the Office of Security and Hazardous Materials Safety (ASH) programs. The FY 2014 request also reflects internal adjustments from FY2012 that are contained within FY 2012 and the next fiscal year but are no longer obvious in the FY 2014 President's budget. The request reflects a base transfer of $1,672,000 and 10 FTEs from ASH to the Office of Finance and Management (AFN) for the Information Technology resources consolidation, and an additional base transfer of $198,000 and 1 FTE from the Office of Human Resources (AHR) to ASH for the Emergency Operations program. The request includes an increase adjustment of $49,000 in anticipated Department of Transportation Working Capital Fund (WCF) charges. The WCF projected bill is $5,607,868, excluding for fee-for-services printing and conference center usage.

Funding in the FY 2014 request will allow us to meet these milestones:

- Continue implementation of a Safety Management System (SMS) program for hazardous materials safety oversight of Part 121 air carriers through surveillance activities in coordination with FAA Office of Aviation Safety certificate management teams.
- Enhance and provide safety regulatory oversight of shippers, air carriers and repair stations in accordance with the Hazardous Materials Regulations (49 C.F.R. Parts 171-180), hazardous materials-related requirements in 14 C.F.R. and the International Civil Aviation Organization (ICAO) Technical Instructions, and provide outreach to the flying public.
- Continue studies with FAA's Office of Aviation Research (Tech Center) and collaborations with external professional testing organizations to test select critical commodities such as lithium batteries and packaging to identify potential regulatory changes and develop and coordinate guidance useful for setting national policy and industry standards.
- Support the implementation of the Facility Security Management Program and the Personnel Security Program that protect critical FAA infrastructure and personnel in the National Airspace System (NAS).
- Use the PIV card to authenticate persons attempting to access FAA facilities and computer systems, as required by Presidential Directive HSPD-12 and OMB Memo M-11-11.
- Follow through on the solution to DOT's reduced password initiative.
- Enhance emergency operations network capability to meet increased user needs and ensure continued situational awareness of daily and emergency events. The planned capabilities include fully integrating the Washington Operations Center Complex (WOCC) and Regional Operations Centers (ROC) with the emergency notification system.
- Establish the minimum communications requirements for Executive Department and Agency headquarters and continuity alternate operating facilities that support the continuation of the National Essential Functions (NEFs).
- Provide a fully operational 24/7 Intelligence Watch supporting WOCC and the Air Traffic Security Coordinators who manage the Domestic Events Network. Continue the development of a Counterintelligence program for FAA Lines of Business and decision-makers and fulfilling requirements in compliance with executive orders and federal directives regarding system auditing and an insider threat program.

- Provide support and assistance to federal, state, local, territorial, and tribal law enforcement agencies that investigate and interdict illicit use of aircraft in narcotics, weapons, and human trafficking, as well as respond to the dramatic increase in attacks on aircraft using lasers.

Anticipated outputs/outcomes:

- Support the development of a Safety Management System (SMS) oversight program that will provide the Hazardous Materials Safety Program with resources to participate in air carrier surveillance activities in coordination with FAA Office of Aviation Safety certificate management teams.
- Provide notifications on over 6,000 significant aviation events.
- Provide outreach letters to over 12,000 airline passengers found with suspected hazardous materials during screening.
- Process over 8,000 employee and contractor investigations.
- Conduct no fewer than 350 FAA facility inspections and assessments.
- Provide FAA subject matter expertise and analysis to more than 1000 daily Intelligence Community secure video teleconferences on an annual basis.
- Deploy the Emergency Response Vehicle (ERV) to no fewer than 3 pre-planned National Special Events. (Emergency response/crisis deployments are not included in this figure.)
- Test and train all emergency response personnel with communication responsibilities on the satellite telephone emergency network (STEN). Current system consists of 171 satellite phones.
- Increased facility and IT security via the use of the PIV card.
- Integrate 200 systems (PACS and LACS) with PIV cards over three years.

What Is This Program?

The Office of Security & Hazardous Materials Safety develops and implements policy to protect FAA employees, contractors, facilities, and assets, provides crisis management support and directly supports the national security responsibilities of the FAA and protects the flying public through the safe air transport of hazardous materials.

Our program supports the Department of Transportation (DOT) strategic goal of Safety and the goal outcome of Reduction in Transportation-Related Injuries and Fatalities. It also supports the Defense Mobility and Emergency Preparedness portion of DOT's Organizational Excellence Goal.

The program's objectives are to achieve the lowest possible accident and incident rate and constantly improve aviation safety while decreasing any unnecessary risks to the traveling public as well as to cargo aircraft operations. This can be achieved by preventing hazardous materials accidents and incidents aboard aircraft before they occur by decreasing all unnecessary risks. Our program is responsible for the agency's critical infrastructure protection, personnel security investigations for federal and contract employees of the FAA, investigations of allegations of misconduct by FAA employees/contractors and violations of federal statutes and aviation regulations by FAA-certified airmen, emergency operations, contingency planning, crisis management and the development and implementation of national policy on hazardous materials through inspections, training and outreach to those involved in the hazardous materials industry worldwide.

Anticipated accomplishments include:

- Support a Safety Management System approach to conducting national surveillance of all Part 121 air carriers, and maintain current level of surveillance of other certificated carriers, shippers, and aviation repair stations to assess compliance and enforce hazardous materials regulations through coordination with other transportation modes and other agencies. This includes coordinating safety-related efforts with FAA's Office of Aviation Safety related to air carriers' transportation of hazardous materials.
- Continue to coordinate efforts to educate domestic and international passengers on the safety ramifications of transporting undeclared hazardous materials in baggage through outreach.
- Partner with other agencies such as Customs & Border Patrol, and with other modes, to capitalize on technology to gain data and information for quantitative and qualitative analysis of trends useful for targeting compliance, enforcement and outreach activities.

- Ensure that FAA executives and continuity personnel have priority access on landlines and cellular phones by managing the Government Emergency Telecommunications Service cards and the Wireless Priority Service programs.
- Ensure FAA executives and Lines of Business have real-time access to and analysis of intelligence and threat information during crisis and national and aviation security incidents.
- Continue development and implementation of FAA-wide Counterintelligence (CI) and Insider Threat Detection Programs to include CI investigative and analytical activities, foreign travel risk briefings, foreign visitor vetting, workforce threat and vulnerability awareness and cyber-risk briefings for all applicable FAA employees and executives as required by Executive Order 13587.
- In partnership with the Pipeline and Hazardous Materials Safety Administration and other stakeholders, assist with the finalization of the lithium battery rule, the development of rules for other critical commodities, the development of operator regulations, and harmonization of the Hazardous Materials Regulations with international requirements.
- Ensure that FAA responds to each reported laser incident and takes appropriate regulatory action when an individual who pointed a laser device is identified by law enforcement.
- Provide investigative support to the Office of Audit and Evaluation (AAE) in support of the congressionally-mandated FAA Whistleblower Program.
- Continue the development of the Emergency Operations Network (EON) to provide a highly available and flexible infrastructure for effective collaborative communications, continuity of operations and adaptive situational awareness for enhancing decision.
- Partner with ATO/AJW to improve facility security by upgrading facility access systems to validate the PIV card – real time – as it is used as an access card.
- Partnering with AFN/AIO, increase the use of the PIV card readers for log-on to on-NAS computer systems, thereby validating the user's access and privileges (and reducing required passwords).

Why Is This Particular Program Necessary?

We develop and implement policy to protect FAA employees, contractors, facilities, and assets, provide crisis management support, ensure availability of continuity of operations/continuity of government facilities and communications, support the national security responsibilities of the FAA and protect the flying public through the safe air transport of hazardous materials. Any failures or lapses in implementation of these programs directly impact the safety and security of the NAS and FAA's ability to execute its functions as one of the key components of our country's transportation infrastructure. These are some of the yearly measurable benefits to our customers and beneficiaries:

- Conduct 6,000+ suitability and background checks.
- Expand SMS hazardous materials oversight of Part 121 air carriers and perform approximately 8,000 HAZMAT safety inspections of and outreach to air carriers, shippers, and passengers.
- Issue more than 20,000 Personal Identity Verification cards.
- Review more than 500 cables from Intelligence, Law Enforcement, Defense, and Homeland Security agencies each day to identify possible threats to U.S. civil aviation, FAA personnel and physical and cyber infrastructure, the National Airspace System (NAS) and US aerospace technologies from foreign economic espionage.
- Provide critical information and support to Flight Standards and Law Enforcement agencies investigating approximately 3,500 laser incidents per year to determine if a subject was identified by law enforcement so that appropriate regulatory action can be taken by the FAA.
- Perform 30+ priority investigative actions in support of the AAE whistleblower mission.
- Integrate 200 systems (PACS and LACS) with PIV cards over three years.

Without the requested level of funding, we will be ill-equipped to successfully execute our mission and support DOT's Strategic Plan. ASH must keep pace with increasing costs, as well as increase the numbers of inspectors and investigators, administrative and supervisory support personnel, training and equipment.

How Do You Know The Program Works?

There are positive measures of the success of the ASH program, which supports the Defense Mobility and Emergency Preparedness portion of DOT's Organizational Excellence Goal and DOT's Safety Strategic Goal. ASH has consistently met our projected targets for success each year as well as required cost efficiency and program effectiveness measures. We adhere to all regulations and laws pertaining to our work and ensure this through our internal auditing.

The program has shown our effectiveness by protecting critical infrastructure during Hurricane Katrina, the earthquakes in Haiti and Japan, and during security incidents, including the attempted Christmas 2009 bombing of NW253 and the October 2010 air cargo bomb plot. Additionally, there have been no fatalities caused by the air shipment of hazardous materials on passenger aircraft within the United States since the ValuJet crash of May 1996.

The PIV-card enabled logical access IT platform, which was developed by ASH, met the DOT Secretary's challenge to reduce passwords. Where ASH has connected facility access systems to authenticate PIV cards in "real time", people have been discovered trying to access FAA facilities with expired and cancelled PIV cards. While a cancelled card of former employee or contractor may display a valid expiration date the invalid card will be captured when the access system instantly checks the PIV card against the PIV Authentication Database maintained by ASH.

Why Do We Want/Need To Fund The Program At The Requested Level?

Any reduction to our request will have a negative impact on our ability to meet our critical safety-security mission requirements. The requested funding level is necessary to maintain base level Security and Hazardous Materials Inspection Programs that protect FAA personnel, systems and facilities and to promote the safety of the flying public. Programs that would be adversely affected by reductions to the request include Emergency Operations and Communications, Investigations, Threat Indication and Warning, Hazardous Materials Safety, Facility Security, Communications Security, Personnel Security, full implementation of FAA-wide Counterintelligence and Insider Threat Detection Programs and ongoing improvements in the Identification Media Program. All of these programs are designed to reduce the vulnerability to terrorist or other hostile penetration of FAA facilities and systems and to improve the protection of individual privacy for members of the FAA workforce.

Receiving less than the amount requested would impact operational travel, mission safety-critical operational/technical training for the National Security Professional Development Program and for the Hazardous Materials Safety Program. One example of mission critical safety operational/technical training for hazardous materials compliance and enforcement involves providing all hazardous materials special agents with the tools necessary to conduct inspections and investigations according to SMS principles for high consequence commodities such as lithium batteries. This is a safety critical need and, if not completed, will impact FAA's ability to provide appropriate safety oversight of both passenger and cargo air carriers which offer or accept hazardous materials within their operations.

Reductions to the requested level would force ASH to consider the following actions:

- Limit implementation of a safety oversight program for the 14 CFR hazardous material requirements that were codified in February 2007, delaying transition to a Safety Management System approach for carrying out FAA's hazardous materials safety oversight responsibilities to only a small number of the 86 Part 121 and Part 121/135 air carriers.
- Reduce ability to identify, evaluate, analyze, mitigate, monitor and otherwise manage safety risks due to air transportation of hazardous materials for air carriers in preparation for transitioning to an SMS approach.
- Delay alignment of procedures and processes between FAA's Hazardous Materials Safety Program and FAA's Office of Aviation Safety in order to enhance efficiency and effectiveness of air carrier surveillance and safety assurance.

- Reduce the number of maintenance agreements for software, hardware, and equipment needed to properly maintain the Emergency Operations Network (EON), secure voice conference systems and facility equipment, such as HVAC and UPS.
- Eliminate logistics support for the repair and replacement of emergency response radio equipment located in field facilities.
- Curtail the inspection and assessment of all areas that store, handle, and/or process Classified National Security Information, Communications Security, Export Controlled Information and Sensitive/Controlled Unclassified Information to determine compliance with FAA Orders 1600.2, 1600.8, 1600.75, other applicable FAA or Federal directives and National Security Agency /United States Air Force directives.
- Slow responsiveness of Law Enforcement Assistance Program agents that provide critical support and information to both the Law Enforcement Community and FAA Lines of Business, to include investigation of those that target aircraft with lasers, which is a threat to aviation safety.
- Increase the time it takes to provide investigative responses or assistance in support of LOB/SO's and other agency requests for investigations. Additionally, ASH will not be able to maintain its congressionally mandated and specifically funded requirement to support law enforcement in the counterdrug mission.
- Hinder the full implementation and maturation of FAA-wide Counterintelligence and Insider Threat Detection Programs at FAA Headquarters and across all FAA Regions.
- Inability to develop tracking and reporting capabilities in EON necessary to handle the increased laser strike activity.
- Reduce the FAA/DOT's ability to use the PIV Card for physical and logical access.
- Reduce the FAA/DOT's ability to use multiple IT platforms with a single password.

Explanation of Funding Changes	Dollars ($000)	FTE
Staff Offices:	**-$484**	**-32**
Overview: For FY 2014, the Staff Offices Assistant Administrators request $199,801,000 and 1,018 FTE to meet their respective missions. The FY 2014 request level reflects adjustments to base, base transfers and other changes.		
Adjustments to Base	**+$1,186**	**-20**
FY 2012 Internal Adjustments: This adjustment transfers resources within multiple Staff Offices. Resource distribution is as follows: the Office of Communications +$400k; the Office of Policy, International Affairs, Environment +$250k; the Office of Security and Hazardous Materials -$650k. This transfer occurred during FY 2012 execution year as a with-in threshold reprogramming and is pending apportionment approval.	+/-0	
FY 2013 Adjustments: This adjustment reflects a decrease to annualized staffing levels.		-20
Pay Inflation: This increase is required to provide for costs associated with base salary increases. (January to September) The factor used is 1.0 percent.	+1,186	
Other Changes	**-$609**	
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. The contract covers about 1,700 employees across six FAA offices (AVS, ATO, ARC, ARP, AGC, and ABA) and includes engineers, computer specialists, program analysts, budget analysts and other professionals. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes, pay inflation, Organizational Success Increase (OSI) and Superior Contribution Increase (SCI).	+16	
Working Capital Fund: This cost adjustment is requested to support the Department of Transportation's (DOT) Working Capital Fund (WCF) profile. These adjustments are being made to best align each office's resources with their expected WCF costs.	-625	
Base Transfers	**-$1,061**	**-12**
Administrative Support: This adjustment of resources (staff and funding) from the Office of Financial Services to the Office of Civil Rights provides administrative support on civil rights, diversity, and equal opportunity matters. This occurred during FY 2012 execution year as a with-in threshold reprogramming and is pending apportionment approval.	+72	+1
Civil Rights Realignment: The base transfer of staff support and funding from the Air Traffic Organization (ATO) to the Office of Civil Rights (ACR) will eliminate redundancy in corporate focus functions and align resources with the appropriate organizations.	+1,499	+4
NextGen Global Outreach Realignment: The base transfer of staff support and funding from the Office of Next Generational Air Transportation System (ANG) to the Office of Policy, International Affairs, and Environment (APL) will support the coordination of global outreach and better align resources with the appropriate staff office.	+300	+1
Intervention Program Establishment: The base transfer of staff support and funding from the Air Traffic Organization (ATO) to the Office of Audit and Evaluation (AAE) will support the implementation of the intervention program and better align resources with the	+290	+1

Explanation of Funding Changes	Dollars ($000)	FTE
appropriate staff office. The intervention program offers an effective, alternative way of identifying and handling disclosures early in the process before they evolve into matters that are more costly to resolve. The implementation of the intervention program is a requirement of FAA order 1100.167 and will benefit the FAA organizations.		
Emergency Operations Coordinator: The base transfer of staff support and funding from the Office of Human Resources (AHR) to the Office of Security of Hazardous Materials Safety (ASH) will support the FAA emergency operations planning as it relates to human behavior and performance. This will better align resources to the appropriate office and will help improve the FAA's emergency preparedness and response to national incidents.	+198	+1
Information Technology Resource Consolidation: This base transfer represents the transformation of multiple IT units aligned with the FAA Lines of Business and Staff Offices into a single centralized IT Shared Services Organization (ITSSO). This request will support ITSSO major initiatives within Information Security and Privacy, Infrastructure Operations, Solution Delivery, Information Delivery, IT Management and Performance, Strategy and Innovation, Enterprise Program Management, and Business Partner Services. Base funds cover Federal staff, contract services, purchase and maintenance costs for specialized hardware and software technology tools, extensive infrastructure operations at FAA Headquarters, Regional Offices, Centers, and help desk support.	-3,420	-20

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

For necessary expenses, not otherwise provided for, for acquisition, establishment, technical support services, improvement by contract or purchase, and hire of national airspace systems 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, including aircraft for aviation regulation and certification; to be derived from the Airport and Airway Trust Fund, $2,777,798,000, of which $482,000,000 shall remain available until September 30, 2014, and of which $2,295,798,000 shall remain available until September 30, 2016: Provided, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred in the establishment, improvement, and modernization of national airspace systems: Provided further, That upon initial submission to the Congress of the fiscal year 2015 President's budget, the Secretary of Transportation shall transmit to the Congress a comprehensive capital investment plan for the Federal Aviation Administration which includes funding for each budget line item for fiscal years 2015 through 2019, with total funding for each year of the plan constrained to the funding targets for those years as estimated and approved by the Office of Management and Budget.

Note.—A full-year 2013 appropriation for this account was not enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 112-175). The amounts included for 2013 reflect the annualized level provided by the continuing resolution.

Program and Financing
(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
	Direct program:			
0001	Engineering, development, test and evaluation	455	583	335
0002	Procurement and modernization of (ATC) facilities and equipment	1,627	1,652	1,200
0003	Procurement and modernization of non-ATC facilities and equipment	180	202	126
0004	Mission support	232	252	183
0005	Personnel and related expenses	472	478	482
0100	Subtotal, direct program	2,966	3,167	2,326
0801	Reimbursable program	74	75	75
0900	Total new obligations	3,040	3,242	2,401
	Budgetary resources available for obligation:			
1000	Unobligated balance brought forward, Oct 1	1,355	1,163	787
1001	Discretionary unobligated balance brought forward, Oct 1	1,352	1,163	
1012	Unobligated balance transferred between expired and unexpired accounts	1	. . . . .	. . . . .
1021	Recoveries of prior year unpaid obligations	61	. . . . .	. . . . .
1050	Unobligated balance	1,417	1,163	787
	New budget authority (gross), detail:			
	Discretionary:			
1101	Appropriation (trust fund)	2,731	2,777	2,778
1132	Unobligated balance of appropriations temporarily reduced	. . . . .	. . . . .	. . . . .
1160	Appropriation, discretionary (total)	2,731	2,777	2,778
1700	Spending authority from offsetting collections: collected	40	89	70
1701	Change in uncollected payment, Federal sources	24	. . . . .	. . . . .
1750	Spending auth from offsetting collections, disc (total)	64	89	70
1900	Budget authority (total)	2,795	2,866	2,848
1930	Total budgetary resources available	4,212	4,029	3,635
	Memorandum (non –add) entries:			
1940	Unobligated balance expiring	-9	. . . . .	. . . . .
1941	Unexpired Unobligated balance, end of year	1,163	787	1,234
1951	Special and non-revolving trust funds: Unobligated balance expiring	9	. . . . .	. . . . .
1952	Expired Unobligated balance, start of year	125	103	103
1953	Expired Unobligated balance, end of year	94	103	103
1954	Unobligated balance canceling	70	. . . . .	. . . . .
	Change in obligated balances:			
3000	Unpaid obligations, brought forward, Oct 1 (gross)	1,980	1,943	2,263
3010	Obligations incurred, unexpired accounts	3,040	3,242	2,401
3011	Obligations incurred, expired accounts	14	. . . . .	. . . . .
3020	Outlays (gross)	-2,968	-2,922	-2,911
3040	Recoveries of prior year unpaid obligations, unexpired	-61		
3041	Recoveries of prior year unpaid obligations, expired	-62		
3050	Unpaid obligations, end of year (gross)	1,943	2,263	1,753
3060	Uncollected pymts, Fed sources, brought forward, Oct 1	-74	-80	-80
3070	Change in uncollected pymts, Fed sources, unexpired	-24	. . . . .	. . . . .
3071	Change in uncollected pymts, Fed sources, expired	18	. . . . .	. . . . .
3090	Uncollected pymts, Fed sources, end of year	-80	-80	-80
3100	Obligated balance, start of year (net)	1,906	1,863	2,183
3200	Obligated balance, end of year (net)	1,863	2,183	1,673
	Budget Authority and outlays, net:			

Identification code: 69-8107-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
4000	Budget authority, gross	2,795	2,866	2,848
4010	Outlays from new discretionary authority	1,107	1,262	1,229
4011	Outlays from discretionary balances	1,859	1,657	1,682
4020	Outlays (gross)	2,966	2,919	2,911
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4030	Federal sources	-50	-49	-30
4033	Non-Federal sources	.....	-40	-40
4040	Offsets against gross budget authority and outlays (total)	-50	-89	-70
	Additional offsets against gross budget authority only:			
4050	Change in uncollected pymts, Fed sources, unexpired	-24	.....	.....
4052	Offsetting collections credited to expired accounts	10	.....	.....
4060	Additional offsets against gross budget authority only (total)	-14	.....	.....
4070	Budget authority, net (discretionary)	2,731	2,777	2,778
4080	Outlay, net (discretionary)	2,916	2,830	2,841
	Mandatory:			
	Outlays, gross:			
4101	Outlays from mandatory balances	2	3	.....
4170	Outlay, net (mandatory)	2	3	.....
4180	Budget authority, net (total)	2,731	2,777	2,778
4190	Outlay, net (total)	2,918	2,833	2,841

Funding in this account provides for the deployment of communications, navigation, surveillance, and related capabilities within the National Airspace System (NAS). This includes funding for several activities of the Next Generation Air Transportation System, a joint effort between the Department of Transportation, the National Areonautics and Space Administration, and the Departments of Defense, Homeland Security, and Commerce to improve the safety, capacity, security, and environmental performance of the NAS. The funding request supports the Federal Aviation Administration's comprehensive plan for modernizing, maintaining, and improving air traffic control and airway facilities services.

Object Classification
(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Direct obligations:			
	Personnel compensation:			
1111	Full-time permanent	312	318	321
1113	Other than full-time permanent	2	2	2
1115	Other personnel compensation	9	9	9
1119	Total personnel compensation	323	329	332
1121	Civilian personnel benefits	88	89	90
1210	Travel and transportation of persons	41	34	34
1220	Transportation of things	2	3	2
1231	Rental payments to GSA	.....	1	.....
1232	Rental payments to others	.....	44	27
1233	Communications, utilities, and miscellaneous charges	54	18	26
1251	Advisory and assistance services	.....	138	90
1252	Other services from non-federal sources	2,136	1,890	1,263
1253	Other goods and services from federal sources	.....	112	65
1254	Operation and maintenance of facilities	.....	95	37
1255	Research and development contracts	.....	3	5
1257	Operation and maintenance of equipments	.....	69	41

Identification code: 69-8107-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
1260	Supplies and materials	21	21	19
1310	Equipment	189	215	192
1320	Land and structures	107	99	97
1410	Grants, subsidies, and contributions	5	7	6
1990	Subtotal, obligations, Direct obligations	2,966	3,167	2,326
	Reimbursable obligations:			
	Personnel compensation:			
2111	Personnel compensation: Full-time permanent	5	8	8
2121	Civilian personnel benefits	1	2	2
2210	Travel and transportation of persons	2	3	3
2252	Other services from non-federal sources	25	26	26
2260	Supplies and materials	2	3	2
2310	Equipment	32	28	28
2320	Land and structures	7	5	5
2990	Subtotal, obligations, Reimbursable obligations	74	75	75
9999	Total new obligations	3,040	3,242	2,401

Employment Summary

Identification code: 69-8107-0-7-402	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
1001 Direct civilian full-time equivalent employment	2,793	2,833	2,833
2001 Reimbursable civilian full-time equivalent employment	39	61	62

EXHIBIT III-1

FACILITIES and EQUIPMENT
SUMMARY BY PROGRAM ACTIVITY
Appropriations, Obligations Limitations, and Exempt Obligations
($000)

	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request	Change FY 2014-2012
Engineering, Development, Test and Evaluation	435,600	438,266	392,325	(43,275)
Air Traffic Control Facilities and Equipment	1,406,731	1,415,340	1,523,223	116,492
Non-Air Traffic Control Facilities and Equipment	173,100	174,159	148,600	(24,500)
Facilities and Equipment Mission Support	240,300	241,771	231,650	(8,650)
Personnel and Related Expenses	475,000	477,907	482,000	7,000
Hurricane Sandy Emergency Supplemental	0	30,000	0	0
Total	2,730,731	2,777,443	2,777,798	47,067
FTEs				
Direct	2,907	2,833	2,833	(74)
Reimbursable	7	61	62	55

Program and Performance Statement

This account provides funds for programs that improve operational efficiency, constrain costs, modernize automation and communication technology and systems, and deal with aging facilities. Particular emphasis is placed on en route and terminal air traffic control, satellite navigation and landing systems, and communications.

Funding is organized within the following activity areas of FAA:

Activity 1: Engineering, development, test and evaluation;

Activity 2: Procurement and modernization of air traffic control facilities and equipment; procurement and modernization on non-air traffic control facilities and equipment;

Activity 3: Procurement and modernization of non-Air Traffic Control facilities and equipment;

Activity 4: Facilities and equipment mission support; and

Activity 5: Personnel and Related Expenses.

EXHIBIT III-1a

FACILITIES and EQUIPMENT
SUMMARY ANALYSIS OF CHANGE FROM FY 2012 TO FY 2014
Appropriations, Obligations Limitations, and Exempt Obligations
($000)

Item	Change from FY 2012 to FY 2014 ($)	Change from FY 2012 to FY 2014 (FTE)
FY 2012 Actual	**$2,730,731**	**2,907**
Administrative Adjustments to Base:		
Annualized FY 2013 FTE	0	
Annualization of FY 2013 Pay Raise	0	
Working Capital Fund Increase (e-gov)	1	
FY 2014 Pay Raise	3,143	
Non-Pay Inflation	11,642	
Subtotal, Adjustments to Base	**$14,786**	**0**
New and Expanded Programs:		
Engineering, Development, Test and Evaluation	(45,466)	
Air Traffic Control Facilities and Equipment	109,415	
Non-Air Traffic Control Facilities and Equipment	(25,371)	
Facilities and Equipment Mission Support	(9,859)	
Personnel and Related Expenses	3,562	(74)
Subtotal New or Expanded Programs	**$32,281**	**(74)**
FY 2014 Request	**$2,777,798**	**2,833**

c. Flight Service Programs

d. Landing and Navigational Aids Program

e. Other ATC Facilities Programs

Activity 3, Procurement and Modernization of Non-Air Traffic Control Facilities and Equipment			
a. Support Programs			
3A01	Hazardous Materials Management	$20,000,000	257
3A02	Aviation Safety Analysis System (ASAS)	$12,700,000	259
3A03	Logistics Support System and Facilities (LSSF)	$10,000,000	262
3A04	National Air Space Recovery Communications (RCOM)	$12,000,000	265
3A05	Facility Security Risk Management	$15,000,000	268
3A06	Information Security	$13,000,000	270
3A07	System Approach for Safety Oversight (SASO)	$9,500,000	277
3A08	Aviation Safety Knowledge Management Environment (ASKME)	$12,200,000	279
3A09	Data Center Optimization	$1,000,000	283
3A10	Aerospace Medical Equipment Needs (AMEN)	$5,000,000	286
3A11	Aviation Safety Information Analysis and Sharing (ASIAS)	$15,000,000	289
3A12	National Test Equipment Program	$3,000,000	294
3A13	Mobile Assets Management Program	$3,000,000	296
3A14	Aerospace Medicine Safety Information System (AMSIS)	$3,900,000	298
b. Training, Equipment and Facilities			
3B01	Aeronautical Center Infrastructure Modernization	$12,300,000	301
3B02	Distance Learning	$1,000,000	304
	Total, Activity 3	**$148,600,000**	
Activity 4, Facilities and Equipment Mission Support			
a. System Support and Support Services			
4A01	System Engineering and Development Support	$35,600,000	308
4A02	Program Support Leases	$42,100,000	310
4A03	Logistics Support Services (LSS)	$11,500,000	312
4A04	Mike Monroney Aeronautical Center Leases	$17,900,000	314
4A05	Transition Engineering Support	$16,500,000	316
4A06	Technical Support Services Contract (TSSC)	$25,000,000	318
4A07	Resource Tracking Program (RTP)	$4,000,000	321
4A08	Center for Advanced Aviation System Development (CAASD)	$70,000,000	323
4A09	Aeronautical Information Management Program	$9,050,000	328
	Total, Activity 4	**$231,650,000**	
Activity 5, Personnel Compensation, Benefits, and Travel			
5A01	Personnel and Related Expenses	$482,000,000	330
	Total, All Activities	**$2,777,798,000**	

Executive Summary – Facilities and Equipment (F&E), Activity 1

What Is The Request And What Will We Get For The Funds?

The Facilities and Equipment (F&E) Activity 1 program requests $392,324,500 for FY 2014, a decrease of $43,275,500 (10 percent) below our actual FY 2012 level. Of the $392,324,500 requested for FY 2014, $339,824,500 is requested to continue multiple basic and applied research efforts in support of future Next Generation Air Transportation System (NextGen) technologies and concepts. The remaining $52,500,000 is requested to support basic research activities under the Advanced Technology Development and Prototyping (ATDP) program and to sustain the facility and infrastructure at the William J. Hughes Technical Center at Atlantic City, New Jersey.

Key outputs and outcomes expected to be achieved in budget year with the requested resources:

- DataComm – Provide funding for the DataComm Integrated Services contract, along with integration and engineering activities, and implementation plans.
- PBN- Funding will expedite development and implementation of PBN procedures, while ensuring safety.
- OAPM - Begin OAPM design work at Memphis and Cleveland/Detroit. Begin OAPM pre-implementation and evaluation activities at South/Central Florida, Chicago, and Phoenix.

What Is This Program?

Activity 1 includes pre-acquisition NextGen F&E programs, continuing basic research programs, and laboratory support for the Technical Center. Activity 1 programs support the initial design, engineering, development, test and evaluation activities associated with producing end-product systems, technologies, and capabilities for the National Airspace System (NAS). This includes the development of operational concepts and proof-of-concept systems and equipment and their demonstration in the laboratory and limited operational settings. Funding supports initial research through early development to concept demonstration, but ends prior to an investment decision for production and implementation across the NAS.

These efforts contribute to the following DOT Strategic Goals:

- Safety: Reduction in transportation related injuries and fatalities
- Economic Competitiveness: Maximum economic returns on transportation policies and investments
- Organizational Excellence: Diverse and collaborative DOT workforce

Why Is This Particular Program Necessary?

We undertake Activity 1 programs to validate operational concepts and proof-of-concept systems and equipment prior to making decisions about moving forward on capital investments that will be deployed across the NAS. We define operational requirements and provide the system engineering associated with accomplishing these activities. We must also maintain and upgrade the laboratories and other infrastructure at the FAA Technical Center that support these activities. We invest in these programs with the ultimate goal of modernizing and sustaining the NAS.

Some of the basic and applied research performed under Activity 1 includes:

- Technology research to prevent future runway incursions
- Airspace analysis for complementing F&E programs
- Various development projects needed to transition to the next level of F&E development
- Pre-implementation studies, requirements documentation, and initial investment analysis

How Do You Know The Program Works?

The objective of performing these activities is to support capital investment decision–making. Based on private sector and federal procurement best practices, we have learned that performing these activities helps us make better investment decisions and reduces risk in the acquisition phase of the system life cycle. To this end, FAA uses industry-benchmarked program management practices and processes. We also comply with guidelines outlined in the Project Management Body of Knowledge (PMBOK).

Efforts under Activity 1 show positive outcomes as individual projects reach maturity and are transferred to Activities 2 through 4 in the F&E Budget, Systems are fielded as a result of efforts at the Tech center, and programs are slated for cancellation as a result of analysis during the pre-acquisition and research work.

Why Do We Want/Need To Fund The Program At The Requested Level?

If funding were reduced, we would prioritize reductions at the overall F&E account level. We would defer long-term NextGen investments, thereby minimizing risks to near-term NextGen deliverables. In addition, we would reduce other, non–NextGen investments in a manner that enables us to sustain ATC safety and capacity at levels expected by the public, the military and other stakeholders. Further reductions would require larger funding cuts in mission support activities.

Detailed Justification for - 1A01 Advanced Technology Development and Prototyping

What Is The Request And What Will We Get For The Funds?

FY 2014 – Advanced Technology Development and Prototyping
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Advanced Technology Development and Prototyping	$29,000	$32,090	$33,500	+$4,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Runway Incursion Reduction Program (RIRP)	---	$5,000.0
B. System Capacity, Planning and Improvements	---	5,600.0
C. Operations Concept Validation and Infrastructure Evolution	---	4,000.0
D. Major Airspace Redesign	---	5,000.0
E. Strategy and Evaluation	---	1,500.0
F. Dynamic Capital Planning	---	2,500.0
G. Traffic Allert and Collision Avoidance System (TCAS)	---	2,500.0
H. Unified Contracting System (UCS)	---	3,300.0
I. Operational Analysis and Reporting System (OARS)	---	1,000.0
J. Next Generation Surveillance and Weather Radar Capability (NSWRC)	---	2,200.0
K. In Service Engineering	---	900.0
Total	Various	$33,500.0

For FY 2014, a total of $33,500,000 is requested for the activities shown above.

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 Destination 2025 vision, which captures the ideal future that FAA strives toward, and promotes the requirements associated with the evolving air traffic system architecture and improvements in airport safety and capacity.

What Is This Program?

A. Runway Incursion Reduction Program (RIRP)

The Runway Incursion Reduction Program (RIRP) will continue research, development, and operational evaluation of technologies to increase runway safety. Consistent with standing National Transportation Safety Board (NTSB) recommendations and initiatives identified in FAA Destination 2025, research emphasis will remain on technologies that provide for direct safety indications and alerts to pilots and aircrews at large airports as well as those that can be applied cost effectively at small to medium airports.

The program will test alternative airport surface detection technology and the application of these technologies for pilot, controller, and vehicle operator situational awareness tools. Current initiatives include Runway Status Lights (RWSL) technology enhancements such as Runway Intersection Lights (RIL) logic, Low Cost Ground Surveillance (LCGS) Pilot sites, Runway Safety Assessment (RSA) studies, Final Approach Runway Occupancy Signal (FAROS) and Enhanced Final Approach Runway Occupancy Signal (eFAROS) for high density airports. When appropriate, investment analyses will be performed to support acquisition and implementation of selected solutions.

The requested funding will support delivery of performance targets outlined in the FAA Destination 2025 and ATO Safety Business Plan. Specifically, the funds will support:

- The development of artifacts and documents required to initiate and support the acquisition of RILs and eFAROS into the Acquisition Management System (AMS)
- The development of annual technical and operational evaluation reports for the four RWSL prototype systems
- The development of annual technical and operational evaluation reports for the four LCGS pilot systems pending a Joint Resources Council (JRC) decision on the acquisition of LCGS
- The evaluation of alternative low-cost runway incursion detection and prevention systems
- The installation and implementation of a runway safety system for direct to pilot indications, using the Low Cost Ground Surveillance platform as the sensor and
- Delivery of Precision Approach Path Indicator (PAPI)/FAROS modification kits to select sites

Key Outputs:

- Develop annual technical and operational evaluation report of four LCGS pilot systems
- Develop annual technical and operational evaluation report of existing RWSL prototype systems
- Develop annual technical and operational evaluation report for RILs at Boston Logan International Airport (BOS)
- Complete the installation and produce operational evaluation report of a runway safety system for direct to pilot indications, using a low cost Surface Movement Radar as the surveillance sensor
- Complete installation and implementation of eFAROS units at second prototype location and commence operational evaluation
- Develop readiness report based on coordination of preliminary requirements document and cost benefit analysis documents required for eFAROS Investment Analysis Readiness Decision (IARD)
- Develop annual technical and operational evaluation report of eFAROS units at all prototype locations
- Complete report on cockpit simulations at MITRE Center for Advanced Aviation System Development (CAASD) testing Human Factors (HF), safety logic, aircraft performance, or any uncertainty or deficiency pertaining to surface based RI indications
- Complete report on testing of safety logic enhancements to RI detection and prevention products
- Publish initial report on field evaluation of alternative direct to pilot testing system at the FAA Tech Center
- Complete initial requirements document for eFAROS
- Publish the initial project plan and Resource Management Plan (RMP) for the utilization of fiber optics as a sensor to drive the activation of direct to pilot alerting safety logic

Key Outcome**:** The above Key Outputs result in Reduced Runway Incursions, which supports the Destination 2025 Goal of reducing aviation risk through all phases of flight (gate-to-gate).

B. System Capacity, Planning, and Improvements

The System Capacity, Planning, and Improvements program provides data and analyses on NAS operations to FAA executives and managers to help them identify deficiencies and develop proposals to improve NAS performance. This work includes:

- Airport modeling and analysis using actual data collected from ATC systems in the field to determine the value of potential improvements in airspace or airfield modifications
- Enhancements of the Performance Data Analysis and Reporting System (PDARS) which is a fully integrated performance measurement tool designed to help the FAA improve the NAS by tracking the daily operations of the Air Traffic Control (ATC) system and their environmental impacts. The PDARS also provides operational data to baseline the measurement and analysis of NextGen capability improvements

- Development of new Agency level metrics to enhance management awareness of, and response to, system performance
- Sponsor operations research to evaluate concepts to improve future NAS performance in support of the Destination 2025 Science, Technology, Engineering and Math (STEM) strategic initiative
- The benchmarking of ATO performance with other Air Navigation Service Provider (ANSP) to support joint projects done as part of ICAO, Civil Air Navigation Services Organization (CANSO) or Aerospace Transportation Advisory Group (ATAG) work plans. These efforts are performed to respond to inquiries on global flight efficiency performance targets for ATM or more general inquiries on the overall flight inefficiency that may be attributed to ATM

This program also sponsors NAS performance and airport capacity studies where experts from the FAA, academia, and industry collaborate to analyze and develop recommendations for improving capacity and system efficiency, and reducing delays at specific airports. It has the added capability of using its performance measurement systems and operations research to quantify the efficiency of the NAS and form the basis of proposals for overall system improvements.

C. Operations Concept Validation and Infrastructure Evolution

Developing operational concepts is an Office of Management and Budget (OMB) recommended first step in developing an Enterprise Architecture. This program develops and validates operational concepts that are key to the Air Traffic Organization's (ATO) modernization programs and the Next Generation Air Transportation System (NextGen). This work includes developing and maintaining detailed second level concepts that support validation and requirements development. Second level concepts identify the personnel and functional changes necessary for the ATO to provide customer service in ways that increase productivity and reduce net cost. Recent work includes developing second level concepts for En Route, Traffic Flow Management (TFM), NextGen Towers, and Integrated Arrival and Departure Operations. This information helps the aviation community anticipate what changes are needed in aircraft equipment in order to operate with the new technology being implemented in the NAS and develop new procedures.

The Operational Concept efforts look at the changing roles and responsibilities of the Air Traffic workforce and the design of Advanced Facilities to derive the associated functional requirements imposed on the NAS infrastructure. Concept development includes preparing system specifications, roles and responsibilities, procedures, training, and certification requirements. These development and validation activities support NAS modernization through:

- Concept/scenario development
- Concept validation
- Simulation and analysis
- System design
- Metric development
- Modeling

D. Major Airspace Redesign

This program supports increased capacity by funding the physical changes in facilities necessary to accommodate airspace redesign. Redesign projects will take on increased emphasis at both the national and regional levels to ensure that FAA is able to effectively manage the projected growth in demand at FAA facilities and airports.

Implementation of airspace redesign efforts frequently results in changes in the number and shape of operational positions or sectors, including changes to sector, area or facility boundaries. Transition to a new configuration after airspace redesign is implemented requires changes in the supporting infrastructure. These infrastructure changes can include communication modifications such as changes in frequencies, connectivity of radio site to the control facility, 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.

E. Strategy and Evaluation

The FAA's Office of Systems Analysis & Modeling is responsible for developing and maintaining mathematical models of the NAS, and using these models to help guide NextGen investments. FAA's modeling suite includes models of varying scope, from systems dynamics models of the entire air transportation system to detailed airport surface models. Several of these models are obsolete and cannot support the analysis of advanced Air Traffic Management (ATM) concepts.

The Strategy and Evaluation program will develop two new computer models to rectify these modeling shortfalls and better support other organizations within FAA with analytical needs.

First, a new airport capacity model, known as ADSIM+, is being developed for use in analyzing new airport capacity-related projects. This model will facilitate rapid analysis of airport improvements, demand changes, and ATM technology insertions. In addition to being used by the Office of Systems Analysis and Modeling, the model will be used by the Office of Performance Analysis for runway capacity studies, the Office of Investment Planning and Analysis for investment analyses, the Joint Planning and Development Office (JPDO) for NextGen analyses, and the FAA's Office of Airports. The model will also be used by aviation consultants and the academic community, and provide a de facto standard for airport capacity analyses.

Second, a system-wide NAS model is being developed to replace the existing 1980s-era model. A new system-wide model is required to analyze advanced ATM concepts and aid with NextGen program trade-off studies, investment analyses, and NAS performance analyses. The new model will support the entire NextGen organization, as well as the FAA's Program Management Office (PMO), Office of Performance Analysis, Office of Investment Planning and Analysis, and the JPDO. Additionally, FAA and National Aeronautics and Space Administration (NASA) contractors and the academic community will use the model. An initial version of this model, known as System-Wide Analysis Capability (SWAC), has been delivered to FAA and is already being used to support the NextGen enterprise and the PMO.

This effort supports the DOT Strategic Goals of Economic Competitiveness and Environmental Sustainability. These models will help us to evaluate existing airport capacity levels (ADSIM+), and set investment and infrastructure priorities and policies and direct Airport Improvement Program funding to enhance capacity where economically justified (SWAC). Furthermore, these models will help us set investment and infrastructure priorities to support NextGen energy and environmental goals.

F. Dynamic Capital Planning

The Dynamic Capital Planning tools will allow ATO to make optimal decisions based on best business practices and provide verification that aggressive approval thresholds have been implemented and that disciplined management of capital programs is being carried out. The requirements analysis for selecting Dynamic Capital planning tools is being evaluated and includes tools to address the following focus areas: determining quantitative economic value and internal benefits validation for capital projects; milestone tracking and schedule modeling; performance measurement; auditing and trend analysis; earned value monitoring through program life cycle; field implementation planning; and post implementation analysis for corporate lessons learned results.

The project will allow the initial procurement of financial analysis tools and consultant support to allow a better evaluation of programs through all phases of the acquisition life cycle.

G. Traffic Allert and Collision Avoidance System (TCAS)

Aircraft flying in the NAS began equipping with the Traffic Alert and Collision Avoidance System (TCAS) in 1990. The TCAS display is mounted in the cockpit to warn pilots of collision risks with other aircraft. There are currently two versions of TCAS. TCAS I is a low-cost version of the system that provides traffic advisories only. TCAS II is a more capable version that can provide resolution advisories (RAs) telling the pilot the specific vertical maneuvers that are necessary to avoid potential midair collisions. TCAS II is required in U.S. airspace for all commercial aircraft with 30 or more seats and on all cargo aircraft with a maximum certified take-off weight greater than 33,000 pounds.

Existing TCAS has been very effective in mitigating the risk of mid-air collisions. Safety studies indicate that TCAS II reduces risk of mid-air collisions by 75 – 95 percent in encounters with aircraft that are equipped with either a transponder (only) or TCAS II respectively. In order to achieve this high level of safety, however, the alerting criteria used by TCAS II often overlap with the horizontal and vertical separation associated with many safe and legal airspace procedures. TCAS II monitoring data from the U.S. indicate that as many as 90 percent of observed Resolution Advisories (RAs) are due to the interaction between TCAS II alerting criteria and normal ATC separation procedures (e.g., 500 feet IFR/VFR separation, visual parallel approach procedures, level-off with a high vertical rate 1,000 feet above/below IFR traffic, or VFR traffic pattern procedures). In order to achieve intended efficiencies in the future airspace, a reduction in collision avoidance alerting thresholds may be necessary in order to further reduce separation while minimizing "nuisance alerts". Initial examination of NextGen procedures such as Closely Spaced Parallel Operations (CSPO) or use of three nautical mile en-route ATC separation indicate that existing ACAS performance is likely not sufficient to support these future airspace procedures. As a result, a new approach to airborne collision avoidance is necessary.

The FAA has been researching a new approach to airborne collision avoidance for the past several years – known as Airborne Collision Avoidance System X (ACAS X). This new approach takes advantage of recent advances in dynamic programming and other computer science techniques to generate alerts using an off-line optimization of resolution advisories. This approach uses extensive actual aircraft data to generate a highly accurate dynamic model of aircraft behavior and sensor performance. Based on a predetermined cost function and using advance computational techniques, this approach generates an optimized table of optimal actions based on information regarding intruder state information. This approach significantly reduces logic development time and effort by focusing developmental activities on developing the optimization process and not on iterative changes to pseudo-code.

Initial evaluations of this approach have been conducted using the same Monte Carlo safety simulation employed in recent TCAS v7.1 safety studies. These studies indicate that, compared to existing TCAS II, the new approach significantly reduces the probability of a Near Mid-Air Collision (NMAC) while also significantly reducing the number of alerts and RA reversals. In addition to enhanced alerting and safety, development of associated new surveillance logic also has the potential to dramatically reduce use of the 1030/1090 MHz spectrum. Initial research on improved ACAS surveillance logic indicates that a 40 percent reduction in spectrum can be achieved and further reductions are likely.

Based on these very promising initial results, the FAA is working towards developing preliminary performance standards over the next five years. This system can accommodate surveillance information in addition to Mode S surveillance and is designed to be compatible with legacy TCAS.

H. Unified Contracting System (UCS)

The FAA's procurement system is based largely on paper-based manual processes, record-keeping and documents. Although some steps in the FAA's procurement processes are automated, a fully integrated and automated tool (commercial off the shelf or through another federal agency) is not available to effectively support FAA procurements. Contract writing is a functional requirement of UCS but is only a very small component of the whole scope. With a scope beyond contract writing alone, UCS will provide benefits much beyond those attainable within a standalone contract writing system.

The Unified Contracting System Program Office conducted extensive market research, including contacting outside government agencies to garner knowledge of their existing procurement systems. Based on our market analysis, it was determined that other federal agencies were not using an end-to-end automated procurement system. It was further determined that the majority of the agencies were utilizing modified commercial off the shelf (COTS) products that were enhanced or modified to meet the agencies specific procurement needs. As a result of the findings, it was determined that the existing systems being utilized by other agencies did not meet the FAA's needs because those systems would leave many UCS requirements unmet. The UCS Program primary focus is to reduce redundancy, reduce risk, and increase efficiency by implementing a procurement system that not only unifies many processes but also automates the execution of contractual documents in a user friendly manner.

The Federal Aviation Administration's procurement system has evolved over time based on the policies and guidelines set in the agency's Acquisition Management System (AMS). The lack of a unified, automated contracting system within FAA has resulted in unmet procurement needs. Some of these needs include having a system-wide automated contract management tool that will provide on-line collaboration tools, the capability to manage workloads and collect metrics, as well as maintain all FAA records to support legal positions.

The UCS will provide full contract lifecycle capabilities by automating contract formulation and execution (pre-award planning, solicitation, negotiation, award, administration and closeouts). UCS will provide validated and timely procurement data, electronic storage and retrieval of contractual documents, and management information reports. Fully operational UCS will automate all FAA procurements in accordance with the FAA Acquisition Management System (AMS) and guidance in the FAA Acquisition Support Tool (FAST).

FAA management recognizes the need to greatly improve procurement actions within the agency in order to increase procurement capacity for NextGen and its ripple effect needs for facilities, equipment and services. UCS will provide an integrated and automated procurement process in place of the largely manual processes. The UCS application will greatly improve the sharing of procurement and contact information through its integration with the document management, email system, other FAA legacy and external systems. UCS will facilitate alignment with agency business goals and enforce enterprise standards and processes to minimize costs.

UCS will normalize and streamline the procurement process by providing an integrated system that uses automated workflow processes, functions and standards, and electronic document management. UCS will enable users and management access to reporting on status, allocation of effort, task durations, and other user and management measurements. UCS will be built upon a foundation consisting of AMS, the ATO's Business Process Management Suite (BPMS) standard, the FAA's enterprise document management tool (Documentum) or other FAA-approved document management system.

Based on data collected from key stakeholders throughout the acquisition, contracting, and procurement communities, the table below depicts the top-level functional requirements that shall be satisfied within the UCS.

REQUIREMENT	USER IMPACT
Auditing Capability	Auditing capabilities to track workflow, approvals, and resource output.
Automated and Customizable Workflow Capabilities	Automated and customizable workflow capabilities based on user role to improve efficiencies and communication and reduce redundant work effort.
Centralized User Interface and Security	Secure interface for procurement actions based on defined roles.
Compliance with FAA, AMS and Federal Requirements	Adherence to federal and FAA policies, procedures and regulations, and AMS policies and guidelines.
Context Sensitive Help	Context sensitive help, support and guidance through the use of wizards, guided help and template libraries.
Data Validation	Validation of all data as part of the workflow process.
Data Warehousing	Data Warehousing of archived contracting data; electronic storage and retrieval of contractual information.
Electronic Contracting and Digital Signature	Standardized electronic templates for contract creation that incorporate digital signatures.
Electronic Document Management System	Interface with searchable, electronic repository of contracts, templates and other contractual materials and tools to assist in the organization, tagging and retrieval of content.
Information Sharing – Internal and External	Internal and external sharing of procurement information based on the user's roles.
Interface with FAA's Financial	Allows sending and receiving of procurement data.

REQUIREMENT	USER IMPACT
Management System	
Remote Access	FAA user community and vendors will be able to access UCS via the Internet to perform procurement actions defined by role.
Reporting and Metrics Capability	Reporting and metrics generation capabilities using standardized and ad-hoc reporting.
Robust System Performance	Continuous systems operations outside of maintenance periods independent of interfacing system.

The Unified Contracting System (UCS) Program is being implemented in several versions. In FY 2014 UCS will be developing the automation of procurement processes. UCS will provide an end-to-end electronic contracting system to produce, route, manage, store, and retrieve the roughly 50,000 contractual documents that are produced yearly by the FAA. The UCS program will be in the testing phase of the interface with the financial management system. UCS will also be testing the integration of Purchase Card Processing System (PCPS2), contract payment through purchase card, into UCS. UCS will improve oversight, standardization, management of information, and reporting capabilities. This is particularly important considering the growing complexity and volume of contracting actions.

The UCS program office has completed the planning phase, requirements, alternatives analysis, and business case, and received its Final Investment Decision in August 2011. In addition, the UCS program office has conducted two pilots based on the selected software platform (Business Process Management Suite). Purchase Card Purchasing System and eFAST Planning Module was built out as the initial production ready UCS modules in FY 2012 and 2013.

Currently the UCS program is in the development and design stage of its first target release, which is scheduled for the 1st quarter FY 2013. Work continues with stakeholders to develop requirements for subsequent releases while remaining on schedule and under budget.

I. Operational Analysis and Reporting System (OARS)

The Air Traffic Organization's (ATO) Operational Analysis and Reporting System (OARS) provides a prognostic approach in identifying National Airspace System (NAS) wide trends and managing emerging risks before they result in accidents or incidents. This initiative delivers a suite of analytical capabilities and user interfaces not currently available to achieve the next level of safety required to support the introduction of Next Generation Air Transportation System (NextGen) technologies, operational concepts, and procedures into the NAS.

In order to identify emerging risks, the ATO collects and analyzes safety data and then uses the results of these analyses to make data-driven decisions on how to best mitigate the identified hazards. OARS is a central platform for data distribution, fusion from multiple locations, and warehousing. OARS will also: (1) Directly supports the ATO Safety core business functions by integrating all ATO domains to identify, create, standardize and disseminate safety data throughout ATO and external organizations; and (2) Integrates with operational NAS systems to ensure that the information required to successfully implement the Safety Management System (SMS) is readily available, not only for component-level safety assessments, but also for an integrated system of systems approach.

Anticipated Accomplishment Achieve a JRC Final Investment Decision and begin Solution Implementation Phase by 2015

J. Next Generation Surveillance and Weather Radar Capability (NSWRC)

The Federal Aviation Administration (FAA) currently operates several models of Airport Surveillance Radars (ASR-8, ASR-9 (with and without Weather Systems Processor), and ASR-11) and Terminal Doppler Weather Radars (TDWR) for aircraft surveillance and weather detection. The FAA also operates and maintains the long range Air Route Surveillance Radars (ARSR-1, ARSR-2, ARSR-3, ARSR-4, and FPS-20 series) for the Department of Defense (DOD), which are used for en route aircraft surveillance and weather detection. The National Oceanic and Atmospheric Administration (NOAA) currently operates Next Generation Weather

Radars (NEXRAD) for weather detection. The technology of the majority of these systems is over 20 years old and in some cases over 40 years old, and most of these systems have exceeded their service life. Ongoing technical refreshes and Service Life Extension Programs (SLEP) may keep these radars operating in the near-term; however, as the demands of the National Airspace System (NAS) increase it is becoming increasingly clear that the present fleet of radars will not be capable of delivering the required functionality in the future.

Also, the definitions of a SLEP and a technical refresh do not allow functionality to be added to existing systems. Shortfalls that will be addressed by the NSWRC include:

- Limited ability to detect and track Unmanned Aircraft Vehicles (UAV) and other non-cooperative aircraft
- Reduced ability to detect and track aircraft and weather in the presence of ground clutter, such as wind farm interference
- Insufficient temporal and spatial resolution of weather data to meet NextGen weather requirements
- Inability to independently determine aircraft altitude for terminal surveillance
- Increasing Operations and Maintenance (O&M) costs from more frequent mechanical failures across multiple radar types and models
- Inability to track or collect weather data that falls into radar coverage gaps
- Inability to effectively discriminate between different types of airborne targets (aircraft, birds, balloons, hang gliders, etc.)
- Inability to effectively discriminate between different types of hydrometeors (rain, ice, sleet, hail, etc.)

The Next Generation Surveillance and Weather Radar Capability (NSWRC) is intended to provide a cost-effective replacement for legacy surveillance and weather radars required to support the FAA transformation of the nation's aviation system by 2025. Specifically, the initial capability to be provided by NSWRC would include primary terminal aircraft and weather surveillance including:

- Improved accuracy and detection with altitude determination
- Weather detection and characterization
- UAV detection
- Wind turbine interference mitigation

This program plans to acquire and deploy approximately 230 FAA radar systems with a 5 - 7 year development period and a 15 year deployment period via a multi-segmented program baseline. The funding for the acquisition and implementation of the Long Range Radars and the NEXRADs will be provided by the Department of Defense/Department of Homeland Security and the National Weather Service, if these organizations agree to participate in the procurement. Discussions with the DoD/DHS and Weather Service are ongoing and it is envisioned that the external funding will be included in the program via an Interagency Agreement coinciding with future baseline segments.

NSWRC is on track for Concept Requirements Definition Readiness (CRDR) by December 2012; Investment Analysis Readiness Decision (IARD) by December 2014; Initial Investment Decision (IID) by 2016; and Final Investment Decision (FID) by 2017.

K. In-Service Engineering

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

DOT Strategic Goals – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

A. Runway Incursion Reduction Program (RIRP)

Runway Incursions are a leading safety concern of the FAA and this project helps to identify solutions that will help prevent them.

Currently, all of the Low Cost Ground Surveillance prototype sites are funded under RIRP, along with the documentation to prepare the LCGS and FAROS projects for Investment Analysis. LCGS sites are: Reno, Nevada; Long Beach, California; Manchester, New Hampshire; and San Jose, California. The FAROS site is Dallas Fort-Worth, Texas which is installed and undergoing operational evaluation. Additionally, Boston, Massachusetts is being evaluated for inclusion as a second site for FAROS. Additionally, RIRP continues to evaluate direct to pilot alerting indicators through Human in the Loop (HITL) studies and simulator assessments.

RIRP is focused on the prototyping and operational evaluation of emerging technologies designed to reduce the risk of runway incursions, thereby allowing the FAA to reduce risks associated with the acquisition of these new technologies into the NAS; while at the same time allowing the FAA to continue to meet the Destination 2025 Goal of maintaining the rate of Runway Incursions at or below 20 per 1,000 events through FY 2018.

B. System Capacity, Planning, and Improvements

This program will facilitate the modeling and analysis of new runways, airfield improvements, air traffic procedures, and other technological implementations to improve airport capacity and system efficiency. Study Teams evaluate alternatives for increasing capacity at specific airports that are experiencing or are projected to experience significant flight delays. Capacity studies provide recommendations and solution sets for improving airspace and airport capacity.

C. Operations Concept Validation and Infrastructure Evolution

The FAA is proceeding with NAS modernization based on the NextGen Operational Concept for 2025. Concept development and validation is necessary to investigate specific concept elements, and to drive out operational and technical requirements and implications for human factors, training and procedures. This project assesses the interaction of changing roles and responsibilities of NAS service providers and pilots, airspace changes, procedural changes and new mechanized systems for distributing weather, traffic and other flight related information. It tests the assumptions behind common situational awareness and distributed information processing.

D. Major Airspace Redesign

Airspace Redesign is the FAA initiative that ensures all airspace related capacity benefits facilitated by the Airspace Management Program (AMP), facility changes and automation improvements are achieved. AMP serves as the FAA's primary effort to modernize the nation's airspace. The purpose of this national initiative is to review, redesign and restructure airspace. Modernization of airspace through AMP is characterized by the migration from constrained ground based navigation to the freedom of a Required Navigation Performance (RNP) based system.

Airspace redesign efforts seek to optimize Terminal, En Route and Oceanic airspace by redesigning airspace in NY/NJ/PHL, CAP, Western Corridor, HAATS, and Las Vegas. F&E funding is planned for NY/NJ/PHL, CAP, Western Corridor, and national integration efforts of the program office. Airspace redesign efforts will modernize airspace in support of the new flows associated with the new runway in Chicago (ORD). This program will support the efforts associated with the FAA's Integrated Control Facility (ICF).

E. Strategy and Evaluation

The FAA currently lacks tools with which to evaluate proposed ATM and airport infrastructure enhancements. The NextGen concept of operations outlines some complex and expensive improvements to the NAS (for both the Federal Government and airspace operators), but FAA lacks the analytical tools with which to properly assess these improvements. The computer models being developed in the Strategy & Evaluation program are generally used to aid in cost-benefit analysis and trade-off studies for operational effects and benefits of future changes to the NAS. This program typically uses actual observed data to measure the effects of technologies and procedures that have already been deployed. For example, to measure the operational impacts of Performance-Based Navigation (PBN) procedures we have been analyzing actual radar surveillance data, airport operations data, and carrier-reported taxi times. None of our current tools allow us to analyze the complex interactions of multiple proximate airports. The new airport capacity model being developed under this program will address this shortfall.

FAA also lacks tools to evaluate the system-wide impacts of improved traffic flow management, surface management, and Trajectory-Based Flow Management (TBFM). The system-wide model being developed under this program will help to address these shortfalls. Together, these tools will allow us to make more informed decisions regarding resource allocation and rulemaking, and help us justify those decisions to internal and external stakeholders.

F. Dynamic Capital Planning

The current Planning tool is obsolete, unsupported and in a state of potential system failure. There is no current real-time FAA F&E database to meet FAA managerial requirements. The various FAA Service Units do not follow the same standardized business processes for identifying and tracking requirements. Currently, FAA financial systems are not standardized in the same language and formats. Also it produces several different reports and the terminology is not standardized.

G. Traffic Alert and Collision Avoidance System (TCAS)

As reflected in RTCA DO-337, Recommendations for Future Collision Avoidance Systems (published March 21, 2012), an improved future collision avoidance system is required to facilitate NextGen procedures and applications (i.e., continuous descent approaches (CDA), curved Required Navigation Performance (RNP) approaches, closely spaced parallel runways approaches, aircraft-based merging and spacing, closer parallel en route operations, lateral passing maneuvers in non-radar airspace) and to compensate for issues in existing TCAS performance (i.e., nuisance alert rate).

H. Unified Contracting System (UCS)

By replacing manual, paper-based methods and document storage, UCS will improve FAA's ability to effectively support the volume and complexity of upcoming FAA procurements, particularly for NextGen and continuing NAS sustainment. In addition, by replacing the existing PRISM procurement data-entry system with its expensive-to-maintain Oracle interface, UCS is projected to provide a net benefit of $8,100,000 over the program's 10-year life.

<u>Quantitative Benefits:</u>

The primary quantitative benefit is the replacement of the FAA's current contracting system, Prism, which has high operations and maintenance costs. It is estimated the UCS will be able to replace PRISM by the beginning of FY 2015. Operating costs for UCS are estimated to be over $2,000,000 per year less than the operating costs for PRISM, while adding additional functionality and process efficiencies.

In addition, automating the FAA's contracting system will ensure proper transaction approval, complete and viable records retention and effective reconciliation of financial information, thus allowing FAA to increase purchase card usage which has historically been a goal the FAA shied away from due to the lack of oversight within the current system. Increasing purchase card usage is estimated to generate over $3 million per year in additional rebates. Not only will these combined quantitative benefits offset the 10 year lifecycle cost of UCS, through the implementation of UCS the FAA will achieve an $8 million net benefit.

<u>Qualitative Benefits:</u>

Due to the manual nature of the FAA's procurement processes, any benefits related to automating the procurement process, improving accuracy or time cycles, amelioration of legal risk, or increasing visibility into the procurement process is very difficult to quantify. Because concrete measurement data of the FAA's procurement processes are not available, many UCS benefits will be intangible and thus difficult to measure and quantify. Therefore, the majority of the resultant benefits of UCS, although numerous, have not been quantified for the purpose of this analysis.

Procurement Dimension	Description	Qualitative Benefits
Strategy and Governance	▪ UCS will improve efficiency and reduce financial, risk, environmental and ethical aspects aligned to overall FAA acquisitions rules and regulations (AMS)	▪ Provides leadership and oversight across the procurement portfolio, designates authority and accountability at appropriate levels and implements controls where required.
People and Culture	▪ FAA procurement staff will utilize a contracting tool that addresses their procurement and acquisition needs. ▪ Training of new staff, recruitment and retention of skilled contracting staff will improve.	▪ A culture of understanding on the importance of procurement. Improved attitude to work with the attainment of new skills and capabilities.
Sourcing and Category Management	▪ Strategic sourcing aggregates demand and raises the sourcing activity to align with FAA planning, while selecting the appropriate supplier.	▪ Improved decision making through higher visibility and improved understanding of spending. ▪ Better management of risk and return across diverse projects by contracting staff.
Technology and Tools	▪ Single integrated system, fully leveraged and automated to provide standard and timely reporting. ▪ Data management and storage with sufficient accuracy to provide reliable expenditure tracking and auditing. ▪ Online document storage.	▪ Enable the development and automatic generation of screening information requests (SIRs), request for proposals (RFPs), and request for information (RFIs), as appropriate. ▪ Will identity breaches of procurement policies. ▪ Enable sharing of digital data and information among system users through network enabled information access so that, "the right information is available to the right people at the right time." ▪ Take advantage of FAA information and technology security infrastructure to improve security around the procurement process and associated artifacts.
Procurement Process - Planning to Close-Out	▪ End to end procurement workflow including Purchase Request creation, requisitions management, evaluation and procurement planning, contract writing, creation of SIR's, management and legal review processes, and storage of contracts and associated documents.	▪ Avoids duplication and reduces manual tasks. ▪ Increase efficiency through implementation of standardized contract formats. ▪ Frequent activities are streamlined for efficiency and transparency. ▪ Automated approval process with built-in delegations of authority. ▪ Streamline frequent activities for efficiency and transparency.
Performance Management	▪ Ensure key performance indicators measure the effectiveness of procurement practices and the performance of suppliers.	▪ Total transparency of all procurement relevant information. ▪ Promote continuous improvement by providing accurate performance metrics and monitoring tools.

Procurement Dimension	Description	Qualitative Benefits
	▪ Monitoring by managers to identify areas of improvement.	▪ Timely reporting providing the necessary planning, procurement performance and management information for executives, and contracting staff.

I. Operational Analysis and Reporting System (OARS)

Safety-related data analysis today is mostly shared through manual processes, often having to re-enter data that exist in stand-alone systems separated by "air gaps" (not networked) versus a centralized data point. These systems include an array of voice communications, email, point-to-point message exchange services. This leads to delays and inaccurate results for safety decision makers (i.e. ATO Management, AVS, and Field Managers) that rely on that information to make crucial safety decisions.

New QA/QC Safety Order effective January 2012 requires a larger amount of safety event records to be collected and investigated. It is estimated 400 percent increase in the number of incoming incident flags (potential safety events) to be reviewed due to CEDAR, TARP implementations. The SAS will provide data-centric integrated approach for ATO safety. In addition, continual increase in safety data analysis is anticipated as we move towards new technologies within the NAS resulting from the NextGen initiatives.

J. Next Generation Surveillance and Weather Radar Capability (NSWRC)

The majority of legacy systems have been deployed for decades and have reached or exceeded their predicted service life. Service Life Extension Programs (SLEPs) and Technology Refresh programs to extend the operational life and address obsolescence issues are being implemented on some of these systems. While these individual system specific SLEP and Technology Refresh programs may ensure reliable operation for several more years, it may not be the most cost effective way to sustain an existing capability long term and is not the best choice for introducing performance improvements to improve surveillance and reduce life cycle costs in order to meet NextGen requirements in support of Destination 2025. The capability to be provided by NSWRC would include primary terminal radar aircraft surveillance including altitude determination, weather detection and characterization, backup surveillance of aircraft broadcasting position information (Automatic Dependent Surveillance-Broadcast (ADS-B)), UAV detection, wind turbine interference mitigation, as well as Air Defense and Homeland Security roles.

How Do You Know The Program Works?

A. Runway Incursion Reduction Program (RIRP)

The demonstration, evaluation and transition of mature runway safety technologies have proven to reduce the incidence of high-hazard (Category A/B) incursions 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.

According to a recent DOT Inspector General (IG) audit, initial operational evaluations of prototype Runway Status Lights (RWSL) technology have yielded a reduction in runway incursions of up to 70 percent at the test runways. Additionally, prototype RWSL systems have been credited with 11 "saves" and LCGS prototype systems have been credited with three "saves" during their operational evaluation period.

RIRP success is measured by the completion of the goals identified in the Research Management Plan (RMP) for each prototype activity. Initiatives that successfully complete all the RMP Goals identified are then presented as candidates for acquisition, or presented for Airport Improvement Program (AIP)-funding eligibility. Production RWSL systems are being installed at 23 different airports throughout the NAS, and FAROS is being considered for airport-eligibility.

B. System Capacity, Planning, and Improvements

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 of airport, airspace, and procedural enhancements. PDARS is the Air Traffic Control System Command Center's (ATCSCC) 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; restrictions data; and playbook scenarios will help to reduce ground delays. These enhancements, which encompass the final phase of PDARS development and are an ATO community requirement, are essential 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.

C. Operations Concept Validation and Infrastructure Evolution

This program uses a variety of validation techniques to explore, develop, and mature NAS operational concepts. The program undertakes research, study, and analysis to explore new opportunities for service delivery, solve problems with current operations, and define high level operational and performance requirements. The ATDP Operational Concept Validation program is doing the early concept research for advanced operational concepts to ensure they are well understood and are based on valid assumptions. Concepts such as High Altitude Airspace and Integrated Arrival Departure Airspace were researched and validated under this Program prior to transition to NextGen Pre-Implementation Programs to ensure the operational impacts were well understood.

D. Major Airspace Redesign

AMP has successfully managed airspace projects throughout the NAS. Without the coordination of AMP, multiple projects supporting the same airspace could arise. By having a central location all airspace changes and efforts are coordinated, thus ensuring project efficiency and success to the NAS.

E. Strategy and Evaluation

Functioning software is being delivered to the FAA and is being used to support on-going analyses.

The capabilities of the new system-wide model SWAC are continually being improved, even while it is being used to support NextGen analyses. The model has been used to generate all publicly-released estimates of future NextGen benefits, including those in the 2009, 2010, 2011, and 2012 NextGen Implementation Plans. The model will continue to be used in support of the NextGen Implementation Plan, with the addition that realized benefits will be modeled, as well as future benefits of past investments, to help quantify the entire value of NextGen. The model has also been used in support of the business case analysis for the DataComm program, and is currently being used to support the Satellite and Broadcast Services (SBS) Program Office, and to perform various financial and operational incentive studies. Nonetheless, there are still significant limitations of the model, not least of which is its ability to simulate traffic flow management initiatives and to replicate the airspace system's response to highly disruptive convective weather.

An initial version of the new airport capacity model ADSIM+ has been delivered to the FAA and is currently undergoing testing. The software is being provided to "beta" testers for further evaluation.

F. Dynamic Capital Planning

The improved data will:

- Lead to better decisions on program implementation, improvements in ATO's performance, and the resulting higher level of customer satisfaction
- Provide reliable data with an automated tracking and reporting system for F&E projects that will enable decision-makers to enhance the use of agency resources

- Will help keep 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/project management capabilities with cost accounting of F&E expenses to the FAA. Managers and engineers will have up-to-date reliable data on F&E projects through resource tracking program (RTP). Productivity is improved by more than 20 percent when we support a standardized project management process and have the application emulating current operating procedures.

G. Traffic Allert and Collision Avoidance System (TCAS)

TCAS is certified equipment currently mandated by a number of countries and equipped on approximately 25,000 aircraft worldwide on airline, cargo, business, and government including military aircraft. Accident and incident statistics have validated the safety benefit provided by TCAS. TCAS has been credited with averting near mid-air collisions in a significant number of documented encounters. Since its introduction, a number of programs have been established to monitor the performance of TCAS II. These programs are used to facilitate evaluation of the safety improvement it provides and its operational acceptability to pilots and controllers. The TCAS Operational Performance Assessment (TOPA) program was established in 2008 to quantitatively characterize and assess the operational performance of TCAS units that are currently operating in the NAS.

H. Unified Contracting System (UCS)

Although UCS has not been implemented yet, the UCS PMO has conducted two BPMS pilots (PCPS and eFAST Planning)-a small-scale BPMS solution to assess user acceptance, operational efficacy, and overall business value of the BPMS platform before adopting the tool for a full-scale implementation of UCS. The UCS Pilots have enabled FAA to reduce overall risk in the full implementation of UCS using the BPMS:

- Verifying, in an FAA operational environment, that the BPMS platform meets FAA ATO IT requirements as outlined in the Enterprise BPMS Requirements Document
- Conducting a proof of concept that a BPMS can automate a typical procurement process (eFAST, PCPS)
- Providing a learning experience regarding approaches and methods for completing and managing the development
- Building standard, reusable components that form the foundation for ongoing development of UCS
- Establishing and testing interfaces between the BPMS with standard FAA systems (e.g., Knowledge Services Network (KSN))

In addition to the UCS Pilot, the UCS program team completed and updated an FAA Systems Engineering Management-compliant risk analysis for the UCS program. A level of severity for the potential impact a risk may have on the project and a probability of occurrence were assigned to each risk in each category along with a mitigation strategy. Based on these criteria we assigned each risk to one of three categories: high risk, moderate risk, or low risk. Mitigation strategies and status are recorded in the right hand column to demonstrate that the program manages risks.

I. Operational Analysis and Reporting System (OARS)

The Safety Analysis System (SAS) will significantly increase efficiency and provide an integrated approach for managing safety within the ATO organization. It will provide management and prognostic evaluation of safety risks to reduce the likelihood of future incidents and accidents and integrate historical and prognostic evaluation through data analysis collection tools. SAS will enable users to perform integrated inquiries across multiple databases, search an extensive warehouse of safety data, and display pertinent elements in an array of useful formats.

The Safety Analysis System process will foster widespread sharing of safety-related data and information. The SAS program will provide a faster, thorough, and more consistent approach to FAA safety reporting for responding to external entities (i.e., GAO, Congress, DOT/IG, etc.). These reports need to be uniform across the organization, eliminating rework when multiple organizations conduct similar analyses but report differing information. Finally, data standardization, enhanced quality checks, and common analysis tools will ensure that reporting across the ATO is accurate, consistent, and will reduce the overall time and resources required to produce safety reports.

J. Next Generation Surveillance and Weather Radar Capability (NSWRC)

The NSWRC program is in the Planning and Investment Analysis phase and is on track for Concept Requirements Definition Readiness (CRDR) by December 2012; Investment Analysis Readiness Decision (IARD) by December 2014; Initial Investment Decision (IID) by 2016; Final Investment Decision (FID) by 2017.

Why Do We Want / Need To Fund The Program At The Requested Level?

$33,500,000 is required to continue all activities within the Advanced Technology Development and Prototyping (ATDP) budget line item.A reduction to ATDP could significantly damage important milestones which have been established. Areduction could also slowdown progress of precursor programs or the effort of studying technical outcomes in the various solution sets.

Detailed Justification for - 1A02 NAS Improvement of System Support Laboratory

What Is The Request And What Will We Get For The Funds?

FY 2014 – NAS Improvement of System Support Laboratory
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
NAS Improvement of System Support Laboratory	$1,000	$1,000	$1,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Integration/Implementation of NAS Laboratory	---	$1,000.0

For FY 2014, $1,000,000 is requested for continued improvements to the laboratory systems and laboratory infrastructure in accordance with the 20-Year Laboratory Master Plan in order to support National Airspace System (NAS) and NextGen programs. The FAA's centralized set of laboratories located at the William J Hughes Technical Center (WJHTC) provide the infrastructure for research, development, testing, and field support to FAA's Capital Investment Plan (CIP) programs. It is necessary to upgrade and improve the supporting laboratory infrastructure and equipment to maintain a laboratory platform capable of supporting these programs.

The Laboratory Master Plan, developed in 2010, identified over 150 improvement areas at a cost of more than $32 million over a 20 year period. The Laboratory Services Division reevaluates the priority list of projects annually to validate needs and review emerging and/or urgent projects which may take priority over planned improvements. Additionally, some improvement projects may be implemented sooner than originally planned because an opportunity existed that would generate short- and long-term savings. For example, a new lab installation is an opportunity to repair raised flooring.

The following is a list of projects that are slated for FY 2014:

- EPO and Clean Agent Fire Suppression - $310,000
- UPS Monitoring System – $12,000
- Laboratory Firestop Project, Phase 2 - $225,000
- Electrical Panelboard Replacements - $164,000
- CAC Unit Replacements - $220,000
- Laboratory Lighting Upgrades - $69,000

What Is This Program?

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 system deliverables.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The program improves FAA's centralized state-of-the-art laboratory environment supporting the implementation, testing, and integration of new NAS systems prior to their delivery to the various FAA field sites. A single, centralized support laboratory will eliminate the cost of establishing and maintaining multiple laboratories for each project, program, Service Unit, and Line of Business. The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provides the infrastructure for research, development, testing, and field support to the FAA's Capital Investment Plan (CIP) programs. It is necessary to modify, upgrade, and reorganize the Laboratory infrastructure as CIP projects and their supporting systems are delivered, installed, and eventually removed. The Technical Center Laboratory infrastructure encompasses approximately 160,000 square feet in the main building and numerous outlying buildings and remote sites.

How Do You Know The Program Works?

The goal of this program is to modernize the equipment and infrastructure necessary for FAA's centralized NAS laboratory facilities so they operate safely, reliably and efficiently. Projects funded with this program, such as electrical system upgrades, installation of fire stops, electrical panel board replacements, uninterrupted power system upgrades, help to meet this goal. The 20-Year Laboratory Facility Master Plan developed in FY 2010 provides a framework for future NAS laboratory improvement projects. Upgrades are necessary to continue providing a safe and reliable laboratory environment for research, development, test, evaluation, and integration of NAS and NextGen systems.

Why Do We Want/Need To Fund The Program At The Requested Level?

$1,000,000 is required to continue improvements to the Laboratory systems and laboratory infrastructure that supports National Airspace System (NAS) programs. A reduction will limit work completed and delay the activity targets into FY 2015.

Detailed Justification for - 1A03 William J. Hughes Technical Center Facilities

What Is The Request And What Will We Get For The Funds?

**FY 2014 – William J. Hughes Technical Center Facilities
($000)**

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
William J. Hughes Technical Center Facilities	$14,000	$11,500	$12,000	-$2,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Laboratory Support Services – Engineering and Maintenance	---	$10,810.0
b. Laboratory Equipment, Parts and Supplies	---	230.1
c. Hardware Sustainment	---	443.6
d. Software Licenses and Support	---	216.3
e. Mandated Pilot Training	---	300.0
Total	1	$12,000.0

For FY 2014, $12,000,000 is requested for continued sustainment of FAA's laboratory test beds and will be used for hardware and software support, licensing fees, support services, and other costs associated with operating and maintaining these multi-user facilities. These laboratories include the En Route and Terminal test beds; Weather, Navigational, Scan Radar, and Automated Tracking sites; Communications switching equipment; Laboratory network; the Flight Program's set of Flying Laboratories; and Aircraft Simulation Systems such as the Target Generation Facility, Cockpit Simulation Facility, Integration and Interoperability Facilities for En Route and Oceanic, and the Human Factors Laboratory.

What Is This Program?

The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provides 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 to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation. It is necessary to sustain these laboratory systems in configurations and capabilities that match field sites that currently exist or are planned for the future. CIP programs and field sites depend on these laboratories to fulfill their mission.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The Technical Center laboratories are the only location where it is possible to realistically simulate the National Airspace System (NAS). These laboratories are essential to the FAA's efforts to transition the NAS to the Next Generation Air Transportation System (NextGen). Laboratory integration, test and evaluation activities result in procedures and systems that ensure a safe, secure, efficient, and seamless transition to NextGen. These activities require numerous test beds that can be configured to replicate desired field configuration and traffic scenario, thus providing stakeholders with an understanding of how upgraded systems will perform prior to operational deployment. These test beds serve a second and equally important role by providing direct field support for Operational NAS systems. Problems identified at various field locations are quickly transmitted to the appropriate laboratory where solutions can be developed and tested by second level engineering personnel. This keeps systems operational avoiding service degradation and costly interruptions.

How Do You Know The Program Works?

This program provides for the management and support of the Technical Center's NAS laboratories through systems engineering, configuration management, test bed maintenance and enhancement, laboratory scheduling, and computer operations. It also provides technical and engineering services for laboratory customers in support of research and development, system installations, and proof-of-concept studies. This includes advanced concepts exploration, human in-the-loop simulations, real time simulations, cockpit simulations, prototyping and flying laboratory support.

To ensure the highest quality services to the FAA's Capital Investment Plan (CIP) programs utilizing the Technical Center's NAS laboratories, a Quality Management System (QMS) was implemented to standardize laboratory procedures and processes. The International Organization for Standardization (ISO) standard is the vehicle to validate the efficacy of the QMS and to obtain certification. The FAA's Technical Center's NAS Laboratories continues to maintain its ISO 9001 2008 registration.

Why Do We Want/Need To Fund The Program At The Requested Level?

$12,000,000 is required to sustain FAA's laboratory test beds and will be used for hardware and software support, licensing fees, and other costs associated with operating and maintaining these multi-user facilities. 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 NAS test beds and to minimize FAA costs. A reduction will result in the elimination of some support services that will have an impact on the FAA's CIP programs utilizing Technical Center's laboratories.

Detailed Justification for - 1A04 William J. Hughes Technical Center Infrastructure Sustainment

What Is The Request And What Will We Get For The Funds?

FY 2014 – William J. Hughes Technical Center Infrastructure Sustainment ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
William J. Hughes Technical Center Infrastructure Sustainment	$7,500	$8,000	$6,000	-$1,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Building 301 Roof Replacement	---	$3,100.0
b. Building 287 Roof Replacement/Mechanical Upgrades	---	2,100.0
c. Building 301 Fire Detection/Annunciation System Upgrades (Phase 1)	---	500.0
d. Building 316 Chiller Replacement (No 1 of 2) - Design	---	300.0
Total	1	$6,000.0

For FY 2014, $6,000,000 of funding is requested for the continued sustainment of FAA's infrastructure at the William J Hughes Technical Center (WJHTC) to accomplish the following projects:

a. Building 301 Roof Replacement

$3,100,000 is requested to replace the roof on Building 301 (Aircraft Maintenance Hangar).

This project involves the replacement of approximately 77,000 square feet of roofing over the entire (hangar bay and administrative office wing) building. In 1976, the building's original (circa 1968) built up roof system was replaced with an inverted built up roof membrane system. The current roof system dates back to 1989, when a new four ply built up roofing and insulation system was installed over the 1976 inverted built up roof. This current roof system is well beyond its useful life (over 20 years old), beyond warranty and in poor condition. Over 23 service calls for roof repair work (leaks) have been made within the last two years and maintenance repairs have been unsuccessful in maintaining a weather tight building.

This project will remove the entire existing roofing system and replace it with a new roofing and insulation system carrying a 20 year total system warranty. Removed materials will be recycled wherever possible. The new roof system will be designed to be environmentally friendly, reduce energy costs through improved insulation, and reduce maintenance expenses. In addition, upgrades and/or replacement of rooftop mounted lightning protection system components will be completed in conjunction with the roof replacement. FY 2013 funding has been requested to support the costs associated with the design for this project.

b. Building 287 Roof Replacement and Mechanical Upgrades

$2,100,000 will replace the Building 287 (Components Fire Test Facility) roof and the associated mechanical equipment located on this roof. The Building 287 roofing system consists of approximately 5,000 square feet of roofing. The current Building 287 roof is a built-up roofing system (multiple roofing sheets adhered together with hot asphalt) originally installed in 1993**.** Numerous roof leaks have resulted in water flowing into electrical panel boxes, the elevator shaft, various offices, and stairwells. Despite repeated maintenance efforts the leaks have resulted in rotted interior wooden doors, saturated drywall and forced the inhabitants to build barriers on the floor to contain the flow of water. This existing roofing system is beyond its warranty of 10 years, will exceed its maximum expected useful life of 20 years by FY 2014, and is in poor condition. Repeated attempts to maintain the roof's water tightness through patching and various coatings have been unsuccessful. A design package for replacement of the roof was completed in FY 2012. The entire roofing system will be replaced including all of the mechanical equipment located on the roof.

The design package also included the design for the replacement and upgrade of all rooftop mounted mechanical equipment and all rooftop lightning protection components to comply with current National Fire Protection Association and Underwriter Laboratories standards. The FY 2014 budget submission request is for the implementation (construction) of this entire design package.

c. Building 301 Fire Detection / Annunciation System Upgrades (Phase 1)

$500,000 will replace the Building 301 fire alarm system. The fire alarm system in this facility is a Gamewell FCI 7200 fire alarm system which was installed in the early 1990's. This product line has been discontinued and this is a legacy system that is no longer being manufactured or sold by Gamewell-FCI. This includes all system control panels, detectors and initiating devices, notification appliances, accessories, and power supplies. This means if any component of the system fails, there are no readily available replacement parts. Our estimate is that we have enough spare parts to maintain the building's fire alarm system for the next two years. An inoperable fire alarm system necessitates evacuation of the building (over 300 employees) or instituting a 24 hour fire watch.

Building 300 has the same type and age of fire alarm system and this building is also at risk. Plans would be to salvage working components during the FY 2014 construction of the Building 301 fire alarm system to use in Building 300, until the fire alarm system in Building 300 is replaced as part of the FY 2015 budget request.

The requested funding will facilitate the construction efforts required to replace the existing system and bring the system up to current code compliance. FY 2013 funding has been requested to support the costs associated with the design for this project (Buildings 301 and 300).

d. Building 316 Chiller Replacement (No. 1 of 2) -- Design

$300,000 will replace one of two 900 ton centrifugal refrigeration machines in Building 316, the Advanced Automation System Building. This 900 ton centrifugal refrigeration machine was installed in 1992. The machine provides chilled water for air conditioning to the Building 316 administrative offices and Building 316 Test Bed Area, which serves as the NAS test area and supports the Enterprise Data Center, Lab Net and Second Level NAS field support activities. This type of machine typically has a useful life (per American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) standards) of 23 years.

In December of 2011, Trace Electrical Services and Testing, LLC was commissioned to test and evaluate the two refrigeration machines in accordance with NETA (International Electrical Testing Association) standards. This evaluation revealed that the 4,160 volt motors tested unsatisfactory, most likely due to a breakdown of the motor insulation system. This condition degrades the reliability and availability of the machine itself, and the Building 316 chilled water plant as a whole. Additionally, the machine uses R-123 refrigerant which is no longer preferred by industry. This necessitates using refrigerant when performing maintenance operations that is more expensive, as opposed to being able to use more readily available and environmentally friendly refrigerants.

As short term repairs are being scheduled, the intent of this project is to provide a design package for the replacement of the existing machine in kind with a new dual compressor/variable frequency drive machine complete with maximum modulation capability. This will enable a more precise matching of load versus equipment capacity than that which would be provided with a conventional single compressor refrigeration machine. The new machine will also be able to tolerate a lower incoming condenser water temperature, thereby more readily enabling use of an energy saving, free-cooling option.

What Is This Program?

The 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.

The 20-year Facility Master Plan, completed in July of 2008, was developed based upon the consultant's consideration of code compliance issues, equipment age, life expectancy, replacement part availability, and general condition for each system. Early years' proposed projects reflected the highest priority due to the significant issues of remediation, safety, code compliance and/or mission important issues. While the Master Plan is a useful tool, a working group within WJHTC Facilities annually identifies projects resulting from changes in equipment conditions and develops a re-prioritized list of projects based upon the master plan and these key projects, and those projects are identified in annual budget requests.

DOT Strategic Goal - Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

The William J. Hughes Technical Center (WJHTC) owns and operates approximately 1.6 million square feet of test and evaluation facilities, research and development facilities, administrative facilities and numerous project test sites. The value of the buildings and infrastructure is about $263.1 million. This value is considered to be extremely low and it does not include the environmental funding (in excess of $100 million), received via a national program, which has been expended to clean up hazardous sites on Center, replace aged and monitor new underground storage tanks and implement the Center's OSHA and Energy Programs. Additionally the value does not include the worth of the land itself, estimated to be approximately $3 million (FY 2003 figure). These facilities require an annual program of capital improvements and modernization. Example projects include: (1) replacing old heating, ventilation, and air-conditioning systems; (2) upgrading the electrical distribution systems; and (3) upgrading fire-suppression systems to current fire safety codes.

Infrastructure sustainment at the WJHTC will improve operational efficiency and effectiveness. This budget line item will also update facilities and facility support systems; and reduce energy consumption on a per square foot basis, thus supporting Executive Orders 13423 and 13514 concerning Federal Energy Management. This Capital Investment Plan (CIP) program is the only available funding stream to sustain the 1.6 million square feet of space together with the required utility and roadway support systems.

The establishment of an infrastructure necessary for providing and sustaining a suitable, reliable environment (i.e. power, cooling, etc.) for the Technical Center's 24x7x365 operations enables the mission crucial systems hosted at the Technical Center such as Traffic Flow Management Production Center (TPC), FAA Telecommunications Infrastructure (FTI), Business Continuity Plan (BCP), and the Enterprise Date Centers that support FAA IT operations to provide increased capacity with enhanced reliability. In addition to these operational systems, the Technical Center must provide 24x7 support for current system monitoring capabilities such as Reduced Vertical Separation Minimum (RVSM), Wide Area Augmentation System (WAAS), and Automatic Dependent Surveillance Broadcast (ADS-B) and future systems such as System Wide Information Management (SWIM) as well as the continual second level support provided to operational NAS systems (ERAM, STARS, ATOP) so that they will perform in a proper environment and hence provide enhanced safety and reliability to the greater NAS/FAA system.

The Technical Center's infrastructure was not designed to provide 24x7x365 reliability and availability. The infrastructure has single points of failure, insufficient monitoring, is aging, and has limited remaining capacity to support these NAS/FAA systems. In order to meet current and future requirements the Technical Center needs to upgrade its current infrastructure or build an infrastructure that meets the availability/reliability requirements for these mission essential systems.

How Do You Know The Program Works?

The modifications have already begun and will continue to 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 changing FAA programs and missions. The program incorporates best business practices and adopts industry standards such as American Society of Heating, Refrigerating and Air-Conditioning Engineers, Incorporated (ASHRAE), National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA), American National Standards Institute (ANSI) and Institute of Electronic and Electrical Engineers (IEEE).

Why Do We Want / Need To Fund The Program At The Requested Level?

$6,000,000 is required to complete the roof replacement at Building 301; roof replacement and mechanical upgrades at Building 287; fire detection/annunciation system upgrades at Building 301; and the design to replace of 1 of the 2 chillers at Building 316.

Detailed Justification for - 1A05 Data Communications in support of Next Generation Air Transportation System

What Is The Request And What Will We Get For The Funds?

FY 2014 – Data Communications in Support of Next Generation Air Transportation System ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Data Communications in support of Next Generation Air Transportation System	$143,000	$142,630	$115,450	-$27,550

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Segment 1 Phase 1 (S1P1)		
a. Program Management	---	$4,758.2
b. DCL Trials	---	1,069.6
c. Systems Engineering	---	3,071.5
d. Monitoring and Control (M&C)	---	1,419.5
e. Operational Test	---	2,718.7
f. Tower	---	2,247.0
g. En Route	---	21,123.8
h. Data Comm Integrated Services (DCIS)	---	5,166.6
i. Data Comm Network Service (DCNS)	---	7,825.1
j. Avionics Equipage Initiative	---	10,400.0
k. Independent Operational Test and Evaluation (IOT&E)	---	350.0
Total (S1P1)	Various	$60,150.0
B. Segment 1 Phase 2 (S1P2)		
a. Program Management	---	$11,031.4
b. Systems Engineering	---	7,273.5
c. En Route	---	14,994.0
d. Data Comm Integrated Services (DCIS)	---	5,229.7
e. Data Comm Network Service (DCNS)	---	16,771.4
Total (S1P2)	Various	$55,300.0

For FY 2014, $115,450,000 is requested for the Data Communications (Data Comm) program. This funding supports the development of Segment 1 Phase 1 (S1P1) and Segment 1 Phase 2 (S1P2) work. Data Comm S1P1 includes Departure Clearance (DCL) service in the tower environment, and will be implemented beginning in FY 2016. S1P2 includes enhancements to En Route services, and will be implemented beginning in FY 2019.

A. Segment 1 Phase 1 (S1P1)

The funding for S1P1 will allow the Data Comm Network Service (DCNS) to be delivered to the William J. Hughes Technical Center (WJHTC) for testing, which will lead to DCNS service acceptance. The program will be finalizing En Route Automation Modernization (ERAM) system developmental testing. Thereafter, operational evaluation testing by the second-level engineering group will be finalized at WJHTC, leading to software acceptance of ERAM release 4.2. Subsequently, system level integration and testing activities will commence and continue through the remainder of FY 2014.

Funding is required to continue the integration and engineering services from the Data Comm Integrated Services (DCIS) vendor; which includes support for systems integration, avionics validation and interoperability, system performance and capacity loading, failure modes and effects analysis, reliability/maintainability/availability, network security, human factors, etc.

There will be staff augmentation services required to support system engineering activities, such as developmental testing, systems integration testing, and operational testing. In addition, support services will be required for the development of the system certification suite, spectrum engineering, program and engineering management, deployment planning and coordination, and initiating second level support.

In 2014, the Data Comm program will be completing the departure clearance (DCL) trials.

B. Segment 1 Phase 2 (S1P2)

The funding for S1P2 will provide for requirements derivation, systems engineering, and software design of ERAM modifications to support En Route Controller-Pilot Data Link Communication (CPDLC). Funding will also provide for En Route airspace network planning and engineering (DCNS/DCIS), En Route spectrum bandwidth clearing, DCIS contract management, and program and engineering management support services.

$350,000 is requested for Independent Operational Test and Evaluation efforts.

The requested funding is also intended to support the following RTCA Task Force 5 recommendations in FY 2013 through the mid-term:

Task Force Recommendations # 16, 17, 39, 44, 42, DataComm

- Achieve final investment decision on acquisition of the digital very high frequency (VHF) aeronautical mobile communications infrastructure
- Initiate development of en route automation enhancements
- Enable revised departure clearance capability in the tower environment via VHF Data Link mode 2 for aircraft equipped with Future Air Navigation System 1/A+

What Is This Program?

The Data Comm program will provide data communications between ATC facilities and aircraft, and will serve as an enabler for the Next Generation Air Transportation System (NextGen) operational improvements. Data Comm is necessary to transition from voice-based ATC communications system to data-centric NextGen.

Data Comm will improve National Airspace Systems (NAS) operations by:

- Improving controller productivity and reducing controller workload by automating delivery of routine clearances
- Improving NAS capacity and reducing flight delay by enabling existing controller staffing to handle increased traffic
- Enhancing safety by reducing operational errors associated with voice communications
- Enabling many of the NextGen operational improvements that require negotiation or exchange of information that cannot be efficiently delivered via voice communications

Data Comm Segment 1 will deliver the initial set of Data Comm services integrated with automation support tools, which provides NAS benefits and lays the foundation for a data-driven NAS. Data Comm Segment 2 will enable more advanced NextGen operations, which would not be possible using the existing voice systems.

Near-term Data Comm program efforts include (FY 2012 - FY 2014):

- Award of DCIS contract – Completed Q4 2012
- Departure Clearance (DCL) Operational Trials and Validation (at Memphis, Newark, and Atlanta)
- Initial DCNS service deployed at WJHTC for system test
- ERAM Initial Test Release

Long-term Data Comm program efforts include (FY 2015 - FY 2022):

- Operational Assessment (OA)
- Final Investment Decision (FID) for En Route Services (S1P2)
- Initial Operating Capability (IOC) for Tower Services
- In-Service Decision (ISD) for Tower Services
- Final IOC for Tower Services (57 Towers)
- IOC for En Route Services

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments

Why Is This Particular Program Necessary?

Data Comm is needed to bridge the gap between current voice-only ATC, and the data-intensive NextGen. Data Comm will enable air traffic controller productivity improvements, and will permit capacity growth without requisite cost growth associated with equipment, maintenance, and labor. Data Comm is comprised of automation enhancements for air traffic control message generation and exchange (hardware and software), and the communications data link between ground and airborne users. Current analog voice communications 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 communication related. Of those, 30 percent of the high severity operational errors were deemed to be communications related. Data Comm will significantly reduce communications related operational errors and improve the safety of air travel. Segment 1 Phase 1 will lay the foundation for a data-driven NAS.

The capacity and productivity of the NAS will be improved by Data Comm. Initially, Data Comm will be used in conjunction with the current traffic control strategies as well as planned strategies such as traffic flow management (TFM) re-routes. Data Comm will increase controller efficiency by automating routine exchanges. As controllers become more productive, tower and En Route capacity will grow without the need to assign additional resources. This increase in traffic handling ability has a direct correlation to reduced delays and increased efficiency - recent benefits analysis suggests airline operations will benefit from reduced gate delay and taxi times, improved on time performance and the opportunity to expand flight schedules. The busiest positions in airport clearance delivery positions at Core 30 airports will see the most dramatic benefit.

How Do You Know The Program Works?

The Data Comm program is currently in the Final Investment Analysis phase. Final investment Decision (FID) for Automation Enhancements (Tower and En Route) combined with the decision to award the Data Comm Integrated Services (DCIS) contract will occur in May 2012. Implementation for S1P1 services will begin in second quarter FY 2016. Deployment of S1P2 services will begin in FY 2019.

Why Do We Want / Need To Fund The Program At The Requested Level?

The Data Comm Program needs to be funded at the requested level so that there will be continuity with integration and engineering activities, implementation plans, and avionics equipage initiatives. The funding will also support the enhancement of En Route Automation Modernization (ERAM) system software for FANS logon and protocol gateway functionality. The FANS logon and protocol gateway functionalities that ERAM is providing in Release 4.2 (R4.2) are necessary for the Data Comm system to work. Funding in FY 2014 is required to ensure a seamless integration into overall ERAM deployment, which is key to achieving the initial roll-out of Data Comm Tower services.

Detailed Justification for - 1A06 Next Generation Air Transportation System (NextGen) – Demonstrations and Infrastructure Development (DEMO)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Demonstrations and Infrastructure Development (DEMO)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Demonstrations and Infrastructure Development	$15,000	$23,300	$24,675	+$9,675

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Various - Demonstrations	---	$23,174.5
b. Infrastructure Management Support	---	1,500.0
Total	Various	$24,674.5

For FY 2014, $24,674,500 is requested to provide for the following:

International Air Traffic Interoperability (IATI)
- Conduct demonstration activities of collaborative end-to-end domain systems
- Develop standards and alternatives of near-term emerging technologies and airspace customer initiatives related to International Air Traffic Interoperability
- Conduct demonstration activities of midterm end-to-end trajectory-based operations
- Conduct demonstration activities for enhanced avionics capabilities
- Conduct demonstration activities for enhanced navigation capabilities
- Conduct Post-Demonstration Analysis and compose the associated Final Report

CDM/Flow management across the ocean - collaborative data exchange with flight deck/international ANSP
- Develop a demonstration Plan with stakeholders (Air Navigation Service Providers (ANSPs) and flight operators) for demonstration of flow management of aircraft with Traffic Management Initiatives (TMI) across multiple ANSPs
- Develop test Bed Requirements and operational scenarios
- Develop initial safety analysis

Global Harmonization of Flight Information and Exchange Strategies
- Conduct a demonstration of Flight Object concepts validation, such as the Flight Information Exchange Model (FIXM) standard
- Develop evaluation strategies to harmonize Flight Object concepts
- Continue efforts in project management and stakeholder coordination to promote collaboration
- Complete a Post-Demonstration Analysis and Final Report
- Provide development, and validation results leading to implementation of early improvements in the NAS while supporting long-term operational objectives

NextGen Infrastructure Development
- Provide reporting and tracking for the NextGen projects in support of the NextGen Segment Implementation Portfolios as well as the pre engineering work that ads I the mitigation of risk to developing projects

- Implement Integrated Master Schedule (IMS) system that houses the current and historical work associated with NextGen projects
- Continue to support OMB 300 development for NextGen transformational technologies

Future Planning Analysis
This segment provides the planning and integration of current technology with transformational technology demonstrations, to achieve NextGen operational objectives as early as possible and to ensure sustainment of the demonstration sites.

What Is This Program?

The NextGen Demonstrations and Infrastructure Development Program is designated to integrate demonstration projects and programs, provide validation of mature solutions, and demonstrate implementation alternatives for the NAS and support integrated planning for NextGen. This program provides agility and flexibility in demonstrating alternative technologies and concepts, while supporting procedure and standards development, as well as provide for the integration of near-term emerging technologies, procedures and/or customers' initiatives with on-going demonstrations. The demonstration program leverages the individual project demonstrations, and supports the integration of these individual projects, into multiple-domains designed to capture the synergies that are needed to provide timely NAS transformation.

International Air Traffic Interoperability
This demonstration project is designed to help the FAA promote safe, affordable, and rapidly implemented innovations into Air Traffic Management (ATM) along oceanic routes. It will 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/subsystems testing and certification; and system checkout. Flight trial execution could include scripted flight tests, limited operational testing, and/or extended operational evaluations. This international interoperability demonstration program contributes directly to NextGen concepts and supports international collaboration, avoids overlap, and will coordinate activities with national and international organizations, including the Department of Defense (DoD). Furthermore, the International Air Traffic Interoperability demonstrations and development initiatives will assist the international communities and the FAA to validate new DOD 4-D Trajectory Based Operations (TBO).

Airborne Execution of Flow Strategies
This project seeks to show how the dynamic exchange of data and Traffic Management Initiatives (TMI) can be achieved across multiple Air Navigation Service Providers to impact more efficient aircraft operations based on the wind aloft. In today's environment, aircraft operating across the ocean may arrive early due to favorable wind aloft conditions but because the ANSP is not prepared, aircraft will be placed in airborne holding which would increase fuel burn and negative impact to the environment.

Global Harmonization of Flight Information and Exchange Strategies
The purpose of this proposed demonstration is to continue to validate the Flight Object concept and the use of the Flight Information Exchange Model (FIXM) standard. The Flight Information Exchange Model (FIXM) is a data interchange format for sharing information about flights throughout their lifecycle. FIXM is part of a family of technology independent, harmonized and interoperable information exchange models designed to cover the information needs of Air Traffic Management. The demonstration will show how ANSPs and flight operators, in both the Pacific and Atlantic regions, can leverage the FIXM standard as a means for sharing common flight information elements.

Future Planning Analysis
Demonstration, development, and validation results can lead to implementation of early improvements in the NAS while supporting long-term operational objectives. The initial segment initiatives provides integrated demonstration and end-to-end demonstration activities, near-term activities necessary to refine and integrate solution set capabilities with emerging technologies and/or emerging customers' NAS initiatives, and mid-term development to better understand future operational concepts. The initial segment

also provides integration of current technology with transformational technology demonstrations to achieve NextGen operational objectives as early as possible and sustainment of the demonstration sites.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The NextGen Technology Demonstrations program is a development effort to support the transformation of the NAS to 4-D trajectory management and a performance-based system. The program provides integration and demonstration of alternate technologies and concepts, while supporting procedures and standards development, integration of near-term emerging technologies and airspace customers' initiatives with on-going scheduled demonstrations. This program provides a vehicle to test concepts and leverage individual transformational program and project technology to create multi-domain cohesive demonstrations to capture the synergies needed to transform the NAS in an expedited manner. The evaluation of technology and the collaboration between public/private industry partners, Air Navigation Service Providers, customers, and owners will continue into perpetuity.

How Do You Know The Program Works?

Demonstrations and Infrastructure Development encompasses the airspace and airports within the NAS. Demonstrations typically take place over the course of 18 - 24 months, with new demonstrations added as previous projects are completed. Since its beginning, the DEMO portfolio has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities from completed and ongoing demonstrations that have and will continue to improve the overall operations within the NAS.

International Air Traffic Interoperability

- Conducted Gate to Gate demonstration with Air France airlines
- Expanded lateral optimization procedures to include Atlantic Interoperability Initiative to Reduce Emissions (AIRE) Eastbound demonstrations
- Coordinated Safety Risk Management Document (SRMD) review process related to Automatic Dependent Surveillance – Contract Climb and descent procedures (ADS-C CDP)

Unmanned Aircraft Systems 4D Trajectory Based

- Drafted final Unmanned Aircraft Systems (UAS) "Demonstration Test Plan (Version 1.5) for UAS NextGen Flight Test at Cape Canaveral Air Force Station (CCAFS)
- Drafted final SRMD Memorandum M for UAS NextGen Flight Test at CCAFS
- Conducted UAS Demonstration (3) at CCAFS for a limited ADS-B Cockpit Display of Traffic Information (CDTI) capability providing enhanced situational awareness to the UA Pilot in the Ground Control Station (GCS) and provided limited point to point digital radio connectivity from the UA pseudo pilot to ATC at CCAFS Skid Strip Tower (KXMR)

Why Do We Want/Need To Fund The Program At The Requested Level?

$24,674,500 is required to continue activities within the NextGen - Technology Demonstrations and Infrastructure Development solution set. This solution set is designated to integrate demonstration projects and programs, provide validation of mature solutions, and demonstrate implementation alternatives for the NAS. A reduction in funding will result in various demonstration projects and programs that provide agility and flexibility in demonstrating alternative technologies, and concepts, while supporting procedure and standards development, not to occur.

Detailed Justification for - 1A07 Next Generation Transportation System (NextGen) System Development (SYSDEV)

What Is The Request And What Will We Get For The Funds?

FY 2014 -- Next Generation Transportation System (NextGen) – System Development (SYSDEV)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System (NextGen) System Development (SYSDEV)	$85,000	$51,980	$61,500	-$23,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Human Factors (Efficiency/Air Ground Integration)	---	$5,000.0
B. New ATM Requirements	---	22,000.0
C. Operations Concept Validation Modeling	---	5,000.0
D. Environment and Energy – EMS and Noise and Emissions Reduction	---	10,000.0
E. Wake Turbulence – Re-categorization	---	1,500.0
F. Operational Assessments	---	8,000.0
G. System Safety Management Transformation	---	8,000.0
H. Staffed NextGen Towers (SNT)	---	2,000.0
Total	Various	$61,500.0

For FY 2014, $61,500,000 is requested to provide for the following:

A. Human Factors (Efficiency/Air Ground Integration)
- Update strategic job analysis and training needs used to support the selection of NextGen Air Traffic Controllers
- Perform Tech Ops Strategic Job Analysis and Training Needs Analysis
- Working to identify and reduce non-conformance to Performance Based Navigation Required Area Navigation/Required Performance Navigation RNAV/RNP standards which will increase capacity and efficiency using RNAV/RNP
- Develop a human error/safety database for NextGen capabilities, which will serve to research and identify human performance hazards, and design requirements that will mitigate those hazards
- Continue development of the Human System Integration Roadmap to reflect major human factor efforts and decisions, in support of the human element in the FAA National Air Space (NAS) Enterprise Architecture
- Develop information requirements for TMC, dispatchers, controllers, and pilots for increased throughput during reroutes and special handling situations
- Characterization of controller interaction with NextGen automation and decision support tools
- Air Ground Integration capability simulations using multiple NextGen tools

B. New Air Traffic Management (ATM) Requirements
- Continuation of the Demonstrations of AAtS which will study the feasibility and benefit of providing operational, weather and regulatory data to pilots in flight, using Class I and II Electronic Flight Bags receiving data via a commercial data provider. This will be a two-way exchange on information pathway between the flight crew and Air Navigation Service Provider (ANSP) via System Wide Information Management (SWIM)

- Conduct formulation of any required acquisition planning to support requirements levied on NAS systems by Uses of AAtS
- Continuation of data elements support for trajectory modeling
- Establishment of standard use for different classes of trajectories
- International harmonization on requirements and definition for information exchange
- Stakeholder Demonstration and Technical Interchange
- Traffic Collision Avoidance System and Automatic Dependent Surveillance-Broadcast Compatibility and Future Requirements development
- Future CAS Logic Development/Future Surveillance Requirements
- CAS Logic Assessment/Avionics Model (Future Surveillance Assessment)/TCAS-ADS-B Compatibility
- New Radar Requirements (Surveillance and Weather)
    - Deliver Industry antenna preliminary design review artifacts
    - Deliver industry antenna design review artifacts
    - Deliver evaluation test plan
    - Deliver antenna simulation evaluation
- Weather Transition
    - Requirements Allocation/Validation with NWS
    - Service Analyses
    - Weather Concept Demonstration and Evaluation
- Cloud computing: Evaluate and review of the NAS system for potential assignment to cloud environment/data center rather than local environment
- Revalidate technical assumptions based on safety and mission crucial, and ability of current architecture to provide service in a non-copper point-to-point environment

C. Operations Concept Validation Modeling
- Concept Validation of end to end and lower level operational concepts
- Development of documentation for technical transfer of validated concepts
- Development of operational requirements for validated concepts
- Research to reduce risk/uncertainties of NextGen Mid Term operational concepts
- Identify procedures to decrease workload/increase reliance on automation for routine tasking, to increase efficiency of the NAS
- Develop operational methods to expand capacity by addressing future growth in demand and reducing transit time
- Products include: Concepts of operations; reports documenting findings of fast-time and real-time concept validation studies; operational requirements associated with validated concepts; shortfall and benefits analysis; safety assessments

D. Environment and Energy – Environmental Management System (EMS) and Advanced Noise and Emissions Reduction
- Enhance EMS capability to assess environmental impacts and metrics which include communication and outreach, refinement of decision support tools, testing and pilot studies, tracking and IT system, analysis of incentivization and NEPA collaboration, and prioritization and implementation of NAS interface testing
- Test and demonstrate Air Traffic Management -related CLEEN (Continuous Lower Energy, Emissions and Noise) technologies and assess noise, emissions and fuel burn reduction benefits of new technologies, market based measures, and environmental standards
- Explore, develop and validate operational procedure concepts; test and demonstrate environmentally efficient gate-to-gate operational procedures

E. Wake Turbulence Re-categorization
- Develop changes to the Advanced Terminal Proximity Alert decision support tool for incorporating the defined "Leader/Follower Pair-Wise Static" wake separation standards into the FAA ATC automation platforms
- Continue to support implementation of the "6 Category" wake separation standards into the FAA ATC automation platforms

F. Operational Assessments

- Release Aviation Environment Design Tool (AEDT) publicly with capability to perform airport to NAS level integrated fuel burn, noise and emissions analyses
- Interface AEDT environmental assessment capabilities with NextGen NAS simulation models
- Develop report on APMT-Economics for domestic/regional NAS-wide NextGen environmental analysis
- Provide report refining analysis and assessment of NAS-wide NextGen environmental benefits
- Enhance Operational Performance Model to support NextGen Operational Assessments
- Update NextGen cost estimates, benefits estimates, and the overall NextGen business case
- Develop and maintain the website for NextGen Performance Snapshots (NPS) to aid in the tracking and reporting of progress within NextGen
- Maintain and update the NextGen Segment Implementation Plan to aid the planning and deployment of NextGen portfolio in the mid-term timeframe

G. System Safety Management Transformation

- System Safety Assessment 1 –Deliver software that Implements and validates the periodic system risk baselines for terminal area operations (gate to top-of-descent)
- Software that incorporates terminal area risk analysis capabilities developed in the previous fiscal years will be implemented in a standard software platform in order to provide it as an FAA wide capability for safety analysis NAS-wide wherever ASDEX and other data are available and produce a daily safety report for the facility on surface movement
- System Safety Assessment 2 – Provide software and analytical reports based upon the integrated system risk analysis program and analyze potential impacts of other domestic safety initiatives
  - The Integrated Safety Assessment Model (ISAM) will be extended to reflect the safety impacts of the impact of NextGen mid term improvements, as well as additional actions on the part of the agency such as non-NextGen related rulemakings, NTSB recommendations, airworthiness directives, and other safety findings. The aggregate result of risk levels will be accumulated and provided as an annual risk analysis evaluation to the NextGen Program Office, the Airport Obstruction Safety Committee, ATO Safety, AOV and other FAA stakeholders. The software platform will be delivered in a web-based environment which will allow all valid (pre-screened) stakeholders direct access to the analysis process and results.
- System Safety Assessment 3 Deliver Software to NextGen program office, AVS and other operational FAA LOBs to provide integrated data collected via FAA-wide hazard tracking systems across all AVS services and offices with oversight responsibility (AFS, AIR, AAM, AOV) into the system risk baseline analysis
- Develop data exchange protocol to feed these data into the ISAM model. This FAA wide database will support operational and other safety assessments within the ISAM web-based platform. This database will be available to all FAA stakeholders via the ISAM web-based platform
  - System Safety Assessment 4 - Safety Modeling Advisory Committee
  - Deliver stakeholder-required analyses in integrated safety modeling that support safety analysis requirements of the group, and improve the applicability of the integrated modeling product
  - Conduct an annual FAA-wide safety risk management coordination workshop, including all SSMT stakeholders, to discuss and critique methodologies, topics and results of recent activities of the SSMT Program

H. Systems Development Staffed NextGen Towers (SNT)

- Program requirements update
- Surface surveillance operational suitability (formerly ASDE-X Certification) documentation
- Initial procedures for surface surveillance operational suitability
- Initial requirements for SNT-Small Medium Airports (SNT-SMA) human-in-the-loop simulation (HITL)
- System safety analysis for surface surveillance operational suitability

What Is This Program?

The FAA operates arguably the safest, most efficient, and most cost-effective Air Traffic Control (ATC) system in the world, while handling more traffic and controlling more airspace than any other Air Navigation Service Provider (ANSP). The goal of NextGen is to provide new capabilities that make air transportation safer and more reliable while improving the capacity of the National Airspace System (NAS) and reducing aviation's impact on our environment. The achievement of these goals will be extremely challenging. The NextGen System Development program provides cross-cutting research, development, and analysis to help achieve these goals, in such areas as human factors research, requirements development, environmental and operational modeling and analysis, and safety research and analysis. The specific activities of the program are described below.

A. Human Factors (Efficiency/Air Ground Integration)

The significant features of this program are the development of a Human System Integration (HSI) Roadmap to complement the other roadmaps in the Enterprise Architecture, the development of a common air traffic workstation to accommodate the various NextGen technologies when providing services, and a series of integrated workstations that deliver the required services using the common workstation. The HSI Roadmap will explain the roles and responsibilities of the actors in the NAS (air traffic controllers, pilots, dispatchers, traffic managers, etc.), their interactions with NextGen technologies, linkage to required changes to staffing, personnel selection, training, and required research and development activities in the human factors area that are needed to realize the NextGen vision.

Research will examine the roles of ANSP and facilities maintenance personnel to ensure safe operations at increased capacity levels and the way the roles would be best supported by allocation of functions between humans and automation. The success of new NextGen technologies hinge upon the actions of air traffic service providers using new decision support tools or automation to achieve the operational improvement. The effectiveness of each of these solutions is contingent upon the proper human engineering of the new capability. This human engineering is not just the visible interface, but the characteristics of the tool and how the tool is used in the context of the work.

B. New Air Traffic Management (ATM) Requirements

The New ATM Requirements 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." Furthermore, this program fits the NextGen goal of expanding capacity by satisfying future growth in demand as well as reducing transit time. For FY 2014, new ATM requirements will focus on six areas: Weather Transition, TCAS, Airborne SWIM, Trajectory Management, and New Radar Requirements (Surveillance and Weather), and Cloud Computing.

Weather Transition ensures that weather concepts coming from aviation weather research are matured and technically developed under FAA guidelines to a level of appropriate readiness for operational use in the NAS. Weather Transition will manage appropriate activities to include the creation, testing and evaluation of prototypes and operational demonstrations for the purpose of defining and refining an appropriate operational use concept.

TCAS had extraordinary success in reducing the risk of mid-air collisions. Now mandated on all large transport aircraft and installed on many smaller turbine powered aircraft, TCAS has been in operation for over a decade and has been credited with preventing several catastrophic accidents. TCAS is a key decision-support system in the sense that it has been widely deployed (on more than 25,000 aircraft worldwide) and is continuously exposed to a high-tempo, complex air traffic system.

TCAS is the product of carefully balancing and integrating sensor characteristics, tracker and aircraft dynamics, maneuver coordination, operational constraints, and human factors in time-sensitive situations. Missed or late threat detections can lead to collisions, and false alarms may cause pilots to lose trust in the system and ignore alerts, underscoring the need for a robust system design. NextGen airspace will have increased capacity due to decreased aircraft separation made possible by new technologies and new procedures, such as the increased use of RNAV/RNP routes and Closely Space Parallel Runways operations. As aircraft separation is decreased, it is vital that TCAS be made even more accurate and dependable to ensure continued pilot trust in the system.

Airborne System-Wide Information Management (SWIM) - The current development of SWIM includes a gap in servicing airborne clients. European concepts of SWIM, built by SESAR, cover this. Thus, there is a need for concepts that would harmonize the FAA and SESAR SWIM systems. There is a need to determine if airborne SWIM is a requirement or an optional feature. Airborne SWIM will identify performance and bandwidth requirements for airborne internet capability to support the exchange of ATM information such as weather, aeronautical information and flight information to support Traffic Flow Management. The program will develop standards and publish standards that will ensure harmonization with SESAR SWIM systems.

Trajectory-based operations require multi-domain interaction with aircraft trajectories in the far-term future. As a step towards that end, trajectory operations (TOps) have been defined to focus on the NextGen midterm. The TOps activity defined an initial cross-stakeholder, common view of the utilization of Communications, Navigation and Surveillance (CNS) components related to TOps in the midterm. The Trajectory modeling project will develop NAS-wide trajectory-related requirements for Mid-Term automation systems. System level requirements will then be developed and allocated across the automation systems. The project focuses on defining concept of use alternatives for trajectory, what trajectory information should be exchanged, defining types and quality of trajectory prediction required, what integrated solution is required to achieve trajectory interoperability across multiple domains in the mid-term NAS and define a strategy for global trajectory harmonization.

New Radar Requirements (Surveillance and Weather) is a concept maturity and technology development initiative in support of the NextGen Surveillance and Weather Radar Capability. The objective of this effort is to identify viable solution implementation alternatives that could provide for FAA's aircraft and weather surveillance radar needs and weather surveillance radar needs of both FAA and NOAA. It will include identifying the technical challenges, evaluating cost models, developing technology approaches and proposed solutions, and concept demonstration through modeling and prototyping. The overall project includes four major areas: Multifunction Phased-Array Antenna Maturation, Engineering Studies – Technology Assessment, Multifunction Radar Backend Definition, and Concept and Requirements Definition. The outcome of this body of work will result in an initial Antenna and Radar Backend specification. The information gained through this effort will support an FAA investment analysis readiness decision (IARD) in 2014 and will provide the government a greater capability of defining specific requirements for a potential joint radar acquisition.

C. Operations Concept Validation Modeling

The Operations Concept Validation Modeling Program addresses developing and validating future gate-to-gate (flight planning through arrival) operational concepts that will increase capacity and improve efficiency and throughput. Special emphasis is placed on researching changes in roles and responsibilities between the FAA and airspace users (e.g., pilots and airlines), as well as the role of the human versus systems.

The Operations Concept Validation Modeling Program will identify procedures to decrease workload and increase reliance on automation for routine tasking, in order to increase efficiency of the National Airspace System (NAS). The program works toward developing operational methods to expand capacity by addressing future growth in demand and reducing transit times.

D. Environment and Energy – Environmental Management System (EMS) and Noise Reduction

There are three aspects to this program: Environmental Management System (EMS), and Environment and Energy - Advanced Noise and Emission Reduction, and Energy and Environmentally Efficient ATM and Operational Procedures.

The NextGen Environmental Management System (EMS) will manage NextGen environmental impacts and help to define and identify optimum mitigation actions and assess their benefits in order to achieve NextGen environmental goals. This subprogram will develop, refine and evaluate EMS framework, support implementation as well as communication and coordination strategies, decision support tools, and environmental impacts metrics and analysis approaches.

The Environment and Energy - Advanced Noise and Emission Reduction aspect of the program has three main components: 1) mature ATM-related CLEEN (Continuous Lower Energy, Emissions and Noise) technologies; 2) evaluate potential NAS-wide environmental benefits from mitigation solutions, (i.e. new aircraft technologies matured under CLEEN for reduction in noise, emissions and fuel burn; potential and viable policies and environmental standards; and market based measures); 3) and identify ways to integrate environmental impacts mitigation options within the NAS infrastructure while demonstrating any NAS adaptation required to implement these solutions such that maximum benefit from NextGen provisions is attained.

The Energy and Environmentally Efficient ATM and Operational Procedures aspect of the program will explore and demonstrate ATM and operational procedures for energy efficiency and improved environmental performance.

E. Wake Turbulence Re-categorization

This program focuses on satisfying the capacity demands of future aviation growth. The last full review of wake separation standards used by air traffic control occurred nearly 20 years ago in the early 1990s. Since then, air carrier operations and fleet mix have changed dramatically, airport runway complexes have changed and new aircraft designs (A-380, very light jets, unmanned aircraft systems) have been introduced into the National Airspace System (NAS). The 20 year old wake separation standards still provide safe separation of aircraft from each other's wakes but they no longer provide the most capacity efficient spacing and sequencing of aircraft in approach and en-route operations. This loss of efficient spacing is adding to the gap between demand and the capacity the NAS can provide.

This program is part of a joint EUROCONTROL and FAA program that has reviewed the current required wake mitigation aircraft separations used in both the USA's and Europe's air traffic control processes and has determined the current standards can be safely modified to increase the operational capacity of airports and airspace that will have heavy operational demand in the NextGen era. Associated work is incorporating new aircraft (i.e. Boeing 787, Airbus A-380, Boeing 747-8 and others) in this ongoing development of safe capacity efficient wake separation standards.

The next phase of the Wake Re-Categorization program is now underway. By 2014, this program will develop sets of tailored leader aircraft and follower aircraft pair-wise static wake separation standards whose application would depend on phase of flight and aircraft characteristics in addition to aircraft weight; resulting in being able to get more aircraft into and out of airports and in the same volume of airspace.

The final and most technically complex phase of the Wake Turbulence Re-Categorization program will be the development of wake separation standards and associated procedures for application that change dynamically with the leading and following aircraft performance parameters and atmospheric conditions in which they are flying.

F. Operational Assessments

The Operational Assessment project focuses on: Systems Analysis, and Environmental Assessment.

The purpose of the Systems Analysis program is to provide analytical products in support of the NextGen enterprise. NextGen is a complex set of technologies, processes, procedures, and policies, the execution of which is being managed by a large number of offices scattered across the FAA. Each of these offices will conduct detailed studies to support their specific activities. But for NextGen to succeed there must also be an integrated assessment of the expected costs and benefits, and actual operational performance, of the entire portfolio of programs. Otherwise, one program's operational benefits may usurp another's. On the other hand, the costs to society of the integrated portfolio could be overstated if each program individually accounts for the cost to equip aircraft or develop ground infrastructure that is shared across programs. Systems Analysis will prepare quantitative estimates of the anticipated operational benefits of the NextGen portfolio, through the "mid-term" and for the entire investment life-cycle; cost estimates for the overall NextGen portfolio, to include aircraft equipage costs; an integrated business case for NextGen, combining the costs and benefits to determine the return on investment (for society at large as well as individual stakeholder groups); and quantitative assessments of the operational impacts of fielded NextGen components as they become available.

The focus of the Environmental Assessment program is to establish the current operational state of the aviation system in order to quantify the change in environmental impacts from NextGen implementation. This will be done by enhancing local to NAS-wide environmental assessment capabilities within the AEDT and the economics component of the Aviation Environment Portfolio Management Tool (APMT) as well as to integrate environmental assessment capability with NAS design tools, simulation models and performance monitoring systems. It also involves application of NAS-wide environmental assessment models to assess environmental benefits of NextGen NAS-wide mitigation options for decision support. The Environmental Assessment program also requires that external forecasts of operations, such as the FAA Terminal Area Forecast (TAF), be combined with fleet technology assumptions to generate future year fleet and operations sequences. This is done within the aforementioned tools.

G. System Safety Management Transformation

This program provides research leading to a comprehensive and proactive approach to aviation safety in conjunction with implementation of NextGen capacity and efficiency capabilities. The implementation of these capabilities will require changes in the process of safety management, the definition and implementation of risk management systems and management of the overall transformation process to ensure that safety is not only maintained but improved. A core foundation of the system safety transformation is the introduction of system-wide access and sharing of aviation safety data and analysis tools within the aviation community, providing safety resources that are integrated with operations of aviation industry stakeholders.

Capabilities to merge and analyze diverse sets of aviation information will be provided to expose and track precursors to incidents/accidents, allowing safety analysts within the FAA and aviation industry to understand emerging risks before they become potential safety issues. This research also enables safety assessments of proposed NextGen concepts, algorithms, and technologies and provides system knowledge to understand economic (including implementation) and operational and performance impacts (with respect to safety) of NextGen system alternatives. A demonstration will be conducted at a National Level. System Safety Assessment working prototype that will proactively identify emerging risks as NextGen capabilities are defined and implemented.

H. Staffed NextGen Towers (SNT)

The Staffed NextGen Tower (SNT) concept provides for a paradigm shift from using the out-the-window (OTW) view as the primary means for providing tower control services to using surface surveillance approved for operational use.

SNTs will provide for improved safety and increased capacity at night and during periods of inclement weather when impaired visual observation from an air traffic control tower results in delays or a reduced level of access to the airport. SNT will also allow the FAA to expand its service to meet projected increases in Air Traffic Control Tower (ATCT) operations.

SNT is planned for high density airports as these airports are likely to have the surveillance infrastructure and most aircraft equipped with avionics that will support SNT operations.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 and NextGen concepts to determine if they can achieve the targets for 2025; and develops air traffic control procedures, separation standards and 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.

How Do You Know The Program Works?

Projects in the Systems Development solution set encompass the entirety of the airspace and airports within the NAS. Since its beginning SYSDEV has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities that have and will continue to improve the overall operations within the NAS.

A. Human Factors (Efficiency/Air Ground Integration)

- Define and catalog NextGen information requirements for TMC, controllers, pilots, and dispatch functions during reroutes and special handling situations, to reduce programmatic risk, and increase safety, fuel savings, and NAS efficiency
- Completed Human Error/Safety Database for NextGen Capabilities, including Human Error/Safety Analysis of Midterm Operations
- Completed NextGen Tech Ops Job Task Analysis and Strategic Training Needs Analysis, informing curriculum development and advancing the FAAs understanding of the impact of NextGen on the Tech Ops work environment
- Demonstration of Human Error/Safety Database for off-nominal NextGen conditions
- NextGen Human Factors Air-Ground Integration Human-in-the-loop Planning
- Human Systems Integration Roadmap facilitates stakeholder engagement, use of HSI products in the development and acquisition of NextGen tools throughout I2I and AMS process, and complete schedule alignment for overall reduction of programmatic risk

B. New ATM Requirements

- Establish an international standards for future communication (AeroMAC)
- Requirements for trajectory modeling developed for existing technology transitioned into the NAS
- Conduct demonstration and complete analysis of the MPAR alternative Backend architecture. Complete final report of the demonstration results
- Conduct demonstration and complete analysis of the MPAR alternative Antenna architecture. Complete final report of the demonstration results
- Complete an update of aviation weather requirements
- Complete service analyses of operational needs for weather information
- Conduct demonstration and evaluation of new/improved weather capabilities

C. Operations Concept Validation/Modeling

- Completed Time-Based Flow Management tool assessment Management integration analysis
- Completed the technical transfer of 3D Path Arrival Management
- Fast-time modeling of initial (implemented with existing automation/communications) Flexible Airspace Solutions
- NextGen Mid-Term Concept of Operations, annotated outline
- Develop methods, metrics, and models to demonstrate that the modernized system can handle anticipated growth in traffic demand, for incremental years leading to the NextGen far-term
- Demonstrate capacity and efficiency increases at 2025 forecasted traffic levels by 2016

D. Environmental Management System (EMS) and Advanced Emissions and Noise Reduction

- Develop EMS for use by stakeholders in managing their environmental performance
- Evaluate potential NAS-wide benefits of Aircraft CO2 Emissions Standards
- Develop and evaluate new ATM and operational procedures for reduced energy use and environmental impact

- Develop and demonstrate ATM-related NextGen aircraft technologies via the Continuous Lower Energy, Emissions and Noise (CLEEN) Program

E. Wake Turbulence Re-categorization
- New 6 Category air traffic control wake separation airport capacity enhancing standards submitted to ICAO; and, FAA has initiated the process for implementing them
- Concept for using Leader/Follower Pair-Wise Static air traffic control wake separation standards has been developed – potential additional airport runway capacity increase of four percent

F. Operational Assessments
- AEDT development and integration with NAS design tools
- APMT Economics development
- Updated NextGen cost analysis
- Updated NextGen benefits analysis
- Annual NextGen Performance Assessment

G. System Safety Management Transformation
- SSA – Completed Integrated Emergent Risk Forecasting Model 2015 (version 0.1)
- SSA – Baseline risk analysis capability distributed system Demonstration (Daily trend analysis capability 35 OEP airports)
- Provided to NSIP program office and FAA-wide stakeholders as a support tool for the NextGen Safety Coordination Group
- SMS – Integrated Hazard Tracking System FAA-wide Acquire and Implement Phase 1

H. Staffed NextGen Tower (Staffed and Autonomous)
- Completion of Field Demo 2 at DFW
- Preliminary Program Requirements
- Updated concept of operations

Why Do We Want / Need To Fund The Program At The Requested Level?

$61,500,000 is required to allow for continued execution of work within the System Development solution set. The FY 2014 work will support strategies to meet future aviation demand in an environmentally sustainable manner, reduce domestic curb-to-curb transit time by 30 percent and minimize the impact of weather and other disruptions to achieve 95 percent on time performance. System Development provides the research and development required to resolve these potential problems. In addition, an increase in demand could cause an increase in the number of accidents, aircraft noise and emissions, as well as the ATC workload. With a reduction in funding, achievement of these targets and solving these issues by 2025 will not occur.

Detailed Justification for - 1A08 Next Generation Transportation System – Trajectory Based Operations (TBO)

What Is The Request And What Will We Get For The Funds?

FY 2014 -- Next Generation Transportation System – Trajectory Based Operations (TBO) ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System – Trajectory Based Operations (TBO)	$7,000	$13,745	$18,000	+$11,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Modern Procedures (D - Side and R - Side)	---	$15,000.0
B. Oceanic Tactical Trajectory Management	---	3,000.0
Total	Various	$18,000.0

For FY 2014, $18,000,000 is requested for the following:

A. Separation Management - Modern Procedures

- Continue to develop En Route NextGen Mid-Term Baseline capabilities, which assist controllers in maintaining safe aircraft separation while optimizing use of airspace system capacity. FY 2014 areas of capability research and analysis include:
  - Automation-Assisted Controller-to-Controller Coordination, a flight data display improvement that allows controllers to electronically coordinate conflict resolutions, and send that information to the sector controlling the aircraft to be maneuvered
  - Alerting for Aircraft-to-Aircraft Problems in three nautical mile (nm) Separation Areas, a conflict probe enhancement to support aircraft-to-aircraft alerts in current three-nm separation areas, including alerts based on wake turbulence separation requirements
  - Integration of Problems Detection onto the Radar Console, a conflict probe enhancement that is displayed on the radar console to be more accessible to the radar controller and the sector team when traffic levels are high
  - Introduction of Probed Menus on the Radar and Data Consoles, a conflict probe enhancement to allow the controller to view the problem status of resolution options in different dimensions
- Development of flight data display improvement software prototypes for:
  - Alerting for Aircraft-Off-Flight Plan Problems, an enhancement to alert the controller when an aircraft is not following the Air Traffic Control (ATC) automation's flight plan specification for an Required Area Navigation/Required Navigation Performance (RNAV/RNP) route
  - Selective Removal of Altitude Restrictions: For each aircraft that qualifies for the altitude restriction removal, the automation will create a trial plan to determine the problem status of the aircraft trajectory if the altitude restriction is removed
  - Alerting for Dynamic Special Activity Airspace (SAAs), an enhancement to determine when an ineligible aircraft's current plan (or trial plan) trajectory is predicted to enter an active, dynamic SAA and alert the controller
- Conduct an Operational Evaluation and/or Human-in-the-Loop (HITL) study, assessing the suitability of the system-level requirements for:
  - Automation Support for Non-Surveillance Airspace modified to provide an automated problem detection and trial planning capability, which will notify the controller of potential separation

violations in non-surveillance airspace. Crucial information will be displayed as electronic flight data, eliminating the need for paper flight strips
- Integration of Manual Trial Planning on the Radar Console: Manual trial planning, which allows controllers to manually create a trial plan by defining it graphically, or by editing the route string text for an aircraft, will be integrated onto the radar console
- Facilitation of the Entry of Clearances and Flight Plan Amendments, automation that will facilitate the controller's task of issuing clearances and amending flight plans (i.e. entry of vectors, steep climbs and descents, and speed changes) via enhancements to the Radar Console
- Introduction of Flight Management Computer (FMC) Route Offset for Current Plans, Trial Plans, and Probed Menus, automation that will allow controllers to amend a flight plan for capable aircraft to fly an FMC lateral offset. The automation will base problem detection and data coordination on the offset route
- Implement Airborne Reroute Automation Capabilities, which will automate the process of reroutes generated by Traffic Flow Management System (TFMS), within the En Route Automation Modernization system, after the aircraft is airborne. These capabilities will include:
  - Development of the Airborne Reroute Interface and Application, within the En Route system
  - Functional validation, integration, and regression testing of Airborne Reroute functionality in ERAM
  - Operational validation, integration, and regression testing of Airborne Reroute functionality in ERAM
  - Perform key site testing and evaluation of Airborne Reroute functionality, in support of Initial Operating Capability (IOC) and in preparation of deployment

B. Trajectory Management- Oceanic Tactical Trajectory Management

- Conduct simulations, benefits analysis, business case, and concept validation for the Controller Capability initiative, a suite of capabilities that provide automation support to oceanic air traffic control. This set of capabilities will enable airspace users to fly closer to their preferred 4D trajectories. These Controller Capabilities include:
  - Auto Re-Probe Controller Capability, which enables controllers to keep track of previously-denied clearance change requests and automatically see when they are available. This automation will re-probe the denied request and notify the controller when the request is conflict-free
  - Auto Route Planner Controller Capability, which calculates wind-efficient reroutes in situations where the controller wants to offer a reroute
  - Conflict Resolution Controller Capability, which offers resolutions to controllers for identified conflicts. The automation displays conflict-free resolution advisories to the controller for consideration in formulating a clearance

What Is This Program?

The Trajectory Based Operations solution set focuses primarily on high-altitude cruise operations in en route airspace. TBO will provide the capabilities, decision-support tools, and automation to manage aircraft movement by trajectory. This shift from clearance-based to trajectory-based air traffic control is important because it will enable aircraft to fly negotiated flight paths necessary for full performance based navigation, taking both operator preferences and optimal airspace system performance into consideration, thus improving efficiency and capacity.

The traditional role of the pilots/controllers will evolve due to the increase in automation, support, and integration.

A. Modern Procedures (D-Side and R-Side)

The performance-based concept calls for separation standards to vary according to aircraft capabilities and pilot training. This activity will result in a set of separation standards requirements and algorithms to implement them, and includes changes to automation, procedures, and training. This also funds an analysis of performance-based data processing to see if it is appropriate for lowering separation minima. Performance-based data processing is a way to integrate all information about an aircraft's path and location to provide full situational awareness and predict possible problems.

Developing new automation Conflict Alert (CA) and Conflict Probe (CP) algorithms, and changing the controller workstations to support the new information, are on the critical path of many NextGen technologies. Completion of this task enables successful completion of other TBO goals, as well as broader NextGen objectives.

Modern Procedures automation enhancements include concepts and technologies, performance enhancements to existing automation functions identified through development, deployment, and operational use of ERAM. Pre-implementation activities include operational and technical risk reduction, and acquisition artifact development. Modern Procedures includes all ATC automation capabilities that assist controllers in maintaining safe aircraft separation while optimizing use of airspace capacity. This project will apply pre-implementation processes to define, prioritize, sequence, and transition to implementation of the Radar-Side (R-Side) and Data-Side (D-Side) controller capabilities and technology enhancements.

Separation Management – Modern Procedures also provides funding to implement Airborne Reroute Automation with Initial Operating Capability (IOC) in 2014. Airborne Reroute technology automates the processing in En Route Automation Modernization (ERAM) of Reroutes generated by Traffic Flow Management System (TFMS) after the aircraft is airborne. The process will minimize delays during Traffic Management Initiatives (TMI) and maximize airspace capacity. This activity supports the Agency's commitment to RTCA – Implement Airborne Reroute Execution (ABRR) in 2014.

B. Oceanic Tactical Trajectory Management (OTTM)

The Oceanic Tactical Trajectory Management (OTTM) seeks to produce a high-performance air traffic management environment where aircraft will transmit and receive precise data, including aircraft routes and the times the aircraft will cross key airspace points. Through its primary focus on optimizing oceanic trajectories in four dimensions, OTTM has adopted specific initiatives that address both the pre-departure and in-flight phases of oceanic flight, as well as projects that promote information sharing between the FAA and airspace users.

OTTM incorporates a wide-range of oceanic aircraft capabilities, Airline Operations Center (AOC) capabilities, and Air Navigation Service Provider (ANSP) capabilities, as well as the maturing of evolving technologies (e.g., System-Wide Information Management [SWIM]) when developing these potential concepts. These oceanic capabilities include procedural and automation changes. The implementation of these capabilities will occur incrementally and will eventually affect all domains and phases of flights to improve airspace capacity. OTTM represents a shift from clearance-based control to trajectory-based control. This program includes:

- Aircraft-specific traffic flow management
- Increased management of flows at merge points
- Improved Air Traffic Management (ATM) through weather information integrated into decision support tools
- Decision support tools for the controllers, resulting in improved efficiency and increased safety

OTTM focuses on the Controller Capabilities initiative, a suite of capabilities that provide automation support to oceanic air traffic control that will enable airspace users to fly closer to their preferred 4D trajectories.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The goals for NextGen focus on significantly increasing the safety, security, and capacity of air transportation operations. These benefits are achieved through a combination of new procedures and advances in technology deployed to manage passenger, air cargo, general aviation, and air traffic operations. Advancements in aircraft capabilities allow for reduced separation and support the transition from rules-based operations to performance-based operations. Separation Management automation is defined to include all Air Traffic Control (ATC) automation capabilities that assist controllers in maintaining safe aircraft separation while optimizing use of airspace system capacity.

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 fixed and conservative, which restricts capacity to the overall system. Modern Procedures includes a series of automation upgrades and improvements in the strategic En Route conflict probe (CP), the tactical conflict alert (CA), and display enhancements. Developing new automation CA and CP algorithms are on the critical path of many NextGen technologies. Completion of this task enables successful completion of other TBO goals, as well as broader NextGen objectives.

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 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 has significant impact in the ability to address weather and congestion limitations.

How Do You Know The Program Works?

The TBO solution set encompasses all of the airspace and airports within the NAS. Since its beginning, TBO has made great progress expediting the integration of TBO technologies within these domains. Below are examples of such successes and planned activities that have and will continue to improve the overall operations within the NAS.

A. Modern Procedures (D - Side and R - Side)

- Developed the Separation Management Concept of Operations (CONOPS), describing the qualitative and quantitative system characteristics of Separation Management
- Completed Concepts of Use documents for the first phase of functional requirements, describing the capabilities and intended use of Separation Management. The first phase of requirements include capabilities such as Flight Management Computer Route Offset, System Assisted Coordination, Radar Associate Position, Conflict Probe at Radar Position, and Strip-less Non-Radar Operations
- Conduct a hardware demonstration and acceptance test, at the Walter J Hughes Technical Center (WJHTC), for ERAM Evaluation System (EES), anticipated to the primary tool for Separation Management functionality
- Develop Initial Functional Requirements for Separation Management concepts, determining the initial necessary requirements for new Separation Management technology
- Development and demonstration of D-Side Upgrade risk reduction prototypes, which will serve as a basis for the introduction of Separation Management enhancements at the D-Side position
- Development and independent evaluation of CA and CP algorithm improvement prototypes, improving the controller's ability to maintain safe separation of aircraft

B. Oceanic Tactical Trajectory Management

- Conduct Automatic Dependent Surveillance-Contract (ADS-C) Climb Descend Procedure (CDP) Automation Transition, a new Air Traffic Control (ATC) procedure designed to optimize airspace use and improve service to appropriately-equipped aircraft
- Conduct an Oceanic Conflict Advisory Trial (OCAT) operational trial, a proposed capability to provide tactical trajectory feedback
- Completed an initial data collection and analysis report on vertical and speed change, initial benefits cost analysis report, and defined initial requirements for In-Flight Operations Automation for Trajectory

Optimization capability. This capability improves the awareness for the Flight Operations Center of traffic and other situations that may interact with their flights in oceanic airspace

Why Do We Want / Need To Fund The Program At The Requested Level?

$15,000,000 is required to continue work within the TBO solution set. The FY 2014 work will continue the shift from clearance-based to trajectory-based control. With an increasing diversity of aircraft characteristics, using a single set of equipment-based separation standards for all aircraft encounters is becoming increasingly inefficient and limits capacity, and with a reduction in funding work towards this shift will be greatly impacted. The ability to handle more diverse traffic, with fewer impacts to operator desired performance profiles will not be realized.

$3,000,000 of the required funding is required to complete the Oceanic Conflict Advisory System (OCAS) demonstration and document the trail results, and develop functional analyses, the initial business case, implementation strategy for OCAS and the other oceanic automation initiatives such as: enhanced conflict probe for surveillance airspace, conflict re-probe, and conflict resolution advisory. The resulting deliverables are required to support a final investment decision planned for early 2016.

Detailed Justification for - 1A09 Next Generation Air Transportation System (NextGen) – Reduce Weather Impact (RWI)

What Is The Request And What Will We Get For The Funds?

FY 2014 -- Next Generation Transportation System (NextGen) – Reduce Weather Impact (RWI) ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System (NextGen) – Reduce Weather Impact (RWI)	$15,600	$13,980	$6,000	-$9,600

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Weather Forecast Improvements	---	$3,000.0
B. Weather Observation Improvements	---	3,000.0
Total	Various	$6,000.0

For FY 2014, $6,000,000 is requested to provide the following:

A. Weather Forecast Improvements:

- Provide support for the integration of weather information into Air Traffic Management (ATM) Decision Support Tools (DST)
  - Analysis on utility of the Convective Weather Avoidance Model (CWAM) for Time Based Flow Management Work Package 3 (TBFM WP3) and Collaborative Air Traffic Management Tools Work Package 4 (CATMT WP4)
- Develop and implement weather-impact metric tools, designed to assess the impact of weather on the National Air Space (NAS)
  - Complete the development of a prediction and forecasting metric tools for assessing impact of weather on NAS operations, and for enabling development of "what if" scenarios to determine NAS behavior (i.e. re-routes, holding, diversions, cancellations)
- Continue development of an International Civil Aviation Organization (ICAO)-compliant Quality Management System (QMS) for aviation weather products produced by NWS
  - Establish QMS techniques for AIRMETS (Airmen's Meteorological Information), weather advisories provided to pilots on the occurrence, or expected occurrence, of weather that will affect flight

In support of FAA's role as the ICAO aviation meteorological authority for the United States, prepare plans for implementation of NextGen requirements for the upcoming ICAO/World Meteorological Organization (WMO) Divisional.

B. Weather Observation Improvements:

- Complete concept demonstration of the Flexible Terminal Sensor Network (FTSN) functionality, a NextGen capability that consolidates output from existing ground-based weather observation systems and increases availability of such observations via System-Wide Information Management (SWIM)
- Begin system engineering activities for FTSN concept including engineering/performance evaluation and risk reduction activities
- Prepare Service Analysis/Idea to In-Service (I2I) Artifacts (i.e. CONOPS, Functional Analysis, Shortfall Analysis, and Alternative Description) in support of potential investment decision

What Is This Program?

RWI is a planning and development portfolio, which ensures NextGen operational capabilities utilize a broad range of weather improvements and technologies to mitigate the effects of weather in future NAS operations. This portfolio has two major elements: weather observation improvements and weather forecast improvements. The RWI portfolio will address many weather problems including, but not limited to rightsizing the observations network; transition of aviation weather research to operations; development of weather impact metrics; integration of weather information into decision support processes and tools; and transition planning for legacy systems. RWI will conduct planning, prototyping, demonstrations, engineering evaluation, and investment readiness activities leading to an implementation of operational capabilities throughout NextGen mid, and far term. The RWI portfolio will incorporate and comply with the Service Oriented Architecture of SWIM. This will allow a significantly expanded slate of weather information to be available to a wider audience of FAA and partner agency users.

A. Weather Forecast Improvements

The RWI-Weather Forecast Improvements program supports the need to improve ATM decision making during adverse weather conditions and to improve the use of weather forecast information in the transformed NAS. RWI-Weather Forecast Improvements includes: 1) facilitating the integration of weather information into Decision Support Tools; 2) planning the transition of advanced forecast capabilities from aviation weather research into operational implementation; 3) developing and using metrics to evaluate the impact of weather on the NAS and the value of improved weather information; 4) developing a weather information QMS to meet NAS and ICAO needs; and 5) leading the effort to the align ICAO and Single European Sky ATM Research (SESAR) weather requirements with NextGen.

B. Weather Observation Improvements

A consistent and effective aviation weather observation sensor network is fundamental to NextGen. The existing sensor network is comprised of aging, stand-alone capabilities that were not designed to meet the flexible, open, and adaptable needs of NextGen. RWI weather observation improvements will manage the evolution of the existing capability to one that possesses the optimal quantity and quality of ground, air, and space based sensors. Initial activities included assessing the current sensor network capabilities and identifying gaps, with the primary focus on ground based sensors for the terminal airspace. Technical studies are underway to identify economical methods to consolidate existing ground-based legacy surface platforms, provide improved capability, and allow surface weather measurements to be more universally available. Improvements to the aviation weather-observation sensor network will be a collaborative effort between the FAA and other NextGen partners, including NOAA and the Department of Defense (DoD).

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

A. Weather Forecast Improvements

Today traffic managers and users must mentally integrate weather, traffic, and airspace information and their potential impact into their decision making. Rules for interpretation and use of today's weather products are generally based on the experience of the user. This results in inconsistent ATM decisions from user to user and/or decisions that are too large-scale or inflexible to respond effectively to dynamically changing weather conditions. Current key decision support tools have limited capabilities when ingesting weather information, thus reducing their effectiveness during adverse weather conditions. The RWI-Weather Forecast Improvements program will address these problems by coordinating between the DST developers, operational users, and the weather community to insure the appropriate integration of weather information into NAS decision making.

Although it is widely accepted that both the weather itself and the quality of weather forecast information have a significant impact on NAS operations, it is difficult to quantify the difference. Weather metrics that are able to distinguish between avoidable and unavoidable delays will provide key information for determining how weather information should be improved or how to change the way that it is used or integrated into decision making. In addition, the USA does not have an ICAO-compliant Quality Management System (QMS). This means that there is no over-arching systematic process to track the quality of weather products used for aviation decision-making.

The RWI – Weather Forecast Improvements program, under the US Meteorological Authority, addresses this problem through coordination with ICAO and EUROCONTROL to maintain alignment of the US with ICAO and SESAR MET protocols.

B. Weather Observation Improvements

Most of the current sensor capabilities in the NAS are based on 1970s-80s technology and have been in the field since that time-period. While the current observation network performs adequately, it is becoming increasingly costly to maintain. Information collected from current sensor platforms is tied to specific missions and not openly available to support new, dynamic weather sensing or advanced forecasting applications. Effective consolidation of today's sensing capabilities into a flexible sensor network will not only save agency resources, but will also provide the opportunity for improved service. For instance, the currently fielded observation network lacks the capability to resolve and identify many types of precipitation. Especially lacking is the ability to discern the type and intensity of frozen precipitation types. This significantly impacts the efficiency of winter weather and deicing operations. Consolidating and modernizing weather sensing capabilities will support the initialization of weather forecasts and alerts that monitor such hazards and ensure aircraft safety and increased capacity occur in the NextGen environment.

How Do You Know The Program Works?

Capacity will be enhanced through the integration of weather information in operational decision making. The combination of optimized weather observations, improved forecasts, and translation into direct airspace constraints, will allow users to identify the best routes to fly for their aircraft type, flight plan, and flying preferences, and for traffic flow management to optimize the airspace capacity given the weather constraints and demand.

The CWAM has undergone extensive testing and user evaluation for the Route Availability Planning Tool (RAPT). It has been evaluated and found to provide benefits to the users as part of the CATMT WP2 investment. Prototype users have attested to its effectiveness in support of strategic planning. The Flexible Terminal Sensor Network (FTSN) is currently under evaluation in a laboratory environment and a prototype will be installed at Atlantic City International Airport by December of 2012 to collect three seasons of data to support the development of a concept of operations and associated requirements.

Successes, such as the achievement of Initial Investment Decision for Weather Forecast Improvements in CY 2012, also highlight the effectiveness of the RWI program. Weather Observation Improvements has also made great progress in documenting the preliminary architecture for the FTSN capabilities.

Why Do We Want/Need To Fund The Program At The Requested Level?

$6,000,000 is required to continue work within the RWI solution set. As stated above, RWI provides improved weather observation capabilities, coordination between the weather community, DST developers, and NAS decision makers for improved weather products, weather impact metrics, an ICAO compliant QMS, support for the US meteorological authority, and overall coordination with ICAO on weather related issues. The solution set enables enhanced capacity by making and facilitating a more efficient use of weather information for operational decision-making.

A reduction in funding will force the agency to fund costly support activities to preserve legacy ground sensor platforms, and delay the development and evaluation of weather translation techniques which can be used by ATM decision support tools and users in the mid-term, such as Time Based Flow Management and Surface Trajectory Based Operations.

Detailed Justification for - **1A10 Next Generation Transportation System – Arrivals/Departures at High Density (HD) Airports**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Transportation System – Arrivals/Departures at High Density (HD) Airports
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System (NextGen) – Arrivals/Departures at High Density (HD) Airports	$12,000	$9,498	$7,000	-$5,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Surface Tactical Flow	---	$3,000.0
B. Time-Based Flow Management (TBFM) Work Package 3	---	4,000.0
Total	Various	$7,000.0

For FY 2014, $7,000,000 will provide for the following:

A. Surface Tactical Flow

- Conduct a field evaluation of Airport Configuration Decision Support Tool, which will help tower controllers plan for and predict the need to reroute traffic to different runways based on forecast and actual changes in wind direction
- Deliver Metrics Reports (Fall), characterizing the use of the surface trajectory based operations capabilities and associated benefits
- Complete the year-end Field Evaluation Report, documenting results and findings from all simulations and field evaluations

B. Time-Based Flow Management Work Package 3

This funding will enable the Time-Based Flow Management Program to refine and validate time-based metering solutions needed to support NextGen in the mid-term. These key concepts include optimized descents during time-based metering; the integration of surface data; an initial step towards dynamic metering; terminal sequencing and spacing; and expansion of the Integrated Departure/Arrival Capability (IDAC) to additional locations. Additionally, this funding will continue to support the development of acquisition documentation needed to obtain a Final Investment Decision (FID) for these capabilities.

Specific deliverables leading to the FID are as follows:

- Finalize Business Case documentation summarizing cost, schedule, and benefit information
- Finalize the Implementation Strategy and Planning document, providing a summary of implementation and maintenance plans for new capabilities to the investment decision authority
- Complete final program requirements documentation, establishing the operational framework and performance baseline for an investment program
- Develop final concept documentation describing the procedures and operational processes proposed for investment
- Complete required NAS Enterprise Architecture Views
- Deliver briefing to the Joint Resources Council (JRC) on the investment decision

What Is This Program?

The Arrivals/Departures at High Density (HD) Airports initiative is a program focused on the development of trajectory-based terminal operations and flow management in support of NextGen. The primary goal of the HD initiative is to increase arrivals and departures in areas where demand for runway capacity is high, or where there are multiple runways with airspace and taxiing interaction, and for close proximity airports with potential airspace/approach interference. The HD initiative expands on the capabilities of the Flexible Terminal and Airports program by developing traffic flow management (TFM) and metering technology to provide greater throughput. Major areas of focus will include: 1) HD corridors with reduced separation to provide trajectory based transitions to match airport arrival capacity; 2) Enhanced surface technologies to support Surface Trajectory-Based Operations; 3) Taxi clearance and conformance monitoring for trajectory-based operations (TBO) and safety; and 4) Expansion of terminal separation procedures throughout the arrival and departure airspace (Big Airspace). HD 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). HD operations will require higher performance, navigation, and communication capabilities than those required for Flexible Terminal Airspace.

The Flexible Terminal and Airports initiative capabilities includes dynamically configurable airspace (flexible airspace) in conjunction with tailored arrivals and departures, development of "equivalent visual" approach procedures, digital aircraft communication (data link), surface trajectory management, low visibility taxi and departure operations, taxi conformance to enhance safety, and collaborative decision support tools to enhance capacity, safety and efficiency. A major metric of this program will be increased capacity without a corresponding increase in human resources.

In addition to leveraging the developmental activities within the Flexible Terminal and Airports, the initiative will also leverage many ongoing FAA programs, including Automated Dependent Surveillance-Broadcast (ADS-B), Area Navigation/Required Navigation Performance (RNAV/RNP), Traffic Management Advisor (TMA), Traffic Flow Management (TFM), System Wide Information Management (SWIM), and future automation interfaces and data communications efforts to provide greater capacity while balancing safety, security and environmental requirements.

A. Surface Tactical Flow

The Trajectory Management - Surface Tactical Flow project is focused on the development of trajectory-based surface operations in support of the NextGen initiative. It leverages the development efforts of the NASA Surface Management System (SMS), and provides guidelines for the development of a collaborative Surface Traffic Management (STM) system with tools necessary to achieve a fully collaborative surface environment, where the input of airlines, airports and air traffic controllers are all used to provide a shared surface situational awareness. This is required to safely improve the use of airport capacity, which is necessary to enable trajectory based operations on the airport surface.

The NextGen Concept of Operations, authored by the Joint Planning and Development Office (JPDO), states that "4DTs [four-dimensional trajectories] may be used on the airport surface at high-density airports to expedite traffic and schedule active runway crossings." Achieving this vision will require a series of advances in procedures and supporting automation systems, and collaboration between air traffic control (ATC) and the flight operators.

This project will demonstrate and document requirements for a series of capabilities that build to the NextGen vision for surface trajectory-based operations. Examples include local data exchange, leading to the sharing of flight readiness information and collaboration, which will enable pre-planned runway schedules integrated with airborne trajectory-based operations. Surface flow management will reduce surface engine operating times, resulting in fuel-savings and reduced environmental impacts, and lead to collaborative resource allocation and avoidance of surface gridlock.

In FY 2014, surface tactical flow plans an initial transfer of the Airport and Runway Configuration Management (ARCM) tool to the Program Management Organization (PMO) with in the Air Traffic Organization (ATO). FY 2015 activities are planned to expand ARCM to a metroplex environment via simulation and analysis, to conduct evaluations of additional ARCM capabilities, to complete a technical transfer of the latest versions of mature capabilities, and to author a year-end field evaluation report. ARCM work is planned to continue into FY 2016. The FY 2017 plan for surface tactical flow envisions a transition to work on a Time-Based Taxi Route Generation tool.

The Trajectory Management – Surface Tactical Flow project will require changes to procedures in the flight operator and ATC Tower (ATCT) environments. The concept and requirements development and acquisition process is designed to allow incremental steps toward the complete concept, providing benefits at each step of the way and remaining aligned with the introduction of other NextGen technologies. Testing and extraction of requirements will be realized through several phases.

B. Time-Based Flow Management (TBFM) Work Package 3
Trajectory Management – Time Based Flow Management (TBFM) will continue to modernize and enhance the current Traffic Management Advisor (TMA) System. Traffic Management Advisor (TMA) is a vital part of the NAS, and enhances air traffic operations by reducing delays and increasing efficiency of NAS operations. TMA is the only NAS-deployed decision support tool currently available for implementation of time-based metering. TMA has been field-tested over the past 10 years and is already installed in 20 Air Route Traffic Control Centers (ARTCCs), and adapted for most of the major airports served by those ARTCCs. Leveraging the existing TMA system, Trajectory Management Time Based Flow Management (TBFM) will provide complete time-based metering solutions across all phases of flight. Point-in-space metering is a key capability that is part of the FAA's effort to achieve NextGen. This program supports the development and implementation of capabilities designed to enhance and expand TMA core time-based metering capabilities and support NextGen time-based flow management operations.

The time-based flow management system is operational in the NAS today and is fulfilling operational user needs and NextGen goals. The current TBFM program incorporates NextGen concepts such as the use of RNP/RNAV data in its trajectory calculations, weather integration, and extended metering. A final investment decision for this segment was achieved in April 2010, and operational implementation is ongoing at this time.

TBFM – Work Package 3 (WP3) is a follow-on phase of TBFM, and focuses on additional NextGen capabilities, such as optimized descents during time-based metering; the integration of surface data; an initial step towards dynamic metering; terminal sequencing and spacing; and expansion of the Integrated Departure/Arrival Capability (IDAC) to additional locations. This work will proceed towards an Investment Analysis Readiness Decision for TBFM WP3 in FY 2013 and a Final Investment Decision in FY 2014.

DOT Strategic Goal – Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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, 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 total use of the capacity and, because of high demand, causes excessive compounding of delay.

How Do You Know The Program Works?

The Arrivals/Departures at High Density (HD) Airports Solution Set focuses on the metroplex airports and the complex terminal airspaces within the NAS. High Density Airports typically see higher demand for runway capacity, have multiple runways, and have complex airspace and ground interactions in the arrival and departure phases of flight. Since its beginning, HD has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities that have and will continue to improve the overall operations within the NAS.

A. Surface Tactical Flow

- Technical transfer of documents and associated artifacts of initial surface trajectory-based operations (STBO) capabilities to the FAA implementing organization were completed during the second quarter of FY 2010 and the first quarter of FY 2012. The next transfer is planned for the second quarter of FY 2013
- Nine Field evaluations of Collaborative Departure Queue Management at Memphis were completed between the forth quarter FY 2009 and the first quarter of FY 2012
- Field evaluations of Flight Operator Surface Application Version 2 (FOSA 2) Interface concept and Collaborative Departure Queue Management Version 2 (CDQM 2) concept and Weather Data Integration at Memphis and Orlando. (FOSA 2) and (CDQM 2) were evaluated several times and the final evaluation was completed in the 2nd quarter of FY 2012. Weather integration was completed in the third quarter of FY 2011
- Successful transition of capabilities from surface tactical flow to the PMO has created funding requests for Terminal Flight Data Manager (TFDM) implementation in the out-years

B. Time-Based Flow Management (TBFM) Work Package 3

- TBFM Work Package 3 is a further development of concepts for use in the currently operational Traffic Management Advisor (TMA) system. The current version of TBFM/TMA in the NAS today is primarily focused on managing the flow of aircraft between the enroute centers (cruise) and the terminal approach area (arrival). The primary goal of TBFM/TMA is to increase airspace capacity and efficiency through the smoothing out of irregularities in traffic flows and through the management of demand
- TBFM Work Package 3 is a further development of concepts for use in the currently operational Traffic Management Advisor (TMA) system. The current version of TBFM/TMA in the NAS today is primarily focused on managing the flow of aircraft between the enroute centers (cruise) and the terminal approach area (arrival). The primary goal of TBFM/TMA is to increase airspace capacity and efficiency through the smoothing out of irregularities in traffic flows and through the management of demand
- Previously, TBFM Work Package 2 reached its Final Investment Decision in 2010 and is currently being implemented in centers throughout the NAS. Work Package 2 is currently on track, executing NextGen capabilities
- Work Package 3 builds on the previous work packages for TMA/TBFM, and involves concept engineering and investment analysis efforts, building towards a Final Investment Decision (FID) in 2014

Why Do We Want/Need To Fund The Program At The Requested Level?

$7,000,000 is required to continue work within the Arrivals/Departures at High Density (HD) Airports solution set. The planned work will continue with the program's initiative to focus on the development of trajectory-based terminal operations and flow management in support of NextGen. With a reduction in funding, the primary goal of the high density initiative to increase arrivals and departures in areas where demand for runway capacity is high or where there are multiple runways with airspace and taxiing interaction, and for close proximity airports with potential airspace/approach interference will not be realized.

Detailed Justification for - 1A11 Next Generation Transportation System – Collaborative ATM

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Transportation System – Collaborative ATM
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System – Collaborative ATM (CATM)	$24,000	$20,631	$41,000	+$17,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Strategic Flow Management Integration	---	$3,000.0
B. Strategic Flow Management Enhancement	---	8,000.0
C. Common Status and Structure Data	---	5,000.0
D. Advanced Methods	---	4,000.0
E. Flight Object	---	10,000.0
F. Integrated NAS Design and Procedure Planning	---	5,000.0
G. Collaborative Information Management	---	2,000.0
H. Systems Development – Information Management	---	4,000.0
Total	Various	$41,000.0

For FY 2014, $41,000,000 is requested to provide for the following:

A. Flow Control Management – Strategic Flow Management Integration (Integration Execution of Flow Strategies into Controller Tools)
- Validating concepts with Human In The Loop (HITL) and high-level requirements development for complex routes with Data Communications
- Continue requirements analysis of integration and delivery needs of re-route information from TFMS through ERAM to Data Comm

B. Flow Control Management – Strategic Flow Management Enhancement (Enhancing the Strategic Flow Program)
- Prototyping and validating concepts for Work Package 4 capabilities, including examination and refinement of concepts and requirements
- Continue the development of documents to support the Investment Analysis Readiness Decision (IARD), including a preliminary program requirements document, enterprise architecture products and amendments, and a Rough Order of Magnitude Cost Estimate
- Continue contract activities, including Screening Information Request (SIR) development and release, and technical and cost proposal evaluations

C. Flight and State Data Management – Common Status and Structural Data (Separation, Tactical, Strategic Trajectory Management)
- Plan and Prototype services to digitally parse relevant data in documents such as Standard Operating Procedures (SOP) and Letter of Agreement (LOA) that are necessary to a wider range of stakeholders. Also, development of SOP/LOA scenarios to support the final investment decision for Aeronautical Information Management (AIM) Modernization future segment
- Plan and prototype Integrated dynamic airport configuration (current and planned) for use by Air Navigation Service Provider (ANSP) systems

- Continue to plan and prototype enhanced automation-to-automation communications and collaboration that enables decision-makers to dynamically manage parsed NOTAM information and special activity airspace, increasing real-time access and use of available airspace
- Perform safety assessments
- Develop artifacts to support the Final Investment Decision (FID) for AIM Modernization future segment

D. Flight and State Data Management – Advanced Methods

- The Unified Flight Planning Filing (UFPF) provides capabilities to enhance and streamline the flight planning and filing processes with more accurate and timely demand forecasts formulated in support of ANSP services. During FY 2014, plans for UFPF include:
  - Completion of a functional analysis report
  - Completion of a preliminary requirements report
  - Development of an initial report on a Range of Alternatives
  - Completion of an initial report for Estimated Costs and Benefits Analysis
- NAS Common Reference (NCR) is envisioned as an automation application for the correlation and dissemination of NAS operational data. NAS operational data usually contains geospatial information in 2 or 3 dimensions such as facility locations or aircraft location, respectfully. The dynamic nature of the NAS operation data is due to rapidly moving aircraft, changing weather and unforeseen constraints such as runway closures or equipment failures. The NCR concept attempts to address the needs for the combination of spatial/temporal data by leveraging Geographic Information System (GIS) industry standards and technologies that are designed to manage spatial and temporal data
  - Shortfall Analysis – Final Report. This document will quantify the current shortfall by providing a clear understanding of the magnitude of the problem, its nature, urgency, and impact. It provides insight into potential benefits NCR may provide. This is a required document to get to the Investment Analysis Readiness Decision (IARD)
  - Execution of Concept Validation Activity 5 – NCR/UFPF Interoperability with SWIM. This concept validation will assess NCR interoperability with UFPF front-end user in the SWIM environment
- Execution of Concept Validation Activity 6 – Governance of Access Control. This concept validation will assess NCR capability of enforcing access control to different types of users

E. Flight and State Data Management – Flight Object

- Flight Information Exchange Model (FIXM) is a data interchange format for sharing information about flights throughout their lifecycle, and a part of information exchange models designed to cover the information needs of Air Traffic Management
- Continue the development of the FIXM, including:
  - Data modeling and XML schema
  - Delivery of FIXM v2.1
  - Delivery of FIXM v3.0
- Conduct the International Flight Object demonstration, based upon the plan developed in FY 2013. This demonstration will expand upon the previous International Flight Object demonstrations of FAA and NAV Portugal, FAA and NATS UK, and FAA and Asia-Pacific service providers and support future demonstrations
- Develop an engineering report of Flight Object engineering issues
- Prepare documentation supporting the AMS process for Investment Analysis Readiness Decision (IARD), and the execute technology transfer of Flight Object to the Program Management Office (PMO) for implementation

F. Flight and State Data Management - Concept Development for Integrated National Airspace Design and Procedure Planning

- Development of a preliminary business case analysis for Required Navigational Performance to Instrument Landing System (RNP to ILS) capture
- Design initial Standard Instrument Departure/Standard Terminal Arrival Route (SID/STAR) RNP separation procedure

G. Collaborative Information Management

- Validation and development of mobile applications for SWIM to support non safety ATM functions
- Validation and development of SOA-to-SOA interchange for interagency network and information exchange. Agencies such as DoD and DHS have SOA environment, this work will explore the requirements to connect and exchange information

H. Systems Development – Information Management
- Complete Concept of Use Document for Information Management and governance
- Complete Information Management Functional Description document
- Develop responsibility matrix for information publishing
- Complete initial Information Management Governance document
- Complete report on performance monitoring methods to ensure delivery of agreed service performance

What Is This Program?

CATM covers both the strategic and tactical interactions with the customers to manage demand when the desired use of capacity cannot be accommodated. CATM includes flow programs, as well as collaboration on procedures that will establish balance by shifting demand to less desirable capacity alternatives such as routings, altitudes, and times. The major demand and capacity imbalances will be worked collaboratively between the air traffic managers and flight operators. Key to enabling this capability is information distributed by System-Wide Information Management (SWIM).

CATM represents an opportunity to evolve towards a fully integrated and tactically managed Air Traffic Management (ATM) system, exploiting the potential of system support in a closed loop environment while increasing opportunities for the exploitation of technical systems by human operators. Furthermore, CATM takes a first opportunistic step in addressing the need to change controller focus to network needs rather than individual aircraft, and airlines need to provide an optimum profile to be followed by the pilot, providing for system stability.

A. Flow Control Management – Strategic Flow Management Integration (Integration Execution of Flow Strategies into Controller Tools)

Flight planners, or an operator's flight planning automation, interact with a common flow strategy and trajectory analysis service, available to all NAS stakeholders. This service 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 goals. All of the parties 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.

Strategic Flow Management Integration (execution of flow strategies into controller tools) provides funding for the implementation of the En Route Automation Modernization (ERAM) modifications. These modifications are needed to receive and process the Traffic Management Initiatives (TMI) in the ERAM baseline timeframe. These improvements include automatic identification to controllers of aircraft affected by Traffic Flow Management (TFM) TMIs, electronic communication of the TMI information in a timely manner to the relevant Air Traffic Control (ATC) operational positions, tools that help monitor how well aircraft are conforming to the TMI, and tools that suggest controller actions to achieve the flow strategy. While the process of executing a TMI is time consuming and mostly manual today, improvements in the TFM and ATC infrastructure over the next several years will make this process more efficient.

This activity will begin engineering analysis for future re-route integration needs, such as communication of complex reroutes from AOC/FOC to TFMS through ERAM to the aircraft via Data Comm.

B. Flow Control Management – Strategic Flow Management Enhancement (Enhancing the Strategic Flow Program)

Currently, flow strategies developed from the various decision support tools used by the Traffic Management Units (TMU) are manually intensive because the tools are not integrated. Traffic Management specialists have to mentally integrate the impacts of multiple Traffic Management Initiatives (TMIs), and the solutions may not be optimal because the current tools do not support analyzing the linkages between multiple TMIs. This project would allow TMU specialists to automatically explore various reroute options and the impact of multiple TMIs and how they fit with efforts to accommodate NAS customer preferences. By automating this process, much more rapid flight reroutes can be developed, which would lead to fewer delays and less congestion.

The primary goal of Air Traffic Management (ATM) is addressing demand/capacity imbalances within the NAS. The FAA needs to improve implementing Traffic Management Initiatives (TMI), such as Ground Delay Programs (GDP), Airspace Flow Programs (AFP), Ground Stops (GS), Reroutes, and Miles-In-Trail (MIT), and Collaborative Trajectory Option Programs (CTOP) in the near future. To improve TMIs, more sophisticated modeling capabilities will be used to assess the impact of implementing a combination of TMIs, determine the value of user feedback data, and projecting the impact of TMIs on overall NAS efficiency. The modeling results will be shared with the aviation community when evaluating these initiatives. Automated and enhanced post analysis capabilities can feed the results back to the TMU originating the initiative. This project provides a solution that allows electronic negotiation with aviation users to manage congestion.

Current Traffic Flow Management System (TFMS) projects identify, analyze, model, and prototype various aspects of the NextGen capabilities. In addition, a TFM Roadmap and initial TFM Gap Analysis have been developed to assess the need for additional concept engineering activities. Collaborative Air Traffic Management Technology (CATMT) Work Package 4 (WP4) will be the investment package for deploying NextGen mid-term CATM capabilities. These enhancements may be integrated with Time-Based Flow Management Work Package 3 as well as mid-term enhancements envisioned in terminal and en route airspace.

Automating the process for implementing Traffic Management Initiatives would result in more efficient use of congested airspace and reduce delays and operational restrictions. Imposing fewer and shorter ground delays and stops would effectively increase airport capacity.

C. Flight and State Data Management – Common Status and Structural Data (Separation, Tactical, Strategic Trajectory Management)

The Common Status and Structure Data (CSSD) program provides the mission analysis and pre-implementation support for achieving NextGen goals of "Shared Situational Awareness" and "Trajectory Based Operations". The integration activities include provision of comprehensive flight planning and pilot briefing services, on-demand NAS operational performance information and integrated airspace management. This program enables the FAA to provide integrated lifecycle management of the aeronautical information necessary to support NextGen capabilities.

Key elements of the Common Status and Structure program include: Capturing and maintaining digital information about flow constraints, structure and status information affecting operations; publishing aeronautical status information digitally using international standards; providing value added services using aeronautical status information such as improved flight planning and briefing services; and using the status information to improve operational performance metrics calculations and forecasting of airspace system performance.

To support future AIM Modernization Work Packages, CSSD will develop prototypes for Dynamic SAA and SOP/LOA web services. They will demonstrate functionality to support objectives and concepts from the On Demand NAS Information portfolio. Work will also include updating the web service standards to support enhanced temporality for dynamic data requirements.

D. Flight and State Data Management – Advanced Methods

Advanced methods for Traffic Flow Management (TFM) will leverage different technologies, infrastructure enhancements, and procedural changes. This work will improve airport capacity, increase sector throughput, and reduce sector delays by providing the NAS Users and Air Traffic Management (ATM) with a common understanding of the NAS Constraints. Advanced Method has two components; Unified Flight Planning and Filing (UFPF) and NAS Common Reference (NCR) address these operational improvements.

The UFPF integrates flight planning and flight filing through an iterative and continuous process that uses a common foundation of data and functionality. The UFPF enhances strategic flight planning, improve operational performance and reduce air traffic control (ATC) workload. The NCR is a virtual, multidimensional conceptual model that facilitates the storage, management, retrieval, filtering, and presentation of the various types of 3-D and 4-D geospatial and temporal information. The NCR harmonizes and integrates information from disparate systems connecting the data objects to one another via the spatial, temporal, and functional relationships among them, storing only the relationships that associate them to one another.

E. Flight and State Data Management – Flight Object

Today in the NAS there are multiple versions of flight data, depending upon the state of flight. The Flight Object is intended to be the standard medium for capturing and sharing the most up-to-date information on any flight, and will serve as the single common reference for all system information about that flight, leading towards improved and consistent flight data management throughout the NAS. A Flight Object will be created for each proposed flight, and the Flight Object information will be updated throughout the entire lifecycle as the flight progresses from gate to gate. The Flight Object will collect, manage and provide flight-specific data, such as aircraft identification, aircraft parameters, current flight plan information, operator preferences, flight capabilities, and security information. The Flight Object will not include environment or weather information, since these are system-wide elements that affect multiple flights. The total information contained in the Flight Object will be much richer than today's flight data.

To support development of the FIXM standard, additional work efforts of the Flight Object program will include engineering to develop the following artifacts:

- Flight Information Exchange Model (FIXM)
- Data Models and XML Schema
- Engineering Analysis Reports
- Requirements Documents
- AMS (Acquisition Management System) documents

Demonstrations will also be conducted of Flight Object in a laboratory environment. To facilitate these work efforts, continuous collaboration will occur with FAA stakeholders, international partners, and industry, via multiple forums including the Flight Object Working Group (FOWG), International FIXM Forum, and FIXM conferences.

F. Flight and State Data Management - Concept Development for Integrated National Airspace Design and Procedure Planning

The objective of this program is to develop criteria for innovative Performance-Based Navigation (PBN) procedure elements. New elements will enhance the toolset for new PBN procedures to utilize advance aircraft navigation performance for fuel-efficient procedures in low-visibility conditions. This would also allow FAA to develop procedures for those aircraft with the navigational system accuracy and the flight performance to comply with traffic management efforts to maximize the use of airspace capacity.

Development activities will include a preliminary business case analysis for Required Navigation Performance (RNP) to Instrument Landing System (ILS) capture, and the initial design for SID/STAR RNP separation procedure.

G. Collaborative Information Management

Collaborative Information Management (CIM) is an information sharing capability that promotes inter-agency communication and collaboration through the use of modern network enabled tools, technologies, and operational procedures for terminal or en-route. This program is envisioned to provide stakeholders with the connectivity and interoperability necessary to rapidly and dynamically share information**.** The connectivity and interoperability will be enhanced by validation and development of processes and procedures to share relevant information with other government agencies that have their own System Oriented Architectures (SOA), such as the Department of Homeland Security (DHS) and the Department of

Defense (DoD). The Collaborative Information Management project will also look at the use of mobile applications in a System-Wide Information Management (SWIM) structure; specifically focusing on the non-safety ATM function.

H. Systems Development – Information Management

The Information Management Program addresses issues that arise when an agency moves from managing and sharing information in a legacy environment, which is controlled through a physical connection, into a network environment, which only requires a simple subscription. Recent experience in sharing surface data information with users in the new service-oriented architecture approach highlighted the need to move from data sharing to full information management. This includes allocating information service by type and amount needed, based on a business case analysis; establishing performance requirements for the delivery of the information and monitoring performance; establishing common protocols and standards across classes of information; and establishing the governance of how and when the information is provided. Information management is necessary to ensure the efficient use of FTI and SWIM as conduits of information.

The research on Information Management will identify the shortfalls in moving from data sharing to a network environment including governance and evaluation techniques, criteria for managing standards, and performance monitoring techniques and policies to ensure compliance. After this analysis is complete, the activities will shift to development and implementation of the required capabilities and governance.

Why Is This Particular Program Necessary?

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 users on resolving imbalance issues.

The overall philosophy driving the delivery of CATM services in 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. If constraints are required, maximizing user opportunities to resolve those constraints, based on their own preferences, is a goal.

How Do You Know The Program Works?

CATM encompasses the airspace and airports within the NAS. Since its beginning CATM has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities that have and will continue to improve the overall operations within the NAS.

A. Strategic Flow Integration

- Execute risk reduction activities
- Conduct concept validation with Human-in-the-Loop (HITL) and storyboard analysis
- Refine active aircraft re-routes concepts; develop active aircraft re-route requirements; analyze, simulate, and develop white papers on active aircraft- re-routes functions

B. Strategic Flow Enhancement

- Complete the NAS Enterprise Architecture (EA) Decision Point (DP) 354: Concept Requirements Definition Readiness(CRDR) for CATMT Work Package 4
- Complete Investment Analysis Readiness Decision (IARD) for CATMT Work Package 4
- Refine concept of operations and requirements for strategic flow management, Work Package 4 capabilities
- Screening Information Request (SIR) release for follow-on Traffic Flow Management Modernization Contract

C. Common Status and Structure Data
- Development of SOP/LOA, dynamic NOTAM, airport and SAA data service Requirements
- Demonstrations and Test Deployments
- Development of AIM Future work package Segment 2

D. Advanced Methods
- Development of UFPF Evaluation Model Platform Plan
- Conduct an NCR Demonstration that shows the search functionality in a real user environment
- Development CRD Readiness Decision Products

E. Flight Object
- Establish international FIXM (v1.0 and v1.1) standard
- Development of the Flight Object Data Dictionary - is the input to this modeling process, and is used to develop this conceptual model. This conceptual model is then in turn used to develop the more detailed FIXM (Flight Information Exchange Model) and XML schema
- Development of the Flight Object Data Model and XML Schema - is a more detailed lower-level logical model of the higher-level FICM conceptual model and defines relationships (e.g., navigability of associations, multiplicities of relationships, etc.). It will also incorporate the use of standards for the definition of basic data types
- Develop engineering and enterprise architecture artifacts, system alternatives and allocation, and Flight Object Management System Concept; demonstrate the international flight object usage outside the lab environment

F. Integrated NAS Design and Procedure Planning
- Greener Skies Advanced RNP procedure Feasibility Analysis for Phase 1 of approach using Seattle-Tacoma International Airport as key site for Concept of Operations (ConOps) development/enhancement and safety validation activities
- ADS-B Interval Management Flight Trials
- Analysis to develop a framework for integrated National Airspace Design and Procedures planning, enhancements to existing infrastructure to support impact assessments, and develop initial concept for best equipped best served
- Best-Equipped, Best-Served Analysis:
  - Conduct evaluation of new airspace and procedure design
  - Evaluate transition for possible implementation
  - Evaluate applications for possible operational trial
- Greener Skies Research and Development:
  - Update ConOps for advanced RNP procedures focusing on SeaTac as key site
  - Conduct necessary safety validation activities of the procedures
  - Develop functional requirements for automation to support Greener Skies procedures
  - Complete transition of research to Greener Skies Design and Implementation team for implementation at the key site
- Blended Airspace
  - Complete a concept of operations
  - Develop adaptation requirements for automation support for blended airspace

G. Collaborative Information Management

- AAI Shadow Unmanned Aircraft System (UAS) Flight Management System (FMS)/4D Trajectory Based Operations (TBO) Capability Integration and Upgrade in NIEC/UAS M&S Suite
- Integrate and test NIEC/UAS M&S capabilities with Standard Terminal Automation Replacement System (STARS) Laboratory
- AAI Shadow Human in the Loop (HITL) simulation conducted
- Shadow "dry run" simulation for live flight
- Shadow live flight was in Warren Grove, New Jersey
- Develop information exchange protocol and architecture with interagency aviation stakeholders, and conduct flight operational trials as needed

H. Information Management

The goal is to ensure that in the transformation to NextGen the necessary and required information, sharing to improve situational awareness, is provided with guaranteed performance. Implementation of Information Management will allow Information to be shared at a level of service that will enable the NAS to more efficiently manage NAS resources to optimize capacity in the system.

- Program has not started

Why Do We Want/Need To Fund The Program At The Requested Level?

$41,000,000 is required to continue execution of work within the CATM solution set. The FY 2014 work continues to cover both the strategic and tactical interactions with the customers to manage demand when the desired use of capacity cannot be accommodated. CATM will continue to execute flow programs as well as collaborate on procedures that will establish balance by shifting demand to less desirable capacity alternatives. If funding for CATM is reduced, the opportunity to evolve towards a fully integrated and tactically managed ATM system will not be realized.

The requested funding is also intended to support the following RTCA Task Force 5 recommendations in FY 2014 through the mid-term:

Task Force Recommendations # 35, Cruise, 7b, 8, 46, 47, Integrated ATM

- Demonstrate prototype Special Activity Airspace Editor
- Engineering analysis for future re-route integration needs, such as communication of complex reroutes from TFMS through ERAM to Data Communication
- Investment analysis readiness decision (IARD) for CATMT Work Package 4

Detailed Justification for - 1A12 Next Generation Transportation System – Flexible Terminals and Airports

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Transportation System – Flexible Terminals and Airports ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Transportation System – Flexible Terminals and Airports	$33,300	$25,411	$15,000	-$18,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Wake Turbulence Mitigation for Departures	---	$3,500.0
B. Wake Turbulence Mitigation for Arrivals	---	1,500.0
C. Approaches, Ground Based Augmentation System	---	2,500.0
D. Closely Spaced Parallel Runway Operations	---	3,000.0
E. Approaches, NextGen Navigation Initiatives	---	1,000.0
F. Alternative Positioning, Navigation, and Timing	---	3,500.0
Total	Various	$15,000.0

For FY 2014, $15,000,000 is requested to provide for the following:

A. Wake Turbulence Mitigation for Departures (WTMD)
- Continue WTMD 2nd Level Maintenance at Intercontinental/Houston Airport (IAH), Memphis International Airport (MEM) and San Francisco International Airport (SFO), and three additional airports
- Complete SFO airport's one year WTMD Operational Demonstration
- Conduct airspace analysis for remaining WTMD candidate airports and if needed, develop airport specific WTMD operating procedures
- Deploy WTMD to remaining candidate airports

B. Wake Turbulence Mitigation for Arrivals (WTMA)
- Complete adaptation changes to ATPA software for the candidate airport and obtain approval to use operationally at the candidate airport
- Conduct operational demonstration of the WTMA procedure and associated modifications to ATPA software at the candidate airport

C. Approaches, Ground Based Augmentation System (GBAS)
- Support prototype development contracts for Category III landing approach requirements
- Maintain the GBAS Key Technical Advisor (KTA) review team, to support system design approval and required activities
- Complete validation of compliance with the International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPS) for the GBAS Category III system

D. Closely Spaced Parallel Runway Operations (CSPO)
- Preparation for site-specific examination
- Acquire High Update Rate (HUR) Surveillance Data for future analysis with closely spaced parallel operations
- Finalize Simplified Aircraft-Based Paired Approach (SAPA) Algorithm

- Perform Human-in-the-Loop (HITL) simulations using algorithms developed for Simplified Aircraft-based Parallel Approaches (SAPA)
- Develop departure concepts for paired aircraft
- Conduct fast-time simulations and analysis for triple approaches or operations using three closely spaced parallel runways
- Support the implementation of revisions to dependent stagger distances from 1.5 nautical miles (nm) to 1.0 nm for aircraft approaches
- Complete analysis of the Automatic Dependent Surveillance Broadcast (ADS-B) systems application to closely spaced parallel operations

E. Approaches, NextGen Navigation Initiatives

- Conduct analysis to support to integration of the Navigation Services Concept of Operations (CONOPS)
- Conduct systems engineering support for NextGen Navigation concepts

F. Alternative Positioning, Navigation, and Timing

- Refine basic alternatives for further research, including Optimized Distance Measuring Equipment (DME), Wide Area Multi-Lateration (WAM), and Pseudolite (PL). This will include an assessment of: accuracy; integrity; availability; continuity; Time to Alarm (TTA); security technology; and common time reference
- Generate information to quantify and characterize capability shortfalls, service needs and requirements, benefit expectations, and design alternatives
- Award and manage feasibility/study contract(s) to develop and field test prototypes for alternatives
- Initiate standards and coordination for APNT avionics Minimum Operational Performance Standards (MOPS), providing preliminary system requirements
- Manage and support prototypes to complete alternative avionics and systems field testing to validate and refine preliminary requirements, operational concepts and potential system solutions
- Develop Enterprise Architecture products: Shortfall Analysis, preliminary performance requirements, range of alternatives, operational concept scenarios, Operational Safety Assessment (OSA), safety requirements for integrity, continuity, and TTA
- Estimate performance and preliminary costs for full scale development
- Develop and provide documentation for Investment Analysis Plan
- Develop safety risk management strategies and documentation
- Build APNT Business Case Plan with cost estimates and benefit analysis
- Finalize Enterprise Architecture products and Acquisition Categorization (ACAT) approval

What Is This Program?

Flexible terminal airspace and airports encompasses the majority of the terminal operation areas and airports within the National Airspace System (NAS). It is anticipated that all high-density terminals and airports will be capable of flexible operations when demands warrant. At terminals and airports where traffic demand decreased from high-density to a lower density, the operations will "flex" or transition to lower density operations. Lower-density operational requirements are not as stringent as high-density operations, affording greater access to a wider class of users, while still maintaining equivalent levels of safety and efficiency. Both trajectory-based and classic operations may be conducted within flexible terminal and airports. It is anticipated that a significant number of airports will not change from their current operation.

The Flexible Terminal and Airports initiative enhances operations at both the high and lower density terminals and airports. Flexible Terminals and Airports include activities to improve both pilot and controller situational awareness, the expanded use of parallel runways in lower visibility, and the general use of Area Navigation/Required Navigation Performance (RNAV/RNP) routings. Operations within flexible terminal airspace and airports include airports in major metroplex's which restrict access to only the most equipped and to airports which are a mix of Instrument Flight Rule/Visual Flight Rule (IFR/VFR) traffic with aircraft types ranging from airline transport to low-end general aviation. Airports can be either towered and non-towered, depending on the traffic demand but all have operations that can benefit from the improved procedures brought by GPS, the improved situational both surface and air brought by the enhanced surveillance and associated improvements in automation.

A. Wake Turbulence Mitigation for Departures (WTMD)

The WTMD decision support tool will enhance Air Traffic Organization (ATO) wake mitigation separation service capabilities. Air traffic control (ATC) wake turbulence mitigation procedures are a major constraint on the departure operations at airports which use their closely spaced parallel runways for departing Boeing 757 and "heavy" category aircraft. Presently, aircraft must wait a minimum of two minutes to depart after the departure of a Boeing 757, or "heavy" category aircraft, on the adjacent closely spaced parallel runway and must wait a minimum of three minutes if the departure thresholds of the closely spaced parallel runways are staggered more than 500 feet. Wake research has shown that if a favorable cross wind is present, the wakes from aircraft departing on the downwind closely spaced parallel runway cannot transport over into the path of aircraft departing on the upwind closely spaced parallel runway. The WTMD decision support tool will provide tower controllers' notification when they can safely allow departures on the airport's upwind closely spaced parallel runways without the required two to three minute wait time following a Boeing 757 or "heavy" category aircraft departure on the adjacent downwind runway.

The WTMD program is being accomplished in two phases. The first phase has developed an operationally mature WTMD prototype and installed it in the air traffic control towers (ATCTs) of George Bush Intercontinental/Houston Airport (IAH), Memphis International Airport (MEM) and San Francisco International Airport (SFO) for operational use and evaluation. The WTMD evaluations at the these airports will be completed in FY 2013 and based on its performance as an airport capacity enhancing tool, a decision will be made to further deploy the WTMD capability to the remaining seven candidate airports at Boston (BOS), Detroit (DTW), Newark (ERW), Miami (MIA), Philadelphia (PHL), St. Louis (STL), and Seattle (SEA). This funding will complete the second phase of the WTMD program.

B. Wake Turbulence Mitigation for Arrivals (WTMA)

This program will evaluate air traffic control, decision-support tool concept feasibility prototypes as possible enablers to safely meet the predicted NextGen demand for additional flights in the nation's air transportation system. If these prototypes are successful, more flights can be accommodated in airport approach corridors because the required wake mitigation separations between aircraft can be safely reduced. This program is taking the results of technology research and development and new wake separation concept modeling and simulation efforts; and, evaluating the resulting concept feasibility prototypes for flight safety and impact on the NAS capability for meeting the demand for more flights.

In FY 2014, this program will complete its adaptation of the Advanced Terminal Proximity Alert (ATPA) decision support tool for use with the WTMA air traffic control procedure. Controllers will use WTMA in reducing wake separations imposed on aircraft following behind Boeing 757 or "heavy" category aircraft when landing on an airport's set of closely spaced parallel runways (CSPR) (runways less than 2,500 feet apart). The procedure development and adaptation changes will have been developed in FY 2013 for a candidate airport that has the runway structure that will allow the use of the WTMA procedure. In FY 2014, the funding will be used to accomplish a year-long WTMA operational demonstration at the candidate airport.

Future work that will result from this evaluation program includes an enhanced WTMA (WTMA-S), augmented with crosswind information (actual and predicted) along the CSPR approach corridors. WTMA-S will allow the use of the WTMA ATC procedure at airports whose CSPR configuration would not support the use of the procedure without crosswind information. For these airports, they will be able to use WTMA-S when crosswinds are sufficient along the CSPR approach corridors that the aircraft flying along the upwind approach corridor will not encounter the wake from the aircraft on the downwind corridor. A similar single runway wake separation capacity enabling crosswind solution will be evaluated and developed by this program after the work on WTMA and WTMA-S has been completed.

C. Approaches, Ground Based Augmentation System

The Local Area Augmentation System (LAAS) is the United States version of internationally accepted standards for Ground Based Augmentation System (GBAS) Category I (GAST-C) services. The worldwide community has adopted GBAS as the official term for this type of navigation system. GBAS is a ground-based augmentation to GPS that focuses its service on the airport area (approximately a 20-30 mile radius) for precision approach, departure procedures, and terminal area operations GBAS is intended as an alternative to Instrument Landing Systems (ILS) with multiple technical, operational, and maintenance advantages over ILS. LAAS, however, was determined not to be a cost effective replacement for FAA

Category I ILS. The Categories of landing systems refer to the minimum altitude and visibility requirements for the type of approach being flown, with CAT I being the highest minimums and CAT III the lowest.

A GBAS Category I design, the Honeywell SLS-4000, has been approved, and design upgrades for radio frequency interference (RFI) mitigation are being tested at Newark with Category I operational approval at Newark planned for summer 2012. Currently a Category III Satellite Navigation (SATNAV) solution is still desired worldwide, and led to the development of International Civil Aviation Organization (ICAO) standards for Category III GBAS, which have been published and are in the validation phase. The Category III GBAS was designed for CAT III from the start, with the Category I system design and approval completed as a stepping stone toward Category III approval. The FAA work being completed leverages the Category I design and will be used to validate the ICAO GBAS Category III requirements. The project goal is to support development of a commercial prototype of a Category III GBAS capability for validation testing with an option of the vendor to seek a Category III non-federal approval using the developed baseline.

An FAA-owned SLS-4000 installed in Atlantic City International Airport (ACY) will continue to be used as an interim platform to develop and validate Category III requirements under this project. Support will be provided for non-federal service providers at Newark NJ and Houston TX. Alternative architectures for potential development and procurement to provide future GNSS Category II/III services will be investigated during this work. Modifications will be investigated to produce a system that will operate with minimized interruption during periods of GPS interference.

The Department of Defense (DoD) also plans to implement GBAS - Technology in their Joint Precision Approach and Landing System (JPALS) program. Civil interoperability is a "Key Performance Parameter" to this DoD system. The FAA will support DoD developments, facilitating technology transfer as applicable.

D. Closely Spaced Parallel Runway Operations

With an increased demand for air travel, the need for increased peak throughput performance at the busiest airports and in the busiest arrival/departure airspace is paramount. Improved flow capability via new procedures, reduced spacing and separation requirements, and more efficient flow management into and out of busy metropolitan airspace is needed to maximize traffic volume and airport usage. Essentially, the challenge is getting each aircraft to the desired runway in the right order to reduce operating time(s) and minimize its individual impact on the NAS. Inefficiencies in any aspect of an arrival or departure operation reduce the total capacity usage and, because of high demand, cause excessive compounding of delays.

Closely Spaced Parallel Operations (CSPO), which refers to the simultaneous approaches of aircraft pairs to airports with parallel and multiple parallel runways that are closely spaced (runways that are closer than 4,300 feet), has been implemented at several metroplex airports to meet the increased demand. Today, independent operations during CSPO provide the maximum capacity increase while weather conditions are less than visual. But, if High Update Rate (HUR) surveillance is used in conjunction with CSPO, this can be reduced to 3,400 feet or even 3,000 feet if one of the approaches has an offset away from the opposite parallel approach path. In comparison, dependent runway operations can be spaced down to 2,500 feet or less and is used at a limited number of airports having approval for dependent staggered approaches under specific restrictions IAW FAA Order JO 7110.308. During Instrument Meteorological Conditions (IMC), closely spaced parallel runways are treated as a single runway if the spacing restrictions of the previous paragraph are not met. This can reduce the airport arrival rate by half since aircraft are scheduled on the assumption of good weather and cleared or released based upon current and forecasted weather. However, because of reduced runway access and capacity restrictions, delays develop and operating costs increase due to a loss of efficiency. A need exists to provide access to parallel runways that are spaced closer than 4,300 feet in all weather conditions.

E. Approaches, NextGen Navigation Initiatives

This program supports NextGen goals related to maintaining and improving capacity during instrument meteorological conditions (IMC), and focuses on improvements supporting both the terminal and approach phases of flight as well as improving situational awareness on the airport surface.

Other elements support the use of Distance Measuring Equipment (DME) - DME area navigation (RNAV) down to 1,000 feet above ground level (AGL) without the need for an inertial reference unit (IRU). Implementation of performance-based navigation is a NextGen goal. The success of this work will allow fuller implementation of RNAV including aircraft other than air carriers and high end business jets. Current research and testing may lead to significant changes to the National Standard for DME usage within the United States, last updated in 1982. Today, to implement DME-DME RNAV requires the spectrum office to perform a case-by-case work on each runway to plan out expanded service volumes. The results of this work could allow each DME to have an expanded service volume over what is possible today, greatly enhancing the NAS capability. Research and testing is focused on determination of what technical issues are required to allow for DME-DME RNAV without IRU. Work with Systems Operations may lead to a better definition of airspace, with the potential to increase the airspace volume around certain airports.

F. Alternative Positioning, Navigation, and Timing (APNT)

In compliance with Homeland Security Presidential Directive-7 (HSPD-7), the FAA needs to provide NextGen Alternative PNT (APNT) services to ensure safety, security, and maintain adequate NAS capacity and efficiency to minimize the economic impacts from the loss of GPS enabled capabilities and services. The NextGen APNT operational concept is to provide position, navigation, and timing services that will seamlessly allow aircraft to continue flight operations with acceptable levels of impact during Global Positioning System (GPS) outages. APNT will ensure operational safety while maintaining acceptable levels of efficiency and capacity enabled by NextGen capabilities.

Further, under National Security Presidential Directive 39, U.S. Space-Based Position, Navigation, and Timing Policy, requires the Secretary of Transportation to:

"In coordination with the Secretary of Homeland Security, develop, acquire, operate, and maintain backup position, navigation, and timing capabilities that can support transportation, homeland security, and other civil and commercial infrastructure applications within the United States, in the event of a disruption of the Global Positioning System or other space-based positioning, navigation, and timing services, consistent with Homeland Security Presidential Directive-7, Critical Infrastructure Identification, Prioritization, and Protection, dated December 17, 2003."

APNT services will support the development of procedures fully enabled by:

- Area Navigation (RNAV)/Required Navigation Performance (RNP)
- Automatic Dependent Surveillance Broadcast (ADS-B)
- Trajectory Based Operations (TBO)
- Four Dimensional Trajectory (4DT) Operations

The APNT strategy is consistent with Destination 2025, the NextGen Implementation Plan and FAA Strategic Goals 1 and 2 for increased safety and capacity, respectfully. Pilots, dispatchers, and controllers will all benefit from the availability of APNT services. Specifically, pilots will be able to utilize the availability of aircraft position, navigation, and timing services during GPS outage. This will avoid inefficiencies for the pilot by eliminating an operational transition from performance-based to conventional VHF Omni-directional Range (VOR) based navigation. Furthermore, aircraft dispatchers will gain the ability to continue to schedule operations and to choose preferred trajectories during a GPS outage. Controllers will be able to manage separation services and continue performance-based operations during the loss of GPS. PNT services in 2012, consisting of conventional navigation and surveillance systems are not capable of providing the PNT performance necessary to support NextGen and provide an RNAV/RNP backup to the performance based navigation capabilities required in NextGen. The NextGen APNT project will investigate three alternatives to provide a backup for GPS. It will investigate Enhanced DME, Wide Area Multilateration (WAM), and Pseudolites (PL).

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The Flexible Terminal and Airports initiative identifies the operational shortfalls for flight operations at both the high and lower density terminals and airports. These shortfalls highlight the need to fully integrate advanced navigation, surveillance and weather capabilities to improve access and efficiency. Flexible Terminals and Airports include activities to improve both pilot and controller situational awareness, the expanded use of parallel runways in lower visibility, and the general use of Area Navigation/Required Navigation Performance (RNAV/RNP) routings. While the benefit varies with demand, aircraft operating at any airport can be provided with reduced noise, emissions and fuel routings into and out of the airport using advanced GPS navigation. Where airports have parallel or converging runways advanced procedures will allow operations closer to full visibility operations. Airports either towered and non-towered, can benefit from the improved situational awareness both surface and air brought by the enhanced surveillance and associated improvements in automation

How Do You Know The Program Works?

The Flexible Terminal Environment encompasses the majority of the terminal operation areas and airports within the NAS. Since its beginning FLEX has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities that have and will continue to improve the overall operations within the NAS.

A. Wake Turbulence Mitigation for Departures

- WTMD Operational Demonstration Prototype system completed at William J. Hughes Technical Center
- Delivered and installed WTMD Operational Demonstration Prototype equipment and initiated operational demonstrations at the first three airports Houston (IAH), Memphis (MEM), and San Francisco (SFO)
- WTMD operational performance assessment (based on data from IAH, MEM and SFO) will be completed in FY 2013

B. Wake Turbulence Mitigation for Arrivals

- Completed the initial feasibility evaluation of the WTMA procedure and supporting decision support tool using a terminal automation engineering prototyping support system
- Completed the specific wake vortex data collection and analysis of Boeing 757 and "heavy" wake category aircraft at SFO and JFK needed to define what reduction of wake separation could be achieved through use of the WTMA procedure and associated ATC decision support tool WTMA

C. Approaches, Ground Based Augmentation System

- Conduct Commercial Category III landing GBAS Ground Prototype development
- Conduct Category III GBAS Avionics Prototype development
- Conduct Radio Frequency Interference (RFI) Robust Commercial Category III GBAS Ground Prototype development
- Validate the GBAS Approach Service Type D (GAST-D) Standards and Recommended Practices (SARPs)
- Achieve GAST-D (Category III) Non-Federal System Design Approval (SDA)
- Conduct investigation and airport assessments for Radio Frequency Interference (RFI) mitigation
- Achieve Non-Federal System Design Approval (SDA) of Block I SLS-4000, an upgraded version of the GBAS Category I design
- Newark Liberty International Airport (EWR) GBAS Radio Frequency Interference (RFI) Modification Report
- RFI Detection System Test Report at Newark Liberty International Airport (EWR)
- Operational Approval of GBAS technology at Newark Liberty International Airport (EWR)
- Operational Approval of GBAS technology at George Bush Intercontinental Airport (IAH) in Houston

D. Closely Spaced Parallel Runway Operations

- Delivered analysis to implement reduced independent approach separation standard from 4,300 to 3,600 regardless of navigation source

- Completed Task Force 5 Recommendation 37a for implementation of closely spaced parallel operations using satellite navigation-based procedures as an alternative to Instrument Landing Systems (ILS) during simultaneous and/or dependent parallel approaches
- Completed Task Force 5 Recommendation 13 for revisions to blunder assumptions that establish the safety case for operating simultaneous independent approaches with closer runway spacing
- Completed analysis of reducing dependent stagger distances from 1.5 nm to 1.0 nm for aircraft approaches
- Performed fast-time simulation with updated blunder model assumptions
- Utilized High Update Rate (HUR) surveillance data for further reductions to closely spaced operations
- Delivered Version 3.0 Software and continue updates to the Modeling and Simulation Toolsets.
- Developing alerting algorithms and accompanying software reference documentation to further aid Simplified Aircraft-based Parallel Approaches algorithm development
- Developed a Parallel Approach Model incorporating the Traffic Alert and Collision Avoidance System (TCAS)

E. NextGen Navigation Initiatives

- Complete the Business Plan for anticipated changes to Special Authorization Category II landing procedures for Enhanced Low Visibility Operations (ELVO). Special Authorization refers to an aircrew that requires particular training to conduct the type of landing being flown, while Category II defines the minimum parameters (i.e. visibility and distance), that must be met to conduct a landing under this Category
- Complete testing and validation of Terminal Area Navigation (RNAV) Distance Measuring Equipment (DME)
- Conduct analysis identifying Navigation shortfalls

F. Alternative Positioning, Navigation, and Timing (APNT)

- Complete artifacts towards achieving Investment Analysis Readiness Decision (IARD)
- Conduct feasibility studies for Optimize DME Network, Wide Area Multi-Lateration Network, and Pseudolite Network
- Perform prototyping and demonstration of Optimized DME, Wide Area Multi-Lateration Network, and Pseudolite
- Conduct analysis and complete reports to evaluate and identify NextGen alternative position, navigation, and timing shortfalls

Why Do We Want/Need To Fund The Program At The Requested Level?

$15,000,000 is required to continue the execution of work within the Flexibility in the Terminal Environment (FLEX) solution set. The FY 2014 work continues to cover activities to improve both pilot and controller situational and the general use of RNAV/RNP routings. With a reduction in funding the Flexible Terminal and Airports initiative will not meet the requirements of both the high and non-high density terminals and airports in the future.

Completion of the WTMD program (just entering engineering development when RTCA Task Force 5 was accomplishing its work) was considered by Task Force 5 to already be a FAA commitment to implement and thus did not provide an individual recommendation concerning WTMD. Requested funding is sufficient to meet that commitment. WTMD is included in the NextGen Segment Implementation Plan (NSIP) Alpha (Segment 6.6.1.8).

The need for WTMA capability was addressed by the RTCA Task Force 5 recommendation 4.2.3.2 to develop the WTMA capability. The WTMA design (procedure and associated modification of ATPA) has progressed sufficiently to allow benefit assessment. The estimated WTMA benefit in incremental CSPR runway capacity to airports, air carriers and their customers reinforces the Task Force 5 recommendation to develop the WTMA capability. Reduction of funding for this work will delay the time when the WTMA benefits can be realized.

Detailed Justification for - 1A13 Next Generation Air Transportation System (NextGen) – System Networked Facilities (FAC)

What Is The Request And What Will We Get For The Funds?

FY 2014 – System Networked Facilities (FAC)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
System Networked Facilities	$5,000	$9,165	$9,000	+$4,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Integration, Development and Operations Analysis Capability	---	$3,000.0
B. Test Bed/Demonstration Sites	---	6,000.0
Total	Various	$9,000.0

For FY 2014, $9,000,000 is requested to provide for the following:

A. Integration Development and Operations Analysis Capability

- Install upgrades and enhancements to NextGen Integration and Evaluation Capability (NIEC), which will further support new NextGen concepts and technology
- Integrate the Traffic Flow Management (TFM) Auxiliary Platform into the NIEC, a platform with the ability to manipulate TFM data onto the Traffic Situation Displays (TSDs)
- Integrate Traffic Management Advisor and Traffic-Based Flow Management (TBFM) data feeds with Distributed Environment for Simulation, Rapid Engineering, and Experimentation (DESIREE) and Target Generation Facility (TGF) at the NIEC laboratory, in order to receive and simulate data to evaluate NextGen technologies
- Provide support services for the NIEC infrastructure and computer systems required for human-in-the-loop simulations for NextGen System Implementation Plan portfolios
- Support operations, maintenance, and engineering

B. Test Bed/Demonstration Sites

- Establish Multi-Test Bed infrastructure to support real time Inter-Test Bed NextGen simulations and demonstrations
- Implement additional network security infrastructure and other core support services, including data archiving and playback, to support the growing demonstration, safety, and security needs that will be determined in consensus by FAA stakeholders through Test Bed governance and policies
- Leverage and connect to laboratories and other capabilities from industry partners
- Support Test Bed operations, maintenance, and outreach activities

What Is This Program?

The primary goal of NextGen is to address and meet the rapidly changing needs of the aviation industry, and does so by introducing innovative concepts and technologies in the air traffic system. As a result, implementing NextGen technology requires extensive work in early evaluations, concept development, and demonstration in a real-time environment. The Transform Facilities solution set allows this work to be done in a manner that is not encumbered by the current structure of the NAS.

The Transform Facilities solution set focuses on capabilities that provide networked, integrated facilities, such as multi-discipline laboratories and test beds, to support safer and more efficient operations. These facilities support NextGen technology as it is integrated into the current system and as they mature over time, and provides a flexible infrastructure, better contingency operations, and a higher degree of service in which to support the development of NextGen requirements and risk-mitigation.

NIEC provides the environment to take mature concepts and successful demonstrations to the next level for evaluation, integration, and testing in a simulated real NAS environment. It provides a platform to explore, integrate, and evaluate NextGen concepts in an integrated environment. The Florida Test Bed was established and is specifically tailored towards the near-term integration of early technologies into existing or planned NAS enhancements, validating large-scale modeling and simulation efforts as an open environment for industry collaboration and demonstration.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

A. Integration, Development, and Operations Analysis Capability

The NIEC is a facility located at the William J. Hughes Technical Center (WJHTC) in Atlantic City, New Jersey, and serves as a research center to support the exploration, integration and evaluation of NextGen concepts through simulation activities. NIEC provides a real-time, NextGen-capable environment that allows early evaluations, concept development, and demonstrations.

In FY 2014, this program will continue to explore integration, development, and operations analysis capabilities. Systems will be integrated to support human-machine studies, and will measure and validate human performance, usability, workload and safety indications. The program will include the development and validation of prototypes and analysis capabilities, which will support the definition of NextGen requirements while researching possible solutions to challenges posed by integrating NextGen technology. Additional software will be developed and systems integrated to enhance these capabilities.

As capabilities are integrated, processes will be developed to operate and maintain the operations analysis capability. The operations analysis capability will provide an infrastructure to evaluate concepts and alternatives.

B. Test Bed/Demonstration

The NextGen Test Bed supports the integration of new or emerging technologies into existing or planned NextGen enhancements, through demonstrations, evaluations and testing, and cultivates government/industry partnerships. One of the main purposes of the Test Bed is to provide an open-access location for industry users and vendors, so new capabilities can be more rapidly harnessed. The Test Bed will also support integrated tests and large-scale modeling and simulation.

During FY 2014, this Test Bed/Demonstration Site program will continue building upon the infrastructure and systems established in prior years. More specifically, the Florida NextGen Test Bed, located at the Daytona Beach International Airport (DAB) in Florida, will be enabled to interact with other key sites, including NASA NTX, located near the Dallas/Fort Worth Airport (DFW), and WJHTC located near Atlantic City, NJ.

Also in FY 2014, the Test Bed/Demonstration Sites is envisioned to be established as a key part of the FAA's Research & Development (R&D) Domain, which enables controlled information sharing among NextGen stakeholders and partners. This will enable direct industry participation, which will facilitate industry innovation and collaboration, and allow for increased government/industry partnerships.

Why Is This Particular Program Necessary?

Prior to the implementation of full-scale operational NextGen capabilities, the FAA requires environments for the design, development, integration, evaluation and demonstration of future NextGen concepts and technologies. These facilities provide a platform for new NextGen demonstrations to be quickly and efficiently conducted at an early stage without affecting NAS operations. This reduces risk and overall costs by enabling the FAA to evaluate the viability of these new technologies and concepts before making further investments and decisions on potential implementation in operations.

How Do You Know The Program Works?

Transform Facilities (FAC) includes multi-discipline laboratories and test beds to support NextGen requirements development and risk mitigation efforts. Since its beginning, FAC has made great progress expediting the integration of new technologies within these domains. Below are examples of such successes and planned activities, which have and will begin to improve the overall operations within the NAS.

A. Facilities Integration, Development, and Operations Analysis

Activity	Explanation
Initiated the integration of System-Wide Information Management (SWIM) Segment 1, NAS wide information system that supports NextGen goals - ITWS (Integrated Terminal Weather System) – December 2010 - CIWS (Corridor Integrated Weather System) via NNEW (NextGen Network Enabled Weather) – August 2012 - WMSCR (Weather Message Switching Circuit Replacement) – September 2012	Supported the development of services for data exchange between FAA programs participating in SWIM Segment 1 - Corridor Integrated Weather System (CIWS) SWIM data publication operational in March 2010 - Integrated Terminal Weather System (ITWS) SWIM data publication operational in January 2011 - Pilot Report of Weather Conditions Encountered During the Flight (PIREP) SWIM data publication operational. PIREP data is published through (Weather Messaging Switching Center Replacement (WMSCR) in June 2012
Automated and synchronized the NIEC Audio and Video recording capability, including controls for background recording (controller actions, surroundings) and on-screen DVR control to prepare for various HITL simulations. This enables FAA to bring in technologies to conduct low and high fidelity high-value exercises - Completed by February 2011	Automation and synchronization of audio visual feeds supports the recording of real time test events in a synchronized manner to support more efficient and accurate interpretation of test data by the researcher. This test data is then used to support programmatic decision making on capabilities, requirements regarding system functionality and Human Factors. This capability can now be reused for testing of any NextGen system studies using the NIEC.
Improved the laboratory capabilities and integrated new tools and systems to support Staffed NextGen Tower (SNT) Phases 1.75 and 2. Improvements included the augmentation of the video stream sent to the Traffic Information Display System (TIDS) display resulting in better user controls for cameras; and, implementation of multiple video streams to the TIDS application providing additional support for ground vehicles during simulations - Completed May 2011	The above synchronization capability was required to run the Staffed NextGen Tower (SNT) simulation supporting phases 1.75 and 2 of the program which were formal full blown HITLs supported by Air Traffic SMEs interacting with the SNT system.
Incorporate Time Based Flow Management (TBFM), Aircraft Simulation Display to Industry (ASDI) and improve weather utilities for streaming live scenarios	The integration of TBFM enabled the conduct of the 4DFMSTBO HITL simulation which occurred in or about March 2011. The study assessed pilot and

- TBFM May 2011	controller issues linked to trajectory-based operations, using the ETA function of aircraft Flight Management Systems (FMS). The HITL simulation included the integration of the en route ATC system (ERAM) emulator including medium-high-fidelity TMA functionality at a low/moderate arrival flow to a TMA-designated metering fix, with aircraft using Flight Management Systems (FMS) with varied levels of ETA capabilities.

B. Test Bed / Demonstration Sites

- Over seven NextGen demonstration activities across several NextGen solution sets have been conducted at the Florida NextGen Test Bed. The following demonstration activities have occurred:
  - 2008: Weather integration into TMA/ERAM
  - 2009: International Flight Data Object
  - 2009: Surface Exchange of Flight Data Objects (FDO)
  - 2010: Unmanned Aircraft System (UAS)
  - 2010 Q4: 4D Flight Management System (FMS)
  - 2011 Q3: Oceanic Conflict Advisory Tool (OCAT) Demonstration & Operational Trial
  - 2012 Q1: Network Enabled Operations (NEO)
  - 2012 Q3: Flight Data Object (FDO) (Pacific)
  - 2012 Q3: Convective Weather into TMA/ERAM
  - 2013 Q1: Flight Information Service (FIS)

- These activities have produced valuable data and initial results that show the feasibility of the concept or technology, help identify potential benefits, and potentially refine the concepts before making further investments and decisions on their eventual implementation in the NAS. These results are ongoing and occur as part of each demonstration activity.
- The Florida NextGen Test Bed has enabled the technologies developed by these activities to be capitalized and reinvested into future activities. This results in cost avoidance, and accelerates program schedules by reusing and building upon prior work. These results are ongoing and occur as part of each demonstration activity.
- To date, 18 NAS and supporting systems, with prototypes of the NextGen concepts demonstrated, have been installed at the Test Bed from prior activities. These and additional planned core capabilities are then available for future activities to build upon. These systems were part of the Segment 1 implementation which was completed in third quarter FY 2012.

The successes of the Test Bed continue to generate interest and support within industry and academia, as well as other governance agencies, including NASA, for further participation.

Why Do We Want / Need To Fund The Program At The Requested Level?

$9,000,000 is required to continue work within the Networked Facilities solution set. The FY 2014 work will maintain focus on delivering an infrastructure that supports the transformation of air navigation service delivery unencumbered by legacy constraints. The funds are needed at the requested level to enable capabilities and resources sharing with external stakeholder facilities and other NextGen sites to begin supporting real time Inter-Test Bed simulation and demonstration. Additional network security infrastructure, policies and procedures planned in FY 2013 for the Florida Test Bed are expected to be implemented in FY 2014 to ensure protection to the growing FAA's and Industry's assets while providing flexibility in supporting Inter-Test Bed activities. With a reduction in funding Networked facilities will not be able to provide for expanded services, service continuity, optimal deployment, and training of the workforce.

Detailed Justification for - 1A14 Next Generation Air Transportation System (NextGen) – Future Facilities Investment Planning

What Is The Request And What Will We Get For The Funds?

FY 2014 – Future Facilities Investment Planning
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Future Facilities Investment Planning	$15,000	$35,136	$10,000	-$5,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Program Support, Systems Engineering, Planning	---	$10,000.0

For FY 2014, $10,000,000 is requested to cover program support, systems engineering, and planning activities. Consistent with the DOT's Office of Inspector General's recommendation for all FAA facility realignments and consolidations, the FAA is working to develop comprehensive cost estimates for key programmatic areas associated with the NY Integrated Control Facility (ICF). In addition to the base construction cost estimate, the FAA is working to develop detailed cost estimates for equipment, salary costs, relocation expenses, and training associated with the NY ICF. FAA issued a Request for Information in December 2012 to gain vital information about potential site options as part of a larger alternatives analysis process in FAA's long-term strategy and approach to the NY ICF. FAA requests these planning funds to ensure that the infrastructure project would generate measurable operational benefits, including airspace redesign, and long term cost savings for the agency.

What Is This Program?

Future Facilities Investment Planning

The FFPO is part of the FAA's Technical Operations Air Traffic Control Facilities (ATCF) directorate which handles all sustainment, modernization, and replacement efforts for the air traffic facilities. The Future Facilities Program Office (FFPO) is responsible for developing plans for a state-of-the-art facility that will combine operations in the NY metropolitan area. This area has the busiest and most complex airspace and it accounts for up to 46 percent of delays in the NAS. The FAA plans to integrate the NY Terminal Radar Approach Control Facility (TRACON) (N90) and NY Air Route Traffic Control Center (ARTCC) (ZNY), and combine operations into an Integrated Control Facility (ICF.)

The NextGen program benefits from redesigned air traffic control systems that are flexible, scalable, and easily maintained. FAA's infrastructure, automation, equipage, procedures, and regulations must evolve from a geographical focus to support the seamless operational and broader air traffic management. Air traffic control facilities must be redesigned to accommodate new technologies and facilitate new operational approaches.

The Future Facilities Program received an Initial Investment Decision (IID) on November 16, 2011. The program is currently developing a business case, alternatives analysis, and airspace resdesign, under the Major Airspace Redesign Program included in Budget Line Item 1A01D, to determine measurable operational benefits that could be realized by the integration of the New York area En Route and Terminal operations.

The NY ICF could help the Agency take full advantage of the benefits of airspace redesign efforts, increase operational efficiencies, maintain or improve safety, and deliver an improved work environment for employees.

The Future Facilities Program will continue to develop its Portfolio Level Agreements (PfLAs) with FAA's inter-dependent programs, such as En Route Automation (ERAM), Advanced Technologies & Oceanic Procedures (ATOP), terminal automation replacement (TAMR), NAS Voice System, Power Systems, and other efforts to ensure that essential equipment is available for installation and testing at the new NY ICF.

DOT Strategic Goal – Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Many of the FAA's air traffic control facilities have exceeded their useful lives and their physical condition continues to deteriorate. Security concerns, including location-based risks, distributed infrastructure constrained by legacy architecture, and disparate automation platforms, further challenge the air traffic control infrastructure. This results in operational inefficiencies, including capacity limitations and less than optimal business continuity plans. Although the FAA has made significant strides to reduce the maintenance backlog, the agency needs a comprehensive strategy to drive decisions regarding NextGen and infrastructure improvements.

The FAA is proposing an integrated facility that could leverage operational efficiencies and enable NextGen technologies. Once fully operational, the NY ICF will allow for the implementation of redesigned airspace and NextGen concepts, while providing an improved working environment for employees.

The Future Facilities Program will provide for increased cost effectiveness through better matching of assets to demand. Additional benefits may include:

- Air traffic control environments that support NextGen operational changes
- Seamless information exchange that increases flexibility and air navigation service provider (ANSP) agility to respond to demand
- Improved work environment and increased opportunity for career progression
- Reduced time and cost to train controllers and other ANSP personnel
- Reduced overall air traffic service provider costs while increasing the level of service
- Cost-effective management of air traffic facilities

The FFPO is actively working with the Airspace Redesign group to define the magnitude of operational benefits expected from the integration of the airspace in the Northeast.

How Do You Know The Program Works?

As part of the planning and development process, FAA will be developing measurements to track the operational benefits of the ICF, and those metrics will be tracked. Preliminary expected benefits, especially for the NY operations, include: reduced complexity, seamless transition in and out of the metro area, more flexibility during severe weather, faster departures, balanced controller workload, and reduced voice communication. Financial benefits and savings to operators will be realized through reduced fuel burn, reduced minutes of delay, improved airport access, and greater route flexibility. Detailed analysis is underway to determine the portion of the total benefit that will be delivered through successful implementation of NY ICF.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding reductions have negatively impacted program schedule and have delayed land acquisition and construction contract award dates. Further funding reductions in this BLI would adversely impact FAA's ability to conduct up-front analysis to ensure that the infrastructure project would generate measurable operational benefits, including airspace redesign and long term cost savings for the agency.

Detailed Justification for - 1A15 NextGen Performance Based Navigation (PBN) – Metroplex Area Navigation (RNAV)/Required Navigation Performance (RNP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – NextGen Performance Based Navigation (PBN) – Metroplex Area Navigation (RNAV)/Required Navigation Performance (RNP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
NextGen Performance Based Navigation (PBN)- Metroplex Area Navigation (RNAV)/Required Navigation Performance (RNP)	$29,200	$41,200	$32,200	+$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Optimization of Airspace and Procedures in the Metroplexes (OAPM) and NextGen Safety (PBN)	---	$20,200.0
B. Navigation Procedures Implementation Plan (NAV Lean)	---	12,000.0
Total	Various	$32,200.0

For FY 2014, $32,200,000 is requested to provide for the following:

- Complete analysis and studies, through established OAPM Study Team processes, at three Metroplex locations Memphis, Cleveland/Detroit, and Boston) focusing on expedited integrated PBN procedure development coupled with airspace design to optimize benefits
- Based on the output of the earlier analysis and study stage, begin OAPM design work at two Metroplex locations (Memphis and Cleveland/Detroit)
- Begin OAPM pre-implementation/evaluation activities at three Metroplex locations (South/Central Florida, Chicago, and Phoenix)
- Establish standardized databases, software and data formats in support of the Navigation Procedures Implementation Plan (NAV Lean) initiative, which will accelerate OAPM projects and NextGen by improving efficiency and production time for all IFPs
- Establish and implement a Web-based request and access portal as the fixed entry point for all IFP requests and/or inquiries

A. Optimization of Airspace and Procedures in the Metroplex (OAPM)

Funds will be used for the Study Phase activities at the Phoenix, Chicago, Memphis, Cleveland-Detroit, and Boston Metroplex as well as Design, Implementation, and Post-Implementation activities planned for all 13 OAPM teams including the continued implementation of OAPM deliverables in the Metroplex that were recommended by the RTCA Task Force 5. In response to RTCA's recommendations, funds will be used to conduct studies, to compile and assess data from select sites, perform environmental analyses, conduct human in the loop simulations, and provide performance metrics and assessments of the proposed and implemented procedures and airspace changes. Using the results of these studies and analyses, Design and Implementation Teams will integrate airspace and procedure design to optimize operations at select Metroplex sites based on the information provided by the studies. OAPM work also includes procedural design and implementation in the high altitude structure to improve Metroplex ingress/egress to and from a given site as well as efficiency between sites.

NextGen Safety (PBN)

With optimized airspace and procedures, additional safety analysis will need to be performed. All changes to the National Airspace System (NAS) require safety analyses and documentation. Funding will be used to increase efficiency in the NAS by updating and developing guidance material such as Orders, Notices, and Advisory Circulars to optimize performance. The guidance material will provide industry and Aviation Safety (AVS) field offices information to safely implement/certify new technologies and develop more efficient flight procedures, improving safe operation within the NAS.

The funding will update standards to better accommodate modern aircraft capabilities. Funding will also be used to study and implement improvements to PBN separation standards for en route operations.

Additional analysis will look at new tools for improved operations such as advanced RNP. Funding in FY 2014 will continue to provide safety risk analysis and studies, flight simulation and data collection. Using the information from the data collection and analysis, updates to PBN instrument flight procedure criteria and guidance materials will begin, with estimated completion by 2015.

B. Navigation Procedures Implementation Plan (NAV Lean)

In response to an RTCA Next Generation (NextGen) Mid-Term implementation Task Force Report (TF-5) recommendation to identify and solve operational approval and certification issues that may impede adoption and acceleration of NextGen capabilities, the FAA initiated a cross-agency Navigation Procedures project to streamline policies and processes used to implement Instrument Flight Procedures (IFP) in the National Airspace System. This initiative, headed by Aviation Safety (AVS) and the Air Traffic Organization (ATO), used the "Lean Management Process" to identify waste and to develop a set of detailed recommendations to improve and streamline the processes used for developing and implementing IFPs.

This Navigation Procedures Implementation Plan (NAV Lean) was published in June, 2011, and contained 21 recommendations to streamline the IFP development process. Full implementation of NAV Lean is estimated to be complete in 2015. Funding will consolidate/upgrade portions of NAV Lean involving the current databases that will support an authorized Web-based portal to manage all IFP requests as the entry point into a system for processing, tracking, and managing the IFP development life cycle.

Certain NAV Lean recommendations and specific activities that will be funded include:

- Recommendation 6: Provide access to, and mandate use of, a single set of data for all IFP providers
- Recommendation 7: Allow electronic transfer of data
- Recommendation 8: Standardize software and data formats
- Recommendation 18: Establish and implement a Web-based request and access portal as the fixed entry point for all IFP requests and/or inquiries

What Is This Program?

The Airspace Optimization Group will integrate airspace design and associated activities, including traffic flow analysis and facilitated design and procedures optimization. This will lay the framework for accelerating PBN initiatives, taking a systems approach for airspace design and procedure implementation. Airspace and procedure integration provides an important systems view that: utilizes additional transition access/egress points not tied to ground-based navigation aids; considers concurrent development and implementation of arrivals and departures, ensuring an integrated approach to procedural optimization; decouples operations between primary and secondary/satellite airports serviced by complex terminal airspace; and develops high altitude routes through congested airspace better connecting major metropolitan areas. Implementation of RNAV and RNP routes and procedures will continue to address the RTCA Task Force 5 recommendations, maximizing benefits, and accelerating NextGen concepts.

Airspace redesign and procedure development will be accomplished with a Metroplex focus, targeting specific Metroplex areas that have been designated as high priority using quantitative and qualitative metrics. Results from Study Teams will be used to implement those improvements yielding the highest benefits and lead to design work that will include analyses and simulations, assessments of alternatives, and modeling of projected airspace and procedures benefits. The program integrates the safety requirements, through all phases of implementation, to ensure successful implementation.

NAV Lean will allow participants in the process to obtain up-to-date information concerning an IFP status, exchange information with other system users, and will provide an archive function and audit trail. This system will also serve as a gateway to the consolidated databases required for IFP design and development, applicable publications, and forms and templates. Consolidation and standardization of the databases will provide improved data integrity and improved process management. Use of this system will facilitate early screening of requests to ensure completeness and prioritization of requests, and will provide transparency for users. It will also promote and ensure that safety, airspace, operational approval, and environmental aspects are all considered early in the process. Use of this common portal will also facilitate the early recognition of potential requirements for new or modified criteria.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments

Why Is This Particular Program Necessary?

Optimization of Airspace and Procedures facilitates an operationally integrated view of NextGen implementation. The OAPM will expedite delivery of key efficiencies for the nation's busiest metropolitan areas. OAPM will help to address the major operational issues faced in today's Metroplexes: flow congestion, inefficient routing and altitudes, airports in close geographical proximity, and other limiting factors such as environmental constraints. Through OAPM, we are implementing new routes and procedures that leverage emerging aircraft navigation capabilities, including PBN, and redesigning airspace to improve flight efficiency. The implementation of these procedures includes the safety oversight of the procedures themselves, and the approval of aircraft and operators to conduct these procedures.

NAV Lean Implementation of the future IFP process is expected to significantly reduce the average time required to implement IFPs and will position the FAA to meet the increased demand for instrument flight procedures that are the cornerstone for NextGen. Achieving this optimal future process and all of its benefits will require full implementation of all recommendations.

How Do You Know This Program Works?

In September of 2010, the FAA initiated two "prototype" study teams for the Washington, DC and North Texas metropolitan areas. Those prototype study teams were used to exercise the study team approach and provide lessons learned to be considered as the full initiative began in early 2011. Leveraging the study team approach at those two sites, the Optimization of Airspace and Procedures in the Metroplex initiative is expected to be a multi-year activity that will have addressed 13 Metroplex areas when completed. An expedited timeline has been implemented at the Houston Metroplex as part of the White House Infrastructure Jobs Initiative by which a compressed schedule supported with additional staffing resources and a streamlined approach for the permitting process should result in an earlier implementation of these Performance Based Navigation (PBN) procedures and airspace changes when compared with the prototype Metroplexes resulting in the delivery of the associated benefits sooner than the baseline timeline. The lessons learned and best practices learned from the prototype and the Houston sites will be applied to the rest of the OAPM sites for their processes betterment. Additionally the positive reaction and high usage levels by the airline partners to the implementation of independent utility PBN procedures in the Washington Metroplex demonstrated the high desire and support of the Industry for this optimization initiative.

NAV Lean: Utilizing an abbreviated amendment process for RNAV STARs enabled by NAV Lean, eight sample procedures were amended by November, 2012. The abbreviated amendments took in average of 25 days to publish after submission to AeroNav Products compared to the standard 174 day process. Additionally, TARGETS reference software was validated for compliance with RNAV STAR design criteria and allows some procedures to go from the Flight Procedure Team (FPT) direct to Quality Assurance (QA), bypassing the standard 45 day Development Branch process. A key step towards approving TARGETS developed STAR output for electronic transfer of data to AeroNav Products procedure production database. As a result of the NAV Lean effort, guidance on preparing focused, concise and timely Environmental Assessments (EA) is also integrated into OAPM and other PBN projects, enabling expedited instrument flight procedure development.

Why Do We Want/Need To Fund The Program At The Requested Level?

$32,200,000 is required to fund key operational efforts that serve as the foundation of the transition to NextGen. Funding will allow for expedited development and implementation of PBN procedures, while ensuring safety. Funding for NAV Lean is imperative to fulfill expectations of FAA stakeholders. Recommendations include a streamlined version of the current core process (request, design and development, approval, implementation and maintenance); auxiliary processes (Safety Management System (SMS), environmental and operational approval); and data base consolidation (inability to electronically transfer data efficiently). A reduction in the requested level of funding will delay the delivery of these necessary procedures, thereby slowing implementation of NextGen capabilities at a number of high-priority Metroplexes. It will also reduce the FAA's ability to process aircraft and operator applications to conduct PBN operations, resulting in application delays and deferred benefits.

Executive Summary – Facilities and Equipment, Activity 2

What Is The Request And What Will We Get For The Funds?

The Facilities and Equipment (F&E) Activity 2 program is requesting $1,523,223,500 for FY 2014, an increase of $116,492,500 above our actual FY 2012 level. The Activity 2 funding request is needed for the following programs:

- $523,875,200 is requested for NextGen technologies, tools, and systems;
- $999,348,300 is requested for legacy systems, buildings, infrastructure, and sustaining a safety infrastructure adequate for ATC services in the NAS.
  - The NextGen Weather Processor Program is transitioning to Activity 2 from Activity 1 in the FY 2014 Budget Submission and is expected to receive a Final Investment Decision (FID) in the 3rd Quarter of FY2014

The funding for Activity 2 programs and initiatives is used for modernization of air traffic control facilities, systems, and equipment. We support infrastructure upgrades, system replacements, and technology refresh at manned and unmanned facilities to sustain:

- Ground-based radar;
- Communications;
- Automation;
- Navigation;
- Landing; and
- Other ATC systems and support equipment.

Together, these programs provide the facilities, systems, tools, and technologies that are required to support our air traffic control system.

Key outputs and outcomes expected to be achieved with the requested resources:

- Terminal ATC facilities Replace program will fund:
  - Full Construction of a tower in Charlotte, NC
  - Construction Costs above original estimates at Tuscon and West Palm Beach
  - Funding for Equipment at Chicago South, IL and Cleveland, OH
  - Disposition and decommissioning at:
    - Fort Lauderdale Executive, FL
    - Las Vegas, NV
    - Traverse City, MI
    - Kalamazoo, MI
    - San Francisco, CA

- NAS wide deployment of ADS-B will continue with subscription services for surveillance across the NAS and for weather in the Gulf of Mexico and Alaska. The national deployment of nearly 730 stations will be complete by the first quarter of FY 2014.
- Deployment of ERAM will continue and all sites will achieve the Operational Readiness Date (ORD) by the end of FY 2014.
- Funding is requested for ERAM System Enhancements and Technical Refresh that will introduce new capabilities under a NextGen Mid-Term acquisition baseline.
- TAMR Phase 3 Segment 1 will: complete Initial Operating Capability (IOC) at Dallas; install STARS equipment at Minneapolis and Potomac; perform site preparation at Louisville, Chicago TRACON, and New York TRACON; and purchase STARS hardware for Denver, and St. Louis.
- Navigational and Landing Aids will fund more than 87 individual projects to complete work that has been initiated and will provide funding for 78 new procurements.
- Major focus of the WAAS program will be on the 5th GEO satellite payload development, GIII reference receiver fielding, TCS (Communications) upgrades fielding, safety computer test and integration, and WAAS software recertification.

- Unmanned Infrastructure Sustainment will: upgrade; modernize; refurbish and replace antenna and equipment tower buildings, shelters, roofs, and storage buildings; plumbing, heating, ventilating and air conditioning (HVAC) equipment; at more than 120 project locations located in all three service areas.
- Funding is requested to address Runway Safety Area (RSA) projects of varying size and complexity that are identified for completion prior to December 31, 2015. The funding being requested will allow the procurement of 21 NavAids systems and the completion of 82 RSA improvements. RSA compliance provides a measure of safety in the event of an aircraft's excursion from the runway by significantly reducing the extent of personal injury and aircraft damage.
- Electrical Power Systems Sustain Support program will procure various power systems and related equipment for 211 projects.
- The NextGen Weather Processor (NWP) program will establish a common weather processing platform that will functionally replace the legacy FAA weather processor systems and host new capabilities and will allow for the decommissioning of the legacy systems.

The Wide Area Augmentation Systems (WAAS) and Automatic Dependent Surveillance-Broadcast (ADS-B) budget request for FY 2014 includes funding required to pay satellite leases/subscription services. The amount included within each budget line item is shown below:

WAAS	$ 36,500,000	(2D03)
ADS-B	$177,011,900	(2A13)
Total	$213,511,900	

What Is This Program?

Activity 2 supports major systems acquisitions and facilities infrastructure programs in the implementation phase. These programs and initiatives fund the procurement and modernization of air traffic control facilities and equipment, including all funding related to the acquisition of air traffic control facilities, navigation and landing aids, surveillance equipment and facilities, automation systems, and communications systems and equipment. Activity 2 programs provide funding for control equipment and agency-owned aircraft that are used for flight inspections and other activities.

With this funding, we continue to ensure that current operational facilities and equipment deliver reliable and accurate services until investments in new technologies are ready to deliver the operational improvements needed for enhanced safety and future growth.

Over the past five years, FAA has met the following goals:

- Operational Availability for the nation's busiest airports;
- Daily airport capacity;
- Major acquisition system cost and schedule performance.

Typical Activity 2 programs include:

- Upgrades to existing equipment;
- Acquiring production systems to replace existing systems, extend serviceable life, or technically refresh system components;
- Deploying systems for installation or transition to operational status;
- Deploying new, satellite-based technologies such as Automatic Dependent Surveillance-Broadcast (ADS-B) and Wide Area Augmentation Systems (WAAS);
- Deploying communications infrastructure to provide surveillance and navigation services;
- Replacing or modernizing manned and unmanned ATC facilities;
- Replacing or modernizing automation, communications, navigation, surveillance/weather infrastructure, systems, and equipment;
- Decommissioning and disposal of the systems and facilities that have been replaced

Activity 2 efforts contribute to the following DOT Strategic Goals:

- Safety: Reduction in transportation-related injuries and fatalities
- Economic Competitiveness: Maximum economic returns on transportation policies and investments

- Environmental Sustainability: Reduced transportation-related pollution and impacts on ecosystems

Why Is This Particular Program Necessary?

These programs are necessary to modernize and sustain the NAS, as well as provide the foundational infrastructure, technologies, and capabilities required for the NextGen System. The demands for ATC

services expected by the year 2020 will be constrained unless targeted investments in system upgrades and new technologies are implemented. At the same time, we must develop the standards, procedures, and safety protocols needed for implementing these investments.

The economic impacts of the air traffic control system are well-documented in FAA's report, "The Economic Impact of Civil Aviation on the US Economy," published in December 2009. It states that, in 2007, aviation accounted for 12 million jobs, $1.3 trillion toward the gross domestic product output, and 5.6 percent of gross domestic product. Continued growth in this industry will be predicated in part on a modernized air traffic control system.

How Do You Know The Program Works?

The procurement and modernization of the nation's air traffic control system was first highlighted in 1980 with the publication of the first NAS Modernization Plan. Since that time, we have replaced old technologies with new generation systems that perform required functions better and more efficiently. During this period, aviation services were extended to new, small and medium-sized localities through the expanded deployment of updated air traffic control technologies, equipment, and infrastructure at these locations. We have efficiently operated and maintained these services through increased funding in Activity 2 programs and initiatives.

We have met most of the cost and schedule goals for the programs within Activity 2. The ERAM program, however, is an estimated four years behind schedule and approximately $330 million over budget. The revised deployment for ERAM is to complete all site Operational Readiness Date (ORD) milestones at all locations by the end of FY 2014. The resulting lessons that were learned from ERAM were applied to TAMR Phase 3 and prompted FAA adjustments in the areas of schedule formulation, testing processes, and user expectation management. Activity 2 programs also contribute to the success of other Flight Plan metrics, including runway incursion reduction, ATC system operational availability, and NAS on-time arrivals.

Why Do We Want/Need To Fund The Program At The Requested Level?

We are funding at this level to minimize risk to our near-term NextGen deliverables. In addition, we are funding other, non–NextGen investments at levels that enable us to sustain ATC safety and services expected by the public, the military and other stakeholders.

Detailed Justification for - 2A01 En Route Automation Modernization (ERAM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – En Route Automation Modernization (ERAM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
En Route Automation Modernization (ERAM)	$155,000	$144,000	$26,100	-$128,900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. ERAM	---	$25,600.0
B. Independent Operational Test and Evaluation (IOT&E)	---	500.0
Total	Various	$26,100.0

For FY 2014, a total of $25,600,000 is requested for ERAM and $500,000 is requested for Independent Operational Test and Evaluation activities.

The deployment for ERAM (re-baseline) is to complete all site Initial Operating Capability (IOC) milestones by the end of FY 2013. Last site Operational Readiness Date (ORD) would occur in FY 2014. The re-baseline approved a total of $330 million for cumulative program spending for the fiscal years of 2011, 2012, 2013 through 2014. In FY 2011 and 2012 the ERAM program achieved a total of nine IOCs and two ORDs at Air Route Traffic Control Center (ARTCC) sites. To date in FY 2013 the ERAM program achieved another seven IOCs and three ORDs at ARTCCs. The remaining four sites are targeted for IOC in FY 2013 and all sites will ORD by August 2014.

The total waterfall funding is required to support the identification, analysis, development of software changes needed by each site and site implementation to complete the ERAM waterfall schedule. Planned implementation activity supports limited to extended air traffic operations and continuous operations to achieve site ORD. Specific activities include: system engineering analysis of all Problem Reports (PRs) and Change Requests (CRs) generated by the sites; prioritization of the PRs, CRs and allocation of the software fixes into software builds that will be incrementally developed, integrated and tested prior to release to the operational sites. The program continues to follow the processes, procedures, and governance described in the approved ERAM Improvement Plan.

What Is This Program?

The En Route Automation Modernization (ERAM) System replaces the 40-year-old En Route HOST Computer System used at 20 FAA air route traffic control centers around the country. This is the main computer system air traffic controllers use to guide airplanes flying at high altitudes. Air traffic control towers, terminal radar approach control facilities, the Air Traffic Control System Command Center, flight service stations, and other agencies such as the Department of Homeland Security and the Department of Defense, all connect to and use the information managed by the En Route HOST Computer System.

Under the re-baseline plan, ERAM Release 2 was viewed as the system baseline for the early sites to achieve IOC. ERAM Release 3 includes ICAO mandate, Automatic Dependent Surveillance Broadcast (ADS-B) and infrastructure capabilities of Segment 1 of the System Wide Information Management (SWIM) that are consistent with ERAM architecture and is the deployment baseline for all remaining Air Route Traffic Control Centers (ARTCCs) in the program waterfall. All operational sites are currently using Release 3.

DOT Strategic Goal – Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The ERAM system is the foundation of the FAA air traffic control (ATC) environment. The system receives processes, coordinates, distributes, and tracks information on aircraft movement throughout the domestic and international airspace. The ERAM system is the key to the FAA's ability to implement new services, concepts, and traffic flows to users.

While the revised ERAM deployment will occur over FY 2011 - FY 2014, the program has installed and accepted the system hardware at all 20 ARTCCs.

How Do You Know The Program Works?

ARTCC	IOC Date	ORD Date	Status
Salt Lake City(ZLC)	18 June 2009	23 March 2012	ORD Complete
Seattle(ZSE)	17 Sept 2009	23 April 2012	ORD Complete
Denver (ZDV)	23 December 2011	19 December 2012	ORD Complete
Albuquerque (ZAB)	30 December 2011	27 December 2012	ORD Complete
Minneapolis (ZMP)	30 December 2011	04 January 2013	ORD Complete
Chicago (ZAU)	7 January 2012	15 March 2013	ORD Complete
Oakland (ZOA)	28 January 2012		Continuous Ops
Los Angeles (ZLA)	28 January 2012	18 March 2013	ORD Complete
Houston (ZHU)	14 April 2012		Continuous Ops
Kansas City (ZKC)	6 October 2012		Continuous Ops
Boston (ZBW)	28 October 2012		
Indianapolis (ZID)	13 October 2012		Continuous Operations
New York (ZNY)	10 November 2012		
Cleveland (ZOB)	13 January 2013		
Washington (ZDC)	23 February 2013		
Memphis (ZME)	2 March 2013		

The baseline ERAM system has been installed at all 20 CONUS ARTCC sites. Plans call for 4 additional sites to achieve initial operating capability (IOC) by the end of September 2013: Fort Worth (ZFW), Atlanta (ZTL), Jacksonville (ZJX) and Miami (ZMA). ORD at all 20 sites is planned to be completed by the end of August 2014.

Why Do We Want/Need To Fund The Program At The Requested Level?

The ERAM system is needed to replace the current HOST system and allow the FAA to continue to provide the high level of safe, reliable air traffic control services that the nation has come to expect; and also put in place the infrastructure necessary to transition the NAS to NextGen. Additionally, the existing Host

Computer System hardware and software would have to be maintained long beyond its expected service life, which may impact the Agency's ability to provide the quality of existing air traffic control services to its users.

Detailed Justification for - **2A02 En Route Automation Modernization (ERAM) D-Position Upgrade and System Enhancements**

What Is The Request And What Will We Get For The Funds?

**FY 2014 – En Route Automation Modernization (ERAM) -D-Position Upgrade and System Enhancements
($000)**

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ERAM D-Position Upgrade and System Enhancements	$0	$10,000	$64,974	+$64,974

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks

	Locations/ Quantity	Estimated Cost ($000)
A. Segment 1 (ERAM System Enhancements and TR)		
a. Program Management	---	$9,000.0
b. System Engineering	---	8,500.0
c. Software Development	---	34,474.0
d. Hardware Prototyping	---	8,000.0
Total	Various	$59,974.0
B. Segment 2 (ERAM Sector Enhancements)		
a. Program Management	---	$1,000.0
b. System Engineering	---	1,500.0
c. Proposal Activities	---	500.0
d. Sector Enhancement Prototyping	---	2,000.0
Total	Various	$5,000.0

Background

The budget request for the ERAM System and Sector Enhancements do not include functionality necessary to complete the waterfall deployment of the core ERAM program, which is funded in F&E BLI 2A01. The requested ERAM System Enhancements in this BLI provide enhancements and capabilities above and beyond core ERAM functionality. The System Enhancements were either a) identified by users of ERAM after it was deployed and operational or b) addresses preplanned or NextGen identified improvements outside the scope of the original ERAM baseline.

Funding will also support a Technical Refresh, because many of the ERAM components, which were procured in 2006, require planning for long lead times for procurement and deployment to the NAS. FAA has transitioned focus from the narrow D-Position Upgrade effort to "ERAM Sector Enhancements" because the scope of work under the program involves both the Radar Controller (R-Position) as well as Radar Associate controller (D-Position) sector team.

The FAA is planning to segment the program's investment decisions. The FAA plans a Final Investment Decision for "ERAM System Enhancements and Technology Refresh" in September 2013. The FAA plans an Initial Investment Decision for "ERAM Sector Enhancements" in March 2014, followed by a Final Investment Decision in Sept 2014.

A. ERAM System Enhancements and Technical Refresh

For FY 2014, $59,974,000 is requested for ERAM System Enhancements and Technology Refresh. This funding will be used for high priority enhancements identified during the core ERAM deployment, for preplanned or NextGen identified improvements, and necessary technology refreshment.

B. ERAM Sector Enhancements

For FY 2014, $5,000,000 is requested for ERAM Sector Enhancements, formally the scope of "the D-Position Upgrade". This funding will be used for ERAM En-Route sector enhancements system engineering, prototyping, proposal activities and investment analysis activity (IID and FID in FY 2014).

ERAM Sector Enhancements will be a multi-year effort to improve the efficiency and effectiveness of En-Route Sector operations by facilitating increased strategic and tactical cooperation between the Radar Controller position (R-Position) and the Radar Associate position (D-Position) as well as establish a common processing platform, with similar tool sets, that may be tailored for either position. This program's primary focus is the re-engineering of the Radar and Radar Associate positions, including equipment and software tool upgrades, to increase the level of strategic and tactical cooperation between Sector positions for improved situational awareness.

What Is This Program?

A. ERAM System Enhancements and Technical Refresh

The core ERAM program is baselined for Initial Operating Capability (IOC) in FY 2013 and last site Operational Readiness Date (ORD) during FY 2014. The System Enhancements and Technology Refreshment effort provides additional capabilities to the core ERAM system. System engineering supporting the selected high priority enhancements and technology refreshment started in FY 2013 and will continue through FY 2014. Software development and deployment of these enhancements is planned to start in FY 2014. Systems Enhancements and technology refresh activities will continue through FY 2021. System enhancements are targeted for ERAM software releases 5 and 6 as well as subsequent releases.

B. ERAM Sector Enhancements

This program provides software and hardware enhancements to the ERAM system for the En Route sector team. This program will re-engineer the D-Position computer-human interface (CHI) software, along with modification to the R-Position CHI software, to provide a common interface at both positions. The D-Position upgrade would provide commercially-available-off-the-shelf monitors, which are larger than the FAA-specific equipment currently installed, and higher capacity processors that can readily manage more data.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

A. ERAM System Enhancements and Technical Refresh

As air traffic levels and the need to allow more fuel efficient flight profiles increase, the Air Traffic Controllers' ability to maintain safe aircraft separation becomes a limiting factor, often resulting in the imposition of airspace structures and traffic restrictions that limit airspace capacity utilization. The ERAM System Enhancements and Technology Refresh effort will increase efficiency, add System functions, provide more efficient tools and data to support air traffic management as well as providing a more robust and capable platform to support future NextGen initiatives. The program will specifically focus on:

- High priority ERAM site system enhancements that are based on needs identified by ERAM users as they gain experience operating the system,
- Improving aircraft separation services including:
  - Reduced levels of misses and false alerts from tactical and strategic conflict alerting functions, and
  - Taking advantage of aircraft performance-based navigation,
- Providing system capacity and processor resources needed for the integration of DataComm Segment 1 Phase 2 (S1P2) Full En Route Services,
- Increasing aircraft direct routing efficiency,
- Improving Aviation Safety by deploying additional En Route Information Display Systems (ERIDS),
- Increasing the availability of useful air traffic management information to controllers.

B. ERAM Sector Enhancements

The Computer-Human Interface (CHI) looks and behaves differently between the R-position and the D-position. The visual displays, menu options, and trackball button actions are unique to each position. Further, if one controller is managing a sector, the controller must make a cognitive shift from the primary mode of interacting with the R-position to the alternative mode of interacting with the D-position. If two controllers are managing a sector, they verbally exchange relevant system data from their respective positions and verify aircraft locations. This program is necessary to reduce position-specific limitations on controllers' information, displays and maximize the commonality of controller equipment (hardware and software).

How Do You Know The Program Works?

A. ERAM System Enhancements and Technical Refresh

The program will establish performance measures upon completion of the Sept 2013 Final Investment Decision. Similar to the core ERAM effort, the primary performance metrics are anticipated to be site operational and acceptance events such as IOCs and ORDs of the software build(s) containing the System Enhancement(s) or corresponding to the Technology Refresh(s).

B. ERAM Sector Enhancements

The ERAM Sector Enhancements program will be a new separate program baseline. It will build upon the deployed ERAM system to harness ERAM's full potential for operational effectiveness. Many of these capabilities have been prototyped in research and development under NextGen Solution Set Programs and proven to provide tangible positive operational results.

Why Do We Want/Need To Fund The Program At The Requested Level?

The core ERAM system will be operational at all 20 CONUS Air Route Traffic Control Centers (ARTCCs) by FY 2014. However, once the core ERAM system becomes operational, this program is needed to implement capability improvements and technical refreshments of the equipment. Lack of enhanced automation assistance in ERAM will impact the ability of Air Traffic personnel to handle traffic growth without increasing restrictions and delays. In addition, current ERAM infrastructure will not fully accommodate an interface and/or integration with other FAA Enterprise Architecture elements (Data Communications S1P2 Full Set of capabilities, Aeronautical Information Management, Tower Flight Data Manager, Traffic Flow Management, International, Oceanic, and Weather).

Detailed Justification for – 2A03 En Route Communications Gateway (ECG)

What Is The Request And What Will We Get For The Funds?

FY 2014 – En Route Communications Gateway (ECG)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
En Route Communications Gateway (ECG)	$2,000	$3,100	$2,200	+$200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Magma Chassis and Operational Analysis, STEP, RMA	---	$1,300.0
B. In-Service Engineering	---	900.0
Total	Various	$2,200.0

For FY 2014, $2,200,000 is requested to provide for the following:

A. Magma Chassis is an integral part of the ECG interface processors. It provides an extension to the Peripheral Component Interconnect (PCI) bus in the base interface processor unit, allowing for installation of additional interface cards

- Program Support services provides assistance with Operational Analysis (OA), Sustainment Technology Evolution Plan (STEP), Reliability Maintainability Availability (RMA) for the ECG Program, which help measure performance and cost of ECG operational assets against an established baseline and identify evolution opportunities, best alternatives, and the best solutions to maintaining and evolving the ECG technical baseline

B. In-Service Engineering provides immediate response to emerging technology solutions

What Is This Program?

The En Route Automation Programs provide automation infrastructure improvements at the 20 high-altitude centers in the continental U.S. 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 (ERAM). These automation systems provide the foundation for FAA's air traffic control system.

The ECG system, which replaced the aging Peripheral Adapter Module Replacement Item (PAMRI), is fully operational nationwide. 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. The ECG program allows the FAA to monitor, maintain, and evolve the ECG system to take advantage of technical advances.

The program office 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.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

ECG replaced the aging PAMRI system. The benefits of ECG over PAMRI are improved efficiency, capacity, and safety by providing controllers with newer, faster, and more capable technology.

More importantly, ECG is necessary to provide the flight/surveillance data necessary for the new En Route Automation Modernization (ERAM) system in support of Air Traffic (AT) operations. ECG uses standardized interfaces and commercial operating systems that facilitate ERAM and allow the addition of EBUS as well as recently implemented interfaces with Flight Data Input/Output (FDIO), Surveillance and Broadcast Services (SBS)/Automated Dependence Surveillance – Broadcast (ADS-B) at Houston ARTCC (ZHU) and system Wide-Area Multilateration (WAM) at Denver ARTCC (ZDV) without architectural changes to meet mission needs and strategic goals. ECG is easily upgraded to support emerging programs and adaptations.

How Do You Know The Program Works?

The ECG Operational Availability (OA) Report measures the performance of the ECG investment against an established set of cost, schedule, and performance parameters. The OA provides metrics associated with monitoring the fielded system performance. The results and recommendations of this report can benefit existing services provided by the ECG system as well as enhancing the capabilities of the ECG system to support emerging needs. The report covers all operationally fielded ECG systems, and spans the period from the first ECG site declaring Operational Readiness Demonstration (ORD) through December 31, 2011. This represents 1,217,304 hours of continuous ECG operation.

- The ECG system has experienced no operational outage to date, and as such has achieved an Operational Availability of 1
- Most Line Replaceable Units are experiencing failure rates well within their performance expectations

The ECG system is meeting and exceeding the benefits estimated in the ECG Investment Analysis Report and continues to be the Preferred Solution.

Why Do We Want/Need To Fund The Program At The Requested Level?

The current funding level is required to provide technology refresh and maintain the ECG systems to support integration of ERAM. A robust and operational ECG system is required to field ERAM and other future systems. If funded at less than the $2,200,000 level, the program office would be unable to sustain the listed hardware components.

Failures of the Magma Chassis extension to the Interface Processors can lead to possible loss of Surveillance and or Interfacility data that is provided to the HOST and ERAM for air traffic control.

Detailed Justification for - 2A04 Next Generation Weather Radar (NEXRAD)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Weather Radar (NEXRAD)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Weather Radar (NEXRAD)	$2,800	$3,300	$4,100	+$1,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. NEXRAD Product Improvement (NPI)	---	$800.0
b. Procure Technology Refresh Hardware	---	300.0
c. Contract Support	---	400.0
d. Procure Radio Video Processor Replacement (SLEP)	---	2,100.0
e. Finalize In-Flight Icing Product Validation (MIT/LL)	---	500.0
Total	Various	$4,100.0

For FY 2014, $4,100,000 is requested to support National Weather Service's (NWS) NEXRAD technology refresh planning and procurement efforts. The FAA funding share for NEXRAD Product Improvement (NPI) is an annual requirement as established in the Tri-Agency Memorandum of Agreement (MOA) between the Department of Transportation (FAA), Department of Defense (USAF), and NWS.

The NEXRAD Service Life Extension Program (SLEP) received a favorable a Final Investment Decision (FID) on September 19, 2012.

What Is This Program?

NEXRAD is a long-range weather radar that detects, analyzes, and transmits weather information for use by the ATC System Command Center, en route, terminal and flight service facilities. NEXRAD products and services are processed by FAA's Weather and Radar Processor (WARP), Integrated Terminal Weather System (ITWS), and the Corridor Integrated Weather System (CIWS).

The Office of Management and Budget (OMB) directed NEXRAD to be a joint program between Departments of Transportation, Defense and Commerce, with National Weather Service as the lead. It is supported under an MOA between these three agencies. The MOA was renewed in January 2012, for a period of 10 years. NEXRAD FAA requirements are documented in WSR-88D System Specification Document Number 2810000H, dated 25 April 2008.

Originally installed between 1990 and 1996 with an economic service life of twenty years, there are currently 160 operational NEXRAD systems in the United States and overseas, jointly operated and maintained by the Tri-Agency partners. By FY 2014 the average age of NEXRAD will have reached the end of its economic life. A major SLEP will be required to extend NEXRAD's service life to 2030, when it can be replaced by a newer technology, such as the Phased Array Radar.

The NEXRAD SLEP will have four main purposes:

- Along with its Tri-Agency partners, the FAA will provide support for product improvements to the legacy NEXRAD program in accordance with the MOA. In addition to annual cost-share requirements for NPI Science Evolution and infrastructure support, the FAA will be required to fund its pro rata share of allocated technical refresh costs
- The FAA will contribute its pro rata share of the overall cost of the NEXRAD SLEP effort. NEXRAD's obsolete radar video processor will lose vendor support after 2015, and will be the first SLEP activity undertaken. The other radar components that need to be refurbished include the radar transmitter and the radar pedestal. These three SLEP activities will be managed by the Radar Operations Center (ROC), and managed by the NWS
- In support of SLEP, the FAA will refurbish NEXRAD physical facilities, which includes most of their towers, radomes, access roadways, and shelters. These SLEP projects will be managed by the NEXRAD Program Office, with coordination through the Service Areas (Western (11 NEXRAD sites) and Eastern (one NEXRAD site))
- The FAA will continue to invest in FAA-specific algorithms that improve NEXRAD weather products for use in aviation applications. In parallel with the recently concluded acquisition of Dual Polarization technology for their NEXRAD platforms, the NEXRAD program has been developing algorithms that use Dual Polarization products to discern and display in real time, incidences of in-flight icing and hail

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

NEXRAD, a Tri-Agency program between DOT/FAA, the DOD/USAF, and DOC/NWS share developmental costs in proportion to the number of systems fielded by each agency. The FAA's NEXRAD SLEP will represent the vehicle by which the FAA contributes its share, and this program ensures that FAA dollars are applied wisely, and in a manner that maximizes the NEXRAD's benefit to the aviation community. The NWS is the lead agency responsible for the overall coordination of the development and implementation of the system upgrades. NEXRAD detects, processes, and distributes for display, hazardous and routine weather information.

The FAA owns and operates 12 NEXRADs, located in Alaska (seven), Hawaii (four), and Puerto Rico (one). Technical upgrades are necessary to enhance NEXRAD and provide air traffic control (ATC) with weather detection capabilities to improve safety by detecting and characterizing hazardous weather phenomena. NEXRAD will reach the end of its economic service life beginning in 2014, and will require a major SLEP if it is going to remain in operation until 2030, or beyond.

The FAA's NEXRAD SLEP program will provide the means to fund the FAA's share of the overall NEXRAD mission, and to ensure that FAA priorities are included in the planning for NEXRAD sustainment and improvement.

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. While Dual Polarization technology, which provides a two dimensional view of precipitation, has been utilized in the commercial weather radar community for over 20 years, it is only now being introduced onto the NEXRAD platform. Dual Polarization will only provide incremental improvements in overall data quality over the present day NEXRAD but the introduction of the in-flight icing and and hail detection algorithms will provide features that enhance aviation safety and detection of weather conditions while aircraft are aloft.

How Do You Know The Program Works?

NEXRAD has been successfully operating in the CONUS, and in the NAS, since 1996.

The Dual Polarization acquisition contract, which was managed by the NWS, employed an acquisition life-cycle approach that is much like the FAA's Acquisition Management System (AMS). Furthermore, contract performance is tracked through a rigorous Earned Value Management System (EVMS), which ensures effective tracking of contractor performance against the program's cost and schedule milestones. Although dual-polarization has been in operation for a short time, and deployments are still ongoing, anecdotal reports about the dramatic improvement in data quality have been received from every site that has been upgraded.

NEXRAD SLEP is predominately a hardware and facilities refurbishment program, which will be managed by the same organizations that have been maintaining NEXRAD over its first twenty years of life. Most of the equipment SLEP will be performed organically by the ROC, or let out to contractors who are intimately familiar with NEXRAD. The facility SLEP activities will be managed by the Service Areas, which are fully knowledgeable in the sustainment and refurbishment of NEXRAD's physical facilities.

Massachusetts Institute of Technology/Lincoln Laboratories (MIT/LL) has a long history of success in developing algorithms for the FAA's NEXRAD and TDWR programs, and preliminary results from their development work on other Dual Polarization radars shows considerable promise. MIT/LL's current development efforts are closely managed by the NEXRAD Program Office, utilizing the support services of senior subject matter experts, who ensure that these efforts are aligned with FAA's mission and primary goals.

Why Do We Want / Need To Fund The Program At The Requested Level?

$4,100,000 is required to fund the FAA's continuing commitment to NEXRAD sustainment and product improvement, in accordance with the Tri-Agency MOA. The MOA, originally implemented in 1980, was renewed in January 2012 for a 10-year period. The MOA, which is essentially a contract among the participating members of the Tri-Agency, was signed by the FAA's VP of Technical Operations.

A funding reduction from the FY 2014 Baseline Funding will impact the NEXRAD Program Office's ability to continue the level of project oversight and subject matter expertise that has made the program work successfully to date.

Detailed Justification for - 2A05 ARTCC Building Improvements/Plant Improvements

What Is The Request And What Will We Get For The Funds?

FY 2014 – ARTCC Building Improvements/Plant Improvements
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ARTCC Building Improvements/Plant Improvements	$41,000	$43,000	$53,000	+$12,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. ARTCC Facility Modernization and Sustainment	---	$50,000.0
B. In-Service Engineering	---	3,000.0
Total	Various	$53,000.0

For FY 2014, $50,000,000 is requested to continue Air Route Traffic Control Center (ARTCC) modernization and sustainment projects. Major construction projects will replace obsolete plant equipment and provide improved work areas. These projects will include asbestos abatement, replacement of mechanical/electrical systems, and the installation of fire detection and protection upgrades as well as interior architectural construction. All facilities will also receive smaller mission sustainment projects to mitigate the risk to operations associated with infrastructure failures. An additional $3,000,000 is requested for in-service engineering activities.

What Is This Program?

This is a multi-year facility modernization and sustainment program that addresses physical plant requirements for the FAA's 21 ARTCC's as well as the Combined Center Radar Approach Control (CERAP) facilities at San Juan and Guam. These facilities were originally constructed approximately 50 years ago and expanded in phases since then. Much of the plant equipment within these buildings has exceeded its' life expectancy and must be replaced. This program replaces obsolete equipment and provides an efficient, reliable and safe work environment for en route air traffic control operations.

Generally, the ARTCCs are standard facilities, meaning that each location requires very similar modernization projects. The ARTCC Modernization Program is primarily composed of 14 standard projects that are implemented at all facilities. Currently nine of the 14 projects are complete. While the remaining four projects are not projected to be complete until the early 2020s, much of the equipment that was installed in the early phases of this program is beginning to reach its lifecycle. Funding at the requested level is required to address remaining projects and keep pace with an increasing amount of equipment replacements that will be required in the upcoming years to avoid impacts to air traffic control operations.

To provide the suitable amount of space and equipment necessary for operational needs, many of these standard projects have required significant hazardous materials remediation (e.g. asbestos, polychlorinated biphenyl (PCB) contaminated transformer oils, lead paint mold, etc.) as well as significant structural and architectural work. The work is also necessary in order to meet the various applicable building code and FAA standards in effect at the time each project is executed. The electrical and mechanical equipment installed during these projects has a typical life span of 15 to 20 years. Since this is an ongoing facility sustainment program, the equipment installed during these projects must eventually be replaced. For example, project 14, the CWB and MMS project, includes the replacement of mechanical equipment that has become obsolete since it was installed during projects 9 and 10, which were completed between 1985 and 2000 and have reached the end of their service life.

The execution period and average cost for each of the 14 standard projects are presented in Table 1.

Table 1:
ARTCC En Route Facilities 14 Standard Major Mod Projects

No.	Project	First Site Completion Date	Last Site Completion Date	Average Cost Per Site ($M)
1	Mod 1	Aug-85	Sep-91	1.31
2	Mod 2 (Only at 2 sites: ZTL and ZLC)	Jun-01	Jun-05	2.19
3	Mod 3	Apr-89	Mar-01	5.58
4	Mod 4 (ongoing) Note 1	Mar-03	*2014**	6.25
5	AWR1 (Auto Wing Basement/1st Floor and Host Room)	May-92	Oct-00	3.47
6	AWR2 (Auto Wing 2nd Floor and Attic (ongoing) Note 2	Oct-91	*2014**	2.89
7	Power Service Building	Jul-89	Jul-98	4.21
8	Fire Protection Backbone	Dec-92	Aug-01	0.78
9	Chiller 1	Aug-86	Apr-95	1.66
10	Cooling Tower Replacement	Aug-85	May-00	1.26
11	Chiller 2	Jul-96	Dec-03	1.49
12	Administration Wing Rehab (Only at 1 site - ZMA)	Aug-02	Jan-07	12.03
13	Administration Wing Mini-Mod	Mar-06	May-11	4.10
14	CWB and MMS(ongoing) Note 3	Feb-11	*2018**	7.45

* *Italicized dates are projected completion dates*
Note 1. Remaining Mod 4 sites: Memphis, Jacksonville, Albuquerque
Note 2. Remaining Automation Wing 2nd Floor sites: Atlanta, Memphis, Jacksonville, Albuquerque
Note 3. Remaining Control Wing Basement/Major Mechanical Sustain sites: Fort Worth, Chicago, Albuquerque, Indianapolis, New York, Houston, Boston, Jacksonville, Memphis, Anchorage, Washington, Atlanta, Kansas City, Cleveland

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The ARTCC Plant Modernization program is necessary to support Air Traffic Control (ATC) operational requirements, to reduce the risk of ATC delays caused by infrastructure failures, and to minimize future capital liabilities associated with infrastructure failures. These facilities and much of the mechanical and electrical equipment within them are approximately 50 years old. Many of the systems have exceeded their life expectancies and are 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 continue operations during one such occurrence. Roof leaks, pipe failures and malfunctioning heating, ventilation and air conditioning (HVAC) equipment can also contribute to mold growth and adversely affect the health of employees within these facilities.

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 also necessary at ARTCC's in seismic areas.

How Do You Know The Program Works?

Over the past seven years this program has been able to reduce the national backlog by approximately $30 million. The associated reduction in out year capital liabilities is approximately $120 million. Operations risks have been mitigated by focusing sustain projects on the most crucial failure modes. Personnel and life safety risks have been reduced through asbestos abatement and fire protection projects. Indoor air quality and mold risks have been reduced through roofing, piping and HVAC projects. Space utilization has been improved by providing more efficient configurations in office areas.

Why Do We Want / Need To Fund The Program At The Requested Level?

A reduction in funding would result in increased risk of infrastructure failures that could affect ATC Operations, and increased OPS liabilities associated with the backlog infrastructure failures. Funding reductions will result in increasing the deferred maintenance backlog and further degrading the condition of the facilities, increasing the risk to operations and potentially increasing the facilities operations budget in the event of failure of equipment where replacement has been deferred.

Detailed Justification for - **2A06 Air Traffic Management (ATM) – Traffic Flow Management (TFM)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Air Traffic Management (ATM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Air Traffic Management (ATM)	$7,500	$21,700	$13,800	+$6,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. ATM-TFM Infrastructure Technical Refresh	---	$5,800.0
B. ATM-TFM Remote Site (or Field Site) Technical Refresh	---	5,700.0
C. In-Service Engineering	---	2,300.0
Total	Various	$13,800.0

For FY 2014, $5,800,000 is requested to perform system test, installation, and continue deployments of replacement hardware for the Traffic Flow Management (TFM) Processing Center (TPC), also referred to as the TFM System Core, at the William J. Hughes Technical Center (WJHTC). $5,700,000 is requested for the TFM Remote Site Tech Refresh to conduct engineering analysis, site surveys, procurement of the TFM Remote Site (also called field) hardware, begin conducting test and installation at the TFM Remote sites. An additional $2,300,000 is requested for in-service engineering activities.

What Is This Program?

The TFM System (TFMS) is the automation backbone for the Air Traffic Control System Command Center (ATCSCC) and the nationwide Traffic Management Units that assist the ATCSCC in strategic planning and management of air traffic. TFMS is the nation's primary source for capturing and disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFMS support the decision-making process used to adjust flight schedules and/or routes as necessary. When the National Airspace System (NAS) is impacted by severe weather, congestion, and/or outages, the TFMS 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.

A. ATM TFM Infrastructure Technology Refresh will:

- Provide a replace-in-kind technology refresh of the hardware used for the TFM Processing Center (TPC), also referred to as TFMS Core, at the William J. Hughes Technical Center. This hardware provides the central data processing capability for the TFMS.

B. TFM Field (or remote) Site Technology Refresh will:

- Provide a replace-in-kind technology refresh of the TFMS hardware used by the Traffic Flow Managers in the field, at over approximately 87 TFMequipped FAA facilities around the country including Air Route Traffic Control Centers (ARTCCs), Terminal Radar Approach Control Facilities (TRACONs), Air Traffic Control Towers (ATCTs), ATCSCC, FAA Regional Offices, FAA test facility located at (WJHTC) and Prime TFM vendor test facilities.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The FAA must maintain mission-essential TFM operations at approximately 87 ATC facilities. The TFMS provides direct mission support to the FAA by ensuring efficient flow of air traffic through the NAS. TFMS is a major NAS system and the primary tool used by Traffic Flow Units in the field.
Currently the TFMS hardware is no longer produced and will not be supported by the hardware vendor after 2014. The TFM system exceeds the current hardware specifications and as a result, is experiencing performance degradation. Performance degradation forecasts have not taken into account the planned Collaborative Air Traffic Management Technologies (CATMT) Work Packages (WP) 2 and 3 functionality which will utilize the same hardware. Therefore there is added risk that the increased utilization due to the additional functionality will accelerate performance degradation. The TFMS Technology Refresh improves performance by replacing the hardware providing the central data processing capability for the TFMS. This Tech Refresh maintains operational availability, avoids hardware obsolescence, and avoids increased cost of maintenance and performance degradation.

How Do You Know The Program Works?

The TFMS Technology Refresh is a hardware replacement of the TFMS Infrastructure (TFMS Core) and Remote Sites equipment to avoid obsolescence, system performance degradation and avoid impact on other programs. The TFM System performs today and provides benefits through the CATMT applications to improve capacity to minimize avoidable delays. By replacing aging equipment, this refresh activity avoids hardware obsolescence, system performance degradation and contributes to maintaining overall operational availability within the National Airspace System (NAS), thus enabling the TFM system and CATMT capabilities to continue providing benefits.

Due to the deployment of TFM CATMT WP 1 enhancements after 2005, the percentage of flights with "Inequitable Delays - Fraction of Flights with the Highest Delay (defined as a delay at least three times the median value of all delays) has been reduced from two percent in FY 2005 to one percent in FY 2009*, the last year data were available.

*Metrics and Analysis report performed by Flatirons Solutions, Inc. (November 2009).

Why Do We Want/Need To Fund The Program At The Requested Level?

$13,800,000 is required to conduct engineering analysis, site surveys, purchase hardware and begin installation for the remote sites as well as continue the technology refresh installation activities for the TFM Processing Center at the William J Hughes Technology Center. TFMS is the platform for the NextGen CATMT enhancements. If funding is not realized, the ability to maintain today's system will be at risk as well as the ability to support the deployment of enhanced CATMT capabilities.

Detailed Justification for - 2A07 Air/Ground Communications Infrastructure

What Is The Request And What Will We Get For The Funds?

FY 2014 – Air/Ground Communications Infrastructure
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Air/Ground Communications Infrastructure	$4,800	$4,000	$5,500	+$700

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Communications Facilities Enhancement (CFE) Expansion	---	$2,500.0
B. Radio Control Equipment	---	1,000.0
C. Radio Frequency Interference (RFI) Tech Refresh	---	1,000.0
D. In-Service Engineering	---	1,000.0
Total	Various	$5,500.0

For FY 2014, $2,500,000 is requested to initiate six new CFE expansion/relocation sites, procure replacement radios, equipment racks, antennas, towers, and site preparation. CFE/expansion/relocation funding was requested for six sites in the FY 2013 Budget: Daven Port, IA; Hayes Center, NE; Abajo Peak, UT; Houston, TX; Reno, NV; Manteca, CA. The six new sites for FY 2014 are:

Milwaukee, WI - Terminal Radar Approach Control (TRACON)
Boston, MA - Remote Transmitter/Receiver (RTR)
Fossil, OR - Back-up Emergency Communications (BUEC)
Marathon, FL - Remote Communications Air/Ground (RCAG)
Kalamazoo, MI - Remote Transmitter/Receiver (RTR)
Long Beach, CA - Remote Transmitter/Receiver (RTR)

For FY 2014, $1,000,000 is requested for engineering and technical services/support to mitigate Radio Frequency Interference (RFI) events in the NAS as well as procurement of 110 Receiver (RX) Multicouplers which will be used to mitigate RFI and maximize the overall throughput of the NAS.

For FY 2014, $1,000,000 is requested for RCE to support NAS growth and RCE attrition until NextGen requirements have been fully deployed. FY 2014 funds will also fund test bed efforts at the William J. Hughes Tech Center which baselines the performance of the RCE modem and source code.

Also $1,000,000 is requested for in-service engineering activities.

What Is This Program?

Air/Ground Communications Infrastructure will replace aging and increasingly unreliable equipment and communications facilities. In addition, Air/Ground Communications Infrastructure will establish new communications facilities.

A. Communications Facilities Enhancement/Expansion (CFE) – This program provides new communications facilities and equipment. The program also improves and/or relocates current communication facilities to meet new demands.

B. Radio Control Equipment (RCE) – This 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.

C. Radio Frequency Interference (RFI) – The RFI Elimination program is designed to help resolve Radio Frequency Interference (RFI) events to maximize the overall safety of the NAS and to replace non-supportable receiver (RX) multicouplers in the NAS. The RX Multicoupler allows for the connection of multiple radio receivers to one antenna which reduces RFI by utilizing the internal filters of the RX multicoupler and provides greater capacity by installing more frequencies on the limited number of antennas located at a Radio Control Facility (RCF).

There are approximately 900 RX multicouplers used in the NAS but many of these units are not supply supportable and have failing power supplies that cannot be replaced. In 2007, FAA awarded a contract for 4 and 8 port RX Multicouplers. Since awarding the Rx Multicoupler contract, 551 Rx Multicouplers have been replaced. A tech refresh is planned to replace the remainder of the approximately 349 RX Multicouplers in the NAS that are not depot supported.

D. In-Service Engineering – Allows for immediate response to emerging technology solution. Funding is needed for on-going engineering support of all prototyping efforts.

DOT Strategic Goal - Economic Competitiveness.
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 controllers to communicate with aircraft around affected areas may remove the ability of ground controllers to communicate with aircraft. Radio frequency interference at an Air/Ground (A/G) facility would severely disrupt air traffic services. Due to the cancelation of the Next Generation Air/Ground Communications (NEXCOM) Segment 1b system development program (in FY 2003), which was to be the Radio Control Equipment (RCE) replacement, the FAA must continue to support the RCE requirement to support expanded communications coverage.

The FAA needs to mitigate and eliminate radio frequency interference that impacts Air Traffic Control communications. The RFI Elimination program is designed to expedite the detection and facilitate the resolution of radio frequency interference events to minimize delays and congestion thereby improving air traffic capacity, while maximizing the overall throughput of the NAS. This program is needed to provide the Service Areas with the tools and support services necessary to quickly restore NAS radio services.

Additionally, the CFE program represents 16 of the top 50 projects listed by the three Service Areas. Examples of these projects include establishing a Very High Frequency (VHF) Remote Communications Outlet (RCO), establishing a Remote Communications Air to Ground (RCAG) facility, and replacing an RCO antenna tower.

How Do You Know The Program Works?

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 communications equipment will lower periodic and correctional maintenance costs associated with the old and technically obsolete equipment in the field.

There are a significant number of RFI Elimination and Tech Refresh program requests that seek to improve communications capability in areas surrounding Core and Focus airports. Funding these projects will improve safety by eliminating gaps in air/ground communications in the NAS.

Why Do We Want / Need To Fund The Program At The Requested Level?

The CFE program maintains and increases air traffic capacity by ensuring the availability of equipment and facilities that are essential component in pilot and controller communications.

A reduction would result in FAA not being able to purchase equipment or fund site surveys for several projects and will delay implementation of two planned sites for FY 2014.

The required funding is for engineering and technical services/support to mitigate RFI events that occur in the NAS on a continuous basis.

Detailed Justification for - 2A08 Air Traffic Control En Route Radar Facilities Improvements

What Is The Request And What Will We Get For The Funds?

FY 2014 – Air Traffic Control En Route Radar Facilities Improvements
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Air Traffic Control En Route Radar Facilities Improvements	$5,800	$5,900	$5,900	+$100

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Long Range Radar Improvements Infrastructure Upgrades/Sustain	---	$5,000.0
B. In-Service Engineering	---	900.0
Total	Various	$5,900.0

For FY 2014, $5,000,000 is requested to continue facility maintenance and upgrades to the 150 Long Range Radar (LRR) sites. An additional $900,000 is requested for in-service engineering activities.

What Is This Program?

The LRR Facilities Improvements program addresses the infrastructure requirements of the FAA-owned surveillance facilities serving the National Airspace System (NAS). The NAS currently has 150 surveillance facilities that provide aircraft position information to FAA En Route control centers and to other users (e.g., Department of Defense and Homeland Security). They all contain vital long-range secondary beacon radars. Many of these (long range radar) sites were established in the early 1950's and have reached their design life. Due to the extreme age of these facilities, the need for infrastructure maintenance and upgrades are required at all of these sites.

The NAS requires reliable and continuous operation of surveillance equipment. The repairs, improvements, and modernization to existing infrastructure will enable the facilities to meet current operational, environmental, and safety needs. It will extend the service life of facilities, and reduce the chance of outages that often cause air traffic delays.

Today, FAA air traffic control (ATC) calls for seamless surveillance information provided within each air traffic controller's area of responsibility. In order to reliably provide flawless surveillance information in en route environment and avoid operational outages that have severe and immediate impacts on the air traffic control services, the infrastructure deficiencies must be corrected without delay.

The existing air surveillance infrastructure has shortfalls that must be addressed sequentially for the air surveillance system to continuously 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.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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. The majority of the en route surveillance facilities require improvements and/or modifications to correct existing deficiencies. Approximately 40 percent of en route surveillance service outages currently experienced can be directly linked to infrastructure failures and deficiencies. Prior year accomplishments lowered the potential for reduced coverage. Projects include repair and replacement of heating, ventilation, air conditioning, air handlers, chillers, engine generators, elevators, uninterruptible power systems, lightning protection, grounding, bonding, and shielding (LPGBS) systems, access roads, security systems, storm water controls, sewage systems, roofs, and structural restorations to support Air Traffic Control Beacon Interrogator model 6 (ATCBI-6) deployments and existing Mode Select beacon radars.

How Do You Know The Program Works?

Air Route Surveillance Radar (ARSR) equipment availability over the previous 12 month period (ending March 31, 2012) has continued in an upward trend:

- Availability from April 2010 through March 2011............................ 98.4 percent
- Availability from April 2011 through April 2012 .... 98.8 percent

The LRR Infrastructure Improvements Program is one of the reasons for this increase. The LRR Infrastructure Program helps LRR facilities continue to meet operational, environmental, and safety needs, well beyond their expected service life. Without this program, infrastructure failures will result, causing surveillance equipment failures that directly impact the NAS.

Why Do We Want/Need To Fund The Program At The Requested Level?

$5,900,000 is required to make repairs to the facilities that are in poor condition and have greatest impact to the NAS. It will extend the service life and lower the risk of NAS outages occurring. Evidence shows up to ten-fold savings if properly funded sustainment programs were instituted. The required funding level will enable a proactive approach to facilities management and life-cycle.

A reduction from the FY 2014 baseline funding will delay the required repairs and upgrades to LRR facilities. These facilities housed and protect the FAA's state of the art systems and equipment from the elements. They are essential to the nation's security and aviation safety. A Majority of these facilities have exceeded their design life and require upgrades and maintenance. Deferring essential maintenance will significantly increase future cost to refurbish and result in an accelerated deterioration of the infrastructure, leading to failures of the surveillance radars and causing flight delays.

Detailed Justification for - 2A09 Voice Switch and Control System (VSCS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Voice Switch and Control System (VSCS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Voice Switch and Control System (VSCS)	$1,000	$14,000	$20,000	+$19,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. VSCS Sustainment Activities	---	$12,375.0
b. Engineering Analysis	---	4,700.0
c. Program Management	---	890.0
d. Contractor Support	---	2,035.0
Total	Various	$20,000.0

For FY 2014, $20,000,000 is requested to conduct VSCS Technology Refresh Phase 3 Activities.

What Is This Program?

The VSCS controls the switching mechanisms that allow controllers to select the communication channel they need to communicate with pilots, other controllers, other air traffic facilities, and commercial telephone contacts. It is essential that controllers be able to select the proper channel so they can communicate with pilots, coordinate with other controllers and/or contact emergency services as necessary. These large switches handle communication connections for 40 to 60 active air traffic control workstations at each of the 21 en route centers.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The VSCS Technology Refresh program will replace and upgrade hardware and software components for the voice switching systems in all 21 en route Air Route Traffic Control Centers (ARTCCs). The technology refresh will be required to ensure that the VSCS continues to provide reliable voice communications, which can support future en route operations. 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 between air traffic control facilities in the en route environment. The real time Field Maintenance/Testing System at the FAA William J. Hughes Technical Center (WJHTC) and the Training System at the FAA Academy will also be upgraded to perform the same as an operational site.

To date, this program has replaced all VSCS internal control systems. Equipment has been procured to replace the VSCS Traffic Simulation Unit at the FAA WJHTC. This test bed is being used to test the capabilities of the upgraded systems to determine if they meet the formal baseline requirements established for VSCS performance.

How Do You Know The Program Works?

VSCS is an integral part of a functional en-route air traffic control system; it provides the following qualitative benefits: Reliable access to many different Air Traffic Control (ATC) radios; Ability for ATC personnel to communicate with each other and coordinate work in the ARTCCs; and Reliable and maintainable voice communication switching in en-route ATC facilities.

Why Do We Want / Need To Fund The Program At The Requested Level?

$20,000,000 is required to conduct:

- Complete Ground to Ground (G/G) Node Reduction at three field sites
- Programming Language for Microcomputers (PLM) to C Air to Ground software conversion efforts
- Continue Single Port Transceiver technology refresh
- Continue Fiber Optic Tie Trunk (FOTT) power supply technology refresh
- Continue VSCS Training and Backup System (VTABS) technology refresh efforts
- VSCS vendor (Harris) Program Management, Engineering Analysis, and associated contractor support to identify and manage ongoing parts obsolescence issues

NAS Voice System (NVS) funding was reduced, requiring the VSCS to provide reliable voice communications for en route operations until at least 2027. This funding will mitigate the risk.

Detailed Justification for - 2A10 Oceanic Automation System

What Is The Request And What Will We Get For The Funds?

FY 2014 – Oceanic Automation System
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Oceanic Automation System	$4,000	$4,000	$4,800	+$800

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Oceanic Automation System (OAS) Prime Contract	---	$4,050.0
b. Program Management	---	750.0
Total	Various	$4,800.0

For FY 2014, $4,050,000 is requested to fund the Oceanic engineering and software development follow-on contract to provide for the delivery of ATOP operational improvements, safety enhancements, and Agency commitments to the three Oceanic Air Route Traffic Control Centers (ARTCCs) at Oakland, New York and Anchorage. Also requested is $750,000 for program management and engineering support for ATOP requirements and the integration of Automatic Dependent Surveillance–Broadcast (ADS-B) operations and NextGen funded enhancements in the Oceanic environment.

What Is This Program?

The Advanced Technologies and Oceanic Procedures (ATOP) program has replaced 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 fully integrates flight and radar data processing, detects conflicts between aircraft, provides data link and surveillance capabilities, and automates the previous manual processes. The ATOP system collects, manages, and displays oceanic air traffic data, including electronic flight-strip data, on the computer displays used by air traffic controllers and integrates 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. Operational systems reside at the Oakland, New York, and Anchorage ARTCCs. A test and training system is in use at the William J, Hughes Technical Center (WJHTC). ATOP is now in operational use, the program office is gathering and documenting performance data and metrics to measure productivity, efficiency, user satisfaction, and project future system benefits.

The technology refresh for the automation system was completed for all three operational sites and the systems installed at the William J, Hughes Technical Center (WJHTC). This technology refresh activity increased system performance, capacity, and usability. The ATOP program will continue to deliver enhanced safety, provide operational efficiency improvements, and support other FAA initiatives such as ASD-B and NextGen oceanic requirements through FY 2015.

DOT Strategic Goals: Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

ATOP allows the FAA to reduce the use of the difficult communications systems and the intensively manual processes that limited controller flexibility in handling airline requests for more efficient profiles over long oceanic routes. The program provides automated displays, Automatic Dependent Surveillance-Contract (ADS-C), and conflict resolution capability required to reduce oceanic aircraft separation from 100 nautical miles to 30 nautical miles.

ATOP has been implemented at New York, Oakland and Anchorage. The system performance data has been analyzed, a baseline has been established, and a fuel savings performance model has been developed.

Further development of the fuel burn model through the use of a comprehensive oceanic analysis, simulation and modeling capability, will be used to further measure how ATOP contributes to fuel efficiency.

How Do You Know The Program Works?

Although oceanic flights comprise only four percent of total U. S. air carrier operations, they provide 43 percent of the cargo revenue and 23 percent of the passenger revenue. The ATOP automation system has enabled 30 NM lateral and 30 NM longitudinal separation (approximately four minutes) to be applied between suitably equipped aircraft in Oakland Oceanic airspace and to be planned for New York Oceanic airspace, thus allowing aircraft separation to be reduced from 50 nautical miles lateral and 10 minutes longitudinal. The average ATC response time to altitude change requests has decreased from over four minutes (pre-ATOP) to two minutes (post-ATOP) and the number of altitude change requests cleared have increased by 40 percent while demand has increased by 34 percent. ATOP has enhanced communication and surveillance, which has increased sector capacity.

Why Do We Want / Need To Fund The Program At The Requested Level?

$4,800,000 is required to fund the Oceanic engineering and software development follow-on contract to provide for the delivery of ATOP operational improvements, safety enhancements, and Agency commitments to the three Oceanic Air Route Traffic Control Centers (ARTCCs) at Oakland, New York and Anchorage. Funding at the required level will also provide for the necessary level of program management and engineering support.

A reduction in funding below the request level impacts the program's ability to deliver external and internal agency commitments and specifically the integration of ADS-B and NextGen program enhancements need for the oceanic environment.

Detailed Justification for - 2A11 Next Generation Very High Frequency Air/Ground Communications System (NEXCOM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Very High Frequency Air/Ground Communications System (NEXCOM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Very High Frequency Air/Ground Communications System (NEXCOM)	$45,150	$33,650	$20,250	-$24,900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$4,000.0
b. Engineering Support	---	1,000.0
c. Hardware/Software	---	10,000.0
d. Logistics	---	1,000.0
e. Implementation	---	4,000.0
f. Independent Operational Test and Evaluation (IOT&E)	---	250.0
Total	Various	$20,250.0

For FY 2014, $20,000,000 is requested for NEXCOM Segment 2 Phase 1 which will be used to install 1,780 Very High Frequency and Ultra High Frequency radios (receivers and transmitters) in terminal and flight services facilities. An additional $250,000 is requested for Independent Operational Test and Evaluation activities.

What Is This Program?

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.

- Segment 2 Phase 1 (2010 - 2018) will implement MDR, UHF and CM-300 V2 radios that will service the high-density terminal areas and the flight service operations
- Segment 2 Phase 2 (2018 - 2027) will implement CM-300 V2 radios that will service the high-density terminal areas and the flight service operations

DOT Strategic Goal: Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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. Air/ground communication is the most fundamental and safety important element of the ATC system supporting all phases of flight for en route, terminal, and flight service operational environments. There are approximately 60,000 analog radio units installed at over 4,650 sites.

NEXCOM will meet the new and growing demands for air transportation services; accommodate the growing number of sectors and services; utilize VHF spectrum required for voice communications more efficiently and make the recovered spectrum available for data communications (a future NextGen initiative); and improve reliability and reduce the growth of maintenance costs by replacing aging air/ground communications equipment with new digital equipment.

How Do You Know The Program Works?

Since deployment of NEXCOM radios in 2005, there have been two Air Traffic delays due to reported radio outages (for comparison, there were 32 in 2001 and 2002). Additionally, the Post Implementation Review team recently finalized an independent study of the NEXCOM program benefits and concluded the following: the NEXCOM investment program meets the service needs of its customers; the NEXCOM investment program meets baseline benefits expectations; and the NEXCOM investment business case is still valid.

Why Do We Want/Need To Fund The Program At The Requested Level?

NEXCOM - Segment 2: Site implementation is on schedule to complete the Acquisition Program Baseline (APB) milestone of Initial Operational Capability (IOC) at 450 sites for Phase 1. Sufficient radios were acquired from the NEXCOM 1a radio contract to bridge an early schedule delay gap until radios from the new procurement were available for deployment.

A funding reduction would delay implementation of multiple sites and negate the schedule gains that the program has achieved in recent years to keep the program within the baseline parameters for the program.

Detailed Justification for - 2A12 System-Wide Information Management (SWIM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – System-Wide Information Management (SWIM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
System-Wide Information Management (SWIM) –Common Support Services, Phase 1 - Weather	$66,350	$57,200	$70,500	+$4,150

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. SWIM Segment 1		
a. Traffic Flow Management Data Publication	---	$1,890.0
b. Terminal Data Distribution System Publication	---	1,690.0
c. SWIM Core Services	---	6,100.0
d. Flight Data Publication Service	---	10,180.0
e. AIM SUA Automated Data Exchange	---	280.0
f. ERAM Capabilities	---	900.0
g. Integrated Terminal Weather System (ITWS) Publication	---	200.0
h. SWIM implementation for CIWS	---	160.0
i. Independent Operational Test and Evaluation (IOT&E)	---	300.0
Total	Various	$21,700.0
B. SWIM Segment 2A		
a. On-Ramping NAS Mission Services	---	$5,500.0
b. Purchase and Deploy SWIM NEMS Nodes	---	3,800.0
c. Deploy NAS Enterprise Security Gateway	---	4,400.0
d. FTI Access Capacity Upgrades	---	1,700.0
e. Develop Segment 2 Core Services	---	8,100.0
f. Independent Operational Test and Evaluation (IOT&E)	---	300.0
Total	Various	$23,800.0
C. Common Support Services, Phase 1 – Weather		
a. Prime Development Contract (Hardware and Software)	---	$17,700.0
b. Program Management	---	2,800.0
c. System Engineering	---	3,000.0
d. Test and Evaluation	---	1,500.0
Total	Various	$25,000.0

For FY 2014, $70,500,000 is requested for System-Wide Information Services (SWIM). Of that, $21,700,000 is requested for Segment 1 efforts, $23,800,000 for Segment 2 implementation of SWIM Service Oriented Architecture infrastructure services, and $25,000,000 is requested for the Common Support Services – Weather (CSS-Wx) Project. The funds will be used towards the development of the operational system. Individual outcomes for that year will include the following:

- Award CSS-Wx contract to a Vendor
- Initiate CSS-Wx Solution Development
- Completion of Requirements Reviews
- Completion of Design Reviews
- Software Development

What Is This Program?

The SWIM program is an information management and data sharing system for Next Generation Air Transportation System (NextGen). SWIM will provide policies and standards to support data management, secure its integrity, and control its access and use. SWIM is being developed incrementally. The initial phase of SWIM, Segment 1, includes capabilities that were selected based upon the needs of various data communities, maturity of concepts of use, and the ability of existing programs to accommodate development of these SWIM capabilities within their existing program plans. In SWIM Segment 2, the program will continue to provide governance, standards, and software to NAS programs. SWIM will also implement enterprise messaging via the NAS Enterprise Messaging Service (NEMS) for new service providers and facilitate the transition by Segment 1 SIPs to using the NEMS. Future segments will be defined in a similar manner and will include additional capabilities that move the FAA toward the data sharing required for NextGen.

SWIM will reduce the number and types of unique interfaces, reduce redundancy of information and better facilitate information-sharing, improve predictability and operational decision-making, and reduce cost of service. The improved coordination that SWIM will provide allows for the transition from tactical conflict management of air traffic to strategic trajectory-based operations. In addition, SWIM will provide the foundation for greatly enhanced information exchange and sharing with other agencies.

System-Wide Information Management (SWIM) - Common Support Services - Weather (CSS-Wx) will be the first instance, in the first phase of a National Airspace System (NAS) Common Support Services capability for major classes of information. The common support services capability will initially focus on the dissemination of weather information in a network enabled and global environment through the use of standards. CSS-Wx will provide quick, easy, and cost-effective access to weather information for all users of the National Airspace System (NAS) internal and external. CSS-Wx will establish the FAA's infrastructure for Common Support Services, extending the core services of SWIM's Service Oriented Architecture (SOA).

CSS-Wx will publish improved weather products from NextGen Weather Processor (NWP); National Oceanic and Atmospheric Administration (NOAA) 4-D Weather Cube and other weather sources to FAA users for input to collaborative and dynamic NAS decision making. Additional capabilities include the filtering and extraction of weather information by user-specified criteria (e.g., along a flight path).

Establishing and utilizing open standards and developing the software necessary to support universal access to this information will provide an enhanced method of making aviation weather information available to aviation weather users. The standardization of the weather information exchange provides the foundation for flexible capabilities realizing long-term cost avoidance.

CSS-Wx supports FAA End User programs such as:

- Traffic Flow Management System (TFMS)
- Surveillance Broadcast Services (SBS)
- Time Based Flow Metering (TBFM)
- En Route Automation Modernisation (ERAM)
- Advanced Technologies and Oceanic Procedures (ATOP)
- NextGen Weather Processor (NWP)

Data sources through CSS-Wx include data such as:

- NextGen Weather Radar (NEXRAD)
- Terminal Doppler Weather Radar (TDWR)
- NWP Products including Weather Translation
- NOAA weather products

Program beneficiaries include commercial aviation, general aviation and the flying public, both directly through publishing of weather information and enhance decision support tools that consume the information within the FAA. Other government agencies that will benefit from CSS-Wx include Department of Defense, Department of Homeland Security and NOAA.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Today's hard-wired infrastructure and systems cannot readily support the addition of new data, systems, data users, and/or 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 the FAA. NextGen relies upon a new decision construct that brings more data, systems, customers, and service providers into the process. Data will be needed at more places, for more purposes, in a timely manner, and in common formats and structures to ensure consistent use. These new "data customers" need to be accommodated by providing the governance and policy that tells them how to connect to existing, open interfaces instead of designing, developing, testing, and implementing new ones from scratch. Network technology and data management software must use commercial equipment and current industry standards, to reduce developmental and upgrade cost and simplifying maintenance. Today's point-to-point architecture does not support these goals.

SWIM is vital to the achievement of national, DOT, and FAA strategic plans and the future evolution of air transportation management in the nation because it will provide vital infrastructure to the NAS, replacing inefficient and costly information exchange currently in use. The current FAA systems and operations cannot support NextGen in part because they are not network-enabled, but are instead characterized by rigidly configured systems (communications lines, computers, and software applications).

SWIM contributes to meeting these NextGen objectives:

- Expand System Capacity - The projected increase of demand on the air traffic system exceeds current or projected growth in FAA resources. Information management is a key to providing increased capacity and efficiency in the NAS. SWIM will enable information to be readily shared and used by all NAS participants. With more widespread use of better data, SWIM will improve strategic planning and trajectory management to allow better use of existing capacity en route.
- 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.
- 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.
- 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.
- Collaborative Decision Making - SWIM will enable collaborative decision-making, by providing all parties access to the same information where they can make real-time decisions and reach agreements quickly.

Delays in the NAS are primarily attributable to weather. Based on Operations Network (OPSNET) which is the official source of NAS air traffic operations and delay data, 68 percent of air traffic delays over 15 minutes for 2003-2012 were due to weather. In addition 73 percent of delayed flights and 86 percent of delay minutes for CY 2010-2012 have weather as the primary cause. Weather also impacts safety. Weather was cited as a cause or factor in over 20 percent of the accidents investigated by NTSB in 2007-2009.

Weather products currently being provided by NWS combined with recent improvements to FAA's air traffic management tools have significantly increased the size and geographic distribution requirements for weather information within the FAA network. In today's NAS, most decision tools, manual and automated, do not utilize weather information effectively or at all. This condition is partly due to gaps and inefficiencies in today's weather dissemination system. Information gathered by one system is not easily shared with other systems. This results in different decision makers having access to different weather information.

This lack of a common situational awareness results in inconsistent decision making across the NAS. Rather than sharing pictures of weather events, CSS-Wx will utilize open international data standards and access to aviation weather information for input into the FAA's collaborative decision-making tools for the NAS.

CSS-Wx will resolve the issue of multiple interfaces, inflexible and inefficient information data management, unique data types and point-to-point information exchange. Implementation of this capability will provide cost savings, improvement of capacity, efficiency and safety in adverse weather.

How Do You Know The Program Works?

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 information to new systems and locations without adding custom interfaces. This will significantly reduce the marginal cost of adding new system interfaces. Among other metrics, SWIM measures the cost of developing an application-to-application interface
- Provide common interfaces that facilitate spontaneously adding new users and applications, for purposes of continuity of operations

Common Support Services, Phase 1, Weather has entered Final Investment Analysis (FIA), and is scheduled to establish a baseline at Final Investment Decision (FID), planned for FY 2014. A limited operational capability is being performed, which establishes a baseline from which to measure performance as improvements are implemented through the NextGen weather Initial Operational Capability (IOC) time frame. That baseline would determine the capacity in adverse weather provided by the legacy system data accessed by the current user set. A comparison will be made to the change in capacity metrics which ensue due to the availability of the improved data to a wider set of users for common situational awareness. In addition, allowing a universal access method for weather data is anticipated to save on communications bandwidth costs.

Open international standards are being used to format and exchange digital weather data to ensure harmonization and ease of future enhancement and implementation. The FAA's also leading the world with EUROCONTROL in developing the Weather Exchange Model (WXXM), which is the emerging worldwide standard for the exchange of weather data. The goal is to provide access to weather data tailored to each user's needs. This enables access by all decision support tools and trajectory-based operations.

Why Do We Want/Need To Fund The Program At The Requested Level?

$44,900,000 is required for the development of SWIM Segment 1 and Segment 2.

Efforts in FY 2014 include implementation of several Segment 1 capabilities and continuation of core oversight activities. For FY 2014, SWIM funding will:

- Complete Flight Data Publication – Independent Operational Assessment (IOA)
- Complete deployment of the SWIM Terminal Data Distribution System (STDDS)
- Continue to operate the NAS Service Registry/Repository, COTS Repository, the SWIM Developer WIKI
- Buy required SOA middleware licenses (FUSE) to develop, test, and operate SWIM-compliant capabilities
- Continue to provide SOA governance of the Segment 1 SWIM Implementing Programs (SIPs)

- Provide NAS Enterprise Messaging Service (NEMS)
- Purchase and Deploy SWIM NEMS Nodes
- Work to make NAS Mission Services available via NEMS

Under Common Support Services, Phase 1, Weather, $25,000,000 is required to begin development of the CSS-Wx System by a vendor. The development will include the necessary requirements reviews, design reviews and will initiate software development. Included in the request is funding for Program Management, System Engineering and Test and Evaluation (T&E).

It is estimated that a reduction in the budget would cause a significant delay in contract award for CSS-Wx which will ultimately impact the Initial Operating Capability (IOC) milestone in 2016. Schedule delays will occur to other programs ability to access aviation specific weather information. NextGen Systems will have to acquire similar information via limited weather dissemination capability if CSS-Wx is delayed. Legacy weather dissemination systems will need to be maintained for a longer period of time which will result in increased operational and maintenance costs.

$600,000 is required for IOT&E activities.

The requested funding is also intended to support the following RTCA Task Force 5 recommendations in FY 2013 through the mid-term:

Task Force Recommendations # 40, 35, Surface
- Publish data for:
  - Pilot weather report
  - Traffic Flow Management
  - Flight Data
  - Runway Visual Range
- Provide terminal data distribution capability
- Provide flight data services with publish/subscribe
- Provide flight data publication host air traffic management data distribution system/flight data input/output and AIM Special Use Airspace client

Detailed Justification for - 2A13 ADS-B NAS Wide Implementation

What Is The Request And What Will We Get For The Funds?

FY 2014 – ADS-B NAS Wide Implementation
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ADS-B NAS Wide Implementation	$285,100	$271,600	$282,100	-$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks		Locations/ Quantity	Estimated Cost ($000)
A.	Segment 1 and 2		
a.	Solution Development	---	$45,452.0
b.	Implementation	---	41,370.4
c.	In-Service Program Management	---	7,021.1
d.	In-Service Engineering	---	1,395.0
e.	Subscription Services	---	177,011.9
f.	Independent Operational Test and Evaluation (IOT&E)	---	850.0
Total		Various	$273,100.4
B.	Gulf Expansion		
a.	Program Management	---	$250.0
b.	System Engineering Support	---	1,250.0
Total		Various	$1,500.0
C.	In Trail Procedures		
a.	Program Management	---	$750.0
b.	System Engineering Support	---	6,750.0
Total		Various	$7,500.0

For FY 2014, $282,100,400 is requested to provide for the following:

Segment 2 for FY 2014 will continue NAS-Wide deployment of ADS-B with subscription services operational for surveillance and air traffic services at ERAM, CARTS, STARS, MEARTS, ATO, ASSC and ASDE-X sites. Further development of ATC Spacing Services i.e.; Ground Based Interval Management-Spacing (GIM-S) (En Route only), and future applications i.e, flight trials for Flight Deck Based Interval Management-Spacing (FIM-S), and Traffic Situational Awareness with Alerts (TSAA) are planned. ADS-B software development will occur for the ATOP automation platform. Subscription charges to the Service Provider consist of Service Establishment Charges (SEC's) for new service volumes established in 2014 and annual subscription charges to provide essential services to existing service volumes.

The anticipated FY 2014 accomplishments are as follows:

- Initial Operating Capability (IOC) - Surface Advisory Services at five Sites (36 Cumulative)
- IOC - Ground Based Interval Management – Spacing (GIM-S)
- IOC - Terminal ATC Separation Services at 11 Sites (61 Cumulative)
- IOC - Advanced Technologies and Oceanic Procedures (ATOP)

- MEARTS Fusion Processing for Separation Services – Fusion Processing Key Site for 3NM Separation (Honolulu HCF)
- Needed Services (ISAT) at 49 Service Volumes (306 Cumulative)
- Continue to provide and maintain baseline services and applications

What Is This Program?

Automatic Dependent Surveillance – Broadcast (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 from 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 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 for 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:** TIS-B is a surveillance service that derives traffic information from one or more radar-based surveillance sources, ASDE-X, and wide area multilateration (WAM), and uplinks this traffic information to ADS-B-in equipped aircraft. TIS-B enables ADS-B-in equipped aircraft to receive position reports on non-ADS-B-equipped aircraft during the transition period to full ADS-B equipage in the NAS. Both the 978 UAT and 1090ES links support the TIS-B service. 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 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.

- **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 safely and efficiently. FIS-B products include graphical and textual weather reports and forecasts, Special Use Airspace Information, Notices to Airmen, and other aeronautical information.

FY 2012 Base:
- Continuation of National Airspace System (NAS)-Wide deployment of ADS-B
- Development of ADS-B software requirements for the Advanced Technologies and Oceanic Procedures (ATOP) automation platform
- Development of Ground-Based Interval Management - Spacing (GIM-S)
- Conduct In Trail Procedures (ITP) Operational Evaluation
- Conduct flight tests for Traffic Situation Awareness with Alerts (TSAA)

- Achieve IOC ADS-B Capability on STARS at Houston TRACON
- Achieve IOC ERAM with ADS-B at Houston Center
- Achieve ISAT at 89 Service Volumes
- Achieve IOC En Route ATC Separation Services at four Sites
- Achieve IOC Surface Advisory Services at 14 sites
- Achieve IOC Terminal ATC Separation Services at 16 sites

Anticipated FY 2013 Accomplishments:
- Completion of IOC for En Route Automation Modernization Release 3 Air Traffic Control Separation Services for at least 12 sites
- Completion of IOC for Surface Advisory Services for at least 15 sites
- Completion of IOC for Terminal ATC Separation Services at 31 Sites
- Completion of Services Implementation Service Acceptance Testing for at least 89 Service Volumes
- Completion of first software delivery for Advanced Technologies and Oceanic Procedures (ATOP)
- Completion of Ground Based Interval Management – Spacing (GIM-S) Integration Testing
- Begin flight trials for Flight Deck Based Interval Management - Spacing (FIM-S)
- Continue to provide and maintain baseline services and applications.

ADS-B NAS-Wide Implementation – Future Segment:
The scope of activities for ADS-B for the fiscal years 2014 - 2020 fall into three general categories:
- Continued provision of baseline services and applications
- Expansion of services in the Gulf of Mexico
- Implementation of the ADS-B 'In' Trail Procedures (ITP)

An investment decision was held on May 30, 2012 for this segment based on the recommendations of the Aviation Rulemaking Committee (ARC).

DOT Strategic Goals – Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

ADS-B NAS Wide Implementation supports the FAA mission and helps accomplish agency goals to increase economic competitiveness and safety. The new Air Traffic Systems (ATS) Directorate's activities influence the performance metrics for Average Daily Airport Capacity and NAS On-Time Arrivals. The enabling technologies provided by ADS-B also facilitate transition to Next Generation Air Transportation System (NextGen) capabilities.

Why Is This Particular Program Necessary?

The completion of the initial sites and approval of separation services enabled the FAA to release the Final Rule for avionics, published on May 27, 2010. FAA made a commitment to industry that the ADS-B service implementation would be completed by the end of 2013, providing stakeholders with an adequate amount of time (approximately seven years) to equip aircraft. Failing to complete ADS-B service implementation as promised would reduce the business benefit of the investment.

On January 1, 2020, when operating in the airspace designated in 14 CFR § 91.225 (outlined below) aircraft must be equipped with ADS-B Out avionics that meet the performance requirements of 14 CFR §91.227. Aircraft not complying with the requirements may be denied access to this airspace.

How Do You Know The Program Works?

Surveillance and Broadcast Services (SBS) includes a number of services and applications. The Essential Services (which include TIS-B, FIS-B and ADS-R) have been tested in the factory, in operations, and through independent tests to verify performance. The Advisory Services have been approved for national deployment. The Advisory Services In-Service Decision was approved in November 2008. The Air Traffic Services (which is ADS-B used for Air Traffic Control separation services) have been through factory and site testing. The four key sites Juneau, Philadelphia, Louisville, and Gulf of Mexico all underwent significant testing and evaluation to support the requirements. All sites have achieved operational readiness through IOC as of April 2010. The completion of the sites and approval of separation services enabled the FAA to release the Final Rule for avionics, published on May 27, 2010. An In-Service Decision for Air Traffic Services was approved on September 23, 2010. While safety is shared between multiple programs, a comparison of equipped and non-equipped aircraft should provide benefits unique to the program. Low altitude Gulf of Mexico benefits are unique to the program.

Why Do We Want / Need To Fund The Program At The Requested Level?

In FY 2014 NAS Wide deployment of ADS-B will continue with subscription services for surveillance across the NAS and for weather in the Gulf and Alaska. The national deployment of nearly 730 stations will be complete by first quarter of FY 2014. Achieving this milestone will serve as the entrance criteria for stakeholders to accelerate the installation of ADS-B Out avionics that meet the performance requirements of 14 CFR §91.227. This will allow for the ADS-B capability to deliver the benefits identified in the business case.

Additionally, ATOP automation platform ADS-B software development will occur in FY 2014. Interval Management IOC will be completed. Implementation of Wide Area Multilateration for surface surveillance will continue.

If funded at less than the $282,100,400 level the program office would have to extend the ADS-B schedule. A funding reduction would negatively impact the program schedule, and it would impact various NextGen programs with ADS-B interdependencies. The long-term impact can affect the national roll-out for the ADS-B implementation in the NAS and subsequent avionics equipage. This will decrease equipage rates and the identified program baseline benefits.

Detailed Justification for - 2A14 Windshear Detection Service (WDS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Windshear Detection Service (WDS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Windshear Detection Service (WDS)	$1,000	$0	$2,000	+$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Hardware Procurement	---	$1,000.0
b. Legacy Sustainment	---	500.0
c. Contractor Support	---	500.0
Total	Various	$2,000.0

For FY 2014, $2,000,000 is requested to procure replacement equipment for the Low Level Windshear Alerting System (LLWAS), Wind Measuring Equipment (WME), and Weather Systems Processor (WSP) Systems that are either obsolete, or no longer supported by the manufacturer. This funding will be used to initiate the Technology Refresh of these legacy wind shear detection systems currently deployed in the National Air Space (NAS), and fund the contractor support necessary to integrate the replacement hardware into existing software platforms.

What Is This Program?

Wind Shear Detection Services (WSDS) Work Package 1 (WP1) is a portfolio program consisting of legacy wind shear detection systems currently deployed in the NAS. The program will address obsolescence of the legacy systems Weather Systems Processor (WSP), Low Level Wind Shear Alert System (LLWAS) and Wind Measuring Equipment (WME). The program will sustain existing service levels by upgrading components of existing systems to mitigate safety hazards and to resolve obsolescence/supportability issues of the 34 WSP, 60 WME, and 50 LLWAS systems currently deployed in the NAS.

The Joint Resources Council (JRC) approved the WSDS WP1 Final Investment Decision (FID) on June 20, 2012.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The systems that are part of the Wind Shear Detection Services (WSDS) Work Package 1 (WP1) portfolio alert controllers of dangerous wind shear events that are detected in approach and departure corridors. Since these systems have been deployed, no major wind shear related incidents have occurred in the NAS. WSDS WP1 will resolve system obsolescence to ensure that Air Traffic Controllers will continue to receive the wind shear alerts necessary to maintain the safety of the NAS.

How Do You Know The Program Works?

The projects contained within the WSDS portfolio contribute significantly to the overall safety of the NAS by preventing wind shear related aircraft accidents. The WSDS project intends to sustain the level of service provided by these legacy ground-based systems to Air Traffic Controllers and the flying public.

Why Do We Want/Need To Fund The Program At The Requested Level?

$2,000,000 is required to address pressing obsolescence and unsupportable issues plaguing LLWAS, WME, and WSP. This funding is needed to resolve the LLWAS RF Radios obsolescence issue where only a small quantity is available in the Depot. Additionally, of the 34 WSP sites, eight are currently running on spare radar video processors. It is essential that the FAA acquire the necessary upgrades to prevent system outages and the resulting loss of service. A reduction in funding would delay the acquisition and replacement of obsolete equipment and cause increased windshear service interruptions, prolonged service outages and negatively impact NAS safety.

Detailed Justification for - 2A15 Weather and Radar Processor (WARP)

What Is The Request And What Will We Get For The Funds?

**FY 2014 – Weather and Radar Processor (WARP)
($000)**

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Weather and Radar Processor (WARP)	$2,500	$500	$700	-$1,800

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
WARP Sustainment	---	$700.0

For FY 2014, $700,000 is requested to continue programmatic support of WARP Sustain. Specific activities include: addressing required System 3-year Security Certification and Authorization (C&A) requirements; program management, test and evaluation and engineering support activities, and conducting assessment of benefits resulting from engineering changes.

What Is This Program?

The WARP system addresses the need to provide accurate, reliable, current and forecast weather conditions to air route traffic control center (ARTCC) controllers, traffic management specialists, and center weather service unit meteorologists. This weather data will allow the FAA to provide timely weather advisories and sustain safe and efficient air travel. The WARP program provides accurate weather data to key National Airspace System (NAS) systems such as the En Route Automation Modernization (ERAM) and Advanced Technologies and Oceanic Procedures (ATOP). The WARP system addresses the following performance gaps:

- Processes weather radar data so it can be integrated and portrayed on air traffic controllers' displays
- Provides access to radar mosaics and other key weather information for Area Supervisors and Traffic Management Personnel
- Accepts data from advanced weather sensors
- Plots and processes forecasted upper air wind and temperature gridded data
- Provides weather data to other NAS systems

WARP supports FAA safety by providing advisories and information that help aircraft without on-board radar to avoid accidents in convective weather.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The system became fully operational in December 2002 and provides weather information on controller displays. The existing architecture must be sustained and maintained until it is replaced by NextGen weather processing and dissemination systems. This will ensure that the weather processing and distribution capabilities continue to provide data to support en route controllers, traffic management specialists, and center weather service unit meteorologists who support air traffic.

In addition to the DOT Safety goal, WARP also addresses the FAA goal of Greater Capacity which requires collaboration among multiple disciplines to provide capacity in the United States airspace system that meets projected demand in an environmentally sound manner. WARP supports the goal's objective of making air traffic flow over land and sea more efficient. Specifically, WARP provides air traffic controllers and traffic management unit (TMU) specialists with high-resolution, integrated real-time and strategic graphical weather information. WARP provides common situational awareness by providing data to other FAA systems such as ATOP and Dynamic Ocean Track System Plus (DOTS+), and is aligned with the NAS infrastructure. The benefit of having better weather information presented in an integrated manner in the En Route environment is in providing a comprehensive picture of where aircraft can safely fly resulting in a more efficient use of airspace.

WARP Benefits include:

- Reduced delays and the resulting savings in passenger time and airline direct operating costs
- Increased safety due to weather advisories that improve pilot awareness of adverse weather conditions and help aircraft without onboard radar avoid accidents in convective weather
- Decreased need for deviations which result from more precise information about severe weather
- Cost Avoidance that result from the elimination of commercial weather service

How Do You Know The Program Works?

In FY 2010 and FY 2011 the WARP Program Office continued to address the aging infrastructure of the existing WARP hardware and software systems to continue to provide timely weather data acquisition and dissemination capability to ensure safe air traffic control. WARP also continues to provide the most timely and accurate current weather products and forecast models to other NAS systems, significantly improving NAS capacity and safety.

The current targets for this Capital Investment Plan (CIP) are: Reduce the fatal accident rate per 100,000 flight hours by 10 percent over a 10-year period (2009-2018) and 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.

Measurement criteria used in support of "Increased Safety" are as follows:

The Measurement Indicator is: Safety - Accident Rate.

The Baseline is: Fatal accident rate of En Route General Aviation (GA) aircraft without on-board weather radar reduced from average of 3.5 per year to 2 per year after introduction of Weather Surveillance Radar – 1988 Doppler (WSR-88D) weather from WARP on controller displays.

Actual Results: The FAA recorded two fatal weather-related accidents involving GA aircraft without on-board weather radar encountering thunderstorms while receiving En Route Services in each of the FYs 2004, 2005, 2006, and 2010. No thunderstorm-attributable fatal accidents occurred in FY 2011 and a determination for FY 2012 can be made once NTSB Probable Cause Reports are filed for all fatal accidents which cite thunderstorms in the Preliminary Reports.

Measurement Methodology: National Transportation Safety Board (NTSB) maintains a web portal recording both historical and current accident investigation reports. These reports are reviewed for weather-related aircraft accidents and evaluated to determine whether or not the relay of information about the location and proximity of thunderstorms to the pilot in command could have with some likelihood broken the sequence of events that lead to a fatal accident.

Why Do We Want / Need To Fund The Program At The Requested Level?

All operational WARP systems must be sustained to continue to meet DOT/FAA strategic goals. Funding is required to test and evaluate tech refresh and maintenance releases to support sustainment activities. Funding is also required to complete the full system security C&A package and conduct assessment of benefits.

A reduction from the requested level will prevent completion of the full Security C&A due to inability to procure an Independent Risk Assessment Team. Without a signed C&A, WARP will be required to shut down and the air traffic controllers and NAS systems will lose weather data. The controllers will not be able route traffic around dangerous thunderstorms which can cause fatal accidents.

Detailed Justification for - 2A16 Collaborative Air Traffic Management Technologies Work Package 2 and Work Package 3

What Is The Request And What Will We Get For The Funds?

FY 2014 – Collaborative Air Traffic Management Technologies ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Collaborative Air Traffic Management Technologies (CATMT) WP2 and WP3	$41,500	$34,420	$29,391	-$12,109

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. CATMT Work Package 2 (WP2)	---	$17,350.8
B. CATMT Work Package 3 (WP3)	---	12,040.0
Total	Various	$29,390.8

For FY 2014, $29,390,800 is requested, of which $17,350,800 under WP2 adds four new capabilities and $12,040,000 under WP3 adds two new capabilities to the TFM system.

What Is This Program?

Traffic Flow Management (TFM) is the nation's primary source for disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFMS support the decision-making process used to adjust flight schedules and/or routes as necessary. When the National Airspace System (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.

A. CATMT Work Package 2 adds four new capabilities to the TFM System:

- Arrival Uncertainty Management (AUM)
- Weather Integration (WxInt)
- Collaborative Airspace Conflict Resolution (CACR)
- Airborne Re-Route (ABRR)

Each user requested new capability will help continue to reduce the avoidable traffic delay impacts of severe weather, excess demand, and NAS equipment outages on the aviation community.

B. CATMT Work Package 3 adds two new capabilities to the TFM System:

- Collaborative Information Exchange (CIX)
- TFM Remote Site-Re-Engineering (TRS-R)

CIX will eliminate the need to manually input Special Use Airspace (SUA) data into the TFMS by automating its incorporation from the System Wide Information Management (SWIM) network. TRS-R will help reduce the cost of maintaining the TFM remote sites and provide greater ease of use to the traffic management users. These new additions will help continue to reduce the traffic delay impacts of severe weather, excess demand, and NAS equipment outages on the aviation community.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 TFM portfolio of tools and capabilities is the only part of the NAS 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.

A. CATMT WP 2 will bring newly developed algorithms and technologies to the traffic management community. Its four new components represent enhancements intended to aid in the reduction of traffic delays due to severe weather, excess demand and NAS equipment outages.

B. CATMT WP 3 will streamline TFM operations and make the tasks less manually challenging. Its two new components represent enhancements intended to aid in the reduction of traffic delays due to severe weather, excess demand and NAS equipment outages.

How Do You Know The Program Works?

CATMT work packages operate on the TFMS platform (Budget Line Item 2A06). The Post Implementation Reviews (PIRs) that have been done on earlier CATMT enhancements show the following improvements:

- The PIR performed on the AFP deployment in ETMS v8.2 showed that AFP saved the aviation community approximately $38 million from June 2006 - December 2006
- The PIR performed on ETMS 8.3 showed that Adaptive Compression was saving at a $22 million/yr rate
- The PIR performed on ETMS v8.4 deployed in May 2007 resulted in a more usable system, although it did not quantify cost savings

Post Implementation Reviews (PIRs) will be conducted after WP2 and WP3 capabilities (section A and B) listed above have been deployed. Metrics are being developed to measure the contribution of both work package efforts to the NAS

Why Do We Want/Need To Fund The Program At The Requested Level?

$29,390,800 is required for CATMT WP 2 and WP 3. These funds are required to keep the efforts on their planned schedule to complete during CY 2015. A reduction would impact the overall schedule and will impact the ability to complete during CY 2015.

The requested funding is also intended to support the following RTCA Task Force 5 recommendations in FY 2013 through the mid-term:

Task Force Recommendation # 47, Integrated ATM

- Deploy CATMT Work Package 2 capabilities below:
    - Arrival Uncertainty Management
    - Weather Integration
    - Collaborative Airspace Constraint Resolution
    - Airborne Reroute

Detailed Justification for - 2A17 Colorado ADS-B WAM Cost Share

What Is The Request And What Will We Get For The Funds?

FY 2014 – Colorado ADS-B WAM Cost Share
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Colorado ADS-B WAM Cost Share	$3,800	$1,400	$3,400	-$400

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Colorado Wide Area Multilateralization	---	$3,400.0

For FY 2014, $3,400,000 is requested for the following activities:

- Denver, CO (ZDV) based Air Traffic Control Separation Services supporting operations in and out of the Montrose; Gunnison; Telluride and Durango Airports

What Is This Program?

This is a cost share program with State of Colorado Department of Transportation (DOT). The State of Colorado Department of Transportation (DOT), Division of Aeronautics has determined that a lack of surveillance is one of the main reasons behind economic losses as a result of reduced capacity during Instrument Meteorological Conditions (IMC). The problem is compounded by mountainous terrain, single instrument runway airport configurations and limited ramp space. The base of existing radar coverage is most often at or above 9,000 feet. The lack of more comprehensive surveillance forces controllers to use procedural separation standards for the Instrument Flight Rules (IFR) arriving/departing aircraft. This is a safe means of providing the service, but it is not efficient enough to provide for Colorado's air traffic service's needs.

Normally, many arrivals into Colorado Mountain airports are conducted under Visual Flight Rules (VFR). IMC reduces acceptance rates for mountain airports from 12-17 flights per hour to four per hour. From November to April, when the Special Traffic Management Program (STMP) is in effect, the Colorado DOT estimates 75 aircraft per airport, per day are delayed or diverted, creating daily revenue loss for the state. Delays and denied service during IMC at mountain airports cause additional traffic to be diverted to the north and south within Denver Center airspace. This results in an additional multi-modal burden on the Colorado DOT due to the large number of people traveling by other means to their original destination.

The availability of ADS-R, ADS-B and Multilateration surveillance services integrated with the En-Route Automation Modernization (ERAM) should allow arrival acceptance rates to be maintained with air traffic control support. This will enhance public safety, increase capacity of the FAA NAS system, and provide increased services and economic benefit to the identified four Colorado Mountain Communities.

Anticipated FY 2012 Accomplishments:

- Achieve ISAT Colorado WAM Phase 2 Key Site (Montrose)
- Achieve IOC Colorado WAM Phase 2 Key Site (Montrose) – APB Milestone

Anticipated FY 2013 Accomplishment:

- Completion of Initial Operating Capability (IOC) at three remaining Sites - Colorado Wide Area Multilateration Phase 2.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investment.

Why Is This Particular Program Necessary?

Over the last 15 years the Ski Country of Colorado has become an increasingly popular recreational destination. The corresponding increase in air traffic volume has resulted in increased numbers of delays and denied service at mountain airports, especially during bad weather. The FAA has established a reservation system known as the STMP during the peak travel months in an effort to regulate and systematically meter the traffic to the airports. This solution keeps the traffic volume manageable for the Denver ARTCC, but produces extended delays and, in some cases, diversions or denial of Air Traffic Control (ATC) services. The airports and communities of Colorado are losing large amounts of revenue that would be generated by visitors arriving by aircraft. The program will permit radar separation standards to be employed for aircraft in areas not currently covered by existing radars and provide an option in the NAS for a WAM service capability.

How Do You Know The Program Works?

The FAA's Surveillance and Broadcast Services Program Office has planned rigorous testing as part of this effort prior to declaring the Initial Operating Condition (IOC) at all four airports. ADS-B and WAM surveillance verification and validation will be conducted through a multi-stage testing process established by the FAA's Acquisition Management System. This process includes the successful testing of all vital requirements and a successful safety risk assessment of the system and the supported air traffic operations. Once an IOC is achieved, the evaluation of the system will continue with an Operational Service Decision (OSD) performed by air traffic controllers and technical operations personnel. The OSD will continue until the system meets all necessary requirements for operation in the NAS.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding is required for the purchase of ADS-B/WAM surveillance services to support the Denver ARTCC separation services into and out of the Durango, CO; Gunnison, CO; Montrose, CO; and Telluride, CO airports. A reduction in funding would cause a loss of surveillance services to one or more of these airports. The program will create additional airport revenue from accommodating additional flights and enhanced search and rescue capabilities at these four Colorado airports.

Detailed Justification for - 2A18 Tactical Flow Time Based Flow Management (TBFM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Tactical Flow Time Based Flow Management (TBFM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
TBFM - Work Package 2	$38,700	$12,900	$10,500	-$28,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks		Locations/ Quantity	Estimated Cost ($000)
a.	Contractor Support	---	$2,668.0
b.	System Engineering/Development	---	7,482.0
c.	Site Preparation for IDAC	---	350.0
Total		Various	$10,500.0

For FY 2014, $10,500,000 is requested to continue the NextGen and Operational enhancements of the TMA system as follows:

- Expand TMA to other sites so additional sites can benefit from the efficiency of time based metering
- Complete development and implementation of NextGen and Operational initiatives such as Integrated Departure and Arrival Capability (IDAC), and Extended Metering - which will push any arrival delay farther into the En-Route flow therefore providing better fuel burn and predictability along the route of flight

What Is This Program?

Traffic Management Advisor (TMA) is a vital part of the NAS and enhances air traffic operations by reducing delays and increasing efficiency of airline operations. Currently, TMA is in daily use throughout the NAS. TMA is the only NAS deployed decision support tool currently available for implementation of time-based metering. TMA has been field-tested over the past 10 years and is already installed in the 20 Air Route Traffic Control Centers (ARTCC) and adapted for most of the major airports served by those centers.

Time Based Flow Management (TBFM) is an evolution of the Traffic Management Advisor (TMA) Program. This system uses Time Based Metering (TBM) software to optimize the capacity in the NAS. Specifically, TBFM will:

- Improve the management of traffic flow throughout the cruise phase of flight through point-in-space metering or extended metering
- Resolve the issue of TMA hardware obsolescence
- Increase airspace capacity utilization through flexible scheduling
- Share metering data with other tools/stakeholders
- Enable more accurate Area Navigation/Required Navigation Performance (RNAV/RNP) routes
- Enable more efficient departure operations with the integrated departure and arrival concept
- Increase traffic manager awareness of severe weather within their area of responsibility

The design, development and deployment of these concepts will be occurring during the 2010-2014 timeframe. These enhancements support the current NextGen OI (Operational Initiatives)

- Current Tactical Management of Flow in the En Route domain for Arrivals/Departures (104115) - TMA displays are used for situational awareness in the current tactical flow management process
- Integrated Arrival/Departure Airspace Management (104122) – Integrating and automating the departure capability with the TMA system
- Point-in-Space Metering (104120) - Extended Metering – adding additional meter points for more efficient Time Based Metering
- Time-Based Metering Using RNAV/RNP Route Assignments (104123) – automating the use of RNAV procedures in the Terminal environment for a more efficient modeling of an aircraft's trajectory

TBFM will develop and deliver on the operational needs such as flexible scheduling that will take advantage of the partial slots that currently causes a loss of efficiency in capacity constrained areas and the need for a system re-architecture which will reduce the logistical footprint of the TMA system. For each airport that is time based metering, there are two monitors, two keyboards and two mice. This hardware takes up space and makes it inefficient to run TMA at all needed airports. The reduction will help to continue the expansion of the TMA system to other airports and the expansion of Time Based Metering. All of the work will bring the TMA system into the NextGen future.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The NAS suffers significantly degraded performance during periods of severe weather, limited visibility, volume spikes due to seasonal traffic or special events, and other causes, specifically needing solutions in the following areas:

Reducing under-delivery of capacity at affected airports

- Increasing equity of delay assessed to flights
- Improving prediction of demand
- Decreasing unnecessary traffic flow management restrictions
- Decreasing abnormal delay
- Decreasing avoidable delay

How Do You Know The Program Works?

The current TMA is an effective and well-tested decision support tool that allows air traffic management units to schedule and optimize the arrival load for major airports. The TMA program has delivered measured savings by reducing delays and increasing efficiency of airline operations. TBFM is the next step in TMA evolution, providing further delay reductions. While analysis has predicted savings from TBFM implementation, metrics are being put into place to measure its actual contribution once its components are deployed.

TBFM capabilities provide automation, communication and decision support tools to continue and expand the following capabilities:

- Increased efficient use of existing capacity
- Increased common situational awareness
- Reduced delay in the terminal and en route airspaces

TBFM capabilities provide additional residual benefits in the way of environmental benefits.

Why Do We Want/Need To Fund The Program At The Requested Level?

$10,500,000 is required to keep the program on schedule. FY 2014 funding at this level will enable TBFM to develop functions such as IDAC and Extended Metering. Thus, meeting NextGen and FAA milestones of delivering enhancements by FY 2015 will enable the benefit and reduce delays. This will increase the efficiency of arrivals and departures, RNAV/RNP route selection data, and international traffic data; deliver the re-architected TMA system to enhance the current system to support the development of NextGen initiatives and Operational enhancements; and continue the deployment of the FAA TBFM system to continue the efficiency of the systemPost Implementation Review (PIR) will be conducted after the final program components have been deployed.

Detailed Justification for - **2A19 ATC Beacon Interrogator (ATCBI) Replacement 6 – Technology Refresh**

What Is The Request And What Will We Get For The Funds?

FY 2014 – ATC Beacon Interrogator Replacement 6 – Technology Refresh
(ATCBI-6 Technology Refresh)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ATC Beacon Interrogator (ATCBI) Replacement 6 – Technology Refresh	$0	$0	$1,000	+$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
ATC Beacon Interrogator (ATCBI) Model 6 Technology Refresh	---	$1,000.0

In FY 2014, $1,000,000 is requested for an Investment Analysis Readiness Decision in support of the Business Case Analysis Study, to determine the degree that a Technical Refresh of the ATCBI-6 system would be required.

What Is This Program?

The Air Traffic Control Beacon Interrogator project contributes to the FAA's Destination 2025 Goal #3 - Delivering Aviation Access through Innovation, by replacing two obsolete systems. The ATCBI-6 provides air traffic controllers with selective interrogation capability, not available in the older systems, that significantly improves the accuracy of aircraft position and altitude data provided to ATC automation systems. Additionally, the ATCBI-6, in conjunction with a co-located primary Long Range Radar, provides back-up Center Radar Approach (CENRAP) surveillance service to numerous Terminal Radar Approach Control (TRACON) facilities in the event terminal radar services are lost. The ATCBI-6 commissioned the first system in FY 2002 and commissioned the last system in FY 2013. The ATCBI-6 Replacement program procured 139, Monopulse Secondary Surveillance Radar (MSSR) with Selective Interrogation to replace the old 4/5's operational beacons, which includes seven support systems for training, testing, logistics, and operational support with 132 operational systems. This approach met the near-term needs, while the FAA is preparing for transition to GPS based technology.

The ATCBI-6 Technology Refresh Program will replace and upgrade obsolete ATCBI-6 Original Equipment Manufacturer (OEM) peculiar and Commercial Off-The-Shelf (COTS) hardware and software to ensure the continued reliable and cost effective operation of the radar system through its designated lifecycle. The ATCBI-6 Technology Refresh Program is an ongoing program to address obsolescence and maintenance. The Technology Refresh is not fully defined yet and we are working on a business case analysis to identify parts obsolescence, operational performance deficiencies, or other areas requiring technology refresh to ensure continued reliable and cost effective operation of the radar system through its designated lifecycle. The Investment Analysis Readiness Decision (IARD) is currently planned for the third quarter 2014 and the Final Investment Decision (FID) is currently planned for the third quarter 2015. The activity will look at the retrofit requirement for 132 operational ATCBI-6 systems in the FAA inventory with the identified modification kits.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The program is necessary to ensure the continued reliable and cost effective operation of the radar system through its designated lifecycle. The ATCBI-6 Technology Refresh Program will be an ongoing program to address obsolescence and maintenance. Although, the Technology Refresh is not fully defined yet; we are working on a business case analysis to identify parts obsolescence, operational performance deficiencies, or other areas requiring technology refresh to ensure continued reliable and cost effective operation of the radar system through its designated lifecycle.

How Do You Know The Program Works?

There are three requirements that drive the business case for the ATCBI-6 technical refresh program:

- ATCBI-6 radars that are not sustainable due to parts obsolescence and other sustainability issues (i.e., increased failure rate, higher maintenance cost and longer repair times)
- Digital automation systems will require digital radar to furnish surveillance data
- Improved system performance due to technology advances

Why Do We Want/Need To Fund The Program At The Requested Level?

$1,000,000 is required to support the development of the ATCBI-6 Technology Refresh business case as well as supportability and sustainability analyses provided by second level engineering support and the logistics center.

Detailed Justification for - 2A20 Next Generation Weather Processor (NWP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Weather Processor (NWP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Next Generation Weather Processor (NWP)	$0	$0	$23,510	+$23,510

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Prime Development Contract (Hardware and Software)	---	$16,172.0
b. Program Management and System Engineering	---	6,233.0
c. NAS Implementation (Planning and Site Preparation)	---	433.0
d. Supply Support (Initial and Depot Spares)	---	414.0
e. Second Level Engineering Support	---	258.0
Total	Various	$23,510.0

For FY 2014, $23,510,000 is requested for the Next Generation Weather Processor (NWP) to provide the following:

- Obtain NWP Final Investment Decision (FID)
- Award NextGen Weather Processor (NWP) contract to vendor
- Begin NWP Solution Implementation activities (e.g. interface and specification documents)
- Execute Project Management oversight by the government
- Maintain 0 - 8 hour convective weather forecast prototype operations (i.e., CoSPA)

What Is This Program?

The goal of the NextGen Weather Processor (NWP) program is to establish a common weather processing platform that will functionally replace the legacy FAA weather processor systems and host new capabilities. As input, NWP uses information such as FAA and National Oceanic and Atmospheric Administration (NOAA) radar and sensors and NOAA forecast models. NWP uses sophisticated algorithms to create aviation-specific current and predicted weather requiring no meteorological interpretation. NWP creates value-added weather information for publishing via Common Support Service-Weather (CSS-Wx). It will perform Weather Translation, which will enable the use of weather information by automated decision-support tools (DST). NWP will also provide aviation safety related windshear, microburst, gust fronts, storm motion, and speed products. Altogether, these features will aid in reducing the rising operations and maintenance costs by consolidating the following systems, funded under separate Budget Line Items (BLIs), over its lifecycle:

- Corridor Integrated Weather System (CIWS): Provides 0 - 2 hour aviation forecast information to the Traffic Flow Management System (TFMS)
- Weather and Radar Processor (WARP): Provides weather radar information to air traffic controllers
- Integrated Terminal Weather System (ITWS): Improved integration of weather data

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Weather information is needed for air traffic management and flight operations decisions. Current aviation weather processing infrastructure and abilities are inadequate to meet real-time needs of ATM DSTs, operational decision-makers, and NextGen. Existing aviation weather products lack the spatial resolution and time accuracy needed for decisions involving key weather phenomena impacting aviation. Current legacy information is in unusable form for integrated use in Air Traffic Management (ATM) decision-support tools (DST) for the potential impacts on aircraft. Aviation weather products for the same phenomena impacting aviation operations are often inconsistent, redundant, or are not accurate. Current legacy-processing and closed architectural systems are incompatible with one another. Legacy weather infrastructure is too limited and unable to ingest and process observation, forecast, and modeling data to meet high-quality products with a longer time horizon. Existing legacy software is inefficient, difficult to modify, and unable or incompatible to serve users across multiple domains. Current weather infrastructure is not up to an enterprise scale, and unable to support NextGen integration requirements and greater societal demand.

How Do You Know The Program Works?

NWP is currently in Investment Analysis. An Initial Investment Decision (IID) is scheduled to occur by the end of the fiscal year 2013. NWP conducted a Market Survey with Industry to determine vendor capabilities. NWP also performed a Request for Information (RFI) with Industry, obtaining information that is allowing the project team to better plan the acquisition. After IID, Final Investment Analysis activities will take place. The baseline will be established at Final Investment Decision (FID), planned for the third quarter of fiscal year 2014.

NWP is tied to producing aviation-relevant weather that meets the needs of users and their decision-support tools. When combined with the optimization of weather observations, improved forecasts, probabilistic forecasts, and translation into direct airspace constraints, users will be able to identify the best routes to fly for their aircraft type, flight plan and flying preferences, and for traffic flow management to optimize the airspace capacity given the weather constraints and demand. Advanced NWP products will also benefit other NextGen solution sets, including trajectory-based operations, collaborative air traffic management, and high-density operations.

The Corridor Integrated Weather System (CIWS) Prototype has undergone extensive testing and user evaluation. It has been evaluated and found to provide accurate results over a two-hour period. Prototype users have attested to its effectiveness in support of strategic planning. Similarly, the 0 - 8 hour prototype product has achieved highly positive user evaluation. The GFI algorithms, which form the basis of these meteorological forecasting applications, have been thoroughly evaluated by FAA research authorities. The NWP Program is hardening the code and producing documentation associated with the legacy prototypes as part of a GFI package for this investment.

Why Do We Want/Need To Fund The Program At The Requested Level?

$23,510,000 is required to continue work within the NWP program. As stated above, NWP provides a weather processing platform that will replace the existing (aging) FAA weather-processor systems, and will also provide new capabilities to meet the anticipated needs of DSTs and operational decision makers in the NextGen era. Overall, NWP will provide the following benefits:

- Transition to operations reliable, highly resolved products of aviation-relevant weather that meet the needs of users and their decision support tools

- Generate Weather information in a form useable by ATM DSTs such as indices that indicate the severity of weather conditions for various parameters (e.g., convection) and the impact of the conditions on various aircraft types and configurations
- Scalable and expandable processor architecture serving multiple domains with capacity to support the intensive processing demands of advanced applications
- Portable, non-proprietary, open software applications to sustain legacy functionality and meet NextGen requirements
- Probabilistic weather information with regard to specific airspaces or trajectories

A reduction in the NWP requirement would cause a significant delay in the NWP contract award which will ultimately impact the Initial Operating Capability (IOC) milestone in 2016. CIWS would also need a technology refresh in the same time frame which would be avoided by subsuming CIWS functionality directly into NWP at the commencement of the contract. The Weather and Radar Processor (WARP) maintenance and sustainment contract is scheduled to end in 2016.

Detailed Justification for - **2B01 Airport Surface Detection Equipment – Model X (ASDE-X) Technology Refresh (TR) and Disposition**

What Is The Request And What Will We Get For The Funds?

FY 2014– Airport Surface Detection Equipment – Model X (ASDE-X) – Technology Refresh and Disposition
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ASDE-X Technology Refresh and Disposition	$2,200	$7,400	$12,100	+$9,900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Hardware/Software Engineering Services	---	$11,200.0
b. Program Management	---	300.0
c. Second Level Engineering	---	600.0
Total	Various	$12,100.0

For FY 2014, $11,100,000 is requested to begin hardware procurement for the ASDE-X processor replacement and Universal Access Transceiver Receiver (UATR) Upgrade project. Funds will also be used to complete processor replacement key site testing. The ASDE-X team completed a study in FY 2012 to determine the equipment and software that needs to be upgraded, updated, or replaced as part of the ASDE-X Technical Refresh effort. Three of the five potential projects identified in the study were approved.

These potential projects are:

- Obsolescence/Spare Parts Procurement will increase the depot stock of components that are projected to be depleted from the ASDE-X Depot prior to the end of the ASDE-X lifecycle
- ASDE-X Processor Replacement replaces the obsolete ASDE-X processors with Linux based processors running applications updated via the Airport Surface Surveillance Capability (ASSC) Program
- The Universal Access Transceiver Receiver (UATR) Upgrade modifies the existing UATR in each remote unit (RU) to the updated UATR2 to address existing UATR performance shortfalls. In addition, $1,000,000 is requested to support continued ASDE Surface Surveillance System sustainment.

What Is This Program?

ASDE-X Technology Refresh and Disposition

ASDE-X is a surface surveillance system that provides air traffic controllers with a visual representation of the traffic situation on the airport movement area and arrival corridors. It improves the controller's ability to maintain awareness of the operational environment and to anticipate contingencies. ASDE-X Safety Logic (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 first ASDE-X system was delivered in 2002. Some of the equipment has reached the end of its life and is no longer supportable. The ASDE-X technology refresh program provides for the replacement and upgrade of hardware to ensure the continued operation of the surface surveillance system through its designated lifecycle. The ASDE-X program baseline included costs for the periodic replacement of commercial off-the shelf (COTS) system components; e.g., processors, displays, computer operating systems, and commercially available software (CAS).

All 35 ASDE-X systems are operational and commissioned in the National Airspace System (NAS). The first ASDE-X system was delivered in 2002 and the final system was installed in 2011. ASDE-X systems are located at the following airports:

General Mitchell International Airport, Milwaukee, WI	Orlando International Airport, Orlando, FL
Theodore Francis Green State Airport, Providence, RI	William P. Hobby Airport, Houston, TX
Seattle -Tacoma International Airport, Seattle, WA	Lambert - St Louis International Airport, St. Louis, MO
Hartsfield - Jackson Atlanta Int'l Airport, Atlanta, GA	Bradley International Airport, Hartford, CT
Louisville International Airport, Louisville, KY	Chicago O'Hare International Airport, Chicago, IL
Charlotte - Douglas International Airport, Charlotte, NC	Washington Dulles International Airport, Chantilly, VA
Detroit Metro Wayne County Airport, Detroit, MI	Phoenix Sky Harbor International Airport, Phoenix, AZ
John F. Kennedy International Airport, New York, NY	Los Angeles International Airport, Los Angeles, CA
Ft. Lauderdale/Hollywood Airport, Ft. Lauderdale, FL	Newark International Airport, Newark, NJ
Boston Logan International Airport, Boston, MA	George Bush Intercontinental Airport, Houston, TX
Miami International Airport, Miami, FL	Denver International Airport, Denver, CO
Philadelphia International Airport, Philadelphia, PA	Minneapolis-St. Paul International Airport, Minneapolis, MN
Dallas/Ft. Worth International Airport, Dallas-Fort Worth, TX	John Wayne-Orange County Airport, Santa Ana, CA
Salt Lake City International Airport, Salt Lake, UT	Ronald Reagan Washington National Airport, Washington, DC
Chicago Midway Airport, Chicago, IL	San Diego International Airport, San Diego, CA
Honolulu International – Hickam AFB Airport, Honolulu, HI	New York LaGuardia Airport, New York, NY
Las Vegas McCarran International Airport, Las Vegas, NV	Baltimore-Washington International Airport, Baltimore, MD
Memphis International Airport, Memphis, TN	

DOT Strategic Goal - Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The ASDE-X technology refresh program will maintain the safety and efficiency benefits attained during ASDE-X system deployment. The first site was delivered in FY2002 and some of the equipment has reached the end of its service life and is no longer supportable. By replacing obsolete and high failure items, the technology refresh effort will maintain the current levels of system availability and reliability. If ASDE-X systems are not operational, safety and efficiency benefits realized during system deployment will be lost.

The ASDE-X systems provide both safety and efficiency benefits. The primary benefit, increased safety, is achieved by providing air traffic controllers with improved situational awareness. This results in a reduction of the number of Category A and B runway incursions and accidents. Additionally, the improved surveillance capacity allows for more efficient coordination and communication with aircraft, improved mobility, reduced taxi times and delays, and consequently lower costs for aviation providers and customers.

Also, the Runway Status Lights (RWSL) system requires ASDE-X data to function. The RWSL benefits are not achievable without a reliable and available ASDE-X system.

How Do You Know The Program Works?

The ASDE-X Technology Refresh program will be considered successful if after the implementation of technology refresh equipment, the ASDE-X system reliability and availability numbers continue to meet the system specification and requirements especially as the system ages.

The program will be deemed a success if the number of Category A and B runway incursions is maintained at the current levels or further reduced.

Why Do We Want/Need To Fund The Program At The Requested Level?

If the ASDE-X Technology Refresh program is not funded at the requested level, ASDE-X systems in National Airspace System (NAS) may see increased system outages. A reduction would result in delays to the technology refresh procurement activities and to the implementation of technology refresh equipment. Operational systems may be impacted when parts of the system start to fail and are no longer supportable. Impact to operational systems may also affect the deployment and operation of Runway Status Lights systems.

Detailed Justification for - 2B02 Terminal Doppler Weather Radar (TDWR) – Provide

1. What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Doppler Weather Radar (TDWR) – Provide
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Doppler Weather Radar (TDWR) – Provide	$7,700	$2,500	$3,600	-$4,100

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$1,050.0
b. Engineering and Software Upgrade	---	1,000.0
c. Computer Hardware Procurement/Production	---	800.0
d. Benefits Assessment Support Activities	---	450.0
e. Antenna Motor Controller/Slip Ring Retrofit	---	300.0
Total	Various	$3,600.0

For FY 2014, $2,600,000 is requested for the TDWR Radar Data Acquisition (RDA) software upgrade, acquisition and installation of production modification kits for the Radar Product Generator (RPG) computer rehost, and Antenna Drive Motor and Slip-ring modification and installation. The TDWR SLEP program replaces Elevation Antenna Drive, Radar Product Generator UPS, Transmitter Control Circuit Cards, RF Filter Amplifier, RDA, RPG Computer, Radome, Facility Air Conditioner, and Antenna Drive Motor with Slip-ring.

In addition, $1,000,000 is requested to perform an investment analysis/business case which includes the Diminishing Manufacturing Sources and Material Shortages (DMSMS) study. This effort will review the logistics supportability, Reliability, Maintainability, and Availability (RMA) analysis, site survey to check the integrity of radar equipment facilities/shelters and grounding systems, and cost-benefit analysis in preparation for the Investment Analysis Readiness Decision (IARD).

What Is This Program

The TDWR is an important component of the Federal Aviation Administration (FAA) and National Weather Service (NWS) weather information, alerting and forecasting family of monitoring and predicting systems. The current system is facing serious obsolescence issues and must be updated to preclude an adverse, potentially disastrous, impact to the current aviation weather safety initiatives.

The primary mission of the TDWR is to enhance the safety of air travel through timely detection and reporting of hazardous weather conditions including wind-shear events, microburst, gust fronts, and thunderstorms in and near an airport's terminal approach and departure zones. TDWRs are installed at higher-density airports with high occurrences of thunderstorms, and provide controllers current information on severe weather so that they can issue warnings to pilots. TDWRs are operational at 46 airports. TDWR weather data is transmitted to FAA automation systems and also to other federal agencies; see below.

- **TDWRs main customers.** The TDWR Service Life Extension Program serves 46 major airports by providing weather data to the Integrated Terminal Weather System (ITWS) which disseminates windshear products based on TDWR data to major ATCTs and to over one thousand airline dispatchers among seven airline companies.

- **TDWRs primary FAA interfaces.** Nine TDWRs receive windshear and airport wind information from the Low-Level Wind Shear Alert System-Network Expansion (LLWAS-NE++) system. TDWR integrates LLWAS-NE data with its own detections to provide enhanced wind shear protection services at those nine airports. At the 37 airports with no LLWAS-NE, the TDWR receives airport wind data from the Wind Measurement Equipment (WME) (formerly LLWAS-2) or from the Automated Surface Observing System (ASOS). TDWR is also a major weather source for the Corridor Integrated Weather System (CIWS) which further integrates a suite of weather decision aids for en route aviation facilities in the U.S.

- **TDWR serves other federal agencies and the general public.** TDWR provides weather radar data to 34 National Weather Service forecast offices. The TDWR data complements the other radar and non-radar sensor data available to the local Weather Forecast Office (WFO) allowing them to prepare better local forecasts, alerts, warnings and additional products and services provided to the FAA and the general public by NOAA/NWS. The four TDWRs in the Washington, DC area provide data to the Urban Shield Wind Dispersion Project that is operated by the Pentagon Force Protection Agency.

DOT Strategic Goal - Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The TDWR system has been in service since 1994. It is comprised of a substantial number of proprietary software and hardware components, many of which have become obsolete and present significant supportability problems that worsen with time. Without the Service Life Extension Program, TDWR outages will become more numerous and lengthy, and support costs will rise faster than will be the case with the SLEP.

The previous TDWR SLEP project funding will end in FY 2014 and all projects will be completed by the end of FY 2017. These initial SLEP projects addressed the antenna drive systems, out of date computer processor systems, and several other assemblies which needed to be upgraded and modernized. TDWR SLEP2 will address other TDWR systems that have deteriorated due to aging, and have become obsolete or unsupportable.

How Do You Know the Program Works?

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 microburst, 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.

Thus far, the SLEP has eliminated outages due to antenna gear failure, and maintained service availability by replacing parts of the system that are difficult to maintain and support.

Why Do We Want / Need To Fund The Program At The Requested Level?

FY 2014 funds are required to complete the TDWR SLEP Program. $2,600,000 is required to complete the TDWR RDA computer hardware and software upgrade and RPG computer rehosting from the obsolescent computer platform. FY 2014 fund will continue to fund installation of the Antenna Drive Motor modification and deployment. FY 2014 is the last year this program is scheduled to be funded to complete this TDWR SLEP Program.

$1,000,000 is required to perform an investment analysis to address operational and maintenance shortfalls in order to sustain the existing TDWR infrastructure and also to preserve this valuable investment from this agency. A reduction in funding will delay the TDWR SLEP2 IARD milestone.

Detailed Justification for - **2B03 Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1) ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1)	$25,000	$34,500	$45,500	+$20,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Task	Locations/ Quantity	Estimated Cost ($000)
A. TAMR Phase 1		
a. Software Design and Development	---	$5,000.0
b. MDM Hardware Procurement	110	2,000.0
c. G-4 Hardware Procurement	6	9,400.0
d. Site Preparation and Installation	3	8,400.0
e. Logistics	---	1,900.0
f. Program Management Support	---	7,300.0
g. System Engineering (COTS/CAS)	---	7,500.0
Total	Various	$41,500.0
B. FTI Upgrade for STARS		
a. Telecommunications Infrastructure	---	$4,000.0

A. TAMR Phase 1 is requesting $41,500,00 for the following:

- $5,000,000 is requested for continuation of STARS software enhancements to implement required security and safety enhancements, and new functionality, upgrades needed for enhanced performance and capacity in support of NextGen initiatives. These include additional tracker changes, priority STRs, and initial efforts for the first TAMR convergence build. The funding will continue to provide for program, system engineering, and technical support. Specifically, STARS will begin coding the merge of the operational builds (R25B and prior) with the TAMR builds (E1). This merge will result in a common software baseline to be used on all current STARS systems

- $36,500,000 is requested to fund the replacement of the Sun Ultra 5 processors and the obsolete Sony Main Display Monitors (MDM) which is the old Cathode Ray Tube (CRT) type displays with current state of the art high definition flat panel LCD displays. A total of 110 displays will be procured. The program will conduct three site surveys and six hardware procurements for the G-1 to G-4 technology refresh three STARS operational sites which currently use the Sun Ultra 5 processor will be technically refreshed. In addition to the site specific activities, Commercial Off The Shelf/Commercially Available Software (COTS/CAS) tech refresh sustainment engineering efforts will continue. This request also funds the programs non-prime support/activities. (This includes Program Management, Systems Engineering, Risk Management, Finance, Deployment and Project Administration).

B. Telecommunications Infrastructure: Also requested is $4,000,000 for a separate core network to provide a parallel backup network, in the event of an unlikely network-wide outage and to meet requirements for NAS services.

What Is This Program?

STARS is a joint Department of Defense (DoD) and Federal Aviation Administration (FAA) program to modernize terminal air traffic control automation systems.

The STARS program funded replacement of the automated radar processing and display systems at 47 TRACONs and their associated Air Traffic Control Towers with Ultra-5 processors and Sony 2K displays (1996 – 2005). The program is currently in a tech refresh cycle. Air traffic controllers use STARS automation and displays to ensure the safe separation of military and civilian aircraft within the nation's airspace. This investment is part of a phased approach to modernizing our terminal air traffic control equipment. Currently the program updates existing TRACONs and towers with state-of-the-art systems featuring, current processor technology, large-screen, high-resolution, LCD displays, and is expandable to accommodate future air traffic growth and new hardware and software. STARS addresses; technology, mobility, and security gaps with the existing systems.

On April 20, 2004, the FAA Joint Resources Council (JRC) directed a phased approach to terminal automation modernization. The JRC approved STARS as a replacement for 47 key site systems, out of the 51 operational STARS sites, within three years. The current scope of the STARS program is to sustain and enhance those systems already deployed. To sustain operations STARS requires technology refreshment and software enhancements. A brief discussion of both initiatives follows below:

Technology Refresh: As in any Commercial Off-The-Shelf (COTS) based system, an aggressive hardware technology refreshment program is essential. Planning for technology refreshment enables identification and qualification of affected components before they become inoperable due to obsolescence. For example, the processor currently used in STARS is no longer available from the manufacturer. The consequences of obsolescence have collateral implications in the areas of engineering, training, maintenance and many other disciplines.

Terminal (Software) Enhancements: Funding for Terminal Enhancements addresses issues identified by controllers, stakeholders, and operating facilities personnel. This project funds required security enhancements, corrective and perfective changes to enhance system performance and functionality. Enhancements include addressing evolving safety requirements (e.g. Minimum Safe Altitude Warning system and Conflict Alert) and upgrading interfaces with other systems (surveillance, centers, oceanic). Regular reviews of system performance identify and prioritize issues and schedule the work to be completed in any fiscal year. Software changes that are needed to address changes in hardware are done under this program to support the STARS Technology Refresh activities, and/or the upgrades needed for enhanced performance and capacity.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

STARS is essential for providing safe separation of arrival and departure aircraft in the terminal area of the national airspace system. The STARS system is fully digital and capable of tracking all aircraft within the defined terminal airspace using available FAA or DOD surveillance products, including ADS-B. This system provides functions equivalent to or better than those accomplished by the existing terminal automation systems along with enhanced security. The 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.

Replacing the original Ultra-5 processors, that have reached their end of maintenance, provides technology refreshment which allows for continued STARS system terminal services. The action to remove the Ultra-5's from service is necessary and is driven by expiring battery life, depleted repair capability, parts availability, and performance degradation due to current and future NextGen requirements. Adequate batteries were procured as a one-time buy to insure utilization of the Ultra-5 processors until FY 2014. A further procurement will not be available. Replacing the original Sony 2K CRT (cathode Ray Tube), that have degraded display capability, provides air traffic controllers with high definition displays.

To enable completion of the Ultra 5 replacement, qualification of a new processor, began in FY 2009 and continued into FY 2010 – FY 2011. Procurement and replacement of the first block of replacement processors occurred in FY 2011. This enabled current system availability to be maintained and allow the STARS system to support proposed NextGen capabilities as they are fielded. The new generation of processors will also enable STARS to move into a more open architecture providing benefits in increased Mean Time between Failure (MTBF) and potentially lower overall system operating costs.

How Do You Know The Program Works?

STARS systems are a vital link in the nation's air traffic control system. Fifty-one STARS systems are successfully operating in the National Airspace System (NAS). For example, STARS is operational at Philadelphia, Miami, Houston, Las Vegas, and Phoenix, all major airports. Over the past five years, the average equipment availability for STARS is 99.9996 percent.

This program will fund the Technical Refreshment activities at fourty-seven of the fifty-one operational STARS sites.

Why Do We Want / Need To Fund The Program At The Requested Level?

$45,500,000 is required to support the continued high operational availability STARS by incorporating software enhancements/refinements and hardware technology refresh. In addition, STARS supports the automation infrastructure on which to build the future NextGen (ADS-B) operational initiatives.

A reduction in funding will defer procurement of Generation 4 (G4) STARS System processors. G4 processors are required to replace STARS G1 (SUN Ultra 5) processors that have been in service beginning in 2001. ithout these upgrades, STARS cannot support ADS-B and advanced applications due to processor limitations. Reductions to proposed funding will also diminish the procurement of MDM replacement for existing SONY CRTs. The Sony CRTs have reached end-of-life and must be replaced.

Detailed Justification for - 2B04 Terminal Automation Modernization/Replacement Program (TAMR Phase 3)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Automation Modernization/Replacement Program (TAMR Phase 3) ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Automation Modernization/Replacement Program (TAMR Phase 3)	$108,750	$153,000	$136,550	+$27,800

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Segment 1		
a. Solution Implementation	7	$59,773.0
b. Program Management	10	2,788.0
c. Systems Engineering	8	6,832.0
d. Site Activation	2	3,185.0
e. Logistics	8	2,683.0
f. Telecommunications	1	1,239.0
g. Independent Operational Test and Evaluation (IOT&E)	1	350.0
Total	Various	$76,850.0
B. Segment 2		
a. Solution Implementation	32	$50,500.0
b. Program Management	33	1,800.0
c. Systems Engineering	32	500.0
d. Test and Evaluation	1	250.0
e. Integrated Logistics Support	33	3,800.0
f. Implementation	---	2,850.0
Total	Various	$59,700.0

For FY 2014, $136,200,000 is requested for TAMR Phase 3, which includes $76,500,000 to complete the development of software, equipment purchases, site preparation, equipment installation of the STARS system for Segment 1, and $59,700,000 for TAMR 3 Segment 2 for hardware procurement, testing, site preparation, and equipment installation of the STARS system for Segment 2. In addition $350,000 is requested for Independent Operational Test and Evaluation efforts.

What Is This Program?

Terminal Automation systems are essential for controllers to manage the operations at our nation's busiest airports. The automation systems rely on information from radar and weather sensors, along with flight plan information for each aircraft to inform controllers of the aircrafts location and intended path of flight so they can safely and efficiently maintain aircraft separation at or near airports.

The TAMR program provides a phased approach to modernizing the automation systems at the FAA's Terminal Radar Approach Control (TRACON) facilities and their associated Airport Traffic Control Towers (ATCT) throughout the NAS.

TAMR Phase 3 addresses the modernization/replacement of Common Arts automation systems at 103 TRACONs and associated Air Traffic Control Tower facilities with STARS to meet NextGen mid-term goals. The FAA will continue to sustain the automation systems at these sites while monitoring system performance to identify any deterioration in service.

On April 21, 2010, the TAMR Phase 3 Program received Joint Resource Council (JRC) approval to segment the program.

A. Segment 1

On December 21, 2011 the TAMR Phase 3 Segment 1 Program received a Final Investment Decision from the Joint Resource Council (JRC) to replace 11 ARTS IIIE automation systems and associated Air Traffic Control Towers with a STARS system in support of ADS-B, and to enable convergence to a single Terminal Automation hardware and software platform by 2017.

The requested funds will be used as follows:

- Complete Initial Operating Capability (IOC) at Dallas (D10) on second software build
- STARS Equipment Installation at two sites Minneapolis (M98) and Potomac (PCT)
- Site Prep Activities at remaining three sites Louisville (SDF), Chicago TRACON (C90), and New York TRACON (N90)
- Purchase of STARS hardware for two sites Denver (D01) and St. Louis (T75)

B. Segment 2

The TAMR Phase 3 Segment 2 program will replace 91 ARTS IIEs and 6 ARTS IEs and associated Air Traffic Control towers with a STARS system and will complete the convergence to a single Terminal Automation hardware and software platform by 2019. The Segment 2 program Final Investment Decision (FID) was approved by the JRC September 19, 2012.

The requested funds will be used as follows:

- Transition from CARTS and activate STARS with IOC at five sites
- Site preparation activities at 10 sites
- Installation of hardware at seven sites
- Procure 18 systems

DOT Strategic Goals - Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

A. Segment 1

The ARTS IIIE automation systems have commercial-off-the-shelf (COTS) hardware that is either aging or approaching the end of its useful life and will need to undergo technical refresh in order to support ADS-B services in the NAS.

The 11 ARTS IIIE automation systems must be modernized. Their size and importance to the NAS will not allow them to continue to operate with current functionalities indefinitely. These systems were installed or upgraded to their current configuration in the 2000 - 2008 timeframe.

Additionally, the decision was made to converge terminal automation systems to a single terminal automation platform to avoid dual software development costs and resolve hardware supportability issues.

B. Segment 2

The ARTS IIE sites have hardware that is aging, is beyond its useful life, and must be replaced to support ADS-B services in the NAS.

The 91 ARTS IIE sites must be modernized. These systems were installed in the 1970s, with processors upgraded to their current configuration in the 2000 – 2002 timeframe.

Additionally, the ARTS IIEs, due to lack of processing speed and capacity, are suffering from software stability issues. Without resolution, these sites risk significant decreases in system availability, and with that, increased safety risk.

The ARTS IEs will be replaced to complete the convergence to a single terminal automation system.

How Do You Know The Program Works?

By replacing the 11 ARTS IIIE, the 91 ARTS IIE and six ARTS IE automation systems with a STARS solution we expect the system to have the same availability as the current STARS solution. The STARS system is already operational at 51 terminal sites, and over the past five years, the average equipment availability for STARS is 99.9996 percent.

Quantitative benefits (cost avoidance) expected include: cost avoidance to maintain aging equipment, maintaining a single software baseline versus two software baseline, lifecycle benefits of common displays and processors, common hardware for re-use and expansions. Qualitative benefits are expected to enhance controller's situational awareness and lessen risk through efficiency and commonality.

The TAMR Program will replace and/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, continued service and support of ADS-B services in the NAS.

Why Do We Want/Need To Fund The Program At The Requested Level?

$136,550,000 is required to complete the activities. Failure to fund these activities at the requested level will result in delays to the program, increased operational and maintenance costs to support two terminal automation systems in the NAS, failure to meet ADS-B and NextGen Segment Alpha operational enhancements, a delay to complete the convergence to a single terminal automation system, and a potential breach of the approved Acquisition Program Baseline.

Detailed Justification for - 2B05 Terminal Automation Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Automation Program
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Automation Program	$2,500	$2,500	$2,600	+$100

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Technical Refresh Implementation	---	$1,475.0
b. Optimization, Enhancements, Engineering Services	---	575.0
c. Program Management	---	150.0
d. System Engineering	---	400.0
Total	Various	$2,600.0

For FY 2014, $2,600,000 is requested to continue procurement of hardware and software to replace obsolete equipment currently in the field and program management support to procure and install replacement Flight Data Input/Output (FDIO) system components at 100 FAA and DoD ATC facilities. Replacement components consist of monitors, terminal servers, and a new Operating System and software procured in FY 2014 and prior years will be deployed at FAA and DoD ATC facilities during FY 2014.

What Is This Program?

The FDIO replacement project ensures the continuation of services in the National Airspace System (NAS) by replacing key components (i.e., servers, displays, keyboards, printers, remote control units (RCUs), and Replacement Alpha Numeric Keyboards (RANKS)) as they reach end-of-life or become obsolete. The replacement of FDIO system equipment serves to enhance the capability and sustain system operational availability at the required levels. Also provided is a common IP infrastructure to support future En Route Automation Modernization (ERAM)/System Wide Information Management (SWIM) architectures.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The NAS relies on the continuation of the capabilities provided by FDIO until these capabilities are replaced by future NextGen technologies such as Terminal Flight Data Management (TFDM) system in the 2017 - 2020 timeframe.

The FDIO equipment operates on 1980's technology which limits system capacity and increases the difficulty in maintaining the systems. Since 1998, the program has replaced obsolete/end-of-life components in the system. However, in FY 2010, components procured and replaced between 1998 - 2007 again reached end-of-life or became obsolete requiring another cycle of technical refresh. For example, the Personal

Computers, keyboards, CRT monitors, and printers are key components of the system that require replacement. Replacement of the legacy equipment will benefit the FAA by providing greater operational availability of the FDIO through the use of state-of-the-art equipment.

The FDIO system provides standardized flight plan data, weather information, safety related data, and other information to air traffic controllers at more than 650 NAS facilities. Controllers input flight data to the Host Computer System (HOST) at ARTCC facilities. The FDIO system electronically retrieves the flight data from the HOST and prints this information on paper strips provided to the controllers at the (TRACON, ATCT, and Radar Approach Control (RAPCON)) facilities. This information assists controllers in tracking aircraft and anticipating the arrival of aircraft in the sector under their control. The FDIO system also receives data from the TRACON, ATCT, and RAPCON facilities and relays this data back to the HOST.

How Do You Know The Program Works?

The FDIO Program has been replacing obsolete and end-of-life components since 1998. According to the NAS Performance Analysis System (NASPAS), the average adjusted level of system availability between 1998 and 2010 has ranged between 99.942 percent and 99.954 percent, which meets the FAA's target to, "Sustain adjusted operational availability of 99.7 percent for the reportable facilities that support the Nation's busiest airports through FY 2013"

Why Do We Want / Need To Fund The Program At The Requested Level?

$2,600,000 is required to ensure the availability and reliability of system hardware and software to support current system capabilities and NAS modifications/enhancements. The modifications help improve airport arrival efficiency, and enhance safety and system utility. The funding requested will ensure the continued procurement of hardware and software as well as the installation of hardware and software procured in prior years.

Moreover, as the FDIO System currently runs on Versatile Real Time Executive (VRTX) which is no longer supported by the vendor, in the current form, the FDIO system is unable to keep up with and meet applicable mandated operational and security requirements for NAS operational systems. A funding reduction will delay the deployment of technology refresh kits which could pose operational and security problems within the NAS.

Detailed Justification for - 2B06 Terminal Air Traffic Control Facilities – Replace

What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Air Traffic Control Facilities – Replace
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Air Traffic Control Facilities – Replace	$51,600	$60,770	$71,998	+$20,398

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Segment 1 Advance Requirements and Other Direct Costs	---	$7,200.0
b. Segment 2 Facility Design	---	0.0
c. Segment 3 Construction Award	---	47,540.3
d. Segment 4 Equipment and Utilities Installation	---	6,700.0
e. Segment 5 Disposition, Demolition, and Decommissioning	---	10,558.0
Total	Various	$71,998.3

For FY 2014, $71,998,300 is requested to fund Segments of the Tower/TRACON Replacement Program.

$7,200,000 is requested to fund the first segment of funding for the Replacement of Tower/TRACON facilities at FAA. These funds support Advance Requirements Definition and Program Management costs for planning and overseeing the program. Activities supported under Segment 1 include the evaluation of unique operational and maintenance requirements that impact Tower/TRACON Facilities, development of the business case, mock-up of the Airport Facility Terminal Integration Laboratory (AFTIL) to assist with evaluation of the attributes of proposed airport sites, actual site selection, and other advance engineering considerations.

No funding is requested for the second segment of funding in FY 2014 for this program. Segment 2 funding would encompass the design phase of a Tower/TRACON replacement project. Estimations for cost and equipage would progress based upon the proposed facility size and the operational level planned for the facility and would be evaluated against standardized facility sizes and designs throughout the NAS. During Segment 2, the standardized design would be modified and adapted as necessary to accommodate the specific site that was selected.

$47,540,300 is requested for segment 3, construction costs, associated with 3 Tower and TRACON facilities. Funding is requested in the amount of $40,198,300 for a new Tower facility at Charlotte, NC and is expected to fund the full construction contract amount for the Tower facility. Funding for the TRACON at Charlotte will be requested in the FY 2015 budget request. In addition, $5,342,000 in construction funding is requested for the planned Tower project at Tucson, AZ that is the result of higher cost estimates that have occurred as the facility design nears completion. $2,000,000 is requested to complete the construction funding for the West Palm Beach TRACON facility. Moving forward, FAA is also closely evaluating construction cost estimations to ensure full funding levels are requested prior to beginning construction.

Segment 4 funding in the amount of $6,700,000 is requested in FY 2014 to procure equipment and utilities installation at facilities that are currently nearing the end of facility construction. Equipment planned for purchase and installation includes: automation systems, airport surveillance connectivity, engine generators, voice switches, and FAA Telecommunications Infrastructure (FTI). The facilities that are slated for Segment

4 funding include the Chicago, IL South Tower for $2,100,000 and the Cleveland, OH Tower/TRACON Facility for $4,600,000.

Segment 5 Funding in the amount of $10,558,000 is requested for five facilities. This segment funds the disposition, demolition, and decommissioning of the old facility that has been replaced. The facilities included in this request are; Fort Lauderdale Executive Tower $300,000, Kalamazoo Tower/TRACON $200,000, Las Vegas Tower/TRACON $3,958,000, San Francisco Tower $5,900,000, Traverse City Tower $200,000.

Replace Terminal Air Traffic Control Facilities:

Segment Description	FY 2014 ($M)
Advance Requirements – Segment 1	
Advance Requirements Definition/Program Management.	7.2
Construction – Segment 3	
Charlotte Tower (CLT)	40.2
Tucson Tower (TUS) *	5.3
West Palm Beach Tower and TRACON (PBI)*	2.0
Equipment Acquisition/Installation – Segment 4	
Chicago South Tower (ORD-S)	2.1
Cleveland Tower and TRACON (CLE)	4.6
Disposition – Segment 5	
Fort Lauderdale Executive Tower (FXE)	0.3
Kalamazoo Tower and TRACON (AZO)	0.2
Las Vegas Tower and TRACON (LAS)	4.0
San Francisco Tower (SFO)	5.9
Traverse City Tower (TVC)	0.2
Total	**72.0**

*Construction costs came in higher than estimate, so this request will complete construction.

What Is This Program?

The FAA provides air traffic control services from more than 500 Airport Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON) facilities. Under this program, FAA evaluates which buildings may need to be replaced, sustained or modernized, especially relative to other facilities across the country, to ensure an acceptable level of building condition in support air traffic control services and to meet current and future operational requirements.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

FAA is concerned about the building conditions at various ATCT/TRACON facilities. The average age of an ATCT is 31 years and a TRACON is 25 years, with some as much as 60 years old, and in some cases, control towers and TRACONs built 20 years ago do not meet today's OSHA, operational, and building requirements. The facilities also may not have been built to meet today's technological needs, and while some facilities can be modernized or sustained to meet those needs, replacement may be the most cost beneficial method for FAA to meet operational need and conform to current building codes and design standards.

How Do You Know The Program Works?

Since 2000, 80 facilities have been commissioned, of which 39 were congressionally directed and 41 were FAA requested sites.

Why Do We Want / Need To Fund The Program At The Requested Level?

$71,998,300 is required to support design, construction contract awards, and to ensure continuation of equipment procurement, equipment installation, and disposition activities. To avoid impacts to the program schedule, the requested funding will ensure the continuation efforts of replacing aging terminal facilities.

Detailed Justification for - **2B07 ATCT/Terminal Radar Approach Control (TRACON) Facilities - Improve**

What Is The Request And What Will We Get For The Funds?

FY 2014– ATCT/Terminal Radar Approach Control (TRACON) Facilities – Improve ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ATCT/Terminal Radar Approach Control (TRACON) Facilities – Improve	$52,000	$25,200	$53,200	+$1,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Initiate Modernization, Improvements, and Repairs System Eng. Configuration Mgmt. Risk Mgmt.	TBD	$46,100.0
b. Facility Condition Assessment	---	2,400.0
c. Facility Planning and Program Support	---	1,500.0
d. In-Service Engineering	---	3,200.0
Total	TBD	$53,200.0

For FY 2014, $53,200,000 is requested to provide for the following:

- Initiate modifications, improvements, and repairs to ATCT/TRACON facilities, system engineering, configuration management, facility planning, facility condition assessments and program support services, and in-service engineering activities.

What Is This Program?

The ATCT/TRACON Terminal Facilities Improvement Program (TFIP) includes projects that 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 within ATCT/TRACON facilities. These upgrades and improvements to terminal facilities support the NAS modernization strategy to achieve efficient aerospace systems and operations.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 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 vital. In many towers, there is no room for additional equipment; therefore, base buildings must be expanded.

The program funds an average of 70 sustainment projects each year. Sustainment is defined as activities to continue the NAS/Terminal Service capability by modifying, repairing and replacing, and reconfiguring. Routine and ongoing maintenance activities are not funded from this program. The sustainment projects include many sites throughout the NAS and will consist of efforts like those described below:

- Waterproofing – Replace/Repair of building envelop components (e.g., siding, roof, windows, fascia's, eaves, gutters, downspouts, soffits, etc.)
- HVAC and Electrical/Mechanical – Replace/Repair HVAC (e.g., replace handling units, condensing units, controls, pumps, boilers, chillers, and roof top units)
- Electrical/Mechanical - (e.g., replacement/repair of electrical power cable, branch circuits and distribution wiring, light fixtures, outlets, etc.)
- Elevators – Replacement/Major refurbishment of elevators
- Plumbing – Replacement/Repair of facility plumbing system and components
- Specialties in Operations Areas– Major Replacement/Repair of Tower Cab or TRACON consoles, renovation of interior finishes, reconfiguration of operational areas
- Exterior (Civil Components) - Establishment of new access road/parking, major replacement of access road/parking lot, refurbishment of facility grounds, replacement of curbs, walkways, step, railing, etc
- Interior Finishes - Replacement/Repair Interior finishes in Administrative areas (e.g., doors, carpets, floor and ceiling tiles, stairs, handrails, catwalks, and reconfiguration of Administrative areas

The $2,400,000 requested will fund in-depth facility condition assessments all the components of a subset of the roughly 500 ATCT facilities to perform a qualitative evaluation and prioritized lists of locations for investing in replacement, sustainment or building modernization efforts. Rough order of magnitude construction cost estimates are then generated for modernizing the existing facility, and upgrading it into compliance with current codes and FAA Orders and standards, to the extent feasible.

How Do You Know This Program Works?

Between FY 2011 – FY 2012, there has been a 1.25 percent increase in FAA maintained facilities rated in "Good" standing and a one percent decrease in those rated in "Poor" standing.

Why Do We Want/Need To Fund The Program At The Requested Level?

$53,200,000 is required to initiate modifications, improvements, and repair ATCT/TRACON facilities. This includes system engineering, configuration management, facility planning, program support services, and in-service engineering.

A funding reduction from the requested level would result in the impact to several improve projects, which are planned for FY 2014. A reduction of funding would adversely impact the current FAA backlog of deferred maintenance and life cycle requirements, which presents life safety/operational risks and increases maintenance costs.

Detailed Justification for - 2B08 Terminal Voice Switch Replacement (TVSR)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Voice Switch Replacement (TVSR)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Voice Switch Replacement (TVSR)	$8,000	$4,000	$5,000	-$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Voice Switch Procurement	5	$2,000.0
b. Technical Support	---	600.0
c. Program Management Support	---	1,275.0
d. Logistics and Testing Support	---	450.0
e. Information Security	---	100.0
f. Site Preparation	---	575.0
Total	5	$5,000.0

For FY 2014, $5,000,000 is requested to procure, test, deliver and install five Terminal Voice Switch systems, refurbish two terminal voice switch systems, and for Voice Switch Bypass (VSBP).

What Is This Program?

The on-going TVSR program involves replacing the aging, obsolete voice switches in the Air Traffic Control Towers (ATCT) and Terminal Radar Approach Control facilities (TRACON). Voice switches enable air traffic controllers to communicate with aircraft as well as other air traffic control facilities. The TVSR program ensures that controllers continue to have reliable voice communications in the terminal environment. The program consists of several multiyear equipment contracts for voice switches, including: Small Tower Voice Switches, Enhanced Terminal Voice Switches, Rapid Deployment Voice Switches model IIA, Voice Switch Bypass Systems, and Interim Voice Switch Replacement. The program also provides contract vehicles for the FAA to procure voice switch equipment for new and modernized terminal facilities.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

New terminal voice switches are required to allow the use of new runway capacity that is being added to the National Air Space (NAS) as well as for all new Air Traffic Control Towers and Terminal Radar Approach Control (TRACON) that require a new Terminal Voice Switch.

These voice switches provide Ground/Ground and Air/Ground communications. Many of the older Rapid Deployment Voice System (RDVS) Type I systems and key systems used to provide Terminal Equipment Systems are currently being replaced under the Terminal Voice Switch Replacement (TVSR) program.

The TVSR program has been successful by replacing the older populated integrated digital voice switching systems in Air Traffic Control Towers (ATCT) and Terminal Radar Approach Control (TRACON) that provide non-blocking voice communication between the air traffic control operator positions, radio channels, and interphone land lines throughout the National Airspace Space (NAS) for both FAA and DoD sites located in CONUS and OCONUS.

Terminal Equipment Systems are the services that provide key equipment or switching systems used to direct and control voice communications. This allows the terminal air traffic controllers to select the various communications paths and direct the communications to desired locations. The controller can communicate with another controller position at his/her own facility or another air traffic control (ATC) facility, with aircraft (via radio) and with other locations as required. Voice switching is the mechanism that facilitates communications between Air Traffic Control and the pilots.

How Do You Know The Program Works?

This program provides reliable voice communications in support of air traffic terminal operations. The reliability of communications from controller to controller and controllers to 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.

Why Do We Want / Need To Fund The Program At The Requested Level?

$5,000,000 is required to procure, test, deliver and install five Terminal Voice Switch systems, refurbish two Terminal Voice Switch systems, and for Voice Switch Bypass (VSBP). A reduction would reduce the number of Voice Switch Bypasses.

Detailed Justification for - 2B09 NAS Facilities OSHA and Environmental Standards Compliance

What Is The Request And What Will We Get For The Funds?

FY 2014 – NAS Facilities OSHA and Environmental Standards Compliance ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
NAS Facilities OSHA and Environmental Standards Compliance	$24,600	$26,000	$26,000	+$1,400

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Environment and Occupational Safety and Health (EOSH) Compliance	---	$16,000.0
b. Fire Life Safety for Airport Traffic Control Towers (ATCTs)	---	10,000.0
Total	Various	$26,000.0

For FY 2014, $26,000,000 is requested to continue the implementation of the following major EOSH programs: Fire Life Safety, Occupational Safety and Health Compliance, Environmental Compliance, Fall Protection, Electrical Safety, Indoor Air Quality, including mold and asbestos, Incident Response, Safety Integration, EOSH Training, Requirements Integration, and Workplace Inspections and hazard abatement.

What Is This Program?

National Airspace System (NAS) Facilities OSHA and Environmental Standards Compliance programs provide comprehensive Air Traffic Organization (ATO) wide environmental, occupational safety and health management initiatives to meet federal, state, and local legal requirements in addition to negotiated agreements with employees. The EOSH Services Group is the lead organization within ATO charged with the protection of employees' well-being and the environment. Through the development of policy guidance, technical assistance, employee training, compliance monitoring, and corrective actions, the EOSH Services Group designs, and manages national compliance programs that integrate risk management into each level of the ATO infrastructure life cycle.

The Fire Life Safety program manages the implementation of projects to upgrade ATCTs and other essential NAS facilities to meet current regulatory and industry standards for employee evacuation and fire suppression consistent with the requirements of negotiated agreements. In addition to physical infrastructure upgrading, the program is responsible for developing policy and guidance, fire prevention and emergency action plans, and for training tower occupants, resident engineers, maintenance technicians, and employees on maintenance requirements for fire safety systems. Effective support and protection of the air traffic control environment is essential to limiting the impact of fire, explosion, or related events on NAS operations and facilities that also affect the flying public and FAA employees.

DOT Strategic Goal - Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

Non-compliance with federal, state, and local environmental, safety and health legal and other requirements imposes significant liabilities on the FAA in the form of interruptions to NAS operations, violations of bargaining unit agreements, regulatory fines and sanctions, civil and criminal lawsuits, post-incident response actions, such as costly cleanups, and a decrease in employee morale. Recent examples of non-compliance events include polychlorinated Biphenl (PCB) contamination after an equipment malfunction at an Air Route Surveillance Radar site, and potential employee exposure to asbestos fibers during ceiling tile removal at an Air Route Surveillance Radar site. Monthly, approximately 31 events result in disruptions to NAS operations. Effectively managing environmental and safety risks to ensure that new acquisitions, installations and modifications do not introduce new hazards and maintaining compliance with regulations, requires the implementation of EOSH compliance programs to continually identify and assess risks, integrate risk reduction into system designs, implement controls and best management practices into daily operations, and maintain a workforce with the knowledge to identify and mitigate EOSH risks at their source.

How Do You Know The Program Works?

This program implements nationally directed technical compliance programs designed to fully address federal, state, and local environmental and safety regulations and bargaining unit agreements. Within the ATO, the EOSH Services Group directs these programs in close collaboration with the Service Areas and Service Centers. The ATO Workplace Inspections and Hazard Abatement Programs are a good indicator that the program works. The ATO Workplace Inspections Program is responsible for overseeing the annual EOSH inspection of over 11,400 separate facilities nationwide. During these inspections, ATO workplaces are evaluated for both OSH and Environmental compliance and deficiencies are noted as workplace hazards. Workplace hazards are recorded in the FAA Workplace Inspection Tool (WIT) database, along with a risk assessment and an estimated cost to correct each individual hazard. The ATO Hazard Abatement Program then tracks the identified hazards until they are completely abated. As of FY 2011 the FAA WIT is tracking 106,305 individually identified workplace hazards, of which 93,668 have been completely abated.

In FY 2011, the ATO overall case rate of injuries/illnesses per 100 employees was 3.13 with total direct cost of approximately $1,190,000. Also, the Fire Life Safety program initiated upgrades at 20 ATCTs and certified 24 completed upgrades to the Occupational Safety and Health Administration, which significantly increased the protection of the Agency's infrastructure and increased employee safety.

Why Do We Want/Need To Fund The Program At The Requested Level?

$26,000,000 is required to continue implementing nationally directed technical compliance programs designed to fully address federal, state, and local environmental and safety regulations and binding commitments. Within the ATO, the EOSH Services Group directs these programs in close collaboration with the Service Areas and Service Centers to ensure the safety and health of FAA employees.

A reduction in the funding requirement would increase the exposure of FAA employees to electrical safety hazards, fall protection hazards and fire hazards. Each year, employees are exposed to potential arc flash hazards at least 6,000 times. Past arc flash injuries have resulted in an average of 12 lost work days and 18 restricted duty days per incident. As stated earlier, the total direct cost for injuries/illnesses to the FAA was approximately $1,190,000 in FY 2011.

A further reduction would have a greater impact. In addition to the impact above, the FAA would not be able to meet the terms of an agreement with OSHA that committed the agency to upgrading fire life safety systems in 20 Air Traffic Control Towers (ATCT) annually. The average cost per ATCT upgrade is $500,000.

Effective fire life safety systems are crucial to protecting personnel. For example, on March 26, 2010, a fire occurred at the Bishop International ATCT in Flint, MI. All occupants were evacuated safely because the fire life safety systems were in good order.

Detailed Justification for – **2B10 Airport Surveillance Radar (ASR-9) Service Life Extension Program (SLEP)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Airport Surveillance Radar (ASR-9) Service Life Extension Program (SLEP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Airport Surveillance Radar (ASR-9) Service Life Extension Program (SLEP)	$6,000	$6,400	$10,900	+$4,900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Implementation	---	$1,000.0
b. Solution Development	---	9,900.0
Total	Various	$10,900.0

For FY 2014, $10,900,000 is to procure Digital Remote Surveillance Replacement (DRSR) production units, complete development test of modern replacement equipment, and procure components for depot replenishment, development of Digital Remote Surveillance Communication Interface Processor (SCIP) Replacement (DRSR), and procure and implement test units.

The 135 Airport Surveillance Radar Model 9 (ASR-9) systems provide aircraft detection and weather information to air traffic controllers at major airports, including the highest activity airports (e.g., Atlanta, Chicago, Los Angeles, and Dallas/Ft. Worth). The ASR-9 SLEP Phase 2 program will mitigate supportability problems and reduce the cost to operate these systems.

What Is This Program?

ASR-9 SLEP Phase 2 will consist of implementing modifications to the aging ASR-9 radar systems and peripheral equipment to sustain primary surveillance in terminal airspace through 2027. The sustainment of the ASR-9 aligns with the NAS Enterprise Architecture Surveillance Roadmap Decision Points[1], and the Surveillance and Broadcast Services (SBS)/ADS-B backup strategy.[2] Based on this strategy, ASR-9 systems will remain in service through 2025.

The ASR-9 SLEP will mitigate issues of obsolescence, reliability and maintainability, and lifecycle costs for:

- **ASR-9 Communications Infrastructure** – The Remote Surveillance Communications Interface Processor is expensive, obsolete, and is not available in sufficient quantities to meet future TRACON expansions and/or consolidations. This replacement will remove unnecessary assemblies, reducing power consumption and reclaiming stock for future use, where applicable. Additionally, Racal Milgo modems are obsolete and other communications infrastructure components need to be replaced.

- **ASR-9 Control and Monitoring Infrastructure –** The ASR-9 Transmitter Backplane provides the interface between four major circuit cards (control and monitoring [C&M]) that control the transmitter

[1] https://nasea.faa.gov/products/roadmap/main/display/7/tab/dps/
[2] https://nasea.faa.gov/products/roadmap/main/display/7/tab/assumptions/

and provide C&M functions to site technicians. The backplane uses a wire wrap-based architecture to support important signal distributions, which couple with 21 ribbon cable assemblies to interface to various C&M components in support of system functions. A customizable transmitter backplane is required to expand transmitter C&M.

- **ASR-9 Depot Replenishment** – ASR-9 SLEP Phase 2 will procure components to reinforce the FAA Logistics center inventory of spare parts including these products: Spectrum Analyzer, Power Meter, and ASR-9 Processor Augmentation Care (9PAC).

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

ASR-9 terminal service provides for maintenance of separation standards, 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. This particular program, ASR-9 Service Life Extension Program Phase 2, reduces the risk of unscheduled outages and ensures the continuation of maximum service capabilities. In addition, this program will reduce the overall lifecycle operation costs by improving system reliability and maintainability.

How Do You Know The Program Works?

Extending the service life of the ASR-9 system will reduce outages due to performance deterioration and parts obsolescence. Furthermore, the ASR-9 service life extension will increase equipment and service availability. The success of the program will be measured by analysis of ASR-9 outages attributable to system components affected by this modification, air traffic delays due to these outages, and related demand for spare parts.

Why Do We Want/Need To Fund The Program At The Requested Level?

The ASR-9 was procured in the mid-1980s and fielded between 1989 and 1994. The system is expected to remain operational until 2027; however, the radar systems are becoming difficult to maintain. The system hosts hardware and software architectures which are becoming increasingly difficult to procure, and some of which are obsolete, resulting in cannibalization and re-engineering for short term results as a means to repair or refurbish in order to maintain this vital system.

A reduction from the FY 2014 requested funding level will result in increased risk to the ability to award contracts to:

- Initiate procurement of DRSR production units
- Initiate procurement of C&M production units
- Conduct development test of modem replacement equipment
- Initiate procurement of depot replenishment components

Detailed Justification for – **2B11 Terminal Digital Radar (ASR-11) Technology Refresh and Mobile Airport Surveillance Radar (MASR)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Terminal Digital Radar (ASR-11) Technology Refresh and MASR
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Digital Radar (ASR-11) Technology Refresh and Mobile Airport Surveillance	$3,900	$8,200	$19,400	+$15,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. ASR-11 Technology Refresh, Segment 1		
a. Retrofit Installation	---	$200.0
b. Program Management	---	100.0
c. System Engineering	---	100.0
Total	Various	$400.0
B. Mobile Airport Surveillance Radar (MASR)		
a. System Procurement and Development	---	$9,100.0
b. Test Support	---	750.0
c. Life Cycle Support Infrastructure	---	2,000.0
d. ASR-9 Refurbishment	---	1,050.0
e. Program Management	---	2,100.0
Total	Various	$15,000.0
C. ASR-11 Technology Refresh, Segment 2		
a. System Engineering Management	---	$2,000.0
b. System Requirements and Definition	---	2,000.0
Total	Various	$4,000.0

A. ASR-11 Technology Refresh, Segment 1

For FY 2014, $400,000 is requested for ASR-11 Technology Refresh Segment 1 to install four technical refresh retrofit modification kits.

B. Mobile Airport Surveillance Radar (MASR)

For FY 2014, $15,000,000 is requested for the MASR to refurbish an ASR-9/Mode-S asset and procure a Mobile ASR-11 asset, start Mobile ASR-11 System Development, Test, Program Management, and System Engineering. Funds will also include life cycle support requirements.

C. ASR-11 Technology Refresh, Segment 2

For FY 2014, $4,000,000 is requested for ASR-11 Technology Refresh Segment 2 to Procure Hardware, System Development, Program Management, and System Engineering. This funding requirement equals the ASR-11 Tech Refresh Segment 2 CIP planned value. The final FY 2014 budget value will be definitized at the Final Investment Decision (FID) scheduled for December 2013.

What Is This Program?

The ASR-11 surveillance capabilities provide air traffic personnel with coverage performance suitable for air traffic control of aircraft arrivals and departures at airports throughout the United States. These capabilities permit safe and efficient movement of aircraft in and out of airport terminal areas allowing air carriers to maximize their resources without compromising the safety of air traffic services.

A. ASR-11 Technology Refresh, Segment 1

The ASR-11 technology refresh Segment 1 program provides for the replacement and upgrade of known obsolete ASR-11 Commercial-Off-The-Shelf (COTS) hardware and software to ensure the continued operation of the radar system through its designated lifecycle. The program will replace the obsolete 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.

The technology refresh kits are planned to be retrofitted into all ASR-11 systems previously fielded with the signal data processor (SDP). A total of 68 retrofit kits have been procured thru FY 2011. ASR-11 technology refresh kits are scheduled to be installed at a rate of one site per month.

B. Mobile Airport Surveillance Radar (MASR)

The MASR is planned to eliminate an existing shortfall, which is the lack of a mobile surveillance system that can provide the level of surveillance performance needed to support planned in-service radar relocations, temporary radar service needs and emergency operations in a dense or complex airspace.

This performance shortfall will be accomplished by procuring a terminal surveillance service that can be deployed within known, short-duration timeframes and is compatible with any airport traffic control towers (ATCT), Terminal Radar Approach Control centers (TRACON), Air Route Traffic Control Centers (ARTCC), and their associated automation systems. Loss of primary and secondary surveillance products, due to either catastrophic events or long term outages, would have a definite impact on Federal Aviation Administration (FAA) mission capabilities, specifically in the areas of controller situation awareness, safety, capacity, and industry vitality.

This proposed system architecture is a reusable, service-oriented capability with an emphasis on providing the terminal surveillance service efficiently and quickly. The program goal is to have interfaces for power, mechanical, data, and remote monitoring and control defined to be interoperable with all currently deployed ASR-8, ASR-9 and ASR-11 terminal radars and their associated automation interfaces.

C. ASR-11 Technology Refresh, Segment 2

The ASR-11 Tech Refresh Segment 2 is not fully defined yet and a business case analysis is being prepared to resolve parts obsolescence and fault monitoring/fault isolation shortfalls to ensure continued reliable and cost effective operation of the radar system through its designated lifecycle. The Segment 2 Investment Analysis Readiness Decision (IARD) was completed November 2012 and the Final Investment Decision (FID) is planned for December 2013.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

A. ASR-11 Technology Refresh, Segment 1

The benefits of the ASR-11 technology refresh retrofit of the ASDP into the 68 production systems will provide a projected $45,500,000 in cost savings to the Operations and Maintenance budget, over a twenty year period, by eliminating duplicative software modifications and allowing for more efficient future signal processing software modifications. The retrofitting of the ASDP into the ASR-11 system allows increased processing speed and memory. Taking advantage of this processing capability, the ASDP software, as delivered, will include baseline changes that were not possible in the original Signal Data Processor due to processing and memory limitations. The changes to the signal processing will allow targeting of known shortcomings of the system that will improve the system performance and target detection capability in the presence of wind farms and other anomalous propagation. The ASR-11 Tech Refresh Segment 1 program addresses identified In Service Decision issues and outstanding action items associated with processing throughput and memory capacity issues with the existing Signal Data Processor (SDP).

B. Mobile Airport Surveillance Radar (MASR)

The benefits of the MASR capability are to eliminate long-term surveillance outages primarily due to airport modernization and construction projects, or a major casualty to the airport radar. Airport modernization and construction often requires the radar to be relocated, causing a multi-month outage. Large-scale radar catastrophic failures, while rare, pose a particularly significant challenge since the majority of deployed radars are no longer manufactured, and complete radar systems are typically not stocked by the logistics depot. The MASR system capability would bridge this gap and provide seamless transition from the existing legacy radar system to the system that will provide terminal surveillance service into the future.

The MASR will eliminate these two crucial operational shortfalls in the National Airspace System (NAS):

- Lack of scheduled Response Assets. The MASR can be deployed to provide temporary terminal surveillance services at an airport while the existing surveillance asset is taken off-line for scheduled relocation, airport construction, or any other long term outage
- Lack of disaster Response Assets. The MASR can be deployed to replace terminal surveillance assets that have been taken off-line due to natural or man-made disasters. The MASR system can be transported by truck, rail, or ship, and installed, and certified operational in as few as five days from the initial incident

C. ASR-11 Technology Refresh, Segment 2

The Technology Refreshment Segment 2 program will allow the Airport Surveillance Radar, Model-11 (ASR-11) to continue to provide terminal surveillance of aircraft in support of Federal Aviation Administration (FAA) and Department of Defense (DoD) air traffic control (ATC) operational needs throughout its intended service life. More specifically the Tech Refresh Segment 2 program will address shortfalls created by parts obsolescence issues and unreliable or incomplete fault monitoring/fault isolation (FM/FI) results. The goal of the program will be to ensure continued sustainment of ASR-11 equipment throughout its service life and reduction in number of Records of Operational Assistances (ROAs) related to incomplete fault monitoring/fault isolation FM/FI results.

How Do You Know The Program Works?

The ASR-11 technology refresh successfully completed testing as documented by the programs Developmental Test and Evaluation and Operational Test and Evaluation Reports. In addition, the program received approval to deploy, as documented by the In Service Decision (ISD), in January 2010. As of February 2013, 52 retrofit kits have been installed at 52 sites. Twelve sites will be installed in FY 2013 and four sites will be installed in FY 2014.

The MASR Program received Investment Analysis Readiness Decision (IARD) on March 22, 2011 from the ATO Executive Council as an ACAT-4 Program and was directed to proceed to Final Investment Decision (FID) using the preferred alternative. The MASR Final Investment Decision (FID) was obtained June 20, 2012.

Why Do We Want/Need To Fund The Program At The Requested Level?

$400,000 is required for ASR-11 Tech Refresh Segment 1 to install four technical refresh retrofit modification kits including the final installation. A reduction to the FY 2014 baseline will impact last site operational date.

$15,000,000 is required for the MASR to refurbish an ASR-9/Mode-S asset procure Mobile ASR-11 assets, start Mobile ASR-11 System Development, Test, Program Management, System Engineering, and lifecycle support requirements. A reduction to MASR budget in FY 2014 will put at risk the implementation timeline for the preferred alternative, which will result in delay in planned in-service relocation activities at several airports with significant decrease in program benefits.

$4,000,000 is required for ASR-11 Tech Refresh Segment 2. Business case analysis and planning commenced in FY 2011. FY 2011 through 2013 funding will be used to assess the ASR-11 program and identify parts obsolescence, operational performance deficiencies or other areas requiring technology refresh to ensure continued reliable and cost effective operation of the radar system through its designated lifecycle.

The Segment 2 Investment Analysis Readiness Decision (IARD) was completed November 2012 and the Final Investment Decision (FID) is planned for December 2013. Any reduction in the ASR-11 Tech Refresh Segment 2 budget in FY 2014 could impact ASR-11 system operation readiness and cost effective operation of the radar system through its designated lifecycle.

Detailed Justification for – 2B12 Runway Status Lights (RWSL)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Runway Status Lights (RWSL)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Runway Status Lights (RWSL)-Segment 1	$29,800	$35,250	$35,250	+$5,450

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$3,307.5
b. Implementation	---	982.0
c. Hardware Procurement	---	4,155.6
d. Construction	---	24,004.5
e. Optimization/Enhancements/Engineering Services	---	762.9
f. ICDLS/Documentation	---	726.0
g. Installation/Check out	---	668.7
h. Second Level Engineering	---	392.8
i. Independent Operational Test and Evaluation (IOT&E)	---	250.0
Total	Various	$35,250.0

For FY 2014, $35,000,000 is requested to continue RWSL implementation and construction activities. These activities include: starting site design for one airport, starting construction at two airports, delivering and installing the system at four airports, and achieving initial operational capability at two airports. Remaining funds will be used for systems engineering, software maintenance, Interim Contractor Depot Logistics Support (ICDLS), spare parts, second level engineering support, initial utility service, information systems security requirements, and contractor support for the program office and all of the above activities. In addition, $250,000 is requested for Independent Operational Test and Evaluation.

What Is This Program?

RWSL serves as stop lights 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/or 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. RWSL is designed to independently supplement existing air traffic controller tools and procedures without increasing the controller workload by automatically providing a clear, prompt indication of runway status directly to pilots and ground vehicle operators. RWSL acts as an independent safety enhancement and does not replace air traffic control issued clearance. The RWSL system provides a vital layer of redundancy in runway safety and is a backup and reinforcement of controller guidance.

- Construction, installation, and Site Acceptance Testing (SAT) has been completed at 8 airports: Orlando (May 2011), Phoenix (November 2012), Las Vegas (March 2013), Charlotte (August 2012), Minneappolis (November 2012), Dulles (March 2012), Houston (June 2012), Seattle (March 2013)
- Construction is ongoing at 5 airports: Baltimore, LaGuardia, Detroit, San Francisco, Los Angeles

DOT Strategic Goal - Safety:

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

A top priority of the FAA is to enhance airport safety while increasing airport capacity. Reducing runway incursions is a major component of this effort. Runway incursions develop quickly and without warning from safe and routine traffic situations on the airport surface. Such time key runway incursions usually leave very little time for corrective action. The National Transportation Safety Board (NTSB) issued a safety recommendation to the FAA to "Implement a safety system for ground movement that will ensure the safe movement of airplanes on the ground and provides direct warning capability to the flight crews." RWSL are designed to provide direct indication to flight crews and vehicle operators that it is unsafe to enter a runway or to begin a takeoff.

How Do You Know The Program Works?

This concept has been proven by Lincoln Labs and four prototype sites were deployed between 2005 and 2010 and are being utilized in an operational environment at Dallas Fort Worth (DFW), San Diego (SAN), Boston (BOS) and Los Angeles (LAX). Runway status lights shown directly to pilots and vehicle operators offer the potential to reduce runway incursions and runway conflict accidents by increasing overall situational awareness of the dynamic runway environment. This automated system has minimal Air Traffic Controller action required for its operation.

Why Do We Want/Need To Fund The Program At The Requested Level?

This program is currently baselined to be deployed at 23 of the busiest airports, to provide an additional layer of safety by the end of 2016. This program is designed to prevent major catastrophic collisions. A reduction in funding would have a direct result in delaying the deployment of this safety system.

Detailed Justification for - 2B13 National Airspace System Voice System (NVS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – National Airspace System Voice System (NVS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
National Airspace System Voice System (NVS)	$9,000	$10,250	$16,000	+$7,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. First Article Test System	---	$1,775.0
b. Software Development	---	2,789.2
c. Engineering	---	2,375.0
d. Program Management	---	1,226.1
e. Logistics	---	1,451.7
f. Contractor Support	---	6,033.0
g. Independent Operational Test and Evaluation (IOT&E)	---	350.0
Total	Various	$16,000.0

For FY 2014, $15,650,000 is requested to deliver a first article test system, conduct NextGen validation and demonstrations, and initiate work required to develop production systems. Segment 1 consists of acquiring test systems to achieve the objectives of: (1) demonstrating NextGen capabilities (e.g., resource sharing, load balancing, and enterprise management); and (2) having a production-ready system for deployment to any of the target environments. Segment 2 will consist of deploying NVS systems to operational NAS facilities. Initial deployments for Segment 2 will focus on Terminal and NextGen future facilities. An additional $350,000 is requested for Independent Operational Test and Evaluation efforts.

What Is This Program?

NVS will provide voice communications services to Air Traffic Control Specialists (ATCS), supervisors, and ancillary Air Traffic Control (ATC) operators in support of continuous ATC operations in the Terminal and En Route domains of the National Airspace System (NAS). Voice communications connectivity will be provided to aircraft flight crews and Unmanned Aircraft System (UAS) operators through Air to Ground (A/G) radio circuits or equivalent network connections. Voice communications connectivity between ATCS, supervisors and traffic managers will be provided through access to intra-facility and inter-facility G/G voice circuits or equivalent network connections.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The current switch technology deployed in the NAS will not support the expected future NextGen concept of operations for either networked facilities, or such concepts as dynamic re-sectorization and off-loading during non-peak operations. These capabilities require that lines connected to a controller's workstation can be changed to add or eliminate lines as the geographical boundaries of the sector change. The NVS will support current and future ATC operations as envisioned by both government and industry forecasters. In addition, the current voice switch system is aging and needs to be modernized to mitigate obsolescence.

How Do You Know The Program Works?

Voice switching and radio controls that are in the NAS today are providing aircraft separation capabilities. The NVS program will replace the voice components that are becoming obsolete and will provide NextGen capabilities. This program will allow the 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).

This program delivers aviation access through innovation and reduces 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
- Reducing potential costs to users from air traffic delays due to projected outages of the existing systems and increased user demand

Why Do We Want/Need To Fund The Program At The Requested Level?

$15,650,000 is required to deliver a first article test system, continue work on engineering and software development efforts, and conduct NextGen validation and demonstrations as part of Segment 1. The demonstration will include current and future NextGen features and operational concepts in the ATC environment. It will enable initiation of the production systems as part of Segment 2. An additional $350,000 is required for Independent Operational Test and Evaluation (IOT&E) activities.

A reduction would delay delivery of NextGen demonstration systems, prolong engineering and software development efforts, and postpone procurement of production systems.

Detailed Justification for - 2B14 Integrated Display System (IDS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Integrated Display System (IDS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Integrated Display System (IDS)	$8,800	$4,200	$4,100	-$4,700

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Procurement, Production and Deployment of IDSR Systems	16	$4,100.0

For FY 2014, $4,100,000 is requested for the IDS program to procure and install workstations at 16 networks at Terminal Radar Approach Control (TRACON) Facilities and the associated Airport Traffic Control Towers (ATCTs).

What Is This Program?

The IDS is a local and wide area network information dissemination and display system that consolidates information from several operational NAS weather subsystems and other operational sources onto a single display, and distributes the data to air traffic controllers and airspace managers at TRACON, Airport Traffic Control Tower (ATCT), and Air Route Traffic Control Center (ARTCC) facilities. These capabilities permit safe and efficient movement of aircraft in and out of airport terminal areas allowing air carriers to maximize their resources without compromising the safety of air traffic services.

The IDS-R program provides for the replacement of the legacy Integrated Display Systems-4 (IDS-4) with current technology. The program will replace 1,944 IDS-4 systems at approximately 256 sites nationwide. The prime contract was awarded in May 2010 and design efforts were completed in early 2011.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The NAS relies on the continuation of the capabilities provided by the IDS. The existing IDS-4 has been operational since 1994 without any technical refresh of hardware/software. As currently configured, the IDS-4 system is unsupportable and lacks the capacity to incorporate software updates. Essential hardware components needed to support DOS-based software are not available from industry and the proprietary software is no longer supported by the vendor. Due to obsolescence issues, Logistic Center spares stocks are being depleted and the single board computer necessary to support DOS based programs is unavailable for purchase. As the age of the equipment increases, the cost of maintenance support increases. Additionally, the lack of repair parts increases the likelihood and frequency of system failures. Increasing system failures will negatively impact ATC workload, increase labor costs, and reduce ATC situational awareness thereby increasing flight delays. Recent obsolescence issues and loss of proprietary software support make it necessary to replace this system to sustain its functionality.

Replacement of the legacy equipment at the 256 facilities will benefit the FAA by providing greater operational availability of the IDS associated with the use of state-of-the-art equipment thereby reducing delays at the airports. The consolidation of information provided by the IDS enhances controller's situational awareness and reduces the need for multiple displays. Additionally, controllers will be able to provide more dynamic responses to operational changes (ex: real-time weather information communicated to satellite facilities). The equipment removed from the 256 sites will enable the depot to provide supply support for the remaining sites.

How Do You Know The Program Works?

Replacing IDS systems with current technology will reduce outages, thereby reducing delays at the airports associated with the sites addressed by this investment. Measurement criteria established upon final investment decision will focus on operational availability, which were assessed on an annual basis beginning in FY 2011.

Why Do We Want/Need To Fund The Program At The Requested Level?

A reduction from the FY 2014 baseline funding will delay the procurement of and installation of the workstations at the sites as planned.

Detailed Justification for - **2B15 Remote Monitoring and Logging System (RMLS) Technology Refresh**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Remote Monitoring and Logging System (RMLS) Technology Refresh ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Remote Monitoring and Logging System (RMLS) Technology Refresh	$4,200	$4,700	$1,000	-$3,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Complete Investment Analysis for AMMS	---	$200.0
b. Develop Beta Services, Using FAA SWIM/SOA Infrastructure	---	800.0
Total	Various	$1,000.0

For FY 2014, $1,000,000 is requested to complete the Investment Analysis and begin acquiring infrastructure hardware, software, and developing web services that support the candidate system interfaces, for the Automated Maintenance Management System (AMMS).

What Is This Program?

The Automated Maintenance Management System (AMMS) will automate data sharing and integrate legacy operation and maintenance systems, web-based systems, and NextGen systems in a secure net-centric environment. AMMS will standardize data sharing using updated tools and technology for the interoperability of Tech Ops operation and maintenance systems. AMMS will effectively share information in near real time with systems, using a System Wide Information Management (SWIM) compliant Service-Oriented Architecture (SOA).

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The main objective of AMMS is to support Tech Ops by ensuring NAS availability and safe operation 24 hours a day, seven days a week.

Several key issues affect the FAA's ability to ensure the efficiency of air transportation, e.g., the numerous stand-alone FAA programs used to support the Operation and Maintenance (O&M) of the NAS. While FAA programs have been working towards making improvements, legacy systems and future FAA systems are not currently planning for improved interoperability and/or integration. This results in unnecessary costs due to duplication of efforts and inefficient labor usage. Many Tech Ops programs are not integrated, and the O&M data is shared through manual processes, e.g., voice communications, email, point-to-point message exchange services, and manually searching multiple databases. Updating system status by these means of communication often results in errors which can lead to potential safety hazards, delays in NAS status information as well as equipment repairs, execution of improper maintenance actions and improper direction for supply chain management.

AMMS will use a web-based implementation of the FAA SOA (SWIM), cloud computing, and other net-centric capabilities to integrate Technical Operations legacy systems into a set of interoperable, centralized data-sharing entities.

How Do You Know The Program Works?

AMMS will not subsume or replace existing programs. Instead, it will improve O&M information processing and comply with FAA's future vision of a net-centric environment as defined in the NextGen Mid-Term Concept of Operations for the National Airspace System v2.1, September 30, 2010. AMMS will implement the proven capabilities of the FAA service oriented architecture, currently known as SWIM, as the web services environment to eliminate unnecessary duplication, manual and limited automated processes.

AMMS will standardize protocols, interfaces, tools, and technology options to provide efficient interoperability and data sharing between existing and future Tech Ops operation and maintenance systems supporting the NAS.

Why Do We Want / Need To Fund The Program At The Requested Level?

$1,000,000 is required for AMMS to complete Initial Investment Decision (IID) in the second quarter of FY 2014, and will be ready to implement beta services leveraging the FAA Service Oriented Architecture infrastructure necessary for several planned system interface candidates.

Several planned interface candidates (e.g., LCSS, Flight Inspection) may be available for detailed design and beta development. A funding reduction will affect the number of interfaces AMMS can undertake as a proof of concept effort.

Detailed Justification for – 2B16 Mode S Service Life Extension Program (SLEP) - Phase 2

What Is The Request And What Will We Get For The Funds?

FY 2014 – Mode S Service Life Extension Program (SLEP) - Phase 2
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Mode S Service Life Extension Program (SLEP) - Phase 2	$4,000	$4,000	$7,300	+$3,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Mode S Service Life Extension Program Phase 2	---	$5,800.0
B. ASR-9 and Mode S Service Life Extension Program Phase 3 Planning	---	1,500.0
Total	Various	$7,300.0

Mode S SLEP Phase 2: For FY 2014, $5,800,000 is requested for solution development to continue development of Lowest Replaceable Units (LRUs), complete development of Beacon Video Reconstitutor, and procure depot replenishment of components and LRUs.

ASR-9 and Mode S SLEP Phase 3 Planning: For FY 2014, $1,500,000 is requested for investment analysis for SLEP Phase 3.

What Is This Program?

A. Mode S Service Life Extension Program Phase 2:

Mode S SLEP Phase 2 will implement modifications to the aging secondary Mode S subsystems architecture and peripheral equipment to sustain secondary surveillance in terminal and en route airspace through 2028. The sustainment of the Mode S aligns with the Surveillance Roadmap Decision[1], and the SBS (Surveillance and Broadcast Services)/ADS-B backup strategy.[2]

Based on this strategy, at a minimum, the Mode S systems at the 23 long range radar facilities and the top 50 high density terminal facilities will remain in service through 2025.

The Mode S SLEP will mitigate issues of obsolescence, reliability and maintainability, and lifecycle costs for:

- **Beacon Video Reconstitutor -** The Beacon Video Reconstitutor is comprised assemblies/components that have reached the end-of-life, and are not supportable. The FAA cannot repair or reverse engineer these assemblies. There are no other known sources of repair for the BVR assemblies. Without the BVR, these radar sites are precluded from the full Mode Select display functionality. Current separation standards cannot be applied using ASR-8 videos and the ARTS II position symbols (ARTS tags) alone. The lack of analog beacon slash is a major configuration change to what is currently in the field and would adversely affect present ATC procedures. The beacon position symbols alone are not acceptable for target separation.

[1] https://nasea.faa.gov/products/roadmap/main/display/7/tab/dps/
[2] https://nasea.faa.gov/products/roadmap/main/display/7/tab/assumptions/

- **Mode S Beacon Antenna System** - A five foot beacon antenna was deployed throughout the mid to late 1970's with a projected lifecycle of 20 years. All five foot beacon antennae currently servicing the NAS are operating at 10+ years past the intended lifecycle, and support for these obsolete assets is increasingly challenging. The primary means of repair/refurbishment is cannibalization of a limited number of unserviceable five foot beacon antennae for parts. There is an urgent need to manage the supportability issues of the legacy five foot beacon antenna issues.

- **Mode S Depot Replenishment –** Mode S Phase 2 will procure the non-volatile memory (NVMEM) to support Mode S systems**.**

- **Mode S Development of 4 Line Replacement Unit (LRU) Prototypes -** The LRU Prototype provides an alternative that will maintain current functionality balanced with the versatility to achieve future requirements. The LRU addresses the issue of diminishing manufacturer sources and parts obsolescence issues at the Line Replaceable Unit (LRU) level.

B. ASR-9 and Mode S Service Life Extension Program Phase 3 Planning:

This program will perform engineering studies to determine the scope of the future ASR-9 and MODE S SLEP Phase 3 programs. There are components of these radar systems that may not be supportable through 2025 and these analyses will determine the extent of re-engineering and system modifications needed. An investment decision for Phase 3 is planned for 2015.

DOT Strategic Goal – Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Mode S terminal and en route service provides for maintenance of separation standards, 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. Providing for the Mode S service life extension modifications reduces the risk of unscheduled outages and ensures the continuation of maximum service capabilities. In addition, the Mode S service life extension modifications will reduce the overall lifecycle operation costs.

How Do You Know The Program Works?

The FAA developed a two-phased strategy to provide the 132 highest traffic airports aircraft surveillance services. Phase 1 was completed in October 2010 four months ahead of schedule. Mode S SLEP Phase 2 will be implemented in a similar fashion to achieve similar benefits (reliability and maintainability improvements).

Phase 2 will build upon previous successes by ensuring that proven Commercial-Off-The-Shelf-Technologies are utilized to the fullest degree possible. Where such products are not available, prototypes will be developed to demonstrate the desired functionality, and will be formally verified for compliance with the Mode S Final Requirements standards and tolerances.

Extending the service life of the ASR-9 and MODE-S systems will reduce outages due to performance deterioration and parts obsolescence. Furthermore, the ASR-9 and MODE-S service life extensions will increase equipment and service availability. The success of the program will be measured by analysis of ASR-9 and MODE-S outages attributable to system components affected by this modification, air traffic delays due to these outages, and related demand for spare parts.

Why Do We Want / Need To Fund The Program At The Requested Level?

Extending the service life of the Modes S system will reduce outages due to performance deterioration and parts obsolescence. Furthermore, the Mode S service life extension will increase equipment and service availability. Absent the requested funding, the Mode S system will continue to experience elevated maintenance costs and increasing reliability issues as the legacy Mode S subsystem and components continue to age.

ASR-9 and MODE-S terminal and en route service provides for maintenance of separation standards, 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. This particular program, ASR-9 and MODE-S Service Life Extension Program Phase 3, will continue to perform engineering studies that determine the scope of these programs.

A reduction from the FY 2014 funding will result in increased risk to the ability to award contracts for:

- Antenna arrays for test and evaluation
- Complete supportability analysis studies to support the investment analysis process.

Detailed Justification for – 2B17 - Surveillance Interface Modernization (SIM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Surveillance Interface Modernization (SIM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Surveillance Interface Modernization (SIM)	$0	$2,000	$6,000	+$6,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$1,854.0
b. System Engineering	---	410.3
c. Software Design Development	---	3,735.7
Total	Various	$6,000.0

For FY 2014, $6,000,000 is requested to complete Final Investment Analysis and fund Second Level Engineering to complete Preliminary Design Reviews (PDRs). The PDRs will include key NAS systems, such as: ASR-9; Mode S; ASR-11; ASR-8; ATCBI-5/6; MicroEARTS; ATOP; and STARS and ERAM automation systems.

What Is This Program?

The Surveillance Interface Modernization (SIM) program will upgrade the legacy systems to provide modern interface capabilities that will allow the surveillance systems (47/ASR-8, 135/ASR-9, 72/ASR-11, 139/Mode-S, 134/ATCBI-6, 58/ATCBI-5) as well as the automation platforms (166/STARS, 21/ERAM, 6/MEARTS, 3/ITWS) to transition to standard data formats.

This allows surveillance information to be transmitted over a modern Internet Protocol (IP) network. The surveillance information can be transferred via FAA Telecommunication Infrastructure (FTI) circuits and equipment to those end users who are allowed access to the service-oriented network to support net-centric data sharing. This net-centric network occurs at the automation platform input. The transition to ASTERIX format enables extensive data, which can only be determined at the radar platform, to be delivered to the automation processor. The processing of this information, including the 24-bit aircraft address, the time stamp associated with the position information and additional resolution bits provides a more accurate determination of aircraft position. Converging all legacy radar interfaces and applications to a standard communications architecture and format will significantly reduce the cost of maintaining these interfaces as the NAS transitions to NextGen. It is also expected that, as a result of using a more modern architecture, the distribution of all available data at the radar site to both the FAA and external users will be made more effective and efficient, and information security measures can be applied more consistently. The availability of additional radar data is expected to enhance performance of ATC automation systems, and allow (in the longer-term) more robust support of future operational improvements (OIs), future facilities, as well as providing improved backup capabilities when ADS-B surveillance reduces the need for existing beacon radar infrastructure.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Surveillance data from today's legacy radars is distributed to automation systems over serial point-to-point interfaces to the nearest one or two automation facilities using various formats. Distribution to additional facilities and external users requires additional physical connections. The point-to-point connectivity and non-standard formats have inherent limitations that restrict the ease of distribution of surveillance information to other users and limit the capability to use reporting accuracy as well as architecture improvements available in more modern reporting formats and distribution schemes.

As part of NextGen, surveillance systems will be required to serve as backup to ADS-B surveillance, and to provide surveillance data needed to other government agency missions (e.g. Department of Defense, Homeland Security), however, they currently cannot be used to support the transfer and flexible distribution of expanded radar data, as legacy systems have not yet been modernized to support the more modern interface requirements. To align with future NextGen requirements additional capabilities are required to be implemented into legacy surveillance systems. These legacy systems will be required to provide data distribution other than point-to-point via modern networking techniques and transition to standard interface message formats with higher reporting precision which also provide additional target information to support future OIs. This program will implement a common industry standard communications architecture and format.

It is anticipated by having all legacy radar interfaces and applications converged to a common data format, the cost of maintaining these interfaces as the NAS transitions to NextGen will be significantly reduced. The number of surveillance interface parts requiring repair and replacement will be reduced.

How Do You Know The Program Works?

The objective of the program is to standardize all FAA radar to automation interfaces from point to point, limited data architecture to net-centric expanded data architecture. This will reduce cost and performance risks associated with data limitations and non-standard interfaces.

Why Do We Want/Need To Fund The Program At The Requested Level?

$6,000,000 is required to complete Final Investment Analysis and fund Second Level Engineering to complete Preliminary Design Reviews (PDRs) in support of the Investment Analysis. Funding for SIM integration will be requested in future year budget submissions.

Detailed Justification for - **2B18 Next Generation Transportation System – Flexible Terminal Environment - Terminal Flight Data Manager (TFDM)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Next Generation Transportation System – Flexible Terminal Environment - Terminal Flight Data Manager (TFDM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Terminal Flight Data Manager	$0	$30,600	$23,500	+$23,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Prime Contractor/Solution Implementation	---	$10,000.0
b. Program Requirements/Systems Engineering	---	5,500.0
c. Investment Analysis and Acquisition	---	8,000.0
Total	Various	$23,500.0

For FY 2014, $23,500,000 is requested to complete Investment Analysis activities, complete program requirements engineering, and award the prime contract for initial TFDM system development and implementation.

TFDM Prime Contractor/Solution Implementation related Activities:

- Complete activities leading to award of the prime contract for TFDM and begin qualification and site deployment activities as follows:Release SIR– Request for Proposal
  - Statement of work/Statement of Objective Developed
  - Interface Documents developed
  - Evaluation Criteria developed
- Stand up facility for vendor presentations of proposed TFDM solutions and screen viable alternatives
- Conduct proposal reviews and generate report to support a source selection decision
- Procure long lead items for TFDM systems to support CY 2015 deployment
- Perform site surveys for sites to be deployed in CY2015
- Place order for FTI service for sites to be deployed in CY2015

Investment Analysis Activities:

Obtain Final Investment Decision (FID) for TFDM Core capability. FY 2014 activities leading to FID include:

- Completion of Final Requirements Document (RD) and final Program Requirements Document (fPRD)
- Completion of Final Business Case
- Completion of Final Enterprise Architecture Views
- Completion of Final Safety/Risk Artifacts
- Completion of Integrated Logistics Support Plan
- Strategy of Post-Implementation Review
- Completion of EOSH- Environmental Occupational Safety and Health Review
- Completion of Implementation Strategy and Planning Document (ISPD)
- Completion of In-Service Review checklist

Program Requirements/Systems Engineering Activities:
Continue engineering activities to primarily support CY 2017 TFDM Core capabilities, including:
- Definition of TFDM interface with TRACON automation and ASDE-X
- Engineering to support TFDM final program requirements
- Finalize portfolio program requirements for integration of TFDM with TBFM and TFMS
- Support the definition of future Flight Data concepts

What Is This Program?

The TFDM program is an integrated approach to maximize the efficient collection, distribution, and update of data and improve access to information necessary for safe and efficient control of air traffic. The system will collect and portray terminal flight data, as well as traffic management tools, on an integrated display, and will be connected to information and decision support tools (DSTs). These DSTs will provide more efficient and safe airport operations, in particular management of airport surface traffic sequencing and scheduling. TFDM also automates manual flight data processes to enable enhanced data sharing.

DOT Strategic Goal - Economic Competitiveness
- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The Terminal Flight Data Manager (TFDM) will be a NextGen terminal automation system which will provide air traffic controllers information which will allow more tactical and strategic decisions covering air traffic operations in the National Airspace System (NAS).

The system will provide air traffic tower controllers with decision support capabilities, integrated flight, surveillance, weather and aeronautical display systems and information. This will allow tower controllers to maintain an integrated view of the air traffic environment, improving their situation awareness of the airport operations.

A key component is the transition from paper flight strips to electronic flight data representation and exchange. This will facilitate flight data exchange between controllers within the tower facility, between Air Traffic Control facilities and between Air Traffic flow systems. This will also facilitate data exchange with aviation partners such as the airlines Flight Operations Centers (FOC) to support collaborative decision making (Eliminates the necessity of physical exchange of flight data, reduces telephone exchange of data between facilities, and reduces manual re-entry of data among multiple ATC systems).

The capabilities provided by TFDM will provide multiple NAS benefits, such as reduced surface delay, taxi time and fuel burn (with improved operational and environmental performance); better performance and airport capacity utilization during severe weather and other off-nominal conditions; improved usability and situation awareness and enhanced safety.

Currently the NAS lacks understanding of actual Surface demand among FAA services, demand predictors are not driven by timely surface demand data, and lacks understanding of Flight Operator intent data. TFDM introduces the scheduler/sequencer capability that will provide the basis for efficient management of traffic flows on the surface at U.S. airports by transitioning the performance of airports surface operations from a first come, first served model to a more strategic model that allocates taxi clearances to minimize taxi distance and time.

How Do You Know The Program Works?

TFDM is in the Investment Analysis (IA) Phase. During IA, the Program Office will identify various alternatives to provide the capabilities to meet the TFDM requirements. The FAA will select the most cost beneficial alternative for acquisition and implementation. The Program Office plans to complete the IA and receive approval in FY 2014 to begin acquisition design and development of the selected alternative. Prototype and Human-In-The-Loop simulation activities were conducted under Next Generation Transportation System – Flexible Terminals and Airports Surface/Tower/Terminal Systems Engineering to validate the TFDM concepts and those activities will continue in order to reduce development and implementation risks during TFDM investment analysis and solution implementation. The TFDM system acquisition will also include a comprehensive test and provisioning program to verify the system operates properly in the NAS and is supportable through the life cycle.

During the IA phase, program metrics and measurement criteria will be established to verify that the program delivers the benefits identified at establishment of the program baseline.

Why Do We Want/Need To Fund The Program At The Requested Level?

$23,500,000 is required to conduct program management and engineering support activities to complete the investment decision to establish the program baseline, award the prime contract for TFDM, and start initial implementation. TFDM is a key ground infrastructure program for NextGen mid-term operations in the areas of flight planning; push back, taxi and departure; descent and approach; and landing, taxi and arrival. TFDM supports NextGen mid-term Improved Surface Operations as the primary contributor to the NextGen Operational Improvement (OI) 104209: Initial Surface Traffic Management.

A funding reduction will delay the implementation of TFDM.

Detailed Justification for - 2B19 Voice Recorder Replacement Program (VRRP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Voice Recorder Replacement Program (VRRP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Voice Recorder Replacement Program (VRRP)	$0	$0	$6,200	+$6,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Voice Recorder Replacement		
a. Voice Recorder Procurement	---	$1,550.0
b. Depot Spares	---	727.0
c. Depot Logistics	---	400.0
d. Program Management and Technical Support	---	445.2
e. Contractor Support	---	377.8
Total	Various	$3,500.0
B. Voice Recorder Safety and Audit	---	$2,700.0

For FY 2014, $3,500,000 is requested for procurement, installation, delivery, and depot spares. An additional $2,700,000 is requested to implement remote voice retrieval capability with 489 existing systems.

What Is This Program?

A. Voice Recorder Replacement

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 impacts the detailed investigation of air traffic incidents and accidents. This reduced system availability impacts controller evaluation and training.

B. Voice Recorder Safety and Audit

The Voice Recorder Safety and Audit initiative is needed to procure Application Program Interface (API) software licenses. This will enable implementation of off-site remote voice retrieval capability for 489 existing systems.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The National Airspace System (NAS), System Requirements Document (NAS-SR-1000) requires that both air-to-ground (A/G) and ground-to-ground (G/G) communications be recorded and stored for later retrieval. FAA Order 7210.3T. This applies to all Air Traffic Control (ATC) domains. Facility Operation and Administration requires that ATC facilities "record operational communications to the maximum extent practicable."

The Voice Recorder Safety and Audit is needed to comply with new and updated FAA safety orders that are adding additional requirements for reporting that is dependent on prompt access to voice data stored on Digital Audio Legal Recorder (DALR) systems throughout the NAS.

How Do You Know The Program Works?

This program has already replaced 444 Digital Voice Recording System (DVRS) voice recorder systems with Digital Audio Legal Recorder (DALR). The VRRP Program Implementation Review (PIR) was conducted in early 2010 and concluded that the program meets the needs of its customers and that it has provided an overall cost savings resulting from lower maintenance costs. It also validated that the program's original business case remains valid, which provides an estimated $7,400,000 of operational benefits annually. These benefits are the results of gains in preventive maintenance, logistics, second level engineering, quality assurance material, and efficiency gains.

Why Do We Want/Need To Fund The Program At The Requested Level?

$3,500,000 is required to procure, deliver and install 21 remaining voice recorders with Digital Audio Legal Recorder (DALR) systems and to fund depot spares. An additional $2,700,000 is required to implement remote voice retrieval capability with 489 existing fielded systems.

A reduction of funding would reduce the number of systems that will have remote voice retrieval capability.

Detailed Justification for - **2B20 Precision Runway Monitor Replacement (PRMR) – Multilateration Technology Upgrade**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Precision Runway Monitor Replacement (PRMR)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Precision Runway Monitor Alternate (PRMA)	$0	$0	$5,000	+$5,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Prime Contractor Engineering	---	$2,500.0
b. Contract Management	---	100.0
c. Program Management	---	400.0
d. Operational T&E (Tech Center)	---	300.0
e. EOSH Support	---	200.0
f. Service Area Support	---	900.0
g. H/W and S/W Modification	---	200.0
h. Telecommunications	---	400.0
Total	Various	$5,000.0

For FY 2014, $5,000,000 is requested to procure a the PRM-R system for the Hartsfield Jackson Atlanta International Airport (ATL), begin ATL environmental and site preparation activities, and begin procurement and installation of the ATL telecommunications requirements.

The PRM-R program received Joint Resource Council (JRC) initial investment decision (IID) approval on September 26, 2012. The program will proceed to a Final Investment Decision (FID), scheduled for December 2013.

What Is The Program?

The PRM Electronic Scan Radar (PRM-E), a congressionally mandated program, is a high update rate surveillance radar specifically designed for use during inclement weather and reduced visibility conditions. It is designed to monitor closely spaced parallel approaches (CSPA) in order to sustain or increase capacity during Instrument Meteorological Conditions (IMC). During IMC, air traffic separation standards require greater distance between aircraft, thus limiting the Airport Arrival Rate (AAR), the number of aircraft arrivals an airport is capable of accepting each hour. The system also incorporates alert algorithms to both predict and warn controllers of aircraft deviations from their nominal approach course. A PRM system must be used to conduct independent simultaneous instrument approaches to runways spaced less than 4,300 feet apart. And when used with the appropriate air traffic procedures, precision runway monitoring enables operations in which aircraft are allowed to fly with shorter separation distances between them than otherwise permitted thus increasing normal IMC airport capacity.[1]

[1] NAS-Wide Precision Runway Monitoring Alternatives Analysis Final Report, September 9, 2004

The PRM comes in two forms, the PRM-E and the Precision Runway Monitor Alternate (PRM-A). The PRM-E is currently installed at Philadelphia International Airport (PHL), Lambert St. Louis International Airport (STL), San Francisco International Airport (SFO), Cleveland Hopkins International Airport (CLE), and Atlanta Hartsfield International Airport (ATL). The PRM-A is a single site system, commissioned at Detroit's Metro Wayne County Airport (DTW) in June 2009. The PRM-A was developed by Sensis Corporation and Raytheon Corporation and utilizes the Airport Surface Detection Equipment, Model X (ASDE-X) multilateration (MLAT) technology to perform the PRM operations.

Due to changing airport conditions, and a subsequent reduction in traffic volume, the need for PRM services at CLE, PHL and STL has been greatly diminished. These airports are able to maintain their AAR during IMC at acceptable levels without the use of the PRM-E. Therefore, the decision was made by the Vice President of Terminal Services to decommission these three systems and return them to the FAA Logistics Center (FAALC) to be used as spare parts to support the needed SFO and ATL PRM systems. The plan to decommission these systems is in process.

The ATL and SFO PRM-E systems are nearing the end of their planned 10-year service life and logistical support for the systems is waning. The PRM-E systems were upgraded in 2005 and 2006 to replace obsolete components and to take advantage of advances in computing technologies. However, this upgrade did not address the costlier antenna and beacon radar subsystems. As a result, obsolescence is a growing concern in these areas, and the systems are reliant on a limited number of non-COTS components for which the availability and serviceability is severely limited. This is especially true with the antenna and beacon RF components, antenna dipoles, and channel cabinet assemblies. In addition, repair times have increased significantly, in some cases in excess of 26 weeks, due to limited parts and a diminishing sub-vendor repair base. Over the last 12 months, the ATL TRACON scopes have failed several times, and the FAALC is coordinating a short-term plan to cannibalize existing equipment from CLE, PHL, and STL to maintain these systems prior to a full system replacement.

The purpose of the PRM Replacement program is to identify the most cost effective solution for maintaining the PMR service at SFO and ATL in support of the Next Generation Air Transportation System (NextGen).

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The PRM Replacement program supports the FAA's Destination 2025 Strategies of using NextGen technologies and operational improvements to reduce the average time it actually takes to go from one core airport to another. This program also maintains the needed PRM capability at SFO and ATL.

How Do You Know The Program Works?

An Airports Arrival Rates (AAR) is a measure of an airports capacity and an airport's AAR is significantly reduced during adverse weather and reduced visibility conditions. The PRM allows for simultaneous, independent approaches on closely spaced parallel runways during reduced visibility conditions, thus maintaining or improving AAR during Instrument Meteoroidal Conditions (IMC). The AAR at ATL and SFO actually increased approximately 23 percent (81 – 100) and 17 percent (29 – 34) respectively during these conditions when using PRM thus returning a portion of lost capacity during adverse weather conditions and thereby reducing delays. ATL uses PRM technology regularly for simultaneous, independent triple approaches, significantly improving capacity during arrival pushes. Without the PRM technology, these airports would be required to conduct dependent simultaneous approaches, significantly reducing the airport's arrival rate (AAR).

Why Do We Want / Need To Fund The Program At The Requested Level?

The PRM-E and PRM-A are both an integral part of the transition to the Next Generation Air transportation System (NextGen) and are currently the only available solutions for providing closely-spaced parallel approach services during IMC. Parts shortages and obsolescence are mounting concerns for the PRM-E systems with limited support provided through a time and materials contract with Raytheon Corporation, the PRM-E manufacturer. Thus, as parts fail, system availability is degraded. The CLE, PHL and STL PRM-E are planned to be decommissioned; however, the PRM service is of benefit and is still required at ATL and SFO. In addition, this project directly supports RTCA and Task Force 5's recommendation to implement closely spaced parallel operations (CSPO) in a phased manner and to extend the use of multilateration using PRM-A on a case-by-case basis.

Detailed Justification for - **2B21 Integrated Terminal Weather System (ITWS) – Tech Refresh and Disposition**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Integrated Terminal Weather System (ITWS) – Tech Refresh and Disposition

($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Integrated Terminal Weather System (ITWS) – Tech Refresh	$0	$0	$1,300	+$1,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Engineering Study	---	$25.0
b. First Article Hardware Procurement and Testing	---	150.0
c. Software Adaptation Work	---	150.0
d. Program Support	---	500.0
e. Hardware Procurement	---	475.0
Total	Various	$1,300.0

For FY 2014, $1,300,000 is requested to support the Integrated Terminal Weather System Technology Refresh planning and procurement efforts. Planned activities include the continuation of the Tech Refresh engineering study, first article hardware procurement and testing, software adaption work, program support and limited hardware procurement. The ITWS Tech Refresh will allow the FAA to sustain the generation of essential ITWS weather products to the Air Traffic Controller user community across the National Airspace System (NAS).

What Is This Program?

The Integrated Terminal Weather System (ITWS) provides automated weather information for use by air traffic controllers, supervisors, pilots and airline dispatch. The ITWS integrates data and information from FAA and National Weather Service (NWS) sensors such as the Terminal Doppler Weather Radar (TDWR), the Next Generation Weather Radar (NEXRAD), Airport Surveillance Radar (ASR), Low Level Wind Shear Alert System (LLWAS), Automated Weather and Surface Observing Systems (AWOS/ASOS), lightning detection systems, NWS weather models and aircraft via the Meteorological Data Collection and Reporting System (MDCRS).

Automated weather products produced by the ITWS include essential safety, windshear and microburst detection and predictions, storm cell intensity and direction of motion, lightning information, detailed winds in the terminal area and a one hour storm forecast. The graphical, full-color display provides an easy-to-use interface that does not require meteorological interpretation. ITWS weather information is available to air traffic managers, controllers and airlines via dedicated situation displays at FAA Air Traffic facilities, the web or an ITWS data feed.

The ITWS Tech Refresh will include the systematic replacement of all ITWS Commercial Off-The-Shelf (COTS) system components, including: processors, situation displays, computer operating systems and software, to assure continued supportability over the service life of the system. This will include the replacement of obsolete hardware at 145 Air Traffic facilities across the NAS.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

ITWS Tech Refresh activities are planned to begin in FY 2014. Beginning in FY 2015, logistics support for the current ITWS sites will begin to diminish, according to an ITWS Supportability Study conducted by the FAA in 2010. System hardware spares, support tools and maintenance provisions for keeping the current ITWS sites operational will become unavailable, support costs will escalate and system outages will increase.

How Do You Know The Program Works?

The ITWS Tech Refresh program will replace COTS components and is mandated to provide the same "form, fit, and function" as the current ITWS.

An evaluation of ITWS by the US Government Accountability Office (GAO) reported that ITWS is a well-managed program that has met all provisions of the FAA Acquisition Management System (AMS). The program has established internal processes that are in accordance with GAO best practices. Most notably, ITWS has been implemented within all FAA approved budget and schedule constraints. The ITWS Tech Refresh program will conform to the same standards. http://www.gao.gov/new.items/d127.pdf

Why Do We Want/Need To Fund The Program At The Requested Level?

$1,300,000 is required to support the Integrated Terminal Weather System Technology Refresh. There are no other FAA weather programs that provide the type of airport-specific weather products that are generated by ITWS. Planned activities for this effort include the continuation of the Technolgy Refresh engineering study, first article hardware procurement and testing, software adaption work, program support and limited hardware procurement. The ITWS Tech Refresh will allow the FAA to sustain the generation of essential ITWS weather products to the Air Traffic Controller user community across the NAS.

A reduction in funding will impact the hardware procurement planned for FY 2014. Lack of available hardware will delay the ITWS Tech Refresh deployment schedule planned to occur at 145 sites during the FY 2015 to FY 2017 time period, thus leading to an increase of system repair time and outages.

Detailed Justification for - 2C01 Aviation Surface Weather Observation System

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aviation Surface Observing System
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aviation Surface Weather Observation System (ASWON)	$2,500	$0	$10,000	+$7,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Hardware Procurement		$7,000.0
b. Integration Contract Award	---	1,000.0
c. ASWON Software Upgrade	---	1,000.0
d. Contractor Support	---	1,000.0
Total	Various	$10,000.0

For FY 2014, $10,000,000 is requested for the procurement of commercial-off-the-shelf (COTS) hardware required to upgrade/replace components of legacy FAA surface observation stations. This activity will extend the service life of the surface observation systems by addressing their obsolescence issues. The funding will also be used to award a contract to assemble and integrate subsystems that will be fielded during site upgrades. Additionally, the funding will be used to continue the FAA's necessary software upgrades for these systems. The remaining funding is required to fund contractors at FAA Headquarters that provide the necessary engineering support for this project.

The FAA granted a Final Investment Decision (FID) on the ASWON Tech Refresh investment September 26, 2012.

What Is the Program?

Aviation Surface Weather Observation Network (ASWON) is a service portfolio composed of the following primary and backup weather observation systems deployed throughout the NAS

- Automated Weather Observing System (AWOS) - 188 systems
- Automated Surface Observing System (ASOS)* -571 systems
- Automated Weather Sensor System (AWSS) - 44 systems
- Stand Alone Weather Sensors (SAWS) - 139 systems
- Digital Altimeter Setting Indicator (DASI) - 500 systems
- Wind Equipment F-Series (WEF) Wind System - 230 systems
- AWOS Data Acquisition System (ADAS) - 22 systems

*ASOS is maintained by the NOAA National Weather Service (NWS) through an interagency agreement.

ASOS, AWOS and AWSS provide the primary weather observation at airports, while DASI, SAWS and F420 provide secondary weather parameter measurements for backup/augmentation purposes at staffed air traffic facilities. These systems provide wind speed and direction, temperature, dew point, barometric pressure, cloud height and amount, visibility and precipitation information for approximately 1,100 airports in the National Airspace System (NAS).

The ASWON Tech Refresh program will provide form/fit/function technology upgrades/replacements to five legacy ASWON systems (ASOS, AWOS, AWSS, DASI, F420) experiencing obsolescence, supportability, and maintainability issues. This sustainment effort will extend the service life of these systems and continue their role of providing required weather observations. The investment will result in a cost-avoidance of the continually increasing maintenance costs of these systems.

The following systems, agencies, and users depend on the data provided by ASWON:

- NOAA National Weather Service (NWS)
- Commercial Aviation, General Aviation, and the Flying Public
- Air Traffic Approach and Ground Controllers
- Surveillance Broadcast Services (SBS) - Flight Information Service Broadcast (FIS-B)
- Common Automated Radar Terminal System (ARTS) - ARTS IIIE
- Airport Surveillance Radar 9 (ASR-9) - Weather System Processor (WSP) for Wind Shear Detection
- Integrated Terminal Weather System (ITWS)
- Weather and Radar Processor (WARP)
- Corridor Integrated Weather System (CIWS)
- Automatic Terminal Information Service (ATIS)

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The five systems in the ASWON portfolio require a tech refresh (or equivalent replacement in-kind) effort in order to continue meeting current operational requirements. No new functionality or requirements will be added by this tech refresh effort. No other FAA initiatives address the shortfalls addressed by the ASWON Tech Refresh program. ASWON Tech Refresh ensures that the following functions will continue to be met:

- Acquisition of surface weather information
- Surface weather observations used by aircraft operators
- A minimum of two altimeter setting indicators (ASI) at ATC facilities
- Back up wind and altimeter required to maintain Parts 121 and 135 operations

How Do You Know the Program Works?

ASWON Systems are deployed and operational at over 1,100 sites in the CONUS, Alaska, and Hawaii. NextGen programs such as ADS-B are installation ASWON weather stations in Alaska for use with their surveillance and broadcasting systems. Surface observations provided by ASWON are used continually by Air Traffic Control, Pilots, the general public and several Air Traffic Control Systems.

ASWON Tech Refresh received Final Investment Decision (FID) on September 26, 2012.

Why Do We Want/Need To Fund The Program At The Requested Level?

$10,000,000 is required to initiate preparatory activities for the Technology Refresh. The FAA second level engineering support group, Logistics Depot, and Maintenance personnel continue to struggle to find ways to support aging, unsupportable, and obsolete ASWON equipment. The required funding will initiate ASWON Tech Refresh implementation and will lead to a supportable and cost-effective ASWON, thus eliminating any risk of losing the essential services that ASWON provides to its numerous users.

A funding reduction from the required level would delay this important task aimed at extending the service life of existing ASWON systems. These delays would potentially cause increased service interruptions, prolonged service outages and ultimately negatively impact NAS safety.

Detailed Justification for - 2C02 Future Flight Services Program (FFSP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Future Flight Services Program (FFSP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Future Flight Services Program (FFSP)	$0	$5,000	$3,000	+$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Future Flight Services Program	---	$3,000.0

For FY 2014, $3,000,000 is requested to conduct studies, perform analyses, for finalization of requirements and related acquisition documentation, release of the Screening Information Request (SIR) to include a draft SIR, and evaluation of proposals for a competitive acquisition of the FFSP.

What Is This Program?

Currently, a combination of entities and automation platforms under multiple programs provide Flight Services that include flight planning, advisory, operations, and search and rescue coordination services in the Continental U.S., Puerto Rico, Alaska, and Hawaii. Flight Services primarily provides weather briefings and flight planning services to pilots. Flight Services also coordinate Visual Flight Rules (VFRs) search and rescue services, provide orientation service to lost aircraft, maintain continuous weather broadcasts on selected Navigational Aids (NAVAIDs), and issue Notices to Airman (NOTAMs). While flight service functions in Alaska are provided by government personnel, flight service functions in the lower 48 states are being provided by contractor personnel. General Aviation (GA) pilots are also able to access flight service information directly through web portals which eliminate the need for pilots to talk to a flight service specialist.

FFSP plans to transition flight services away from human delivery to automation. Based on research that suggest General Aviation pilots prefer to access flight service functions directly, FFSP will transition to a much more automated approach. Once this transition is complete, the overall cost associated with providing flight service will be significantly reduced. The plan is to expand the web portion of flight services, and limit human delivery of flight services substantially. The timeframe associated with the transformation is heavily dependent on the technologies responsible for enabling the new functions, and the availability of the interdependent programs to perform their essential functions. Flight services will continue to be provided by government personnel in Alaska and contractor services in the lower 48 states.

DOT Strategic Goal – Safety

- Reduction in transportation related fatalities and injuries.

Why Is This Particular Program Necessary?

The FFSP will replace the existing flight services program being provided under multiple contracts that cover the CONUS and Alaska. These contracts end in FY 2015. The contract that allows pilots to access flight service information directly expires in 2013. Continued delivery of flight services within the continental US and Alaska is dependent upon the success of the Future Flight Service Program.

FFSP will replace services provided by existing contracts. Currently the combined services are utilized more than 30,000 times on a typical day by GA pilots with the vast majority using the direct access web portal contractor service. Replacing this essential service while eliminating the high cost associated with human delivery of many of the services, and will require extensive coordination and analysis to ensure continuity of service and program success. The first phase will be to award a new contract for the direct access web portal called Flight Information Services Direct (FISD). Other functions such as weather and NOTAM entry and inflight services will also be delivered in a more effective and cost effective manner. These tasks are planned for 2014 in order to maximize the cost savings associated with reducing or eliminating the legacy flight service contracts.

How Do You Know The Program Works?

General Aviation pilots have shown a clear preference in using electronic means to obtain the services they need through. FFSP will move to make that the primary means by which these customers utilize FAA Flight Services. The functions not directly or specifically related to flight planning are provided by other means today, i.e., NOTAM entry, weather entry, inflight assistance, etc. FFSP will be performing the necessary analyses and coordination to determine how best to deliver these services in the future.

Why Do We Want/Need To Fund The Program At The Requested Level?

$3,000,000 is required to conduct analyses, perform studies, conduct demonstrations, conduct outreach to the GA community, finalize requirements and related acquisition documentation, release of the Screening Information Request (SIR), and evaluation of proposals for a competitive acquisition of the FFSP.

Detailed Justification for - 2C03 Alaska Flight Service Facility Modernization (AFSFM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Alaska Flight Service Facility Modernization (AFSFM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Alaska Flight Service Facility Modernization (AFSFM)	$4,500	$2,900	$2,900	-$1,600

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Alaska Flight Service Facility Modernization (AFSFM)	---	$2,000.0
B. In-Service Engineering	---	900.0
Total	Various	$2,900.0

For FY 2014, $2,000,000 is requested for interior upgrades at Fairbanks, Juneau, Northway, Kenai and Talkeetna. FSSs. The interior upgrades will consist of upgrades and/or rehabilitation of the operations area including pilot briefing area, restrooms and breakroom. The upgrades will include compliance as applicable with the Architectural Barriers Act Accessibility Standard (ABAAS) and FAA electrical, environmental, and fire life safety standards. Also requested is $900,000 for in-service engineering activities.

What Is This Program?

The Alaska Flight Service Facility Modernization (AFSFM) program modernizes or replaces the 17 Flight Service facilities in Alaska to ensure the security and sustainment of Flight Services, and develop the infrastructure for continuity of operations. Over 33 percent of the Alaska Flight Service facilities were constructed in the 1970's and require extensive renovations to meet current building codes, fire life safety, Architectural Barriers Act Accessibility Standard (ABAAS) and electrical standards. Specifically, Flight Service buildings will be updated to meet Occupational Safety and Health Administration (OSHA) and Americans with Disabilities Act (ADA) requirements, and the electrical and safety systems will be upgraded to ensure they meet standards. The program benefits FAA flight service specialists and technical operations personnel by providing a safe and secure environment for conduct of flight service operations.

In addition, the program corrects deficiencies such as substandard lightning, grounding and bonding protection, electrical systems, and/or heating and cooling systems that could disrupt flight service operations by reducing reliability of flight service automation systems.

The AFSFM program conducts on-going analysis of Alaskan Flight Services facilities to identify and prioritize actions required to maintain and sustain each facility. The projects vary each fiscal year depending on priorities and available funding. In coordination with Alaska Technical Operations and Western Service Center personnel, individual Site project plans and schedules are developed to maintain and sustain Alaskan Flight Services facilities.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The existing Flight Service facilities in Alaska are old, suffer from environmental, electrical, structural and safety deficiencies and generally do not meet the American's with Disabilities Act accessibility requirements, as defined and imposed by the Uniform Federal Accessibility Standards and the Architectural Barriers Act Accessibility Standard. These conditions endanger FAA personnel health and safety and increase the risk of service outages.

How Do You Know The Program Works?

Each project is managed in accordance with a schedule and cost baseline. Monthly status reports track scheduled activities and funding expenditures. A project is not complete until FAA Technical Operations personnel conduct a Joint Acceptance Inspection of the work performed as compared to the project scope of work, associated standards and policy. Any identified exceptions must be cleared before the project is designated "completed" within the FAA's Corporate Work Plan system.

Why Do We Want / Need To Fund The Program At The Requested Level?

A funding reduction from the requested amount would require re-prioritization of planned projects and result in a delay in initiation for one or more projects. The FY 2014 funding required is planned for interior upgrades at Fairbanks, Juneau, Northway, Kenai, and Talkeetna FSSs. The planned projects are based on expected funding, project cost estimates and available FAA engineering resources to manage and accomplish each project.

Delays due to reduced funding will prevent the expected benefits of this program identified above (i.e. providing a safe and secure working environment for FAA personnel; disruption of flight service operations by reducing reliability of flight service automation systems due to environmental, power or electrical deficiencies) from being achieved.

Detailed Justification for - 2C04 Weather Camera Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Weather Camera Program
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Weather Camera Program	$4,800	$4,400	$1,200	-$3,600

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Install Weather Cameras	6	$1,200.0

For FY 2014, $1,200,000 is requested to fund the continued installation of weather camera sites in Alaska. Equipment for six sites will be procured and installed. 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.

What Is This Program?

The Weather Camera Program improves safety and efficiency by providing weather visibility information to aviation users that is obtained from near real-time camera images. These images, from airports and strategic en route locations, are provided to pilots and flight service station specialists to enhance 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. Additionally, the program funds procurement and installation of weather camera sites.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Additional weather camera installations will contribute to the FAA goal by reducing a subset of Alaska accidents per 100,000 operations. Following is the program metrics as compared to actual results.

Year	Goal	Actual
2007	.28 accidents per 100,000 operations (Baseline)	
2008	.24 accidents per 100,000 operations	.21 accidents per 100,000 operations
2009	.22 accidents per 100,000 operations	.21 accidents per 100,000 operations
2010	.20 accidents per 100,000 operations	.17 accidents per 100,000 operations
2011	.18 accidents per 100,000 operations	.13 accidents per 100,000 operations

2012	.17 accidents per 100,000 operations	Not Yet Available
2013	.16 accidents per 100,000 operations	
2014	.15 accidents per 100,000 operations	

Annual accident analysis is conducted to determine if program metrics are met. Metrics are based on a baseline of an en route or approach and landing low visibility related accident rate per 100,000 operations for non-IFR capable commercial and general aviation aircraft within the state of Alaska.

Why Is This Particular Program Necessary?

In the state of Alaska, flying is equivalent to driving in the continental U.S. (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 1,497 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.

How Do You Know The Program Works?

The installation of weather cameras improves pilot situational awareness which prevents aviation accidents. Performance metrics for reducing accidents have been exceeded every year (2008 through 2012) since the program was baselined and measurements began as reflected in the questions above.

Why Do We Want/Need To Fund The Program At The Requested Level?

Statistics indicate that weather cameras have contributed to the actual reduction in aircraft accidents in Alaska at a rate that is better than targeted. Funding for the six final weather camera sites in 2014 will continue to reduce aircraft accidents to a rate of .15 accidents per 100,000 operations. A reduction in the baseline level of funding requested will reduce the number camera sites that can be installed which will result in a greater number of aircraft accidents occurring that could have been prevented.

Detailed Justification for - **2D01 VHF Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)**

What Is The Request And What Will We Get For The Funds?

**FY 2014 – VHF Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)
($000)**

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
VHF Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)	$5,000	$2,500	$8,300	+$3,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. VOR with VORTAC		
a. Procure VOR Dopplerization Equipment	---	$500.0
b. Complete on-going Project to Dopplerize a Conventional VOR	---	2,000.0
Total	Various	$2,500.0
B. VOR Minimum Operating Network (MON) Implementation Program	---	$5,800.0

For FY 2014, $2,500,000 is requested for procurement of two VOR/DME Doppler Electronic Antenna Kits, 10 VOR/DME Hardware Antenna Kits, and to complete an on-going project to dopplerize a conventional VOR. In addition, $5,800,000 is requested to fund a collaborative effort to manage the transition from a legacy network of VORs to a Minimum Operating Network (MON) by a target date of 2020.

What Is This Program?

A. VOR with VORTAC

This program sustains and relocates VOR and VORTAC facilities and also converts conventional VORs to Doppler VORs to improve NAS efficiency and capacity.

B. VOR MON

The VOR MON effort will support the agency transition to the deployment of Performance-Based Navigation (PBN) in support of Next Generation Air Transportation System (NextGen).

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The VOR/VORTAC network remains the primary source of navigation in the NAS and will continue as such until the use of GNSS becomes the primary source of navigation. Without this program the VOR/VORTAC network would deteriorate to the point of being unsafe and essentially unusable. The program maps to the FAA goal of reduced congestion by making air traffic flow more efficient over land and sea. The sustainment, relocation, conversion, or modification of VOR/VORTAC facilities will enable FAA to maintain a highly reliable, safe, and efficient ground based VOR/VORTAC systems. The continuation of this program provides enhanced aircraft routing and increased airport capacity.

The program procures and installs Doppler VOR (DVOR) electronic and hardware antenna kits to dopplerize a conventional VOR. There are numerous VORs that have restrictions due to encroachment of the VOR sighting criteria caused by natural and manmade obstacles. These restrictions are having a serious impact on both en-route and arrival and departure procedures. The main natural encroachment comes from the growth of vegetation (mostly trees) that is located outside the sighting restriction area but, are now tall enough to cause electromagnetic interference. There are many manmade obstacles that cause the same electromagnetic interference, resulting from the growth of nearby towns/cities such as the construction of tall buildings, new industrial parks with their high concentration of metal buildings, transmission lines, radio/TV/cell towers and most recently, wind farms. Dopplerizing a VOR eliminates most of these restrictions.

VOR, Tactical Air Navigation (TACAN), and VORTAC (combination VOR and TACAN) systems provide navigational guidance for civilian and military aircraft in both the en-route and terminal areas. The VOR MON effort will provide the roadmap regarding whether VOR or TACAN systems will remain in service or be shut down. If they are retained, they will serve as a backup to satellite navigation and continue to define VOR routes and procedures for legacy users. VOR/VORTAC supports the transition to both RNAV and the NextGen by maintaining the present level of en-route and terminal navigation service. Until that transition is complete, VOR/VORTACs must remain in service and they must be relocated, technologically refreshed, or replaced.

Finally, analysis of the current VOR/VORTACs will:

- Provide for a technical and cost effective evaluation to extend the service life of VOR/VORTACs
- Evaluate the feasibility of extending the service life of VOR/VORTACs
- Assure viability of the VOR/VORTAC network through the transition

How Do You Know The Program Works?

VOR/VORTAC equipment have been deployed and maintained in the NAS for more than 50 years. VOR/VORTAC equipment is the primary source of navigational aid for commercial, private pilots, and military flying within the NAS and also for worldwide aviation.

Why Do We Want/Need To Fund The Program At The Requested Level?

The VOR/DME program maps to the Federal Aviation Administration (FAA) goal of reduced congestion by making air traffic flow more efficient over land and sea. The replacement, relocation, conversion, or modification of VOR facilities (including VOR/DME) will improve VOR performance and enable the FAA to maintain a highly reliable, safe, and efficient ground based VOR and VOR/DME system until the use of Global Positioning System is widespread. The improved availability of this program provides enhanced aircraft routing and increased airport capacity.

$2,500,000 is required for procurement of three VOR/DME VOR Doppler Antenna Kits and completion of a project to dopplerize a conventional VOR. If the program were funded at a lower level the Navigation Program Group would procure fewer VOR Doppler Antenna kits and/or delay funding the on-going project to dopplerize a conventional VOR which could result in a schedule slip. $5,800,000 is required to initiate the VOR Minimum Operating Network.

Impact if there is a reduction from the budget request would result in schedule slips and impact implementation.

Detailed Justification for - 2D02 Instrument Landing System (ILS) – Establish

What Is The Request And What Will We Get For The Funds?

FY 2014 – Instrument Landing System (ILS) – Establish
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Instrument Landing System (ILS) – Establish/Expand	$5,000	$12,000	$7,000	+$2,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Equipment Procurement	---	$2,465.0
b. Complete Two ILS Replacements/Begin Three ILS Replacements	---	4,375.0
c. Logistics/Engineering Support Service	---	160.0
Total	Various	$7,000.0

For FY 2014, $7,000,000 is requested for engineering and technical services support; procurement of five ILS systems, to complete ILS replacement projects and to begin three new ILS replacement projects.

What Is This Program?

This program replaces older ILS equipment. The ILS provides the pilot with both vertical and horizontal guidance information allowing aircraft to land in weather conditions that would otherwise be prohibited. The ILS also enables airports to meet increasing traffic demands. The ILS includes three components, a localizer which gives lateral guidance to the runway centerline, a glide slope to give vertical guidance and marker beacons. 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 aircraft are equipped with an autopilot which can directly receive ILS signals to automatically guide the plane to a landing.

There are three categories of ILS. Each category is defined by 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).

- 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
- 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 may be replaced because they have exceeded their expected service life and their original manufacturer no longer provides support. The FAA is aggressively pursuing implementation of satellite navigation but until that transition is complete, the 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.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The ILS along with required approach lighting systems directly impact both system safety and capacity. The ILS provides the pilot with vertical and horizontal guidance allowing aircraft to land safely in both Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). The ability to land in IMC reduces the number of weather caused flight delays, diversions, over-flights and cancellations, therefore, increasing the capacity of the airport. A precision approach capability allows an airport to remain open to traffic when it would otherwise have closed; thereby avoiding weather caused flight delays. Additionally, replacement of aging ILS equipment will improve reliability and availability, therefore reducing the outage rate and the maintenance man-hours.

How Do You Know The Program Works?

ILS equipment currently deployed in the National Airspace System (NAS) has been there for better than 40 years. The ILS has proven itself as a navigational aid for pilots landing within the NAS.

Why Do We Want/Need To Fund The Program At The Requested Level?

$7,000,000 is required for engineering and technical services support; procurement of five ILS systems; completion of ILS replacement projects and begin three new ILS replacement projects. A reduction would defer engineering and technical support. If the program were funded at a lower level the Navigation Program Group would procure fewer ILS systems and/or delay funding ILS replacement which could result in a schedule slip.

Detailed Justification for - 2D03 Wide Area Augmentation System (WAAS) for GPS

What Is The Request And What Will We Get For The Funds?

FY 2014 – Wide Area Augmentation System (WAAS) for GPS
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Wide Area Augmentation System (WAAS) for GPS	$95,000	$95,000	$109,000	+$14,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Wide Area Augment System (WAAS)		
a. GEO Satellite Acquisition	---	$36,500.0
b. Technology Refresh	---	34,320.0
c. NAS Implementation	---	11,780.0
d. Technology Evolution	---	2,400.0
e. Technical Engineering Program Support	---	22,000.0
Total	Various	$107,000.0
B. WAAS Surveys and Procedures	---	$2,000.0

WAAS is closely linked to the ADS-B program. WAAS satellites provide the exact positioning expertise for ADS-B and will enable ADS-B to achieve reduced separation of aircraft.

A. Wide Area Augmentation System

GEO Satellite Acquisition, $36,500,000 - Lease payments are ongoing for the 3rd and 4th GEOs as well as the Gap Filler. Funds will sustain the current 3rd and 4th as well as the Gap Filler leases. In addition, development of GEO satellite payload for the 5th GEO will be ongoing.

Technology Refresh, $34,320,000 – Dual Frequency design work will be underway for the L5 transition. WAAS Telecommunications Subsystem (TCS) will be upgraded with routers and software updates. In addition, the development Signal Generator Subsystem (SGS) for installation into the 5th GEO GUS sites will be completed.

NAS Implementation, $11,780,000 - 500 WAAS procedures are planned for development, which includes flight inspections sufficient to meet this goal. Funds have been allocated to cover increased survey costs, due to new airport Advisory Circulars (AC) 150/5300-16,-17, and -18. In addition, funds will be used for data collection by operators, benefits analysis, and development of WAAS-specific operations within the NAS. A principal focus in FY 2014 will be on terminal area operations.

Technology Evolution - $2,400,000 – Support the WAAS Integrity Performance Panel threat model assessments, ionospheric evaluation, and safety analyses. Support ongoing GNSS evolutionary architecture studies in cooperation with GPS Modernization efforts. A major focus for FY 2014 will be to begin to assess the integrity of the L5 transition activity.

Technical Engineering/Program Support - $22,000,000 - Hazardously Misleading Information (HMI) analysis support, Radio Frequency Interference (RFI) support, software and hardware development, system performance assessment, finance, logistics, training, test and evaluation, reliability-maintainability-availability (RMA) analysis, quality assurance (QA), human factors, earned value management (EVM), security, safety engineering, program management, planning and specialty engineering. In FY 2014, a major focus of the Program will be on the 5th GEO satellite payload development, GIII reference receiver fielding, TCS (Communications) upgrades fielding, WAAS safety computer test and integration and WAAS software recertification.

B. WAAS Surveys and Procedures

$2,000,000 - Developing Localizer Performance with Vertical Guidance (LPV) procedures is a necessary step toward realizing the benefits from WAAS. The Destination 2025 initiative calls for development of 500 new procedures in FY 2014, and that initiative will continue in future years. Based on historical data, it is estimated that 650 approach surveys will be required each year to support this number of usable procedures. LPV and Localizer Performance (LP) procedures developed in a current fiscal year require surveys conducted the two years prior. Surveys contracted in FY 2013 will be delivered in 2014 and used to support procedure development in FY 2015.

Planned Milestones:

- Provide funding for three WAAS geostationary satellite leases
- Publish 500 WAAS Approaches
- Release 5 – L5 Development Phase I: Development draft L5 algorithm
- Implement WAAS TCS Upgrades for GIII receiver
- Develop and complete GEO Signal Generator Subsystem-Type (SGS-T) installation

What Is This Program?

WAAS, a satellite based navigation technology, allows qualifying airports in the NAS to have vertical and horizontal guidance during all phases of a flight, regardless of weather conditions, without installing expensive legacy navigation hardware at each runway. WAAS consists of a network of 38 FAA ground reference stations distributed across the continental United States and Alaska that monitor the global positioning system (GPS) satellite signals. 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 across the entire NAS and precision approach take off and landings at 95 percent of the qualifying airports in the 48 contiguous states.

WAAS has been used as the ADS-B on-board sensor in all demonstrations to date, because it meets the requirements to achieve levels of accuracy, integrity, and availability required by an ADS-B sensor. The development of a common WAAS/ADS-B avionics suite using the same WAAS-based position sensor will reduce the overall cost to the user and will facilitate the widespread, rapid, and cost-effective deployment of both WAAS and ADS-B.

WAAS also supports NextGen Navigation and Timing (PNT) satellite navigation capabilities and interfaces with GPS capabilities at DOD and GPS chips and recievers that are available on the commercial market. Other investments that WAAS interfaces with include Continuously Operating Reference Stations (CORS) operated by the National Geodetic Survey under the National Oceanic and Atmospheric Agency, Mobile E911and a very large population (hundreds of thousands) of WAAS enabled GPS receivers being used in aviation, marine, automobile, telecommunication, agriculture, surveying and recreation.

FY 2014 is the first year of the next important segment - WAAS Phase IV Dual Frequency Operations. Phase IV incrementally implements changes to the WAAS necessary to launch Dual Frequency Operations. WAAS Phase IV activities for FY 2014 include development, test, integration and operational cutover of initial incremental changes. Additionally, the Department of Defense has announced December 2020 as the sunset of the current GPS L2P(Y) signal necessary for WAAS user services. The WAAS Phase IV Dual Frequency Operations effort will address this mandate by replacing the L2P(Y) with the L5 signal.

WAAS Strategy to Contribute to NextGen, Air Traffic Operations domain:
The WAAS program is developing 500 LPV/LP procedures per year enabling more efficient aircraft trajectories. WAAS will be used in the redesign of airspace with RNAV T and Q routes that will increase efficiency and capacity, which supports Trajectory Based Operations, Increased Flexibility in the Terminal Environment and Increased Arrivals and Departures at High Density Airports.

In Alaska, WAAS enables users to operate under Instrument Flight Rules (IFR) on routes currently classified as uncontrolled airspace. The WAAS enabled routes improve operator efficiency, access and safety, while incrementally reducing dependency on Ground Based navigation, which supports the solution sets of Trajectory Based Operations and Flexibility in the Terminal Environment.

WAAS will support the near-term demonstrations with vertical flight aircraft, business/regional jets, and air carriers with airspace redesign and WAAS LPV approaches. The business/regional jet portion of these projects will be to develop RNAV/RNP routes from an en route environment using Optimized Profile Descents (OPDs), and WAAS LPV final approach segments that avoid environmentally sensitive areas.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The FAA is required by law to establish, operate, and maintain navigation capability for all phases of flight. Historically, the FAA has invested in ground-based navigation equipment, such as Instrument Landing Systems (ILS), to provide this navigational capability, but FAA has determined that WAAS' satellite-based GPS naviation capability provides the most efficient and cost-effective means of providing the service moving forward. It leverages modern technology advancements and NextGen capabilities will build off this capability. While a minimum operating network of ground based navigation aids will be retained, FAA has begun decommissioning and disposing ground-based navigational equipment.

Many of the aircraft flying in the national airspace system (NAS) lack seamless navigation capability and many runways 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 with the traditional ground based systems. 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). The FAA determined that the safest, most efficient and cost-effective means of providing this service is via a satellite-based navigation capability. WAAS increases the accuracy, continuity, availability, and integrity of Global Positioning System (GPS) data, with concomitant improvements to air traffic system capacity and safety. WAAS also provides aviation service far exceeding that of currently fielded navigational aids.

How Do You Know The Program Works?

In terminal area and approach operations, a Flight Safety Foundation Report found that there is nearly an eight fold reduction in approach accident rates (53 per million for non-precision approaches vs. seven per million for precision approaches) when non-precision vs. precision approaches were used. Specifically, 141 accidents could be prevented over a 20 year period and save over 250 lives when using WAAS for vertically guided approaches at airports where stable vertical guidance is not available or not used today. WAAS provides vertical and horizontal guidance with an aviation safety component enabling pilots to make stable, vertically guided approaches to all qualified runway ends in the continental United States and most of Alaska. Presently precision vertically guided approaches using CAT I ILS are only available at 1,283 of the nation's 19,000 runway ends.

WAAS performance data is collected daily and provided in a quarterly report that produces real time plots, daily plots, real time data, performance videos and performance analysis. The website for this information is http://www.nstb.tc.faa.gov/.

Cargo aircraft have shown increased cargo capacity, reduced fuel loads, reduced divert rates (inability to land at planned destinations), and operational cost savings of approximately $200,000 per year. Regional airlines have shown fuel and time savings by utilizing satellite-based waypoints that facilitate straight-line, shortest-distance routes as compared to legacy (zigzag) routes that fly a series of straight line route segments connecting ground based navigation aids. Commuter airlines have demonstrated cost avoidances attributable to lower minimum descent altitudes at airports through the installation of LPV approach procedures. This savings, along with very short ROI timelines, has translated into commitments to fully equip airline fleets with WAAS avionics. Business jet operators in FAA GIPs have been able to decrease in-flight conflicts with major airport traffic while on approach at feeder airports. This has allowed increased frequency of operations and reduction of in-flight and ground clearance delays.

EMS helicopter operators have been able to create IFR LPV approaches to medical center helipads, eliminating the requirement to land at distant airports necessitating ground transportation and consequent delays in patient care. WAAS-based helicopter routes have allowed elimination of Air Traffic Control delays by assuring deconfliction with airline traffic at major metroplex airports. WAAS based helicopter routes and LPV approaches have been developed into independent infrastructure systems that eliminate ground delays for executive transport in extremely complex and congested airspace such as the New York metropolitan area, allowing significant increases in flight operations during poor visibility. In effect WAAS, and the resulting ability to reduce separation requirements, has enabled the creation of a second infrastructure system where previously only one could exist.

In 2010, an independent Post Implementation Review (PIR) found that WAAS was successfully delivering the expected performance and benefits while maintaining the program cost and schedule baseline.

Why Do We Want/Need To Fund The Program At The Requested Level?

The FAA mission to transition to Performance Based Navigation is heavily dependent on the WAAS program to be fully implemented. Funding reductions for the WAAS Program will directly impact the ability of the NAS to transition from ground based to satellite based navigation. WAAS is a key enabler for NextGen programs (ADS-B, RNAV/RNP, etc.) and supports solution sets for the following: Trajectory Based Operations, High Density Airports, and Flexible Terminals and Airports. WAAS has 54,329 users over a broad cross section of the aviation community, such as regional and national airlines, airports, helicopter operators, general aviation pilots, and many other users. The program provides precision approaches to airports that do not have ground based navigation aids. Failure to fund the WAAS program at the requested level will cause a cascading effect, which would also impact non-aviation communities that relyon the WAAS signal for navigation.

FY 2014 is the first year of the next important segment - WAAS Phase IV Dual Frequency Operations. Phase IV incrementally implements changes to the WAAS necessary to launch Dual Frequency Operations. WAAS Phase IV activities for FY 2014 include development, test, integration and operational cutover of initial incremental changes. Additionally, the Department of Defense has announced December 2020 as the sunset of the current GPS L2P(Y) signal necessary for WAAS user services. The WAAS Phase IV Dual Frequency Operations effort will address this mandate by replacing the L2P(Y) with the L5 signal.WAAS is a large-scale system requiring involvement with the Department of Defense, FAA (ADS-B, RNAV/RNP, Airspace Modernization), ICAO, aircraft manufacturers, avionics vendors, and airlines.

Detailed Justification for - 2D04 Runway Visual Range (RVR) and Enhanced Low Visibility Operations (ELVO) Program

What Is The Request And What Will We Get For The Funds?

**FY 2014 – Runway Visual Range (RVR) and Enhanced Low Visibility Operations (ELVO) Program
($000)**

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Runway Visual Range (RVR) and Enhanced Low Visibility Operations (ELVO) Program	$5,000	$4,000	$6,000	+$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Complete RVR Replacement Projects and Initiate Activities to Increase Operating Capability at Existing RVR Locations	---	$4,000.0
B. Enhanced Low Visibility Operations	---	2,000.0
Total	Various	$6,000.0

For FY 2014, $6,000,000 is requested for engineering and technical services/support; to complete 14 RVR replacement projects and to begin activities to increase the operating capability at a minimum of five existing RVR ELVO locations.

What Is This Program?

This program replaces older RVR equipment with new generation RVR equipment. The RVR provides air traffic controllers and pilots with vital 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 National Airspace System (NAS) exceed their 20 years of Economic Service Life. 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.

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 accidentally by aircraft during take-off or landing.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 fatalities 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 them during departure or landing.

How Do You Know The Program Works?

The Federal Aviation Administration (FAA) has been deploying RVR equipment for more than 40 years. The RVR has proven itself as an extremely useful aid for controllers and pilots flying within the NAS.

Why Do We Want/Need To Fund The Program At The Requested Level?

$6,000,000 is required for engineering and technical services/support; completion of RVR replacement projects and initiation of activities to increase operating capability at eight existing RVR locations. If the program were funded at a lower level the Navigation Program Group would have to delay funding RVR replacement projects and/or decrease the number of existing RVR locations where it is planned to increase operating capability.

Detailed Justification for - **2D05 Approach Lighting System Improvement Program (ALSIP)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Approach Lighting System Improvement Program (ALSIP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Approach Lighting System Improvement Program (ALSIP)	$5,000	$3,000	$3,000	-$2,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Equipment Procurement	---	$1,990.0
b. Begin One MALSR Replacement	---	950.0
c. Logistics/Engineering Support Service	---	60.0
Total	Various	$3,000.0

For FY 2014, $3,000,000 is requested for engineering and technical services/support; procurement of eight Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) systems and begin one MALSR replacement project.

What Is This Program?

The Approach Lighting System Improvement Program (ALSIP) upgrades approach lighting systems built before 1975. It upgrades the equipment to current standards and reduces the potential severity of take-off and landing accidents by replacing rigid structures with lightweight and low-impact resistant structures that collapse or break apart upon impact. The entire approach lighting system is replaced when rigid structures are replaced. The High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) provides visual information on whether the pilot is aligned with the runway centerline, the aircraft's height above the runway plane, roll guidance, and horizontal reference for Category II and III Precision Approaches. The 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.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

Improved Safety: This program reduces fatality incidents and costs associated with aircraft accidents involving rigid approach lighting structures, through the use of low-impact-resistant structures.

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.

How Do You Know The Program Works?

Collisions between aircraft and low impact resistant structures have shown minimal or no effect on aircraft, passengers and crew.

Why Do We Want / Need To Fund The Program At The Requested Level?

$3,000,000 is required for engineering and technical services/support; procurement of eight MALSR systems and to begin one new MALSR replacement project. If the program were funded at a lower level the Navigation Program Group would reduce the number of MALSR systems procured and/or reduce the amount of funding provided to start the planned MALSR replacement project.

Many of the older approach lighting systems in the National Airspace System (NAS) have rigid structures. Aircraft that accidentally strike these structures during departure or landing can incur substantial damage. The National Transportation Safety Board (NTSB) recommended replacing the rigid approach lighting structures with low-impact resistant structures that collapse or break apart upon impact.

A reduction in funding would reduce the number of MALSR systems procured.

Detailed Justification for - 2D06 Distance Measuring Equipment (DME)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Distance Measuring Equipment (DME)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Distance Measuring Equipment (DME)	$5,000	$5,000	$4,000	-$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Distance Measuring Equipment (DME) Procurement	---	$2,870.0
b. Complete Establish/Replacement DME Projects	---	800.0
c. Logistics/Engineering Support Services	---	330.0
Total	Various	$4,000.0

For FY 2014, $4,000,000 is requested for engineering and technical services/support; procurement of 35 DME systems and completion of 35 establish/replacement DME projects.

What Is This Program?

DME is a radio navigation aid that is used by pilots to determine the aircraft's slant distance from the DME location.

This program procures state-of-the-art DME systems to support requirements for Commercial Aviation Safety Team (CAST), sustainment of DMEs that have exceeded their 20 year service life expectancy, replacement of ILS markers and new DME requirements.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The current antiquated DME network will not meet the projected 2025 requirements. Without replacement of the current DME systems the network will be unsustainable. The unavailability of a DME network will severely impact general aviation's capability to navigate, commercial aviation's FMS performance, airport capacity due to the non-availability of CAT II/III ILS approaches and safety of the flying public in the NAS. Foreign carriers operations in the NAS will also be severely impacted. Delaying the upgrade of the DME network will increase future replacement costs and will prevent realization of the projected cost savings from future NAS improvements.

The program requires the new DME design to incorporate enhanced local and remote diagnostics and repair capability utilizing proven industry best practices and design. While the design of the new DME is more complicated, it has been designed with human engineering factor considerations for ease of troubleshooting and replacement of LRUs as well as system status indication, high reliability design considerations, ease of future improvements and upgrades, and 150 percent increase in aircraft interrogation capability. The new system will improve reliability by 300 percent andl reduce down time and maintenance cost.

DMEs are replacing ILS marker beacons at existing and newly established Category I ILS locations thus eliminating the need for expensive land lease outside airport property.

How Do You Know The Program Works?

The FAA has successfully procured, deployed and maintained over 900 DMEs within cost and schedule for over 50 years. All systems procured on the DME program have met or exceeded their functional requirements to be used in the NAS.

Presently there are the plans, procedures, technical resources, appropriate support and a contract in place to successfully manage this program within cost and schedule.

Why Do We Want/Need To Fund The Program At The Requested Level?

$4,000,000 is required for engineering and technical services/support; procurement of 35 DME systems and completion of ten establish/replacement DME projects. If the program were funded at a lower level the Navigation Program Group would procure fewer DME and/or delay funding DME installation projects.

The program is required to meet urgent needs to sustain DMEs according to the FAA Roadmap to 2025 and beyond.

Detailed Justification for - 2D07 Visual Navaids – Establish/Expand

What Is The Request And What Will We Get For The Funds?

FY 2013 – Visual Navaids – Establish/Expand
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Visual Navaids – Establish / Expand	$3,400	$3,500	$2,500	-$900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Procure Precision Approach Path Indicator (PAPI) Equipment	---	$448.0
b. Complete PAPI Establish Projects	---	1,680.0
c. Logistics/Engineering Support Service	---	372.0
Total	Various	$2,500.0

For FY 2014, $2,500,000 is requested for engineering and technical services/support; procurement of nine PAPI systems and to install CAST PAPI Systems at nine locations.

What Is This Program?

This program supports the procurement, installation, and commissioning of Precision Approach Path Indicator (PAPI) systems and Runway End Identification Light (REIL) systems. The 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. PAPI consists of four lamp housing assemblies arranged perpendicular to the edge of the runway. PAPI projects a pattern of red and white lights along the desired glide slope so a pilot can tell whether they are on the glide slope and how to correct their glide slope if they above or below it. A REIL is a visual aid that provides the pilot with a rapid and positive identification of the approach end of a runway. The REIL system consists of two simultaneously flashing white lights, one on each side of the runway landing threshold.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

Visual Navaids are necessary to assist pilots in optically acquiring the runway environment. These lighting systems facilitate the transition from cockpit instruments to external visual references during the final landing phase. Different categories and types of approaches require different visual navaid equipment.

The program supports a Commercial Aviation Safety Team (CAST) recommendation to implement a visual precision-like vertical approach capability on various airport runways and Land and Hold Short Operations (LAHSO) requirements. The CAST, a group including Federal Aviation Administration (FAA), airline and airport personnel, has identified 781 runway ends that require implementation of a visual precision-like vertical approach capability. This capability will reduce the number of the controlled flight into terrain accidents during approach and landing. The FAA has agreed to implement this capability at the 170 highest priority runways. The FAA will procure and install Precision Approach Path Indicator (PAPI) equipment to satisfy the CAST requirements. A PAPI is a visual glide slope indicator system that provides visual approach slope information to pilots enabling them to make stabilized descent and approach clearances over obstructions.

How Do You Know The Program Works?

The FAA approved and began deployment of the PAPI in the mid 1980's. For more than 25 years the PAPI has served as the preeminent visual glide slope indicator for pilots flying within the National Airspace System (NAS). The benefit gained from this program is to reduce the occurrences of Controlled Flight into Terrain (CFIT) and accidents during approach and landing. The FAA is scheduled to complete the remaining high priority runways by FY 2015.

Why Do We Want / Need To Fund The Program At The Requested Level?

$2,500,000 is required for engineering and technical services/support; procurement of eight PAPI systems and completion of PAPI establishment projects. If the program were funded at a lower level the Navigation Program Group would reduce the number of PAPI systems procured and/or reduce the amount of funding provided to PAPI establish projects which could result in schedule slips.

Detailed Justification for - 2D08 Instrument Flight Procedures Automation (IFPA)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Instrument Flight Procedures Automation (IFPA)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Instrument Flight Procedures Automation (IFPA)	$2,200	$7,100	$4,500	+$2,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Technology Refresh/Computers/Servers	7	$400.0
b. Technology Refresh/COTS Software Upgrade	340	2,000.0
c. Technology Refresh/Workflow Implementation	---	2,100.0
Total	Various	$4,500.0

For FY 2014, $4,500,000 is requested to continue IFPA technology refresh activities to include purchase of Commercial Off-The-Shelf (COTS) servers, completion of workstation-based COTS software upgrade, and design, configuration and development of server-based business process workflow software.

What Is This Program?

IFPA is a suite of next generation Information Technology (IT) tools. These tools create products using fully integrated solutions for visual and instrument flight procedures. IFPA consists of the Instrument Procedure Development System (IPDS), Instrument Flight Procedures (IFP) database, Airports and Navigations Aids database (AirNav), Obstacle Evaluation (OE) system, and the Automated Procedures Tracking System (APTS). The IPDS tool is being developed in modules, with the first module providing space-based navigation (RNAV and RNP) procedure design capability. IPDS module two will provide ground-based navigation procedure design capability and the legacy design tool will be replaced and decommissioned.

DOT Strategic Goal – Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

IFPA provides the following benefits:

- Increases the airport arrival capacity for eight major metropolitan areas, and at the nation's busiest airports when visibility is restricted
- Modernizes systems in support of both visual and instrument flight procedure development such as approaches, standard terminal automation replacement system, airways, and departures
- Increases automated capabilities for all types of precision and non-precision flight procedures, including conventional ground-based equipment and space-based area navigation (RNAV)
- Provides an integrated obstacle evaluation application, replacing a manual process
- Provides new capability because 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

In addition to supporting FAA Flight Plan goals and strategic initiatives, IFPA provides additional benefits as follows:

- Capability for ongoing maintenance of over 21,000 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 (WAAS) and Local Area Augmentation System (LAAS)
- Efficient response to Air Traffic Obstacle Evaluation (OE) requests, evaluating effects on instrument flight procedures, alleviating manual effort currently required for more than 50,000 OE requests annually. In addition, application of TERPS rules as part of automated obstacle evaluation will be an important benefit
- Conversion of legacy software to OMB, DOT and FAA recommended architecture, providing opportunities for improved integration as well as a foundation for anticipated flight procedure demand well beyond FY 2010

How Do You Know The Program Works?

The IFPA tool suite provided productivity gains for all of Aeronautical Navigation (AeroNav) Products' major work products, using FY2006 labor hours as a baseline. For example, the development time required for a new Instrument Flight Procedure was reduced from 132 labor hours in FY2006 to 104 hours by FY11, the amendment time for an existing Instrument Flight Procedure was reduced from 46 labor hours to 27 hours, the procedure NOTAM generation time was reduced from ½ labor hour to ¼ labor hour, and the obstacle evaluation time was reduced from ½ labor hour to 3/8 hour. These efficiency gains are multiplied by the hundreds and thousands of these products produced on an annual basis. A table of these benefits is included in the program's Baseline Case Analysis Report (BCAR) approved by the JRC in FY2006. Also, these gains are included in AeroNav's documented unit cost reductions, tracked and reported on an ongoing basis.

Why Do We Want/Need To Fund The Program At The Requested Level?

IFPA is a key component in evolving the National Airspace System (NAS) into a performance-based system. Such an evolution requires an investment in systems integration and the automation of aviation data for safety and reliability purposes, as well as an automated electronic means of information sharing. COTS workstations were deployed in early FY 2008 to all procedure developers. In accordance with the approved program baseline, technology refresh activities began in FY 2012 and extend through FY 2016.

A reduction from the FY 2014 IFPA baseline funding request would result in the program not being able to complete the purchase of COTS servers, as well as delaying the COTS software upgrades and/or delaying the business process workflow implementation.

Detailed Justification for - **2D09 Navigation and Landing Aids – Service Life Extension Program (SLEP)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Navigation and Landing Aids – Service Life Extension Program (SLEP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Navigation and Landing Aids – Service Life Extension Program (SLEP)	$7,000	$7,000	$3,000	-$4,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Equipment Procurement	---	$1,056.0
b. Complete Replacement Projects	---	1,854.0
c. Logistics/Engineering Support Services	---	90.0
Total	Various	$3,000.0

For FY 2014, $3,000,000 is requested for engineering and technical services/support; procurement and installation of ALSF-2 Runway Lamp Monitoring System (RLMS) sets and to complete ten Runway End Identifier Lights (REIL) replacement projects.

What Is The Program?

This program renovates or replaces airport approach lighting systems at sites where there is a high risk for failure of these systems and where failure would result in denying use of the primary precision approach. NAVAIDS include:

- Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) for Category I approaches
- High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) at Category II/III approaches
- Runway End Identifier Lights (REIL)

This program also supports Instrument Landing Systems (ILS) sustain and replace efforts at non-Core Airports where primary precision approach capability outages are most likely. ILS components include electronic devices (i.e., localizers, glide slopes, and distance measuring equipment, etc.). ILS's (Mark 1F) removed from Core Airports are reinstalled at lower activity airports to replace existing Mark 1D and Mark 1E ILS.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

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 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.

How Do You Know The Program Works?

Under this program the Federal Aviation Administration renovates or replaces the older equipment within the NAS with newer equipment that performs the same functionality or service. The replacement of the current equipment with new equipment merely preserves the functionality or service already existent. Furthermore, the technological changes are minimal, if any at all, between the old and the new equipment. Finally, the functionality or services being performed is the same as that for the past 50 plus years.

Why Do We Want/Need To Fund The Program At The Requested Level?

$3,000,000 is required for engineering and technical services/support; procurement and installation of ALSF-2 RLMS/Lamp Holder sets, and funding REIL replacement projects. If the program were funded at a lower level the Navigation Program Group would need to reduce the number of ALSF-2 RLMS sets procured and installed and/or reduce the amount of funding provided for REIL replacement projects which could result in schedule slips.

The replaced and upgraded REIL and RLMS equipment will help to reduce runway downtime and technician time associated with maintenance and repair of the visual and navigation aids.

Detailed Justification for - **2D10 VASI Replacement – Replace with Precision Approach Indicator**

What Is The Request And What Will We Get For The Funds?

FY 2014 – VASI Replacement – Replace with Precision Approach Indicator ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
VASI Replacement – Replace with Precision Approach Path Indicator	$8,000	$4,000	$2,500	-$5,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Precision Approach Path Indicator (PAPI) Equipment	---	$504.0
b. Complete VASI Systems with PAPI Systems	---	1,890.0
c. Logistics/Engineering Support Services	---	106.0
Total	Various	$2,500.0

For FY 2014, $2,500,000 is requested for engineering and technical services/support; procurement of nine PAPI systems and complete nine projects to replace a Visual Approach Slope Indicator (VASI) system with PAPI system.

What Is This Program?

The International Civil Aviation Organization (ICAO) has recommended that all International airports replace the Visual Approach Slope Indicator (VASI) lights with Precision Approach Path Indicators (PAPI) lights. This standardizes the equipment used to allow pilots to determine visually that they are on the proper glideslope for landing. The program supports the procurement, installation, and commissioning of PAPI systems in order to comply with this ICAO recommendation.

At the inception of this program, there were approximately 1,387 older (pre-1970's) VASIs at international and other validated locations requiring replacement. The first phase of the program addresses replacement of VASI systems at approximately 329 ICAO runway ends. The remaining VASI systems in the National Airspace System (NAS) will be replaced during the second phase of the program.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

This replacement program:

- Fulfills the need to replace the aging VASI systems within the NAS
- Supports the ICAO standard to install PAPI systems at all international runways
- Responds to Airline Pilots Association and General Aviation requests for PAPI equipment at validated approaches within federally controlled airspace
- Reduces maintenance labor

- Eliminates the current supply support deficiencies related to lack of uniformity between various VASI configurations

How Do You Know The Program Works?

To date, the Federal Aviation Administration (FAA) has replaced 629 VASIs with PAPIs. FAA began deployment of the PAPI in the mid 1980's and for more than 25 years the PAPI has served as the preeminent visual glide slope indicator for pilots flying within the NAS and as the international standard.

Why Do We Want / Need To Fund The Program At The Requested Level?

$2,500,000 is required for engineering and technical services/support procurement of nine PAPI systems and funding to replace VASI systems with PAPI systems. If the program were funded at a lower level the Navigation Program Group would reduce the number of PAPI systems procured and/or reduce the amount of funding provided to replace VASI with PAPI projects which could result in schedule slips.

Detailed Justification for - 2D11 Global Positioning System (GPS) Civil Requirements

What Is The Request And What Will We Get For The Funds?

FY 2014 – Global Positioning System (GPS) Civil Requirements
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Global Positioning System (GPS) Civil Requirements	$19,000	$15,000	$20,000	+$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Technical Oversight	---	$3,000.0
b. L1C Implementation	---	7,500.0
c. OCX Civil Signal Monitoring	---	7,500.0
d. Civil Studies	---	2,000.0
Total	Various	$20,000.0

For FY 2014, $20,000,000 is requested to accomplish the following activities:

- Continued development of 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
- Continued design, procurement, integration, testing and factory acceptance of GPS monitor station and the processing facility equipment. The design and prototyping of the signal monitoring software algorithms will also continue
- Continued 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
- Technical oversight, GPS Directorate Civil Applications (GPC) and National Coordination Office (NCO) support

What Is This Program?

The civil signal monitoring requirements are documented in the Civil Monitoring Performance Standard (CMPS). 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 Directorate. In FY 2014, the work required to implement L1C is expected to consist of system design and development activities 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.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

Currently, the GPS operational control segment does not monitor all civil signals so it may take several hours to detect an anomaly on an unmonitored signal. The Civil Signal Monitoring capability closes this gap by providing monitoring for all existing civil signals and the new civil signals being implemented through GPS modernization. Civil Signal Monitoring provides a real-time interface between the GPS Operator and the status of the entire GPS civil signal outputs. Failure to fund this effort would contravene formal direction received by the Department of Transportation (DOT) to serve as the implementing agency for civil unique capabilities by the GPS program.

How Do You Know The Program Works?

GPS Civil Signal Monitoring fills a shortfall in the current GPS system to ensure all civil signals are monitored. When implemented, the new L1C and the legacy L1-CA signals will be directly observed and usable, the Civil Signal Monitoring analysis will be directly displayed to GPS operators.

Why Do We Want/Need To Fund The Program At The Requested Level?

This project has been directed by DOT to fulfill responsibilities to fund civil unique capabilities (L1C and Civil Signal Monitoring) under the National PNT Policy NSPD-39, December 2004. The FAA serves as the implementing agency to fund the civil unique requirements per a Memorandum of Agreement (MOA) with the Department of Defense (DoD) and DOT. DoD has awarded a contract for the GPS work jointly funded by DoD and FAA. Failure to provide funding may require DoD to delay or stop work on the Civil unique items.

Detailed Justification for - 2D12 Runway Safety Areas (RSA) – Navigational Mitigation

What Is The Request And What Will We Get For The Funds?

FY 2014 – Runway Safety Areas (RSA) – Navigational Mitigation
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Runway Safety Areas (RSA) – Navigational Mitigation	$25,000	$30,000	$38,000	+$13,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$400.0
b. Procurement of NAVAIDs	---	7,000.0
c. Installation of NAVAIDs	---	30,600.0
Total	Various	$38,000.0

For FY 2014, $38,000,000 is requested to conform to RSA standards contained in AC 150/5300-13 Airport Design. RSA compliance provides a measure of safety in the event of an aircraft's excursion from the runway by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots and veer-offs.

What Is This Program?

The FAA runway safety program includes numerous programmatic elements intended to improve the overall safety of the runways and RSA. The RSA must be free of all objects that are three inches above the grade and are not frangible. The program will focus on and accelerate efforts to complete RSA improvements. One key element of this program is RSA Sterilization. Current standards for RSA Sterilization include provisions for clear areas, surface drainage, and weight supportability. The FAA currently owns and operates numerous NAVAIDs that violate the RSA clear area provision of 14 CFR Part 139. Although measured incremental progress has been made to correct these FAA-owned NAVAID RSA violations, a concerted, focused initiative must now be launched to ensure compliance of FAA owned NAVAIDs with 14 CFR 139 pertaining to RSA. PL-109-115 requires the FAA to complete RSA compliance with 14 CFR 139 not later than December 31, 2015 which is inclusive of FAA owned NAVAIDs.

The initiative to correct FAA-Owned NAVAID violations in RSA will take the corrective action on those Navigation systems that are not in compliance with the RSA requirements. The scope of the work to be accomplished will range from the installation of frangible connections on identified structures to the relocation of facilities within RSA if no other solution is available. The objects are in two classifications: those fixed by function and those not fixed by function. Those objects that are fixed by function and will not be able to perform their intended function if relocated, in all likelihood, may receive a waiver with the addition of frangible mounting. Those objects that are not fixed by function will have to be moved outside of the RSA. Below is a listing of objects by classification.

Objects fixed by function:

- Runway End Identifier Lights (REIL)
- Precision Approach Path Indicator (PAPI)
- Visual Approach Slope Indicator (VASI)

- Inner Marker (IM)
- Approach Light System (ALS)
- Runway Visual Range (RVR)
- Access Roads
- Radar Reflectors
- Power Panels (case by case)
- Individual Control Cabinets (ICC)
- Engineered Materials Arresting System (EMAS)
- Glide Slope Antennas
- Antennas
- Maintenance Stands (Frangible Connections)

Objects not fixed by function:

- Localizer (most cases when not possible to relocate)
- NAVAID Buildings (power sheds)
- Transformers
- Power Panels (case by case)

The activities associated with this effort will be prioritized according to the major airport hubs, their supporting reliever airports and then other airports with reported NAVAID violations. The FAA has identified approximately 2,384 violations that need to be addressed at various airport locations. These activities are required to be completed by the end of Calendar Year 2015.

DOT Strategic Goals – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The primary benefit is the prevention of loss of life from aircraft striking non-compliant NAVAIDS located in designated RSAs.

Large NAVAIDs that are not moved or made frangible can pose a considerable safety risk to aircraft and passengers when struck during an overrun. For example, in June 1975 a Boeing 727 crashed into several non-frangible approach lighting systems (ALS) towers while attempting to land at John F. Kennedy Airport in New York. Of the 124 persons aboard, 113 died of injuries received in the crash. Another example, in November 1976, an aircraft taking off at Stapleton International Airport in Denver Colorado collided into two non-frangible ALS structures resulting in 14 injuries.

In response to the Stapleton incident, the National Transportation Safety Board (NTSB) recommended that FAA expedite retrofitting of ALS structures with frangible materials so that the improvements would be completed within three to five years. However, more than 30 years later, FAA found that non-frangible ALSs remain in RSAs and continue to pose a safety risk to aircraft and passengers.

How Do You Know The Program Works?

The FAA has relocated and/or modified NAVAIDs at more than 74 RSAs over the last three years through grants provided by the Airport Improvement Program (AIP). However, to address projects that do not meet the criteria for the AIP grants program, the FAA request additional funding to focus on accelerating the completion of NAVAID improvements by the end of Calendar Year 2015.

Why Do We Want / Need To Fund The Program At The Requested Level?

$38,000,000 is required to address RSA projects of varying size and complexity currently identified for completion prior to December 31, 2015 in accordance with the 2006 DOT Appropriation (PL-109-115). The funding being requested for FY 2014 will allow the procurement of 21 NavAids systems and the completion of 82 RSA improvements.

Detailed Justification for - 2E01 Fuel Storage Tank Replacement and Management

What Is The Request And What Will We Get For The Funds?

FY 2014 – Fuel Storage Tank Replacement and Monitoring
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Fuel Storage Tank Replacement and Management	$5,400	$6,600	$8,700	+$3,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Tank System Modernization and Replacement	---	$8,093.0
b. Engineering and Program Support	---	607.0
Total	Various	$8,700.0

For FY 2014, $8,700,000 is requested to fund:

- $4,915,000 for two Air Route Traffic Control Center (ARTCC) fuel storage system upgrades
- $1,485,000 for three Prime Power/Terminal Radar Approach Control (TRACON) fuel storage system upgrades
- $2,180,000 for General National Airspace System (GNAS) fuel system replacements focusing on coastal and island locations subject to salt water deterioration
- $120,000 for modification efforts in response to changes in environmental regulatory requirements

Based on the current funding profile, the Fuel Storage Tank (FST) program has prioritized requirements for field services. Implementation of Air Route Traffic Control Center (ARTCC) fuel storage system upgrades and Prime Power/TRACON) modernizations are primary program initiatives. System upgrades are implemented to increase operational readiness, attain regulatory compliance, and for lifecycle sustainment.

For FY 2014, the FST Program has scheduled two ARTCC FST System upgrades, two Prime Power upgrades, and 16 general fuel system upgrades.

What Is This Program?

The Fuel Storage Tank (FST) Replacement and Monitoring Program designs, fields, and sustains bulk liquid storage systems in support of vital FAA operations across the NAS. FST systems are fielded at facilities that cross every FAA line of business and all operational divisions.

The majority of FAA FST systems support electrical generator operations that provide primary and emergency power supplies for key NAS facilities. The FST is also deployed to service bulk liquid storage requirements for lubricating oils, building heater and boiler system fuels, service vehicle fuels, liquid wastes, and similar NAS operational requirements. The FAA active tank system inventory includes over 3,800 units that must be continually sustained.

The FST Replacement and Monitoring Program operate under three primary objectives:

- Sustain NAS operational readiness
- Mitigate environmental damage and regulatory non-compliance

- Manage system lifecycle

The FST Program interacts with and supports numerous organizations in sustaining bulk liquids storage requirements.

- The Program office coordinates FST systems fielded as subcomponent of larger FAA stakeholder projects (new ATCT installations, ASR replacements)
- The Program acts as the Subject Matter Expert repository for all FAA organizations and provides technical oversight, support, guidance and resources to the FAA Service Areas, Service Centers, District Offices, and Systems Support Center (SSC) for tank system construction, installation, operations, and removal

The FST Program serves as the primary coordination point for FAA storage system construction, installation, removal, and operations with outside regulatory authorities/agencies (U.S. EPA, state programs, county and municipal governments, building code officials, fire protection officials, and airport operating authorities). This coordination supports the Department and Agency goals for environmental stewardship and eco-friendly solutions.

DOT Strategic Goal – Environmental Sustainability

- Reduction in transportation related pollution and impacts on ecosystems.

Why Is This Particular Program Necessary?

The FST Program reduces potential FAA environmental liabilities. The FST lifecycle sustainment initiative supports the FAA goal of greater capacity by avoiding aircraft delays due to NAS equipment outages.

How Do You Know The Program Works?

Monthly reporting indicates fuel systems continually achieve minimum goal of 99.7 percent sustained operational availability.

Why Do We Want/Need To Fund The Program At The Requested Level?

The FST lifecycle sustainment program maps to the FAA goal of greater capacity by avoiding delays from NAS equipment outages. Executing an FST lifecycle sustainment program achieves the cost benefit of sustaining availability of the systems for NAS operations, reducing the risk of leaking FST systems, minimizing adverse impacts to personal and environmental safety, and preventing regulatory fines of up to $32,500 per day that may be assessed by the Environmental Protection Agency for failing to comply with regulatory standards for tank system installation, configuration, operation, and removal.

Detailed Justification for- 2E02 Unstaffed Infrastructure Sustainment (UIS) Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Unstaffed Infrastructure Sustainment
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Unstaffed Infrastructure Sustainment	$18,000	$18,000	$33,000	+$15,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Unstaffed Infrastructure Sustainment	---	$30,000.0
B. In-Service Engineering	---	3,000.0
Total	Various	$33,000.0

For FY 2014, $30,000,000 is requested to sustain approximately 120 unstaffed infrastructure projects located in all three Service Areas for Communication, Navigation, Surveillance, Weather and Support Services. In addition, $3,000,000 is requested to support in-service engineering activities.

The sustainment projects include upgrades, modernization, refurbishment and replacement of National Airspace System (NAS) antenna and equipment towers buildings, shelters, roofs, storage buildings, plumbing, heating, ventilating and air conditioning (HVAC) equipment, electrical panels and distribution wiring, locks and alarm sensors and lighting, access roads, grounds, fencing, storm water controls, parking lots, security lighting, and walkways.

What Is This Program?

The FAA owns thousands of buildings whose sole purpose is to house, support and protect the NAS Communications, Surveillance, Weather and Navigation aids. These structures are failing. They suffer from leaking roofs, deteriorated foundations and walls, inadequate air conditioning systems and electrical systems, and severely eroded roads that hinder access by FAA technicians. A majority of these 36,000 plus structures were built during the 1940's and 1950's. The FY 2014 request includes a substantial increase to this program, and shows FAA's commitment to sustaining the infrastructure and reducing the current maintenance backlog. The funding will allow FAA to convert the program's current reactionary model to a proactive enterprise portfolio management system that prioritizes component sustainment activities against impact to overall NAS operations.

The Unstaffed Infrastructure Sustainment (UIS) Program proactively sustains infrastructure supporting the NAS to enable the delivery of NAS systems required availability. Proactive NAS sustainment includes major repairs to and replacement of real property and structures which are normally not staffed. Sustainment of the unstaffed infrastructure includes:

- Major repair and replacement of FAA property including: grounds, fencing, storm water controls, parking lots, security lighting, and walkways
- Major repair and replacement of FAA facilities including: buildings, shelters, roofs, storage buildings, plumbing, heating, ventilating and air conditioning (HVAC) equipment, electrical panels and distribution wiring, locks and alarm sensors and lighting

- Major repair, refurbishment and replacement of NAS antenna and equipment towers

Funding will also support modification, acquisition or development and population of tools to better support program decision making and project/funding prioritization, project tracking, facility and infrastructure condition and upward reporting. Perhaps most significantly, less reactive sustainment shall allow for the cost effective integration of NextGen with the existing and emerging unstaffed NAS communication infrastructure.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The UIS program is striving to reduce the backlog of deferred maintenance by approximately 10 percent annually. The majority of 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, preventing system outages and providing cost savings for FAA, the airline industry and the public. The request will also fund building inspections, which could identify life safety hazards that must be addressed to satisfy OSHA and FAA Safety Management System requirements.

How Do You Know The Program Works?

As a result of the continued sustainment at the Unstaffed Infrastructure facilities that house the NAS equipment, NAS outages have decreased at Core Airports.

The UIS Program supports the FAA's greater capacity goal by providing major repairs to or replacements of existing FAA-owned unstaffed facilities and structures serving the NAS. The NAS requires reliable and continuous operation of surveillance, navigation, communication, and weather equipment. In addition the infrastructure protects the electronic equipment from weather hazards, radio interference, and unauthorized entry. Failure of the infrastructure will result in NAS equipment failures directly reducing capacity of the NAS.

The benefits of increased funding to the UIS Program will be:

- Improved availability of Air Traffic Control (ATC) services as a direct result of building improvements (e.g. Heating Ventilation and Cooling (HVAC) replacement, electrical system upgrades) that provide a safe and optimum operating environment for electronic systems
- Extended operational service life of NAS remote facilities that house and protect valuable systems and equipment
- A safe and secure work environment for the Air Traffic Organization (ATO) technical operations personnel that is free from safety hazards
- Identification of opportunities for consolidation, modification, or reuse of existing assets in alignment with NextGen implementation requirements

Why Do We Want/Need To Fund The Program At The Requested Level?

$33,000,000 is required to reduce the number of NAS outages and repair facilities in poor condition and support the FAA facilities paradigm shift to a proactive enterprise-wide portfolio management system rather than simply the current reactionary model.

Detailed Justification for - 2E03 Aircraft Related Equipment Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aircraft Related Equipment Program
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aircraft Related Equipment Program	$11,700	$10,100	$10,400	-$1,300

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Flight Inspection (FI) Flight Program	---	$9,000.0
B. Advanced Fly-by-Wire (FBW) Simulator Technical Refresh	---	1,400.0
Total	Various	$10,400.0

For FY 2014, $10,400,000 is requested for the following:

A. Flight Inspection Flight Program: $9,000,000 is requested for ongoing modifications/upgrades to FAA's flight inspection (FI) aircraft, avionics, and mission equipment. Of the total request, $1,000,000 will be used to continue the Beech aircraft fleet modernization program; $2,000,000 will be used for the Challenger aircraft fleet to modify the space configuration and wiring requirements necessary to support Phase I installation of Next Generation Automatic Flight Inspection System (NAFIS) and to modernize the aircraft avionics for upgraded Traffic Alert and Collision Avoidance System (TCAS) and radar altimeters; $1,500,000 to sustain the current generation NAFIS; and, $4,500,000 to begin implementation of NAFIS Phase I and continue development of NAFIS Phase II.

B. Advanced Fly-By-Wire (FBW) Simulator Technical Refresh: $1,400,000 is requested to continue a technology refresh of the FBW simulator. The request is for a technology refresh to install Automatic Dependent Surveillance-Broadcast (ADS-B) Forward Field-of-View and ADS-B Autopilot Upgrade. This upgrade will enhance existing capabilities by providing key expansion of operational research initiatives necessary to support operational procedures and regulatory guidance development. Fundamentally, operational research will be conducted to leverage these advanced technologies to enhance aviation safety. This technology refresh of the FBW simulator will accomplish the following objectives:

- Provide FBW simulation with existing and emerging cockpit configurations
- Integrate FBW simulator system with ground operations and automation
- Perform FBW data collection for applied research

What Is This Program?

A. Flight Inspection Flight Program: The FAA's worldwide flight inspection (FI) mission is to evaluate and certify instrument flight procedures and to evaluate and certify both ground-based and space-based navigational equipment including facilities for Federal, State, Department of Defense (DoD), private and international customers. The FI mission requires aircraft equipped with specialized test equipment. The Aircraft Related Equipment program ensures the FAA's flight inspection aircraft fleet is equipped with systems required to inspect, certify, sustain, and modernize the NAS and evolving NextGen requirements.

The FI aircraft fleet is composed of 32 specially equipped aircraft. Currently, 66 percent of the FI fleet is limited in its support capabilities. This program provides the technical equipment upgrades and/or replacements to existing aircraft avionics and mission equipment to meet current and future performance requirements. It also provides the Flight Operations Management System (FOMS), used to schedule and manage the inspection process, and the navigation facility data upgrades needed for the inspection systems.

The Flight Inspection Flight Program projects are grouped into three activities:

- Aircraft Modernization projects to support avionics technical refreshes and new or changing regulatory requirements for operating aircraft in domestic and international airspace
- Flight Inspection System Sustainment projects to support mission equipment technical refreshes and new or changing regulatory requirements necessary to continue flight inspection of legacy NAS systems
- Flight Inspection System Modernization projects to support new mission equipment requirements and new or changing regulatory requirements necessary to provide flight inspection of Performance Based Navigation and implementation of evolving NextGen systems

B. Advanced Fly-By-Wire Simulator Technical Refresh: The FAA's Airbus 330/340 aircraft simulator entered into service at the Mike Monroney Aeronautical Center (MMAC) on February 27, 2009. Since the initial acquisition of the simulator, numerous initiatives and enhancements to avionics software and hardware components have been proposed to keep pace with the advancement of new technologies. Equipment upgrades and technical refresh are required for expected future NAS improvements in aircraft and avionics capabilities. If maintained in its current state, the Airbus 330/340 simulator will not be able to support research of future Next Generation Air Transportation System (NextGen) initiatives that would directly benefit implementation of operational procedures and regulatory guidance.

Solutions to current supportability issues have been identified with the following projects: Advanced Head-Up- Display (HUD), Synthetic Vision System (SVS), Automatic Dependent Surveillance-Broadcast (ADS-B) Forward- Field-of-View (FFOV) upgrade, ADS-B autopilot upgrade, and Airbus 380/350 aerodynamic performance model upgrades.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

A. Flight Inspection Flight Program: The FI mission ensures FAA navigational systems, facilities, and tools are sound and operating according to specifications. This program not only provides for expanded capability across the fleet, but the useful life of the aircraft, avionics, and mission equipment is extended from 20 years to more than 30 years.

The FAA sustains system availability by ensuring the accuracy of navigational aid electronic signals, as well as validating and certifying the approach/departure flight procedures and terminal routes at all airports within the NAS and at military facilities world-wide. To do this the fleet of flight inspection aircraft must be modernized and updated to be compatible with the latest equipment and procedures. By constantly checking electronic aids for navigation and landing, and the associated procedures, availability is maintained. As the data below shows, the checks identify discrepancies that are fixed before they cause delays and diversions of aircraft.

In FY 2011 and FY 2012, a total of 31,849 flight inspections were conducted of existing ground based navigational aids and existing Instrument Flight Procedures (IFPs) and 1,988 had reportable discrepancies. This equates to 6.2 percent of published IFPs and associated ground based navigational aids requiring further attention. In addition, 7,162 IFPs required flight inspection in order to publish a new or amended flight procedure. The results of those flight inspections required 808 IFPs to be adjusted and found 126 IFPs to be unsatisfactory. Of the new or amended IFPs, 11.3 percent required correction and thereby avoided potentially unsafe IFPs from being published.

Flight Inspection is a key component of FAA's safety and increased capacity initiatives and evolving the NAS into 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 (RNAV), in addition to the Ground-Based Augmentation System (GBAS) and the Satellite-Based Augmentation System (SBAS). To meet these safety and greater capacity objectives, the FI aircraft fleet must be updated to continue to certify an expanding number of RNAV RNP, GBAS, and SBAS approaches at the lowest possible cost.

The following FAA programs are dependent on flight inspection services.

- NextGen
  - Performance Based Navigation (PBN)
    - Required Navigation Performance (RNP)
    - Area Navigation (RNAV) Routes
    - RNAV Standard Instrument Departure (SID) (includes DME)
    - RNAV Standard Terminal Arrival Route (STAR) (includes DME)
  - Augmentation System Navigation
    - Space Based (SBAS) - Wide Area Augmentation System (WAAS), Lateral Precision with Vertical (LPV) Guidance
    - Ground Based (GBAS) - Local Area Augmentation System (LAAS), GNSS Landing Systems (GLS)
  - Surveillance Systems
    - Automatic Dependent Surveillance Broadcast (ADS-B)
    - Wide Area Multilateration (WAM)
    - Airport Surface Detection Equipment Model-X (ASDE-X)
- Legacy
  - Instrument Landing System (ILS)
  - Visual NAVAIDS
  - Very High Frequency Omni-Directional Range station and/or Tactical Air Navigation (VORTAC)
  - Distance Measuring Equipment (DME)
  - Non-Directional Beacon (NDB)
  - Global Positioning System (GPS)
- ARE supports Aeronautical Information Management (AIM) by
  - Ensuring data integrity for IFP development and publication
  - Verifying the accuracy of the National Flight Database (NFD)

If the program was not funded, FI would not be able to meet FAA published goals/schedules and the aircraft would lose certification as the NAS evolves. For example, the FAA ADS-B mandate would not be met.

B. Advanced Fly-By-Wire Simulator Technical Refresh: Technical refresh enhancements will allow future research that provides regulators with performance data analysis for safe implementation of new technology. It will also provide simulation realism and high fidelity capability for Human-in-the-Loop data across all aviation safety areas. Furthermore, it will provide human factor evaluations of cockpit issues related to work load, operating procedures, and shared Air Traffic Management (ATM) responsibilities.

In the absence of a technical refresh, the FAA will not be able to conduct high fidelity data collection for analysis of emerging technologies to ensure continued worldwide leadership in aviation safety.

How Do You Know The Program Works?

A. Flight Inspection Flight Program (ATO): In the last 20 years the Aircraft Related Equipment program has overcome numerous challenges in the engineering, manufacturing, and development of new technologies that provide the necessary mission equipment and support required of FAA-owned flight inspection aircraft to commission new facilities or NAS systems and to certify the flyability of new or amended Instrument Flight Procedures. Flight Inspection services are provided both domestically and internationally. This program is key to successfully meet the legacy and NextGen flight inspection workload demands with minimal or no impact to the NAS or international commitments.

Flight Inspection productivity has increased by 2.5 percent from 2009 to 2012 and this program will continue to support expansion in the number of Instrument Flight Procedures (IFPs) published and support existing NAS periodic flight inspection requirements within the periodic window and/or grace period.

Accomplishments include the first deployment of two "enhanced" BE-300 aircraft with the capability to flight inspect NextGen instrument flight procedures (e.g., performance-based navigation).

B. Advanced Fly-By-Wire Simulator Technical Refresh: The FAA Airbus 330/340 simulator is Level D certified in accordance with AC 120-40B/JAR-STD 1A and the International Qualification Test Guide (IQTG) for Airplane Simulator Qualification. The FAA National Simulator Team tests, inspects, and approves any change that affects the certification of the simulator.

The Airbus simulator is specifically designed to collect high-fidelity data for the purpose of safety analysis programs. The Airbus simulator provides real-time pilot responses, work-load, pilot/controller interface, and avionics integration with new operational procedures, i.e. HUD, Enhanced Flight Vision System (EFVS), Synthetic Vision System (SVS), ADS-B, and Electronic Flight Bag (EFB).

Since the certification of the A330/340 simulator in February 2009, it has been used in Closely Spaced Parallel Operations (CSPO) safety studies, Guided Missed Approach procedure studies, Required Navigation Performance (RNP) validations, Simultaneous Offset Instrument Approach (SOIA) validation, and Flight Management Guidance and Envelope Computer (FMGEC) system validations. Additionally, ADS-B preliminary research and development utilizing installation on an EFB has been used in assessments of the Cockpit Display of Traffic Information (CDTI) to facilitate In-Trail-Procedures (ITP) and CDTI Assisted Visual Separation (CAVS) HITL workload. The National Transportation Safety Board (NTSB) utilized the A330 to create an aircraft mishap playback to collect aircraft performance data and evaluate HITL factors.

Why Do We Want/Need To Fund The Program At The Requested Level?

A. Flight Inspection Flight Program: This program should be funded at the requested level in order to continue multi-year initiatives and to implement new NextGen starts as planned without negatively impacting the flight inspection support required by non-NextGen (legacy) facilities, systems, and equipment across the NAS. The FAA will continue to ensure the safe operation of over 5,000 Navigational Aids (NAVAIDS), the periodic re-certification of over 21,000 Instrument Flight Procedures (IFPs), and up to 3,000 new and amended IFPs annually. In addition, flight inspection aircraft will be modified to operate in the NextGen NAS (ADS-B/SBAS/GBAS/DoD JPALS) and the evolving international environment.

A reduction from the budget submission would impact the Challenger space configuration and wiring project which would impact NAFIS Phase I implementation.

B. Advanced Fly-By-Wire Simulator Technical Refresh): The technical refresh programs are requested to be implemented according to schedule due to their interdependencies on each other. Additionally, the scheduling follows the roadmap of NextGen initiatives.

An additional reduction in budget would delay installation of Advanced HUD and SVS. Low visibility testing of ground operations and terminal approaches would be delayed impacting future approvals of low visibility operating requirements. This would impact the ability to collect needed data to support safety analysis for implementation of these technologies into the NAS.

Detailed Justification for - 2E04 Airport Cable Loop Systems – Sustained Support

What Is The Request And What Will We Get For The Funds?

FY 2014 – Airport Cable Loop Systems – Sustained Support
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Airport Cable Loop Systems – Sustained Support	$5,000	$5,000	$5,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Site Engineering and Fiber Optic Installation	28	$4,150.0
b. Program Management	---	750.0
c. Engineering Support/Design/Documentation	---	100.0
Total	Various	$5,000.0

For FY 2014, $5,000,000 is requested for advanced engineering, construction activities, and Fiber Optic Transmission Systems (FOTS) equipment installations for Anchorage (ANC) and Oakland (OAK). In FY 2013, intermediate engineering and construction efforts will be underway at Miami (MIA), San Francisco (SFO), Cleveland (CLE), John F Kennedy (JFK), and Denver (DEN).

What Is This Program?

The program replaces existing on-airport, copper-based, signal/control cable lines that have deteriorated. The primary focus will be on projects at airports with high traffic counts and enplanements. The obsolete underground telecommunications cable infrastructure systems are vulnerable to failure and have caused flight delays related to these cable outages. These lines feed airport surveillance radar, air/ground communications, and landing systems data and information to the Air Traffic Control Tower (ATCT), and operational and maintenance information to FAA-staffed facilities. Where cost effective, the program will install fiber optic cable in a ring configuration to provide communications diversity. The ring configuration allows information to flow from either side if there is a break in the cable. The program takes advantage of opportunities to save cost by coordinating projects with major construction projects (e.g. tower relocations and runway projects).

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

All surveillance, navigation, landing, and Air/Ground communications systems at National Airspace System (NAS) airports are endangered because of the condition of the underground cable (either copper or aged multimode fiber) supporting these systems. Many of the control/signal cables serving key airport facilities are 25 to 50 years old, exceeding expected service life, and are badly deteriorated. The copper cable used to sustain the airports infrastructure that meets the FAA specifications is in short supply and not logistically supported. Copper cable, in the gauge required, is not readily available from the industry and is costly since it has to be special ordered in large quantities. This makes the NAS vulnerable to catastrophic failure. Additionally, the cable infrastructure supporting newly developed NAS systems must be upgraded with fiber optics or the deteriorated cable replaced in order to meet these new NAS requirements. This relates to the higher capacity demands of future NAS systems. The sustainment performed under the Airport Cable Loop (ACL) program addresses these issues.

How Do You Know The Program Works?

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 runway incursions. System reliability and safety are enhanced due to increased system performance from diverse paths provided by the airport cable loop ring configurations. Standardizing installation configurations and fiber optic equipment will simplify logistics, configuration management, training, procurement, and depot support.

The FAA can realize savings in costs, resources, and time. Using fiber optic cable instead of copper reduces the possibilities of interference and impedance faced by deteriorated copper wire currently in use. Fiber optic cable is impervious to extremes in weather, lightning strikes, electromagnetic pulses, and electromagnetic interference. By using fiber optic cable and equipment, known as Fiber Optic Transmission Systems (FOTS), the agency will be assured of bandwidth and capacity to serve future requirements.

The program measures the delays associated with cable outages on airports and analyzes them from previous years to determine success in trying to reduce delays by two percent a year on average. The impact of one project may not be seen immediately as a typical project takes 2.5 - 4 years to complete. We are presently reducing cable related outages for Operational Evolution Partnership (OEP) airports by 3.42 percent averaged annually based on the original data record from 1998 of 128 delays.

Why Do We Want / Need To Fund The Program At The Requested Level?

$5,000,000 is required to ensure the ability of the FAA to improve, sustain and/or upgrade the communications infrastructure at airports across the nation.

Detailed Justification for - 2E05 Alaskan Satellite Telecommunications Infrastructure (ASTI)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Alaskan Satellite Telecommunications Infrastructure (ASTI)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Alaskan Satellite Telecommunications Infrastructure (ASTI)	$15,500	$6,800	$11,000	-$4,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Replace/Upgrade Modems, Multiplexers, Switches and Radio Equipment	---	$5,024.0
b. Install and Test Network Management Hardware and Software	---	3,244.4
c. Engineering, Technical and Program Management	---	1,716.4
d. Logistics Support	---	622.4
e. Training	---	392.8
Total	Various	$11,000.0

For FY 2014, $11,000,000 is requested to continue the ASTI Technology Modernization and complete key site testing activities including engineering and integration work efforts. Goals include completing Limited Deployment Installation and Test and start of Full Scale Deployment. The final investment analysis decision for the ASTI Technology Refresh was received in June 2011 and implementation is currently underway. This funding request is necessary to complete modernization efforts in the allotted five-year implementation schedule and achieve improved availability.

What Is This Program?

The Alaskan NAS Interfacility Communications System (ANICS) program (forerunner to ASTI) was implemented in the mid-1990's to achieve system-wide National Airspace System (NAS) inter-facility telecommunications throughout Alaska including circuit connectivity for the following NAS services:

- Remote Control Air Ground and Remote Communications Outlets for voice communication with pilots
- En Route and Flight Service Station Radio Voice Communications
- En Route and Terminal Radar Surveillance Data; Digitized Radar Data and Digitized Beacon Data
- Flight Service Station Flight Service Data processing System and the Digital Aviation Weather Network
- Weather Advisories, Briefings, and Products supporting Automatic Surface Observation System (ASOS), Automated Weather Observation System (AWOS), and AWOS Data Acquisition System (ADAS)
- WAAS Reference Station
- Automatic Dependent Surveillance-Broadcast (ADS-B)

ANICS provides Alaska with 90 percent of the inter-facility communications for essential, and routine air traffic control services. In recent years, aggressive system technical service efforts have been required to maintain overall system availability and reliability. The loss of performance capability, along with increased maintenance and higher costs make it necessary to replace outdated technology platforms.

The ASTI Technology Modernization program provides for the replacement and upgrade of vital system components due to aging and obsolescence and implements improved Support Services: Training, Logistics, Second Level Engineering, and radome maintenance. The program will raise system availability to required levels (0.9999), reduce the frequency of system alarms and outages, and reduce the level of FAA maintenance.

The ASTI funding request is consistent with the December 2009 FAA CFO Business Case submittal and Independent Government Cost Estimate for the ASTI Modernization effort. The final investment analysis for the ASTI Technology Refresh was completed June 2011.

DOT Strategic Goals – Safety

- Reduction to transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

ASTI is needed to address the current system deficiencies:

- Availability has fallen significantly below 0.9999 and continues to decline
- Cruical systems components are no longer supportable for required system operations
- Environmental destruction of system components
- Lack of support infrastructure for training, second level engineering support, radome maintenance, and logistics

The ASTI technology modernization effort will increase system availability to 99.99 percent. ASTI will improve and sustain the availability of the infrastructure and reduce future operations and maintenance costs. Additional qualitative benefits include:

- Improved training for FAA technicians and other operations personnel
- Improved second level engineering support
- Improved logistics support system
- Improved radome maintenance
- Modern and flexible system to support emerging NAS requirements
- Improved Information Systems Security (ISS)

How Do You Know The Program Works?

The ASTI network is already a part of the NAS (facility type "SACOM"). Phase I site construction began in 1994 and the last sites were completed in 1999; Phase II site construction began in 2001 and completed in 2007. Modernization is required to ensure future system availability to meet air traffic requirements.

ASTI is in the implementation phase with Final Investment Decision (FID) completed in June FY 2011. The ASTI program has completed the radome and antenna installations with the exception of warranty issues. Radome maintenance was completed at six locations in FY 2012. FY 2014 activity targets include continuing efforts to upgrade satellite communications equipment at 64 facilities through the completion of Key Site, Site Testing, In-Service Decision, completion of ASTI Limited Deployment locations, development of ASTI Operations and Maintenance course, development of NMCS courses, and completion of ASTI technical documentation.

Why Do We Want / Need To Fund The Program At The Requested Level?

$11,000,000 is required for the continued ASTI Technology Modernization effort to achieve system-wide component replacements/upgrades at 64 locations (including four hubs). The most serious concern surrounds a potential failure at one of the hubs. If the Anchorage ARTCC hub converters fail, 50 of 52 RCAGS at the ARTCC would not be available, leaving the ARTCC without air-to-ground communications.

A reduction to the FY 2014 required funding level would delay implementation of system-wide upgrades and impact Key Site Test, Limited Deployment and delay the start of full scale deployment since sufficient lead time is required for equipment ordering.

Detailed Justification for - 2E06 Facilities Decommissioning

What Is The Request And What Will We Get For The Funds?

FY 2014 – Facilities Decommissioning
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Facilities Decommissioning	$5,000	$5,000	$6,500	+$1,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Facility Disposition	131	$5,950.0
b. Program Management	---	550.0
Total	Various	$6,500.0

For FY 2014, $6,500,000 is requested to fund the final disposition of decommissioned infrastructures and associated property restorations, conducting Environmental Due Diligence Audits (EDDAs), and investigating required work as listed below:

- Final disposition of decommissioned infrastructures and property restorations, meeting all applicable laws, including, but not limited to: the appropriate removal and disposal of hazardous materials; appropriate disposal of debris, evaluation of impact upon cultural preservation, historic preservation, wetlands, natural resource protection issues
- Conducting Phase I EDDA reports for government owned properties, as required by the General Services Administration (GSA), and other applicable laws
- Investigating and documenting the structures to be removed at each site and associated restoration

What Is This Program?

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. Funding was identified in FY 2007 to begin the divestiture (including environmental testing, infrastructure demolition, and property restoration) of these facilities. In addition, under the Next Generation Air Transportation System (NextGen) program, FAA plans to decommission entire classes of facilities such as Non-Directional Beacons and Remote Communications facilities.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

This program is necessary to complete the life cycle of the project/program. The program results in the final disposition of decommissioned buildings, access roads and other real property. This program provides the expertise and oversight to enable all discontinued FAA facilities to be handled in a comprehensive and systematic approach. The future NextGen facilities will require disposition of legacy systems in order to meet the Cost Benefit Analysis derived from facility disposal. The program has the structure in place to provide for those needs.

How Do You Know The Program Works?

This program has experienced great success since FY 2005 to present. Funded work results in the release of decommissioned real property from FAA inventory and associated cost avoidance of: property lease fees; property maintenance fees (grass cutting, snow removal, etc.); utility fees and communications frequency fees. There are also monetary gains for the US government in the sale by GSA of FAA property no longer needed. The cumulative 10 year cost avoidance for reduction of real property in 2011 was $5,600,000.

Why Do We Want / Need To Fund The Program At The Requested Level?

$6,500,000 is required to fund the final disposition of decommissioned infrastructures and associated property restorations, conducting Environmental Due Diligence Audits (EDDAs), and investigate other required work. The work this funding level will support is approximately 131 projects. The current backlog of inventory is projected to increase every year due to the discontinuance of ground based NAS facilities.

Detailed Justification for - 2E07 Electrical Power System – Sustain/Support

What Is The Request And What Will We Get For The Funds?

FY 2014 – Electrical Power System – Sustain/Support
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Electrical Power System – Sustain/Support	$77,581	$72,700	$85,000	+$7,419

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Battery Set Replacement	60	$6,225.0
b. Power Conditioning System (UPS)	13	4,800.0
c. DC BUS Systems	20	4,000.0
d. ACEPS En Route Critical Power Systems	3	22,000.0
e. Lightning Ground Bonding Protection System	4	3,000.0
f. Power Cable Replacement	7	13,000.0
g. Engine Generator Replacement	89	15,275.0
h. Critical Power Distribution Systems (CPDS)	2	1,700.0
i. Alternative Energy Sustainment	7	700.0
j. Power System Sustain Support (PS3)	6	14,300.0
Total	Various	$85,000.0

For FY 2014, $85,000,000 is requested to accomplish the following:

- PS3 ensures that electrical power is reliable and that availability meets NAS requirements
- PS3 directly impacts all NAS service areas having air traffic control equipment and responsibilities
- Backup Power provides an average of 40 hours of uninterrupted operation each year to every system in the NAS. Each system would fail to provide any service for a total of 40 hours per year without access to backup power
- Sustainment is implemented with national contracts for the supply and installation of replacement infrastructure
- The Joint Resource Council (JRC) approved a 10 year baseline (FY 2009 - FY 2018) that provides proactive power sustainment for 92 percent of NAS value (300 top airports/En Route) and arebased on average costs of the power systems over that time period. The costs shown above reflect site specific considerations for the power systems requested in FY 2014.

The National Airspace System (NAS) power system infrastructure is vital to both maintaining existing capacity and increasing the capacity of the NAS in the future. 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.

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. 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.

a. 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 PS3 sustains in excess of 4,000 battery installations with periodic replacement to assure reliability.

b. Uninterruptible Power Supply (UPS): A UPS is a device that conditions commercial power and prevents power disruptions and surges from adversely affecting electronic system performance. An UPS is necessary within an Airport Traffic Control Tower to ensure the continued performance of the facility and eliminate power disruptions to key infrastructure. PS3 currently sustains 1,783 UPS with an expected service lifecycle 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.

c. Direct Current (DC) Power Systems: DC power systems are used to provide a low cost, shorter term alternative to an engine generator. Crucial safety electronic system availability is increased and commercial power disturbances of up to several hours no longer disrupt air traffic operations. The PS3 sustains 541 DC Power systems with a service lifecycle of up to 15 years.

d. En Route Power Systems: The FAA operates 23 En Route Center power systems. Because of the essential 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 essential power and significant delays to air traffic. Each ARTCC requires $11,800,000 to correct this situation. The delivery of this correction will take several years to complete due to funding and disruption constraints. The ARTCC Critical and Essential Power System (ACEPS) has a payback period of less than six months.

e. Lightning Protection Grounding, Bonding and Shielding (LPGBS): LPGBS program provide a systematic approach to minimize electrical hazards to personnel, electromagnetic interference and damage to all FAA facilities and electronic equipment from lightning, transients, ESD, and power faults. The LPGBS program reflects investigation and resolution of malfunctions and failures experienced at field locations. The requirements thus are considered the minimum necessary to harden sites sufficiently for the FAA missions to prevent delay or loss of service, to minimize or preclude outages, and to enhance personnel safety. The requirements in the document have been coordinated with industry standards, and in some cases exceed industry standards where necessary to meet the FAA missions.

f. Power Cable: 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 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 $35 million. 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 request.

g. 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, an FAA site may expect 10 or more hours per year of commercial power failure and hence significant NAS disruption. The PS3 sustains 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.

h. Critical Power Distribution System (CPDS): CPDS provides within a NAS facility to operate and sustain designated electronic equipment and systems that directly support Air Traffic Control (ATC) functions.

i. Alternative Energy Systems (AES): AES Program integrates and sustains a broad range of clean energy technologies to meet NAS operational demands. Utilization of AES technologies reduces the Agency carbon footprint and helps to achieve Executive goals for reduction of fossil fuel dependencies. Alternative energy generation systems include any of the following: Biomass; Waste to Energy; Landfill Gas; Geothermal Energy; Solar Energy; Ocean Energy; Hydropower; Hydrokinetic; Wind Energy; and Fuel Cell.

j. Power Systems Sustained Support (PS3) and System Engineering: PS3 ensures that electrical power is reliable and that availability meets NAS requirements. PS3 directly impacts all NAS service areas having air traffic control equipment and responsibilities. Backup Power provides an average of 40 hours of uninterrupted operation each year to every system in the NAS. Each system would fail to provide any service for a total of 40 hours per year without access to backup power. Sustainment is implemented with national contracts for the supply and installation of replacement infrastructure. Training Facility options and architectural drawings are included in this effortSystems engineering is an interdisciplinary field of engineering that focuses on how electrical power systems in the NAS should be designed and managed. Systems engineering within the power services group focuses on defining and documenting customer requirements, administering the design phase, system validation, quality control, quality assurance, safety improvement, and system life-cycle.

Prioritization: Projects will be prioritized to provide the maximum reduction of risk of loss of NAS service. This will utilize the magnetized 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.

What Is This Program?

PS3 is an infrastructure sustain and renewal program. Other NAS programs fund the initial purchase and installation of components for backup power systems and power regulation and protection equipment.

PS3 supports system sustainability by providing emergency power systems that are necessary to allow continued operation of air traffic control facilities when there is an interruption in commercial power sources. These power systems also protect sensitive electronic equipment from commercial power surges and fluctuations. After new equipment/facilities have been commissioned, the Power program replaces, refurbishes and renews components of their emergency power system and cable infrastructure when necessary to maintain and improve the overall electrical power quality, reliability, and availability.

Program elements include replacing, refurbishing, or sustaining: the large battery systems used for essential power and power-conditioning systems; uninterruptible power systems; DCBUS; ACEPS; CPDS; engine generators; airport power cable; and lightning protection and grounding systems. Projects are prioritized using NAS metrics of capacity, demand, passenger value of time, and other specific expert information.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The PS3 program is vital to both maintaining and increasing NAS capacity by sustaining the reliability and availability of NAS equipment. These actions avoid system and equipment failures that result in costly delays. Without reliable NAS power systems, ATC electronics cannot deliver their required availability and commercial power disruption results in flights being kept on the ground, placed in airborne holding patterns, or being re-routed to other airports. The PS3 program also prevents expensive damage to ATC electronic equipment. Without backup power it is not possible to deliver Air Traffic operations with the required availability.

How Do You Know This Program Works?

The target for this Capital Investment Plan (CIP) program is to sustain adjusted operational availability of 99.7 percent for the reportable facilities that support the Nation's busiest airports through FY 2018. Currently PSG has maintained operational availability for the Nation's busiest airports at 99.9 percent.

Why Do We Want/Need To Fund The Program At The Requested Level?

The PS3 program is vital to both maintaining and increasing NAS capacity by sustaining the reliability and availability of NAS equipment. These actions avoid power disruptions to NAS equipment that result in costly delays. Without reliable NAS power systems, air traffic control electronics cannot deliver their required availability and commercial power disruption results in flights being kept on the ground, placed in airborne holding patterns, or being re-routed to other airports. The PS3 program also prevents expensive damage to air traffic control electronic equipment.

Detailed Justification for - **2E08 FAA Employee Housing and Life Safety Shelter System Service**

What Is The Request And What Will We Get For The Funds?

FY 2014 – FAA Employee Housing and Life Safety Shelter System Service ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
FAA Employee Housing and Life Safety Shelter System Service	$2,500	$2,500	$2,500	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Baseline Program and Asset Management Tools	---	$50.0
b. Logistics and Contracting	---	500.0
c. Construction and Materials	---	1,200.0
d. Inspection	---	750.0
Total	Various	$2,500.0

For FY 2014, $2,500,000 is requested to sustain quarters and shelters including establishment of a facilities management system to enable cost-effective facilities management. Refurbishment of facility structures and roofs, mechanical systems, HVAC systems, roads and grounds, and other infrastructure directly related to housing and shelters would be planned and accomplished to provide safe, healthy and habitable housing and shelters.

Primary locations are Alaska, Grand Canyon and American Samoa. Other housing and shelters are located throughout the United States, including the U.S. Virgin Islands. Because there are relatively few roadway systems in Alaska, barge and heavy-lift aircraft are the primary methods for delivering cargo, resulting in high costs for logistics and construction.

The American Society of Home Inspectors (ASHI), a recognized professional organization for home inspectors in North America. Intent is to develop an internal database, using a facilities/asset management tools (e.g., National Park Service and US Fish and Wildlife Service use variations of IBM Maximo).

What Is This Program?

FAA Employee Housing and Life-Safety Shelter Services manage, sustain, and buy/build/lease adequate housing and shelters to accomplish the FAA mission. Included would be establishment of a standard housing and shelter services policy, internal cost controls, life-cycle planning, exploration of use of commercially-managed housing services, and infrastructure management (including roads, community heating systems, water supply, sewage treatment/disposal, and other utilities).

DOT Strategic Goal – Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

In remote locations or overseas, FAA owns, or in a few cases leases, approximately 260 dwelling units that are used for three purposes:

- Provide permanent housing for FAA employees in remote locations
- Provide temporary quarters for FAA employees at remote locations (for example Islands in the Bering Sea)
- Provide a system of life-safety emergency shelters in harsh environments (i.e., remote arctic and mountaintop locations)

Employees who use these facilities provide air traffic control services and/or National Airspace System (NAS) facilities maintenance services. Additionally aviation inspectors and flight standards routinely use temporary lodging. All employees work to ensure safe, efficient, and expeditious movement of air traffic. Adequate and reasonably priced housing is not commercially available in these locations for employees and their families. The scope affects all of FAA because it applies to ATO and non-ATO, housing and shelter services. FAA Housing and Life-Safety Shelter System Services are vital elements of the Human Resources Management Plan.

Employee Housing and Life Safety Shelter System Services introduces a life-cycle approach for facilities management and sustainment. Establishment of a program with a planned funding path will allow for economy of scale for well-planned management of facilities.

Key principles of facility life-cycle management would be applied via a detailed database to establish a management system. This system would track and implement routine, cyclical and major sustainment/refurbishment projects for these facilities. Similar methods are employed for NAS facilities, but FAA Housing and shelters have deteriorated due to pattern of deferred maintenance resulting from assignment of low priority. This results in ultimately higher costs to restore building structures, mechanical components, HVAC systems, and supporting infrastructure.

How Do You Know The Program Works?

A similar, but less comprehensive, program was in place from FY 1992 until FY 2001. The proposed element within FAA's Capital Investment Plan (CIP) would fully encompass life-cycle management of all types of housing, including permanent living quarters, temporary lodging and emergency shelters. Supporting buildings and infrastructure are included (e.g., community service facilities, water systems, community heating systems, and sewage systems).

Why Do We Want/Need To Fund The Program At The Requested Level?

The required funding level will enable a proactive, multi-year approach to facilities management and life-cycle sustainment. Likewise, this will result in overall cost savings through early solutions and program-level management. Evidence shows up to a ten-fold savings if properly funded sustainment programs were to be instituted. For example, a repair to a sewage system initially estimated at $20,000 was deferred for several years. When the project was finally initiated due to impending system failure, the cost exceeded $200,000.

The estimated multi-year funding is comparable to that expended by the National Park Service and the US Fish and Wildlife Service in similar, remote locations, particularly in Alaska.

A reduction from the FY 2014 housing baseline funding would increase deferred maintenance and increase risk for facility damage resulting in a higher remediation cost in subsequent years. This will increase the risk that these projects will increase in cost due to further deterioration of Housing assets.

Executive Summary – Facilities and Equipment, Activity 3.

What Is The Request And What Will We Get For The Funds?

The Facilities and Equipment (F&E) Activity 3 program is requesting $148,600,000 for FY 2014, a decrease of $24,500,000 (14 percent) below our actual FY 2012 level. This funding supports modernization of non-air traffic control facilities, business systems, and equipment. The programs support safety, regulation, security, information technology security, and regional and service center building infrastructure and support.

$15 million has been requested for Aviation Safety Information Analysis and Sharing (ASIAS) which has identified opportunities to support NextGen Operational Improvement (OI) incremental design, development and post-implementation performance tracking. The ASIAS program will be instrumental in detecting the impacts of system performance anomalies around the NAS. The Aeronautical Medical Equipment Needs (AMEN) program is requesting $5 million to perform major upgrades of outdated lab equipment at the Civil Aerospace Medical Institute (CAMI) in Oklahoma City, Oklahoma. In addition, the Aviation Safety Knowledge Management Environment (ASKME) is a suite of information technology (IT) tools designed to support and enable Aircraft Certification (AIR) to more efficiently certify new aircraft and modifications to existing aircraft. In FY 2014, ASKME is requesting $12.2 million to perform technical evaluations, airworthiness directives development, engineering design approval, electronic filing service, and work tracking software activities.

A key outcome expected to be achieved in the budget year with the requested resources includes increasing functionality enhancements of existing systems to allow FAA to be proactive in analyzing safety data.

What Is This Program?

This Activity is a subset of F&E programs that support modernization of the tools and support infrastructure used to perform Aviation Safety, Regions and Centers, Information Security, and Security and Hazardous Materials activities. Activity 3 also provides funding for the procurement and modernization of systems that allow the agency to archive safety-related data and perform complex analyses in support of aviation safety issues.

Activity 3 efforts contribute to the following DOT Strategic Goals:

- Safety: Reduction in transportation related injuries and fatalities
- Economic Competitiveness: Maximum economic returns on transportation policies and investments
- Environmental Sustainability: Reduction in transportation related pollution and impacts on ecosystems
- Organizational Excellence: Diverse and collaborative DOT workforce
- Organizational Excellence: Enhance cyber security and privacy and improve governance of IT resources

Why Is This Particular Program Necessary?

Our number one priority is safety, and the majority of Activity 3 programs support our safety, security, and statutory functions. These programs support the efficient and effective processes we use to meet the increasing demands of a growing National Airspace System (NAS). Several programs in this portfolio directly support external mandates. For example, the NAS Recovery Communications (RCOM) and Information Security programs are both presidentially- and congressionally-mandated.

How Do You Know The Program Works?

Funding for Activity 3 programs has been requested in the budget for almost two decades. We believe our approach for funding these programs is succeeding because these programs have successfully achieved their performance measures over time. For example, RCOM has a Continuity of Operations Plan (COOP) that is tested regularly and serves as a major element of our training exercises in this area. The Information Security program, which is responsible for tracking and reporting cyber security incidents in compliance with the provisions of the Federal Information Security Management Act (FISMA) of 2002 and National Institute of Standards and Technology (NIST) Special Publication (SP) 800-61 has allowed the discovery and remediation of multiple system compromises. In addition, ASIAS has discovered potential safety issues in the NAS that were addressed through procedural and airspace design. Coordination efforts have ensured that throughout the NextGen evolution planning process ASIAS results were integrated into the airspace and design process and information design tools.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding for Activity 3 programs is required for accomplishing our safety, security, and statutory mission effectively and efficiently. If F&E funding is reduced, implementation of Activity 3 programs would be delayed, and the costs of these improvements would increase over time. We would prioritize reductions in Activity 3 programs with respect to the ATC requirements identified in Activity 1 and 2 programs. Activity 3 investments would be reduced in a manner that would enable FAA to sustain ATC safety and services at levels expected by the public, the military, and our other stakeholders. Further reductions would require larger funding cuts in mission support activities.

Detailed Justification for - 3A01 Hazardous Materials Management

What Is The Request And What Will We Get For The Funds?

FY 2014 – Hazardous Materials Management
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Hazardous Materials Management	$20,000	$20,000	$20,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Superfund Sites Remediation (WJHTC)	---	$7,000.0
b. Investigation and Remediation (Alaska)	---	12,000.0
c. Investigation Other Sites and Program Management	---	1,000.0
Total	Various	$20,000.0

For FY 2014, $20,000,000 is requested to continue the management and remediation of approximately 100 of the 750 contaminated areas of concern (AOCs) that require investigation, remediation, and closure activities.

- $7,000,000 for remediation activities at 10 AOCs at the National Priority List (NPL) "Superfund" site at the William J. Hughes Technical Center, Atlantic City, New Jersey
- $12,000,000 for investigation and remediation at 70 AOCs in the former legacy Alaskan Region
- $1,000,000 for investigation and remediation of 20 AOCs at the Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma, and the Central Service Area, the Eastern Service Area and the Western Service Area (not including the Alaskan Region)

What Is This Program?

The FAA operates the Hazardous Materials (HAZMAT) Management program to clean up approximately 750 contaminated areas of concern at approximately 150 distinct sites nationwide that require investigation, remediation, and closure activities. Site investigations at the identified sites have revealed that toxic contamination resulted from a variety of hazardous substances, including cleaning solvents, degreasing agents, pesticides, asbestos, polychlorinated biphenyls (PCBs), and heavy metals.

DOT Strategic Goals - Environmental Sustainability

- Reduction in transportation related pollution and impacts on ecosystems.

Why Is This Particular Program Necessary?

The FAA has identified 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 (WJHTC) prompted the United States Environmental Protection Agency (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 HAZMAT Management program account for a large portion of unfunded environmental liabilities documented in FAA's financial statements.

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; remediating site contamination; and obtaining closure of sites.

How Do You Know The Program Works?

The target is to remove five percent annually of the total sites listed in the HAZMAT Management program's published Environmental Site Cleanup Report (ESCR).

The FAA exceeded its goal of closing eight sites in FY 2011 with 17 sites being closed, and exceeded our goal of closing seven sites in FY 2011.

The United States Environmental Protection Agency (EPA) lists federal facilities that require remediation actions on the Federal Hazardous Waste Compliance Docket (FHWCD). Currently, there are 73 DOT facilities listed on the Docket, of which 70 are FAA facilities, the most of any DOT organization. Of the 70 sites FAA is responsible for, 66 have achieved No Further Remedial Action Planned (NFRAP) status from EPA. The FAA is currently conducting investigation, remediation, and closure activities at the four FHWCD sites that have not achieved NFRAP status. Those sites are:

- Kirksville ARSR, Air Force Station
- Mike Monroney Aeronautical Center
- Ronald Reagan Washington National Airport
- William J. Hughes Technical Center

The HAZMAT Management program continues to maintain the DOT's goal of a status of "No Further Remedial Action Planned" (NFRAP) at 94 percent of FAA sites listed in the Federal Agency Hazardous Waste Compliance Docket. On an annual basis, the Environmental Site Cleanup Report (ESCR) is prepared to monitor the progress of site identification and remediation efforts throughout the Agency.

A 2002 cost benefit analysis determined a benefit ratio of 3.7 and an internal rate of return of 12.6 percent for the HAZMAT Management program. In FY 2011 the agency's reported Environmental Remediation (ER) liability was reduced by six percent ($35 million) from the ER liability reported in FY 2010.

Why Do We Want / Need To Fund The Program At The Requested Level?

$20,000,000 is required to continue the management and remediation of the 800 contaminated areas of concern. 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.

$20,000,000 is required to:

- Continue to attain 94 percent "No Further Remedial Action Planned" closure documentation for FAA listed on EPA's Federal Hazardous Waste Compliance Docket by conducting contaminant investigations, implementing site remedial projects, and completing regulatory closures at the four remaining Docket sites: Kirksville ARSR, Air Force Station; Mike Monroney Aeronautical Center; Ronald Reagan Washington National Airport; and William J. Hughes Technical Center.

- Continue to perform investigations and remediation projects at all other identified contaminated sites in accordance with federal and state mandates and enforcement agreements to limit future liability to the Agency and foster environmental stewardship.

Detailed Justification for - 3A02 Aviation Safety Analysis System (ASAS)

What Is The Request And What Will We Get For The Funds?

FY2014 – Aviation Safety Analysis System (ASAS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aviation Safety Analysis System (ASAS)	$30,100	$18,800	$12,700	-$17,400

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Hardware/Software System/Services	---	$12,700.0

For FY 2014, $12,700,000 is requested to support the Aviation Safety Analysis System (ASAS) Registration and Certification Infrastructure for System Safety (RCISS). ASAS RCISS will provide technology refresh of equipment for the existing infrastructure as it continues to develop and implement Information Technology (IT) services. The ASAS RCISS program will continue to deploy these IT services in the following areas:

- Mobile Technologies
- Remote Connectivity Telecommunications
- Consolidated Server/Storage Area Network (SAN) systems
- Enterprise Software
- Disaster Recovery

These services ensure continuity of operations for critical and non-critical safety systems. Additionally, these services ensure that safety data are safeguarded against loss by providing a secure, reliable and timely back up of data. These new services support the coming integration of AVS' safety data when data are no longer associated with a system. In this new environment, safety workers assemble data as needed from various data sources to support new business processes. Data in these data stores requires vital recovery response.

What Is This Program?

This program consolidated all previous IT infrastructure programs that supported the Associate Administrator for Aviation Safety's (AVS) safety workforce. It also enhances the current AVS infrastructure while leveraging components across the AVS services. ASAS RCISS provides all IT infrastructure components to the AVS safety workforce, ensuring standard and reliable accessibility to safety data. The program is continuing to enhance and maintain the AVS IT infrastructure to meet evolving AVS business needs by addressing its mobile safety workforce requirements and changes in the aviation industry. The program focuses on providing safety data to the AVS workforce while they are mobile (off-site) and conducting safety inspections and investigations of airlines, manufacturers, pilots, accidents, etc. ASAS RCISS' enterprise infrastructure provides the access methods to all AVS national safety applications developed by System Approach for Safety Oversight (SASO) or Aviation Safety Knowledge Management Environment (ASKME), and all other national safety programs deployed within AVS. The ASAS RCISS infrastructure directly contributes to the success of AVS in meeting its mission goals as it is developed, implemented and administered as an integrated IT solution.

During FY 2014, RCISS Segment 2 will be performing technology refreshments and enhancements on the enterprise infrastructure that was established during RCISS Segment 1.

RCISS encompasses the following six key components:

- Devices for AVS' 7,000+ Safety Workforce (including mobile devices) - Activities include lifecycle replacement of existing devices.
  - Provides equipment designed to meet operational demands
  - Replaces outdated or malfunctioning devices
  - Supports growth of AVS safety workforce (nearly 1,000) from Segment 1 to Segment 2

- Telecommunications - Activities include lifecycle replacement of existing devices and procurement of additional equipment and services where telecommunications bandwidth is deficient.
  - Improves accessibility and speed in utilizing national safety systems and supports centralized server infrastructure
  - Provides enhanced services for the transmission of safety data
  - Replaces outdated or malfunctioning equipment
  - Provides enhanced communication infrastructure for Disaster Recovery environment

- Enterprise Services (Hardware and Software which allow components of the infrastructure to work together) - Activities include lifecycle replacement of existing devices and software.
  - Improves management and operation of the infrastructure through enhanced monitoring, consolidation of equipment and data collection
  - Improves infrastructure reliability
  - Maintains Service Oriented Architecture (SOA) infrastructure and services that lower development costs for AVS national safety applications

- Application Data Servers (Hosting of national AVS safety applications) - Activities include lifecycle replacement of existing servers and storage devices.
  - Continues implementation of application servers supporting national AVS safety applications
  - Replaces outdated or malfunctioning servers by reducing the number of physical servers through virtualization, resulting in reduced costs
  - Provides additional processing power and data storage for the AVS Data Center required to support new (SASO and ASKME) and legacy AVS safety applications
  - Provides enhanced data center environmental upgrades to increase reliability, maintainability and availability (RMA)

- COTS Software (Operating System Software, Database Software) - Activities include maintenance of enterprise software licenses.
  - Ensures continued vendor support for software
  - Evaluate future software to support safety workforce, enterprise management services and all other aspects of the infrastructure

- Contractor Support - Activities include assistance in refining and streamlining the ASAS RCISS enterprise infrastructure.
  - Provides specialized technical expertise in the enhancement of select component areas, e.g., mobile technologies and data center optimization

DOT Strategic Goal – Safety:

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The ASAS RCISS program addresses AVS' need to design and implement its next generation enterprise IT infrastructure to support AVS personnel responsible for promoting aviation safety through regulation and oversight of the civil aviation industry. ASAS RCISS addresses the need for redesigning the current infrastructure to support data storage, data access, data integration, connectivity, availability and disaster recovery created by the changes in the aviation and IT industries.

The next generation ASAS RCISS IT infrastructure supports the AVS safety workforce in their effort to reduce aviation accidents by making real-time safety data immediately accessible to and from all involved, e.g., inspectors, engineers, investigators, and medical examiners.

Additionally, work load capacity, performance, and reliability of the workforce is increased and enhanced by the ASAS RCISS IT Infrastructure. It also enables AVS to modify its IT infrastructure to respond to changing business processes without additional staffing requirements, such as allowing for a more mobile workforce and the creation of virtual workplaces.

How Do You Know The Program Works?

The ASAS RCISS program provides detailed reports about Information Technology (IT) investments and their progress over time to senior FAA executives and makes reports publicly available on the Federal IT Dashboard. The ASAS RCISS program assesses actual program results against baseline expectations determining if performance and benefit targets as well as customer needs are being met. The program management team continues to conduct surveys and data calls to monitor actual investment costs, schedules, benefits, performance, and mission outcomes.

The ASAS team has an integrated master schedule that provides a holistic view of the program and its components. ASAS RCISS uses Earned Value Management techniques and metrics to assess actual results against appropriate measures of effectiveness. As variances occur, ASAS RCISS prepares and executes corrective action plans and/or contingencies to head off substantial variances.

RCISS program management team periodically surveys end users to measure effectiveness of mobile safety devices deployed. Results are used to validate solutions meet end user requirements and to identify lessons learned for future deployments. Surveys conducted to date have successfully demonstrated user satisfaction and validated benefit projections.

Why Do We Want/Need To Fund The Program At The Requested Level?

A reduction from the FY 2014 required level would delay the technical refresh of infrastructure components and end user devices that have reached the end of their lifecycle. Devices in service beyond their intended lifecycle have higher component failure rates resulting in reduced overall reliability of IT infrastructure. To avoid these failures, RCISS would need to forego necessary infrastructure enhancements needed to accommodate new capabilities resulting from evolving business needs. It is vital that RCISS address these business needs in order to contribute to the DOT and FAA strategic goals to increase aviation safety.

ASAS RCISS enables the safety benefits promised by the SASO and ASKME programs by providing the IT infrastructure required by those programs. The data developed, manipulated, analyzed, and reported on by the SASO and ASKME programs will reside on the ASAS RCISS IT infrastructure. Without the ASAS RCISS infrastructure, SASO and ASKME will not be able to realize their full capabilities.

Further reductions would also delay the consolidation of the Registry Data Center into the AVS Data Center. These reductions will have the effect of deferring facility enhancement costs from FY 2014 to future years but will also increase overall operational costs associated with operating two data centers.

Detailed Justification for - 3A03 Logistics Support System and Facilities (LSSF)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Logistics Support System and Facilities (LSSF)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Logistics Support System and Facilities (LSSF)	$10,000	$10,000	$10,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Final Delivery of Full Operational Capability	---	$6,965.6
b. Government Labor/Maintenance/Integration	---	2,740.6
c. Program Support	---	293.8
Total	Various	$10,000.0

For FY 2014, $10,000,000 is requested for full operational capability, maintenance, integration and government and contract support.

What Is This Program?

Logistics Center Support System (LCSS) is a mission support information technology procurement to re-engineer and automate the FAA's logistics management processes. The program aims to modernize the FAA's supply chain and replace the 20-year old Logistics Inventory System (LIS) through two segments (18 and 27 months respectively).

- Segment 1 (Blueprinting) – evaluates the current logistics management business processes and develops a Business Case for re-engineering current processes to match industry best practices and the selected commercial off-the-shelf (COTS) enterprise resource planning (ERP) system
- Segment 2 (Implementation) – implements policy changes and deploys the COTS ERP solution

Anticipated FY 2014 Accomplishments
- Finalize end user training
- Complete system documentation and transfer of knowledge
- Fully deploy LCSS solution to FAA

The current LIS system fails to meet the current agency business needs. Performance gaps (as noted below) will continue to impact supply support to the NAS. Additionally, the FAA will need to cancel the FFP solicitation awarded to Lockheed Martin. These mission gaps include:

- An expensive legacy system that does not meet business requirements – LIS was implemented in 1990 and contains undocumented modules dating back to the 1960s. Over 39,000 patches/revisions have been made to LIS degrading system performance and increasing operational costs. The system requires specialized knowledge to maintain because of obsolete technology and tacit understanding of its database structure. The workforce to maintain this system continues to retire, which puts the FAA at a risk of being unable to sufficiently maintain the system. Additionally, the use of old technology has made it tedious and error-prone to interface with new systems. If the system fails, logistics support of the NAS will be disrupted

- Limited shop floor automation – Minimum visibility of assets in repair at the Logistics Center, comprising 30,000 assets valued at $241 million annually, or 50 percent of all repairs to the NAS
- Limited monitoring of part quality and limited vendor performance monitoring and metrics to identify poorly performing parts and suppliers. Serial number tracking is not currently 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 at agency cost. Without a picture of the agency's repairable asset population, purchases for economies of scale cannot be realized. We need a timely connection to be proactive rather than reactive
- Warranty – The agency incurs the cost of Logistics Center or commercial repair when the manufacturer should bear the cost
- Spares planning - current agency cost of initial spares for new programs is unknown

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The FAA provides a safe, secure, and efficient global aerospace system, contributing to United States national security and promoting aerospace safety. In support of this mission, the FAA Logistics Center (FAALC) manages the central NAS inventory warehouses and distribution facilities for the FAA. It provides routine and emergency logistics products and services to 8,000 FAA customers at 41,000 facilities and 28,000 sites as well as to the Department of Defense (Air Force, Navy, and Army), state agencies, and foreign countries. It provides logistics support for 80,000 parts and services and supplies, tracks, and account for Capital and Operations-funded parts totaling $740,000,000. The current system used to support this mission is the Logistics and Inventory System (LIS). LIS is an agency-developed legacy mainframe application that lacks the capability and flexibility to accommodate the near term or future long-term supply support needs necessary to maintain the NAS. LIS was built using Natural and COBOL languages and was deployed in 1990. Over the last two decades more than 39,000 changes have been implemented in LIS.

Its archaic architecture lacks the scalability to support the increased performance requirements projected by the NAS architecture. The goal of the LCSS Program is two-fold: replace the current LIS system and greatly increase the efficiency of the FAA's supply chain management process by leveraging an ERP system using best industry practices.

LCSS will be a COTS ERP implementation. In addition to gaining the technological benefits associated with adopting object oriented software design, service oriented architecture (SOA), relational databases and a web-based user interface; this system will provide the robust operational business practices and industry standard business processes to the FAA that are needed to support the NAS and meet the objectives outlined in the flight plan.

The implementation of LCSS directly supports the agency initiative of improving the NAS supply chain through modernization of the supply chain infrastructure. The benefits of acquiring an industry leading COTS solution from the commercial supply chain industry will provide significant capability improvements. These benefits directly accommodate the agency goal to increase capacity and meet the projected demand.

How Do You Know The Program Works?

So far the program has met all its objectives on time and within budget, and provides a high probability to deliver the baselined benefits. The program has been planned with comprehensive analysis, which has been vetted by entities within the FAA, but external to the program. These entities include the Office of the Chief Financial Officer, Office of the Chief Information Officer, and various offices within the Air Traffic Organization (COO, CFO, CIO, etc.).

The program's technical solution was identified after extensive market research vetted by Gartner, Forrester, and AMR. The solution is a commercial-off-the-shelf (COTS) containing industry standard best practice for supply chain management. An independent third party assessment found that 80 percent of the 64 core functional requirements could be met without extensions or customizations.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding at the requested level is needed to complete the final segment of the currently baselined program. Based on the programs Final Investment Decision for Segment 2 (Implementation), the funds are needed to meet its baseline and contract obligations for an FY 2014 completion. Additionally, not implementing LCSS on schedule will mean extending the lifecycle for the legacy LIS system that LCSS replaces, and will be an additional operating expense.

Detailed Justification for - 3A04 National Air Space Recovery Communications (RCOM)

What Is The Request And What Will We Get For The Funds?

FY 2014 – National Air Space Recovery Communications (RCOM)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
National Air Space Recovery Communication (RCOM)	$12,000	$12,000	$12,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. VHF/FM and HF Radio Equipment	---	$2,500.0
b. Emergency Operations Network (EON)	---	3,500.0
c. Emergency Operations Facility	---	2,000.0
d. Communications Support Team (CST)	---	100.0
e. Secure Communications (COMSEC)	---	1,200.0
f. Information Technology Support	---	2,000.0
g. Satellite Telephone Emergency Network (STEN)	---	700.0
Total	Various	$12,000.0

For FY 2014, $12,000,000 is requested for NAS RCOM. For this amount the Command and Control Communications (C3) program will provide the FAA thecommand and control communications 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 will also provide capabilities for Continuity of Operations (COOP) for the FAA.

What Is The Program?

The C3/NAS RCOM program provides both emergency and routine capabilities. These capabilities are based on both FAA needs and national security mandates. FAA specific needs are taken from the public safety mission to maintain a continuously viable National Airspace System. The national security mandates are contained in executive orders, national security defense directives, federal preparedness circulars, and other national policy edicts.

- $2,500,000 to continue funding of the Very High Frequency (VHF)/Frequency Modulated (FM) and national High Frequency (HF) radio network modernization efforts. 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 in accordance with the National Telecommunications and Information Administration (NTIA)
- $3,500,000 to continue funding Emergency Operations Network (EON). Support includes the continued development of Google Earth layers, Secure Instant Messenger, EON Dashboard, EON Off-line, and the EON Data Discovery platform
- $2,000,000 to continue funding Emergency Operations Facilities activities which includes, the development of audio/video display systems, national situational awareness view, Domestic Event Network (DEN), incident monitor, emergency notification system, conference bridge, and help desk support
- $100,000 for support of the Communications Support Team (CST) emergency response activities and related communication equipment

- $1,200,000 for continued funding of Secure Communications (COMSEC) activities and exercises to ensure continued system viability related to all secure telephone, secure facsimile, and secure classified communication equipment
- $2,000,000 for continued funding of C3 Information Technology (IT) Activities used to maintain the IT infrastructure for COOP sites and the Emergency Operations Network
- $700,000 for continued support and refresh of the Satellite Telephone Emergency Network (STEN)

DOT Strategic Goal - Organizational Excellence

- Enhance cyber security and privacy and improve governance of IT resources.

Why Is This Particular Program Necessary?

The Command and Control Communications (C3)/Recovery Communications (RCOM) program enables the FAA and other Federal agencies to exchange and collaborate information both, classified and unclassified, to promote national security. The C3/RCOM program also supports the Washington Operations Center Complex and modernizes several "continuity of operations" sites, which ensures FAA executives command and communications during times of crisis. Where applicable, C3 is an OMB SAFECOMM compatible program that encompasses multiple independent procurement projects, which are currently at various stages in the acquisition lifecycle.

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 can no longer be utilized. 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 approximately 20 years, long past its expected life cycle. For example, the cost to repair one module is more than the purchase of a new modern radio, yet for compatibility reasons, the repair of outdated equipment is continued.

The FAA, Emergency Operations, and C3 have a mission to develop web-based emergency operation information-sharing tools that create a common operational picture and support effective decision-making. A secure, highly available, and flexible infrastructure has been created for effective collaborative communications, continuity of operations, and adaptive situational awareness for enhancing decision support.

This new infrastructure has been built upon existing FAA networks and technologies and the operations framework is built upon the lessons and best practices learned from previous and existing initiatives. It is called Emergency Operations Network (EON).

The C3 program office has Presidential and Congressionally mandated responsibilities to provide reliable communications support to the White House, Department of Transportation, FAA and other government agencies during national security events, disaster recovery efforts, accident investigations, government exercises, and special invitational events.

Other efforts within the C3 program also revolve around National Security. There are several operational command and control centers within the Washington area and other sites around the country that require modernization. Since September 11, 2001, the C3 program has had its responsibilities increased to meet the current national security demands.

How Do You Know The Program Works?

The C3 program performs annual exercises to ensure that COOP sites are functioning properly and improving. Emergency and non-emergency communications are tested regularly. Site installations for

VHF/FM have proceeded according to established goals, and knowledge sharing products have been developed and released with much success.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding the C3/NAS RCOM program at the current level will ensure that the FAA fulfills its mission to maintain emergency communications in the event of a crisis and meet national security mandates. Furthermore, current funding levels will allow the FAA to replace aging VHF/FM radios and meet NCS Directive 3-10, FAA Emergency Operations Plan (FAA Order 1990.1), the National Telecommunications and Information Administration (NTIA) narrow-banding, and the OMB/DHS SAFECOM compatibility requirement.

The C3 program office provides key communications for both daily NAS operations and disaster/crisis management by providing:

- Increased command and control by national leaders in the FAA and other agencies
- Quicker response to natural and wartime disasters thereby helping avoid loss of life and property
- Assurance that COOP will be maintained
- OMB/DHS SAFECOM compatibility

The new C3 equipment will directly benefit the FAA in the form of lowered periodic and correctional maintenance costs of the old and technologically obsolete C3 equipment in the field. The C3 program also provides the FAA with OMB/DHS SAFECOM compatible emergency communication systems, ensuring interagency interoperability.

Detailed Justification for - 3A05 Facility Security Risk Management

What Is The Request And What Will We Get For The Funds?

FY 2014 – Facility Security Risk Management
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Facility Security Risk Management	$16,000	$15,859	$15,000	-$1,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Construction/Installation for Security Upgrades	---	$3,000.0
b. Equipment Design/Installation	---	3,000.0
c. Engineering Design/Equipment Installation (MMAC and NCT)	2	7,000.0
d. Security Upgrades at 12 Security Level-1 and Security Level-2 Facilities	---	2,000.0
Total	Various	$15,000.0

For FY 2014, $15,000,000 is requested to support the continuing effort for the following upgrades:

- Construction/ Installation for security upgrades
- Security Equipment Installation at Mike Monroney Aeronautical Center (MMAC)
- Engineering design and equipment installation at MMAC and Northern California TRACON (NCT)
- Security upgrades at 12 Security Level 1 and Security Level 2 facilities

What Is This Program?

In 1999, the FAA established the Facility Security Risk Management (FSRM) Program. The program implements standardized facility protective measures at all FAA staffed facilities. These measures include personnel access control (via card readers, fencing, gates and security guards), surveillance (cameras), vehicle access control (barriers), visibility enhancements (lighting) and x-ray machines. The FSRM Program participates in construction of facilities that secure FAA personnel and assets; such as guard houses, and facility retrofitting to protect against blast (explosive attacks). Finally, the FSRM Program manages contracts that provide maintenance of installed security systems regardless of age, manufacturer or condition. In addition to the protection of FAA personnel and assets, another program goal is one of standardization across the NAS. The standardization of security equipment and processes will result in a substantial cost savings to the FAA. To aid in NAS-wide standardization, the FSRM Program facilitates security system installation for not only ATO facilities, but also for facilities serving the Aviation Safety (AVS) and Airports (ARP) Lines of Business within the FAA. FSRM is participating with NextGen Planning in identifying security needs and vulnerabilities of future NextGen facilities to ensure that the safety and security of FAA assets and personnel are maintained as FAA prepares for the Future of Flight.

DOT Strategic Goal - Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

Aviation assets are attractive targets for those who would seek to harm and terrorize Americans. FAA facilities are vulnerable to outside intruders if not properly protected. Security vulnerabilities jeopardize air traffic services to the National Airspace System. Threats to aviation safety are ever increasing and ever adapting. FSRM, in conjunction with FAA Security and Hazardous Materials (ASH), ensures that FAA has an operational and administrative environment that provides reasonable safeguards against disruptions that could occur if FAA facilities were attacked. Homeland Security Presidential Directives (HSPD) 7, Crucial Infrastructure Identification, Prioritization and Protection mandates that agencies identify, prioritize, and coordinate the protection of infrastructure and key resources against terrorist acts. The work of FSRM is part of that effort.

The FSRM Program is instrumental in ensuring that FAA efficiently and cost effectively implements all issued Presidential Directives aimed at securing federal facilities and personnel. With regard to HSPD 12: "Policy for a Common Identification Standard for Federal Employees and Contractors", through the national Security System Design and Integration Contract, managed by FSRM, card readers throughout the NAS are being replaced with those that will read the common ID media required by the Directive. Through HSPD 16, National Strategy for Aviation Security, the federal government intends to "deter and prevent terrorist attacks and criminal or hostile acts in the Air Domain." The installation of security measures by the FSRM Program accomplishes the goal of this Directive.

How Do You Know The Program Works?

FSRM has contributed to obtaining security accreditation at over 980 FAA facilities. This was accomplished by the Program's management of national contracts through which security measures such as X-ray machines, cameras, card readers, gates, vehicle barriers, etc. were installed. The installation of the measures led to security accreditation of the facility as required by FAA Order 1600.69. The impact of those upgrades has been to reduce the risk of the facility to intrusion and unauthorized entry. Additionally, the installation and standardization of security equipment across the NAS has led to cost savings to the FAA.

Why Do We Want/Need To Fund The Program At The Requested Level?

$15,000,000 is required in order to sustain the work of securing FAA facilities. Securing the facilities requires funding to continue the following:

- Construction/Installation of security measures at all FAA staffed facilities
- Security engineering design and equipment installation at MMAC and NCT
- Security equipment installation at MMAC
- Security upgrades at 12 Security Level 1 and Security Level 2 facilities

A reduction in the funding required would reduce the number of facilities at which required security upgrades could be performed.

Detailed Justification for - 3A06 Information Security

What Is The Request And What Will We Get For The Funds

FY 2014 – Information Security
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Information Security	$15,200	$15,000	$13,000	-$2,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. Information Systems Security (ISS)	---	$12,000.0
B. Federal Identity and Access Management (FICAM – formally LAACS)	---	1,000.0
Total	Various	$13,000.0

For FY 2014, $13,000,000 is requested for the following:

A. ISS

$12,000,000 is requested to provide funds for Information Security Services. This includes:

- Cyber Security Management Center (CSMC)
- Enterprise Architecture and Interoperability
- Academia and National Science Foundation Technology
- William J. Hughes Technical center (WJHTC) Prototyping Laboratory
- Advanced Concept Technology Demonstrations
- Wireless Intrusion Detection System (WIDS)
- Vulnerability Code Scanning
- Data Loss Prevention (DLP)
- NAS/NextGen Information System Security Capability

These projects and services allow FAA to meet the following outcomes:

- Achieve zero cyber security events that disable or significantly degrade FAA mission systems
- Protect NextGen and NAS systems and networks from attempted attacks; with improved and predictable, reliable, available systems
- Protect the Enterprise by expanding capability through Advanced Persistent Threat (APT) efforts
- Complete Enterprise Mapping
- Achieve Full Packet Capture through FAS
- Comply with OMB Memorandums and mandates, remain green
- Improve the efficiency for access mechanisms that meet current federal security guidelines
- Ensure confidentiality, availability and integrity of FAA assets, particularly crucial information systems, networks, and administrative systems, through the purchase and customization of commercial-off-the-shelf (COTS) products
- Privacy and sensitive information scanning software installed and monitored for all FAA egress points Increase capability to detect rogue access connections into FAA networks
- Increase number of software scanning services to meet ongoing testing and evaluation of information security software controls effectiveness
- Improve cyber incident detection, analysis and response in NextGen ISS activities

- Improve and enhance boundary protection, internal policy enforcement, and ISS governance
- Applied Technology transition to improve operations and increase efficiency
- Implement Internet Protocol version 6 (IPv6) securely in the FAA network environment
- Develop data and information architecture to seamlessly share information internally and externally
- Develop strategies to evaluate and implement applied technologies in support of FAA programs and initiatives; such as, Cloud Computing, Trusted Internet Connection (TIC), IPv6 and Mobility.

B. FICAM

$1,000,000 is requested to fund the FAA Identity and Access Management Program required by HSPD-12 and OMB M-11-11 (among other mandates) using the Federal CIO Council's Identity, Credential and Access Management (ICAM) Roadmap. The Federal Identity Access Management (FIAM) group will perform these functions to make accessing computers and facilities more (1) secure, (2) user-friendly, and (3) efficient.

- The functions enhance security by closing gaps in authentication, authorization, encryption, logging, auditing, on-boarding and off-boarding
- The functions improve accessibility so that personnel can use ubiquitous credentials (e.g., PIV Cards) everywhere after the agency ties together disparate facilities, systems and workflows across the Agency and among its partners
- The functions increase efficiency, reduce costs, and increase service by consolidating redundant functions and streamlining transactions

What is This Program?

A. ISS: The FAA ISS program is a partnership between the FAA Chief Information Officer (CIO) organization and FAA lines of business and staff offices (LOBs/SOs) with a focus on protecting our information technology (IT) infrastructure. The program is comprised of the following areas: Cyber Security Management Center (CSMC); IT and ISS awareness and training; IT development; policy, standards, and requirements; program evaluations; system certification and compliance; Data Loss Prevention and applied technology and enterprise architecture.

The Cyber Security Management Center (CSMC) is the operational branch of the FAA ISS Program. It is comprised of facilities, technologies, as well as FAA and contract personnel working as a unified entity to provide extremely effective, enterprise-focused cyber security services to its clients. The CSMC is a 24x7x365 day operation supporting the entire FAA and the Department of Transportation (DOT). In executing the CSMC mission of cyber security for the FAA, the CSMC is the central reporting point for all cyber incidents occurring within the FAA and DOT. Along these lines, the CSMC also represents the entire DOT as the single source provider of the cyber "big picture" when reporting to the Department of Homeland Security (DHS). At the Federal reporting level, the CSMC holds two seats on the National Cyber Response Coordination Group (NCRCG), a DHS-sponsored emergency action team and advisory council reporting directly to the White House on cyber issues affecting, or potentially affecting, national security. Specific security services CSMC provides are described in the question below.

Enterprise Architecture as mandated by OMB A-11 aligns the FAA's investments to the Capital Investment Plan approved by the Investment Decision Authorities. The FAA Acquisition Management System (AMS) enforces compliance with these federal mandates; the FAA EA has been approved by the Joint Resource Council and the FAA Enterprise Architecture Review Board for the last several years.

B. FICAM: The Federal Aviation Administration (FAA) performs three key activities to enhance security, improve accessibility, and increase efficiency.

- **Platform.** Operate the Agency's ICAM Platform. Set up, operate, and connect other systems to the Platform to authenticate users. Consolidate the Agency's workflows and enterprise systems that identify personnel, manage credentials, and control access
- **Support.** Support users, system owners and partners who need to use PIV Cards and other ubiquitous credentials for access. Maintain a help desk and train other help desks on access controls. Issue

guidance and resolve access problems. Enable non-agency credentials to use agency resources and vice versa
- **SMEs.** Employ subject-matter experts who collect metrics, track progress, write policy, answer questions, and represent logical access functions on initiatives that affect access

DOT Strategic Goal – Organizational Excellence
- Enhance cyber security and privacy and improve governance of IT resources.

Why is This Particular Program Necessary?

A. ISS: This program funds Information Security Services including the Cyber Security Management Center (CSMC) with responsibility for cyber security incident management for the Department of Transportation (DOT) in compliance with the Federal Information Security Management Act (FISMA) of 2002 and National Institute of Standards and Technology (NIST) Special Publication (SP) 800-61, Revision 1. In 2011, the CSMC detected over 7.5 billion alerts/attacks generated against DOT infrastructure. From these alerts the CSMC generated over 3,700 incidents for DOT infrastructure including the FAA. To date, the FAA alone has had 181 special threat events. The facilities and equipment required to maintain this level of vigilance is essentiall to the overall success of the CSMC's cyber security mission.

The 2002 FISMA states that each Federal department and agency must maintain an information security program that is consistent with policies, standards, requirements, and guidance issued by the Office of Management and Budget (OMB), NIST, US-CERT, and other designated Federal agencies.

The OMB Circular A-130, Management of Federal Information Resources, states that Federal departments and agencies must implement policies, standards, requirements, and procedures that are consistent with standards and guidance issued by the NIST.

As part of the National Response Framework (NRF), the DOT has been designated as a Cooperating Agency in the Cyber Incident Annex of the NRF. The CSMC fulfills its responsibilities listed in the Cyber Incident Annex if requested by the DHS and/or other coordinating agencies as designated by the NRF.

B. FICAM: Users access computers (e.g., desktops, agency websites, other federal websites, applications, etc.) using different credentials (i.e., usernames, passwords and smartcards). FIAM consolidates access to the agency's networks and information systems and responds to over 70,000 personnel who have questions and report problems related to access. Identities, credentials, and access controls are growing in number and complexity. Access workflows touch every employee and contractor every day. Under HSPD-12, the Agency issues a PIV Card to someone every three-to-five years. Under ICAM, the Agency validates a PIV card of someone at least every three to five hours—every time someone accesses a computer or application on it. ICAM workflows are highly interconnected. Partners will continue to evolve, and eventually the Agency will need to accept their PIV Cards and allow its partners to accept the Agency's PIV Cards. Their evolution demands one enterprise approach.

FIAM reduces access breaches that result in compromised confidentiality, integrity, availability, authenticity, and repudiation. Combating these breaches is increasingly difficult because the Agency uses many different workflows and systems to manage access. These breaches are not theoretical but real. When personnel leave the Agency, much of their access remains active because too many parties must revoke each piece. Without adopting minimum federal standards, many LACS are accessible when they should not be (and vice versa). Several audit findings already cite security incidents such as a password reset of tens of thousands of webmail accounts and other events that reveal an increased need for oversight and central management of access controls to Agency resources.

The overall security program also ensures compliance with the following additional mandates:

Federal ICAM Mandates:
- Continued Implementation of Homeland Security Presidential Directive (HSPD) 12—Policy for a Common Identification Standard for Federal Employees and Contractors, OMB M-11-11 (Feb. 3, 2011)
- Homeland Security Presidential Directive/HSPD-7

- Homeland Security Presidential Directive/HSPD-12
- Executive Order 13231, Crucial Infrastructure Protection in the Information Age
- National Institute of Standards and Technology (NIST) SP 800-37
- Federal Information Security Management Act, OMB M-03-19
- OMB Circular A-130
- Management of Federal Information Resources, OMB Circular A-130
- Preparation, Submission and Execution of the Budget OMB Circular A-11
- Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, OMB Circular A-94
- Transition Planning for Internet Protocol Version 6 (IPv6) OMB M-5-22

How do you know the program works?

A. ISS: Information Security has allowed the discovery and remediation of multiple system compromises:

- The immediate discovery of the exfiltration of FAA employee data in 2009 allowed the FAA to mitigate the severity by providing Identity Theft Protection to those affected in a timely manner
- By the detection of hacker activity, we were able to remediate systems and prevent valuable information from being stolen

Information Security has been responsible for FAA system vulnerability scanning and assessment to provide a proactive approach to protecting the FAA network:

- Vulnerabilities on FAA websites have been found that could have been used in compromising FAA servers
- Vulnerability Audits are provided to the FAA to enable an awareness of the risks on their network

The program relies on ongoing assessment by subject matter experts and feedback from field technicians to continually evaluate and evolve the program to meet changing threats and evolving technology. An ongoing dialogue and training and awareness programs, issue white papers, bulletins and security alerts ensure that all partners have the information they need to support the agency's security posture. The success of this approach is demonstrated by the fact that the agencies systems have not been significantly degraded or interrupted by cyber-attacks.

The ISS conducts ongoing internal assessments, audits and tests, and works collaboratively with FISMA to ensure that risks are proactively addresses and vulnerabilities remediated.

B. FICAM: The Agency relies on experience and industry research to predict the most successful solutions. FIAM uses mature, commercial off-the-shelf (COTS) capabilities that have been repeatedly proved throughout multiple agencies. FIAM performed an industry-day and vendor-day review to verify requirements and eliminate any requests outside of existing COTS capabilities. FIAM performed a request for information (RFI) and developed a use case and test case document proven to be valid by existing standards. One of the key components of the system is user authentication based on pre-authorized roles and attribute-based privileges. FIAM ensures the Agency provides an automated work flow provisioning capability to manage account setup, modifications, and de-activations in order to improve the efficiency and effectiveness of security and access controls. With the implementation of access control and identity management capabilities, the FAA operations create a secure environment for the agency while protecting internal and external entity intellectual property and privacy.

Why do we want/need to fund the program at the requested level?

A. ISS: The FAA must ensure the integrity and availability of all information systems, networks, and administrative systems due to ever increasing cyber terrorism and malicious activities by hackers and other unauthorized personnel. In the Homeland Security Presidential Directive/HSPD 7, FAA was directed to protect and ensure the integrity, confidentiality, 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 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.

State Sponsored 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. They, by design, reflect hostile intent. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the FAA is capable. The development of the term "State Sponsored 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 work of the Office of the Chief Information Officer 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.

Information systems security will enhance the National Airspace System (NAS) architecture to include cyber security; harden individual NAS systems and network elements by completing remediation for the discovered vulnerabilities in each of the Nation Airspace Systems; enhance boundary protection to NAS facilities; improve recovery rate during times of cyber attacks through information sharing from the FAA Cyber Security Management Center (CSMC); conduct systemic monitoring at the CSMC, and address the challenge of providing cyber protection while maintaining reliability, availability and high system integrity through applied research and development initiatives. The safety-essential aspect of NAS operations leads to stringent requirements for reliability and availability, resulting in extensive use of system and equipment redundancy, path diversity, and software diversity. Mandates for high integrity increases the time and cost to design, develop, and verify NAS components during initial deployment, routine upgrades, and emergency patches. At the same time, the FAA is under pressure to deploy cost efficient new systems that meet stringent safety and security targets. This creates a challenge to reduce the time and cost to deploy high integrity systems to the U.S. national airspace, while at the same time enhancing confidence in the safety, security, and reliability of these systems.

Security risks continue to increase at an alarming rate. The sharp increase in "Special Threat" events over the past several years and the number of alerts shows that FAA is still a target for cyber terrorists. Insufficient funding poses a serious risk to FAA infrastructure, applications, and network operational security. Also, our key information systems security measure, zero cyber security event threats that disable or degrade our networks, may not be achieved. Breaches to our systems, or outright network outages could have an impact on aviation and the US economy, impact FAA's reputation and public image, and cost more than the funding and positions requested. A reduction in funding below the requested level could reduce FAA's ability to prevent data loss from increasing threats and attacks on our mission networks and applications.

NAS Information Systems Security Transformation: FAA will complete concept of operation and implement strategy for automated recovery, which involves isolating those systems that have been affected by a virus, instituting the fix, and making sure that affected systems get back online as soon as possible. Architecture and engineering efforts for alternative solutions to secure new NAS systems will be developed (NSure concept). The NAS information technology systems will be monitored and all necessary actions will be taken to ensure the systems are not interrupted and are available at all times. AIO will acquire and implement enhanced tools to be used by the Computer Security Incident Response Center to address complex and rapidly changing cyber threats and vulnerabilities. These include analysis of NAS Netflow data, modeling and simulation of attack vectors into the NAS, data clustering and early indications and warning; as a result FAA will gain the capability to do predictive analysis of events that could cause a service outage to the NAS. Funds are also required to begin to examine the ISS requirements of a space based NAS.

Enterprise Architecture (EA) and Interoperability: OMB Circular A-130 and OMB Circular A-11 mandate an annual baseline of the EA by the Investment Decision Authorities. The FAA Acquisition Management System (AMS) enforces compliance with these federal mandates. The FAA EA has been approved by the Joint Resource Council and the Architecture Review Board for the last several years. OMB recommends the FAA EA as a model to other federal agencies in IT investment management practices.

F&E funding supports the current state "as is", transition, and target "to be" architecture compliance, governance, and planning. In FY 2014, FAA will continue to enhance its enterprise architecture including the target architecture to ensure that Administrative, NAS-Support and the NAS architecture, defined by the Next Generation Transportation System (NextGen) program, target architecture states are compatible and meet the agency's future requirements. FAA will pursue opportunities to leverage architectural products to reduce costs and improve efficiencies, including the development and enhancement of investment roadmaps.

Data and Information Architecture: Continue to develop and maintain the necessary information architecture to seamlessly share information between the agencies participating in the NextGen architecture, formalize agreements and develop policies to foster the transfer of necessary information between Government agencies and commercial entities. Continue to support the System Wide Information Management (SWIM) program and other NAS program's data architecture efforts.

Applied Technology Transition: Provide the capabilty to explore and execute implementation plans and demonstrate strategies to leverage existing technology applicability to meet ongoing operational requirements. Artifacts from the demonstrations will be transitioned into FAA networks and facilities.

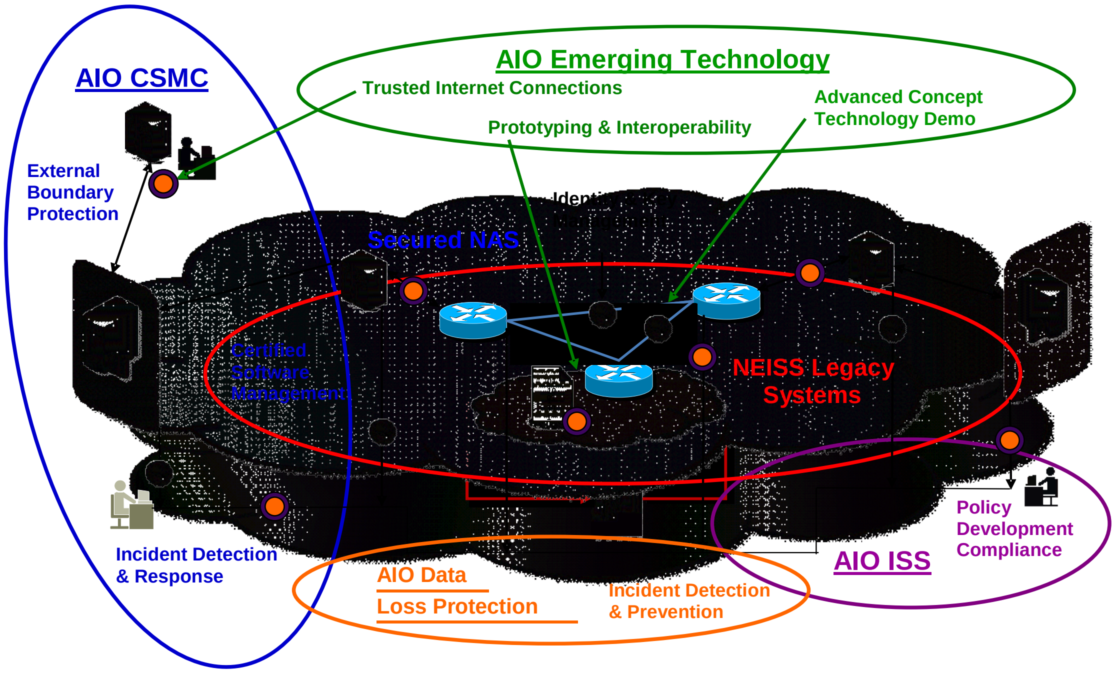
B. FICAM: This level of funding will support integrating 400 applications across the enterprise over three years, fully redundant infrastructure for access controls, the capacity to avoid and quickly resolve work outages, and sufficient training to leverage ubiquitous access and achieve results.

Without this level of funding, the Agency cannot consolidate access controls for its applications, and it will not comply with OMB M-11-11 and related federal mandates. Without the requested level, the Agency's PACS and LACS will continue to be insecure, inaccessible and inefficient. Without meeting the federal mandates, the Agency risks (1) escalating breaches in security, (2) reduced accessibility (i.e., by personnel and partners), and (3) waste (e.g., unnecessary redundancy and complexity).

The NextGen system and the flying public demand safety and security and this capability can help ensure that need. The FIAM group and the ICAM LACS functions it performs have the capability to provide many security solutions where risks exist today. FIAM aligns the Agency so that security will be a strategic enabler working in the background, providing a seamless security capability for the FAA as an agency. The flying public will continue to see the FAA is the premier flying capability in the world because of its safe and secure flying record.

The following graphic shows the interrelationships between all FAA information security components.

NAS Security Enterprise Architecture



Detailed Justification for - 3A07 System Approach for Safety Oversight (SASO)

What Is The Request And What Will We Get For The Funds?

FY 2014 – System Approach for Safety Oversight (SASO)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
System Approach for Safety Oversight (SASO)	$23,600	$23,000	$9,500	-$14,100

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Software Development	---	$4,900.0
b. Change Management Design and Development	---	2,700.0
c. Program Management	---	1,900.0
Total	Various	$9,500.0

For FY 2014, $9,500,000 is requested to continue the Safety Assurance System (SAS) Phase 2a development and implementation. SASO Implementation is composed of two segments, Phase 2a and 2b. Changes in the testing and deployment strategy have necessitated a program re-baseline decision planned for the fourth quarter FY 2013. Implementation of SAS Phase 2a will satisfy the Safety Assurance component ("pillar") of the Safety Management System (SMS) for Title 14 CFR Parts 121 (air carriers), 135 (commuter and on-demand operators) and 145 (repair stations). Phase 2b is the second segment of SAS development and deployment and covers FY 2014 thru FY 2018. During this phase, the remaining SAS functionality will be developed and implemented for all remaining Title 14 CFR Parts regulated by AFS along with the three remaining components ("pillars") of the Flight Standard's Service (AFS) SMS; Safety Risk Management, Safety Policy, and Safety Promotion. Additionally, Phase 2b will result in the consolidation and decommissioning of several AFS Information Technology applications. A Phase 2b Final Investment Decision (FID) is planned for June 2014.

What Is This Program?

The SASO program is one of several FAA initiatives to increase safety and control cost by adopting the International Civil Aviation Organization (ICAO) mandate to revise State Safety Programs to incorporate SMS principles. To accomplish the above, the SASO Program is reengineering AFS business processes and developing an oversight system based upon SMS principles. The difference between the current "regulatory compliance-based" approach and the reengineered SMS-based approach is the performance gap SASO is closing.

The SASO program will transform the FAA Flight Standards Service to a national standard of system safety based upon SMS principles. The primary beneficiaries are to the flying public.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

As the regulator of a major segment of the U.S. aviation industry, AFS must continually strive to improve aviation safety. AFS is responsible for oversight of nearly the entire civil aviation industry that uses America's National Airspace System (NAS). Today's safety oversight system is stove piped, reactive in nature, and "regulatory compliance-based". While many technical and human factors problems contributing to accident rates have been resolved, more complex organizational factors requiring additional systems-based, data-driven analysis and assessment for their resolution remain. Increases in technical and operational complexity of aviation operations and introduction of new technologies further stress today's oversight system. SASO will make the system safer and anticipate future needs and challenges. It will implement a more structured, data-supported risk-based oversight system that will use hazard identification and risk assessment strategies to formulate surveillance plans and target FAA resources. The scope of the investment includes reengineering AFS business processes and consolidating 56 AFS applications into the appropriate number of enterprise systems that serve: 4,800 FAA Aviation Safety employees, in eight regions, at headquarters and approximately 110 field offices, and more than 25,000 aviation industry professionals managing aviation safety throughout the United States. It leverages technology instead of increasing oversight personnel as budgetary pressures constrain personnel growth. By implementing SASO via the SAS, AFS expects to contribute to reducing the commercial air carrier fatalities per 100 million persons on board by 24 percent over the nine-year period (2010 - 2018), no more than 6.2 in 2018.

How Do You Know The Program Works?

The SASO program sponsored five years of research and development from 2003 through 2007 inclusively. The research resulted in capabilities adopted by the SASO Program that are currently being implemented to create an SMS. Phase IIa implements the SAS which completes the first of four pillars of the SMS, and Phase IIb implements the remaining three pillars. These capabilities are also recommended as best practice by the International Civil Aviation Organization (ICAO) and are being adopted by all member aviation authorities.

Why Do We Want/Need To Fund The Program At The Requested Level?

The success of the SASO program depends upon continued development funding through FY 2018 to achieve and sustain full benefits. Failure to continue funding at the requested level will limit the automation of oversight capabilities achieved through business process reengineering and require additional manpower (aviation safety inspectors) not currently budgeted to achieve aviation safety goals. Less than full funding will delay system implementation and threaten the FAA strategies and metrics achievement. A complete loss of funding will put the FAA at risk for achieving aviation safety goals.

Detailed Justification for - 3A08 Aviation Safety Knowledge Management Environment (ASKME) – Segment 2

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aviation Safety Knowledge Management Environment (ASKME)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aviation Safety Knowledge Management Environment (ASKME)	$17,200	$12,800	$12,200	-$5,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Program Management	---	$2,800.0
b. Application/Solution Requirements	---	1,300.0
c. Application/Solution Design and Development	---	4,700.0
d. Application/Solution Testing	---	500.0
e. Electronic File Service	---	2,900.0
Total	Various	$12,200.0

For FY 2014, $12,200,000 is requested to fund the following ASKME requirements:

- Electronic Filing Service (EFS) – Historical scanning activities - fourth year
- Work Tracking Software Budget Management (WTS-B Mgmt) – Complete Design, Development, Test, and Deployment phases (follows System Specification Requirements phase)
- Airworthiness Directives Development (ADD) – Continue Design, Development, Test, and Deployment phases (follows System Specification Requirements)
- Airworthiness Certifications (AC) - Finalize the Documented Detailed System Specification Requirements phase
- Start the Design, Development, Test, and Deployment phases for the following ASKME applications
- Standard Airworthiness Certification (StdAC)
- Special Airworthiness Certification (SpclAC)
- Special Flight Authorizations (SFA)
- Certification of Imported/Exported Products (CI/EP)

What Is This Program?

The ASKME is a suite of IT tools designed to support and enable the FAA AIR to more efficiently certify new aircraft and modifications to existing aircraft.

The program was established to provide a comprehensive automation environment for vital safety business processes for AVS through deployment of 18 integrated business solutions/projects between FY 2008 and FY 2016. Segment 1 covers FY 2008 - FY 2012, and Segment 2 covers FY 2013 to FY 2017. ASKME, Segment 1, obtained its baseline decision (FY 2008 - FY 2012) on June 20, 2007 from the FAA Joint Resources Council.

The environment created by integration of ASKME deliverables will provide for the electronic storage and retrieval of FAA technical documentation and lessons learned from previous certifications that involve aircraft design and manufacturing safety issues so that they can be accessed and shared more easily. This technical data includes the rationale for design and production certification decisions, interpretations of rules and policies, and audits of aircraft industry manufacturers. ASKME will provide tools to improve the ability to identify potential unsafe conditions by analyzing this documentation along with safety information such as Service Difficulty Reports, National Transportation Safety Board safety recommendations and reports, accident reports, and Maintenance Difficulty Reports. ASKME will also provide electronic tools for capturing key safety related data resulting from its standard 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.

The ASKME program will leverage an Earned Value Management (EVM) System as the primary mechanism for planning, controlling, and integrating of project scope, schedule, and resources. The ASKME EVM system will deliver schedule and cost performance metrics enabling the program to anticipate, forecast, and communicate performance while ensuring the program performs on schedule and within cost. The EVM system will also measure progress towards milestones in an independently-verifiable basis.

ASKME business process tools will help AIR to streamline work activity and oversight practices, enabling AIR technical staff to transfer non-safety work activities to its pool of designees, resulting in future cost savings by allowing staff growth to be maintained at minimal levels. Further, the work transfer will enable AIR technical staff to focus more on safety identification, risk management, resolution, and improvement activities.

The analytical tools produced by ASKME provide the basis for AVS technical staff to identify and pre-empt potential hazards and events through predictive analysis and subsequent decision-making and corrective action. Corrective actions will then be monitored to assess impacts safety for further refinement of the risk management model.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

Within the FAA AVS organization, AIR is responsible for ensuring that civil aircraft are designed and built to operate safely within the NAS.

In carrying out their responsibilities, FAA personnel perform numerous business activities that generate massive amounts of data and 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 AIR services. Additionally, within AIR, new security requirements related to terrorist countermeasures have surfaced as a result of the September 11, 2001, terrorist events.

The ability of AIR to remain responsive to industry growth will be impaired without maximizing the use of automation.

ASKME will provide current and accessible information, designee program effectiveness will be improved, designees better utilized, and AIR designee oversight and evaluation will be enhanced.

ASKME will provide a history of past decisions and reliable substantiation of previous decisions. ASKME will provide a system for electronically storing FAA technical documentation and lessons learned identifying aircraft design and manufacturing safety issues so that they can be found, accessed, and shared more easily. This technical data includes the rationale for design and production certification decisions, interpretations of rules and policies, and audits of aircraft industry manufacturers. ASKME will provide tools to improve the ability to identify potential 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. ASKME will also provide electronic tools for capturing key safety related data resulting from its standard 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 suite of IT tools designed to support and enable the AIR to meet specific FAA goals of Safety, Organizational Excellence, and International Leadership.

ASKME activities are as follows:

- 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, build, operations, and maintenance into the 'safety management process/automated lessons learned feedback' mechanisms. The risk assessment performed on the safety data may be used for risk management analysis, root cause analysis, corrective action, 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 utilization 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:

- Web-based knowledge management portal designed to store AIR's valuable knowledge assets, making them accessible, facilitating management and workforce decision making, providing a proactive systems safety approach, and improving overall productivity and customer- and citizen-based satisfaction
- Collaboration tools to facilitate real-time communications, decision making, and management between AIR, FAA Designees, and aviation industry applicants as well as AIR's domestic and international partners. This collaboration capability will enhance identification, analysis, management, and resolution of safety issues; certification and production approvals as well as 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 real-time exchange with other countries of accident/incident information and aviation supplier audit information
- Predictive safety data analysis tools designed to support the full range of continued airworthiness analytical activities, including safety data identification/collection, risk assessment, risk management, prescription of corrective action, monitoring, and feedback. The tools will provide the capability to access and analyze accident/incident data to enable recognition of potential safety problems and development of solutions and intervention strategies. The tools will also provide the capability to integrate and analyze compliance, production, operations, oversight, and regulatory data to aid in identifying potential safety risks, develop new regulatory material, and approve design modifications. The tool will also 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

How Do You Know The Program Works?

The measurement criteria for expanding accessibility to current and historical safety documents are the number of safety document types readily available to the AVS safety workforce. Currently, the AIR RGL provides access to 14 safety document types (FARs, SFARs, NPRMs, Final Rules, Make/Model Information, Type Certificate datasheets, Special TCs, Airworthiness Directives, Advisory Circulars, Orders and Notices, TSOs, Special Conditions, Exemptions, and Equivalent Levels of Safety). ASKME will increase the number of safety document types electronically available in the AVS Knowledge Management environment.

The measurement criteria for applying risk-based targeting of the AIR safety workforce are the percentages of AIR work to which Risk Based Resource Targeting (WTS-RBRT) is applied to determine planned work. Currently, 57 percent of WTS-RBRT is applied for planning work. ASKME will provide tools and technologies to enable expansion of WTS-RBRT for all ASI and ASE activities. The current ASKME performance baseline funding runs through FY 2012, so parameters reported below in Table 1. ASKME Performance Baseline reflects targets as reported in OMB Exhibit 300 only through the end of FY 2013.

Table 1: ASKME Performance Baseline as Reported in OMB Exhibit 300

Performance Baseline	
Performance Parameter	**Values (Units)**
Number of AIR business processes integrated into AVS enterprise architecture and ASKME	8 of 25 processes integrated by 2013
Percentage of AIR work to which risk based resource targeting is applied to determine planned work	Increase to 71 percent by 2013
Percentage of e-learning/blended learning assets using FAA metadata tags	Increase to 50 percent of all AIR learning assets by 2013
Percentage of functionality included into the ASKME environment	Increase to 55 percent by 2013

Why Do We Want/Need To Fund The Program At The Requested Level?

AIR is gaining the desired benefits of the ASKME program with the successful deployment of the ASKME sub-functions, Electronic Filing System and Project Monitor Safety Related Data- Monitor Safety Analyze Data and the imminent deployment of the WTS-RBRT sub-functions.

ASKME Sub-functions status for FY 2012 and FY 2013:

- Work Tracking Software-Budget Management (WTS-BMgmt) - Starts FY 2013, Ends FY 2014 – will Complete Design, Development, Test, and Deployment phases
- Airworthiness Directives Development (ADD) – Starts FY 2013, Ends FY 2015 - will continue Design, Development, Test, and Deployment phases
- Airworthiness Certifications (AC) - Starts FY 2014, Ends FY 2016 - will finalize the Documented Detailed System Specification Requirements phase
- Start the Design, Development, Test, and Deployment phases for the following four related ASKME applications
- Standard Airworthiness Certifications (StdAC)
- Special Airworthiness Certifications (SpclAC)
- Special Flight Authorizations (SFA)
- Certification of Imported/Exported Products (CI/EP)

A reduction in ASKME would impact completing the ASKME programs that are already in-progress and will impair the ability of AIR to remain responsive to industry growth. AIR would be unable to use IT to modernize its business practices and maximize the productivity of its workforce without a comprehensive system with new processes and automation.

Detailed Justification for - 3A09 Data Center Optimization

What Is The Request And What Will We Get For The Funds?

FY 2014 – Data Center Optimization
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Data Center Optimization	$1,000	$1,000	$1,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Reduction in Data Center Spaces	4	$1,000.0

For FY 2014, $1,000,000 is requested for the DCCI program to achieve the following:

- Achieve Final Investment Decision ($250,000 for Final Investment Analysis support)
- Establish contract with two Tier III magnet data centers to support data center consolidation and host new services. ($100,000 for one-year hosting services contract)
- Begin migrating servers and applications from legacy FAA data center spaces to the magnets. ($650,000 to migrate 20 servers and hosted applications)
  - Migration planning
    - Inventory verification
    - Transformation Planning
      - Environment profile and consolidation parameters
      - Analysis and development of high-level plan
    - Scope Validation
      - Server inventory list
      - Target servers
      - Finalize requirement
  - Migration deployment
    - Review infrastructure availability (including bandwidth)
    - Solution review and approval
    - Migrate
      - Confirm data migration solution and on-site readiness
      - Execute pre-move data synchronization
      - Turn over virtual machines for FAA application installation
      - Confirm dependencies for post-migration
      - User acceptance testing

The FAA is aligned with the Federal Data Center Consolidation Initiative (FDCCI), which is the OMB mandate to optimize and consolidate data centers across the government.

What is This Program?

The Data Center Consolidation Initiative (DCCI) program delivers a consolidated data center environment and provides lines of business (LOBs) and staff offices (SOs) access to state-of-the-art data center services for administrative and mission support needs. The total cost of the investment is $44 million, as shown below:

- Program planning and engineering analysis ($11 million)
- Software ($2 million)
- Migration ($27 million)
- Bandwidth and associated upgrades ($4 million)

The DCCI program is in Initial Investment Analysis (IIA) with projected Initial Investment Decision (IID) in January 2013 and Final Investment Decision (FID) in December 2013. During IIA the scope of the investment will increase to include investment costs for the Herndon data center cloud project.

Currently the FAA maintains 162 data center spaces (not including Herndon), which comprise 58,000 square feet of data center space and contain approximately 2,700 physical servers and 2,300 virtual servers. Year-to-year growth in business services and mission support activities drives up the total number of servers that require hosting, on the order of five percent per year. The agency now spends $80 million annually to manage data center hosting for these services.

The agency can do better for less. It can optimize within a few highly efficient, modern data centers; scale back and eventually decommission most of its legacy data centers; and significantly cut back on spending.

The DCCI program will deliver a new hosting solution for the agency that provides:
- Flexible, scalable, adaptable service to support evolving FAA business requirements
- A diverse service catalog with transparent pricing and service level agreements
- Full compliance with DOT, FAA, and applicable federal government privacy and security requirements
- Disaster recovery capabilities
- Cloud migration capabilities
- Price competitive hosting fees compared to other marketplace solutions

DOT Strategic Goal – Organizational Excellence
- Enhance cyber security and privacy and improve governance of IT resources.

Why is This Particular Program Necessary?

Compliance with OMB Mandate: In February 2010, OMB launched the Federal Data Center Consolidation Initiative (FDCCI), which requires a steady reduction in the number of data centers the government owns, operates, and leases. As part of the FDCCI, agencies are required to continually inventory their data center assets, create consolidation plans and integrate these plans into fiscal year budget submissions. AIO/AOT is managing this effort in coordination with the Department of Transportation (DOT).

Data Center Reductions and Related Cost Savings: The FAA requires the investment to accomplish large-scale consolidation. Savings will be achieved over time as spaces are decommissioned and the agency stops incurring related facilities costs; staffing needs are reduced; and services are migrated to modern, optimized data center facilities. Current modeling shows the agency will spend on average at least 25 percent less year-to-year for data center services than what it now costs the agency to maintain the legacy environment.

Solve Persistent Agency Shortfalls. Year after year the agency faces the same, persistent shortfalls which are nearly impossible to solve without this investment program. The most significant shortfall and the primary driver for this investment is that the agency continues to maintain costly data center sprawl year after year without any real alignment to enterprise-level planning and needed services. This is an inefficient way for the agency to manage its applications hosting requirements and gives rise to other related shortfalls:
- Most of the agency's current data center capacity is inadequate to support the FAA's applications and supporting infrastructure
- The agency has nearly run out of adequate data center capacity. LOBs/SOs continue to host applications in sub-standard data center spaces in part due to this capacity shortage

- The agency's large, geographically dispersed footprint exposes it to security and disaster recovery (DR) risk
- Lack of governance leads to inefficiencies and inability to consolidate
- The agency cannot guarantee it is getting best value for what it currently spends on hosting

DCCI solves these problems by consolidating the agency's data center infrastructure while providing the right opportunity to migrate to more efficient hosting environments. From a benefits perspective data center consolidation provides significant opportunity for:

- Operational costs savings
- Natural transition to data center shared services
- Standardization in security controls and technology standards
- improving the agency's security posture by reducing the amount of physical data center infrastructure that the agency must manage
- Providing common, government-operated alternate facilities for contingency operations (i.e., disaster recovery)
- Shifting IT investments to more efficient cloud computing platforms and technologies

How Do You Know The Program Works?

The DCCI program will continue to measure success against the performance objectives cited above, namely, number of data center spaces decommissioned and number of servers migrated to magnet data centers. Current modeling shows the agency will spend on average at least 25 percent less year-to-year for data center services than what it now costs the agency to maintain the legacy environment. However those costs savings will not be realized until significant consolidation has been achieved within the magnets – at least 50 percent of the current inventory of 5,000 servers – and the agency has developed a method to capture those savings.

The DCCI program will continue to manage reporting to OMB on the required data center consolidation. It will implement a standard model for measuring total cost of ownership of data center services, which is now in development and finalization.

Why Do We Want / Need To Fund The Program At The Requested Level?

$1,000,000 is required to complete investment analysis, procure initial hosting service and migrate approximately 80 servers to the magnets. The need to fund this program at or above the requested level is substantial if the agency is to meet the OMB mandate to reduce data center infrastructure and cut back agency spending on data centers.

FY 2014 funding provides for migration of 80 servers, or about two percent of the current inventory. This level of funding keeps the consolidation effort moving forward on more of a pilot basis rather than shifting the agency to full-scale migration and further delays realization of benefits. A reduction would reduce the number of pilot migrations and make compliance with the OMB mandate more difficult.

Detailed Justification for - 3A10 Aerospace Medical Equipment Needs (AMEN) Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aerospace Medical Equipment Needs (AMEN)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aerospace Medical Equipment Needs (AMEN)	$10,000	$5,000	$5,000	-$5,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Hardware	40	$5,000.0

For FY 2014, $5,000,000 is requested to continue the technology refresh to replace Aerospace Medical Research Division's laboratory assets at the Civil Aerospace Medical Institute (CAMI).

The AMEN technology refresh program will replace and/or update 40 equipment items, with Commercial-Off-The-Shelf (COTS) products in FY 2014. The types of equipment are summarized as follows:

- Biochemical Sample Analyses Systems – e.g., chromatographs, spectrometers, molecular biology instruments, and sequencing systems
- Biochemical Sample Preparation and Physiological Monitoring Systems – e.g., centrifuges, plates, tonometers, oxymeters, extraction, and balances
- Storage, Cleaning, Machining, and Laboratory Safety Systems – e.g., refrigerators, freezers, fume hoods, filing cabinets, lockers, washers, dryers, and drills
- Scientific and Engineering Research Systems – e.g., data acquisition system for the horizontal accelerator/sled, data mining statistical tool, and aeromedical research results databases
- Mechanical and Monitoring Systems – e.g., environmental monitoring, light system electronic control, anthropometric dummies, calibration systems, and transducers

What Is This Program?

CAMI is the medical certification, education, research, and occupational medicine wing of the Office of Aerospace Medicine (AAM) under the auspices of the Federal Aviation Administration's (FAA's) Office of Aviation Safety (AVS).

CAMI's Aerospace Medical Research Division personnel work in complex research laboratories and testing facilities with scientific, engineering, and medical systems. However, much of this equipment is too old and becoming obsolete. The AMEN technology refresh program is designed to replace this aging equipment to avoid potential work stoppage and quality control failures. The equipment requested by the AMEN technology refresh program supports two crucial FAA research areas: (1) Bioaeronautical Sciences and (2) Protection and Survival.

- Bioaeronautical Sciences personnel perform research activities regarding pilot certification and performance, aircrew health, atmospheric and radiation risk data, and other factors important to aerospace safety. For example, the forensic toxicology laboratory serves as the primary national site for toxicology-testing for federal agencies, including the FAA and the National Transportation Safety Board (NTSB). Accident and fatality research and testing are routinely conducted on a wide variety of biological specimens. In support of this research, databases of medical and accident data are maintained. There are five laboratories that perform bioaeronautical sciences research in support of the CAMI mission: forensic toxicology, biochemistry, functional genomics, radiobiology, and bioinformatics.

- Protection and Survival research personnel provide state-of-the-art information, procedures, and equipment evaluations relative to aircraft accident investigation, survivability, health, and security of passengers and crewmembers during normal operations and emergency events such as in-flight fires, decompression, emergency evacuations, and crash landings on land or water. Additionally, Protection and Survival personnel, in the form of the Autopsy Program Team, acquire autopsies for all fatal aviation accidents in the U.S. and maintain a database of this information.

The beneficiaries of the research resulting from the use of the equipment sought by AMEN include: the General Public, Aeromedical Scientific and Engineering Communities, Aeromedical Education/Training Communities, Aeromedical Certification, including FAA AAM Regional Flight Surgeons and Aviation Medical Examiners (AMEs), Aircraft Accident Prevention and Investigation, Aircraft Certification, Flight Standards, Legal Counsel, Space Transportation, Quality Management, Aviation Operations Personnel and their organizations, Aircraft manufacturers, and Industry/Government Accreditation/Standards development organizations.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The current aeromedical laboratory equipment does not reflect the capabilities offered by advanced technology and procedures currently available in the market. Modern laboratory analysis and associated methodologies cannot be implemented using outdated equipment.

The aging and obsolete laboratory research equipment is no longer supportable. Vendors for some of the current laboratory equipment have notified CAMI that further support of systems cannot be guaranteed and in some cases both hardware support and the associated software is no longer available. In addition, parts' obsolescence will increasingly cause higher costs for replacement parts when they can be found or fabricated. Failure to replace the subject equipment places numerous laboratory accreditations, certifications, standards, programs, and procedures at risk. Suitable state-of-the-art replacement laboratory equipment will provide a significant and urgently required benefit in support of the DOT/FAA strategic goals.

CAMI's unique human resources, their research capabilities, and their professional competencies are being negatively impacted by the use of outdated equipment and associated procedures. Further, FAA and NTSB responsibilities in transportation accident investigations supported by the CAMI laboratories demand high quality control and assurance.

How Do You Know The Program Works?

This program is a Technical Refreshment effort that will replace the aging biomedical equipment in 10 different FAA laboratories at the Aeronautical Center. The current equipment is 20 to 30 years old and no longer supportable. This replacement will enable the FAA to continue safety improvements as a result of research programs that use the latest technology advancements pertinent to the human element of flight. In addition FAA will continue world leadership in the aeromedical toxicology, biochemistry, functional genomics, radiobiology, bioinformatics, cabin safety, biodynamics, vision, and environmental physiology fields.

Why Do We Want / Need To Fund The Program At The Requested Level?

$5,000,000 is required to replace aging equipment. This equipment jeopardizes mission accomplishment, places several accreditations at risk, and does not allow the FAA to keep pace with science and technology advances currently available in the market.

Detailed Justification for - 3A11 Aviation Safety Information Analysis and Sharing (ASIAS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aviation Safety Information Analysis and Sharing (ASIAS)

($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aviation Safety Information Analysis and Sharing (ASIAS)	$0	$15,000	$15,000	+$15,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. ASIAS Participations Work Area	---	$400.0
b. Data Work Area	---	2,500.0
c. Architecture Work Area	---	4,000.0
d. Analytical Capabilities Work Area	---	5,000.0
e. Vulnerability Discovery Work Area	---	250.0
f. ASIAS Studies and Results Work Area	---	1,000.0
g. Collaboration Work Area	---	1,000.0
h. Program Management & Reporting	---	850.0
Total	Various	$15,000.0

For FY 2009 through FY 2012, ASIAS was part of and received funding from the Systems Safety Management Transformation (SSMT) program. For both FY 2011 and FY 2012, $7,850,000 was included in SSMT for ASIAS. There are no funds included in SSMT for FY 2013. For FY 2014, $15,000,000 is requested for the following:

Developing ASIAS capabilities to include enhancements that build upon and extend existing capabilities for managing and processing aviation performance data. Developing tools that convert both textural and numeric data into information and creating visualization capabilities that aid causal/contributing factor analyses and risk assessment.

Work Area
ASIAS Participation
▪ Demonstrate that ASIAS commercial airline (FAR Part 121) participation meets risk based, statistically significant goals for assessing risk at US locations where US major and regional carriers operate
▪ Establish ASIAS participation goals for US non-flight operations aviation communities (maintenance, dispatch and cabin safety) based upon NAS wide safety risks to US operators
▪ Initiate data sharing with international carrier(s) operating in the US airspace to improve visibility of safety issues that ASIAS can directly influence
Data
▪ Establish and deploy a new data standard for ASIAS Flight Operational Quality Assurance (FOQA) data to increase the type and quality of digital data available for ASIAS and more efficiently captures the data needed for safety analysis
▪ Establish and deploy data standards for all voluntary safety reports used by ASIAS, including ATSAP and ASAP for all communities (maintenance, dispatch and cabin

Work Area
safety)
▪ Develop and deploy a process for monitoring data quality issues and alerting the FAA and ASIAS participants on identified data quality issues
▪ Perform biennial analysis of changes in the NAS and technology (e.g., avionics) and conduct risk-based assessment of data benefits for incorporation into ASIAS
▪ Develop and deploy data standards for international operators to participate in ASIAS
Architecture
▪ Complete the evolution of the ASIAS architecture to a centralized mode to achieve operational cost efficiencies
▪ Develop a coordinated Evolution Plan that supports the required expansion of data and analytical capabilities by FAA and ASIAS participants based upon a market survey of emerging technologies
▪ Deploy architectural enhancements (e.g., cloud computing) required to support use of ASIAS analytical capabilities by FAA and ASIAS participants and supports the expanded set of NextGen data as it becomes available for data ingest
▪ Deploy Architectural Enhancements to support the collection of international data
▪ Modify the underlying architecture to support access by FAA and ASIAS participants to the data visualization tools
Analytical Capabilities
▪ Fuse threaded surveillance track data and voice data analysis capabilities
▪ Develop physics based models for all phases of flight and address scalability issues
▪ Develop customized text mining and information extraction methods for use with automated speech recognition of voice communications to detect operational ATC risks such as hearback/readback errors and possibly other information, such as workload or stress levels
▪ Enhance data visualization capability, including 3-D visualization tools for a selected set of parameters, using data fusion/linked data and providing an interface to visualize additional data layers
▪ Incorporate clustering methods in trend/anomaly detection capabilities to find groups that exhibit similar anomalous behavior (multiple airports with same change in rate, etc.)
▪ Enhance data visualization with more aggregated views of track data, including ability to visualize differences between groups
Vulnerability Discovery
▪ Incorporate assessment of NextGen changes into the risk assessment framework and assess risk prior to the implementation of the changes
▪ Develop and deploy algorithms and processes for exploratory analysis (knowledge extraction) on selected databases (e.g., ASAP)
ASIAS Studies and Results
▪ Develop and deploy an initial set of Risk Monitoring metrics specifically for NextGen system changes based upon risk prioritization assessment framework and timeline for changes
▪ Develop and deploy two new FOQA benchmarks and two new ASAP trending metrics
▪ Complete two directed studies as directed by the AEB and as driven by insights from Vulnerability Discovery for commercial operations
▪ Include Corporate/Business operator data into directed studies
Collaboration
▪ Deploy on the ASIAS portal trending dashboards for all categories of CAST metrics and Known Risk Monitoring metrics
▪ Deploy data visualization tools to enable users to customize parameters and create individual views for their own use
▪ Deploy library of auto classification models developed to standardize the identification of reports referencing defined safety concepts for use by FAA and ASIAS participants for their internal analysis
▪ Deploy improved Airport Daily Overview to include Field Condition Reports, National Convective Weather Data, NOTAMS, and provide more integrated visualization

Work Area
techniques
▪ Deploy on the ASIAS portal an "airport scorecard" for selected airports based upon the risk assessment framework
Program Management and Reporting
▪ Plan and conduct program reviews, ASIAS work groups, ASIAS Executive Board, and Issue Analysis Team Meetings and provide updates to NextGen tracking documentation
▪ Update and publish the ASIAS 5-year program plan (2014 – 2018)

ASIAS will consist of an integrated, operational capability to support aviation safety management systems, and proactively identify and evaluate safety issues through aggregation of data and sharing of analysis capabilities, based on trusted partnerships among Federal government agencies and industry stakeholders.

What Is This Program?

The ASIAS program is an information safety analysis and data sharing collaboration involving industry and government to proactively analyze broad and extensive data to advance aviation safety. The primary objective of ASIAS is to provide a national resource for use in discovering common, systemic safety problems that span multiple airlines, fleets and regions of the global air transportation system. ASIAS leverages internal FAA datasets, airline proprietary safety data, publicly available data, manufacturers' data and other data. ASIAS fuses these data sources in order to identify safety trends in the NAS, leading to a comprehensive and proactive approach to aviation safety in conjunction with implementation of NextGen capacity and efficiency capabilities. By FY 2015, this program element will provide system knowledge to enable early identification of event precursors allowing intervention strategies to avoid accidents and incidents and to mitigate potential operational safety impacts of NextGen system alternatives.

Safety insights from ASIAS analyses are communicated to the FAA and ASIAS participants and to the others in the aviation community and are applicable to a broad range of aviation communities (e.g., commercial, general aviation, helicopters, airport operators, airport authorities).

ASIAS has identified opportunities to support NextGen Operational Improvement (OI) incremental design, development and post-implementation performance tracking and for the enhancement of ASIAS data collection and analysis upon OI implementation. The following NextGen portfolios will benefit from ASIAS capabilities and analyses:

- OAPM (Optimization of Airspace and Procedures in the Metroplex)
  - Approach: support arrival route design and performance via Traffic Alert and Collision Avoidance System/Terrain Awareness and Warning System (TAWS/TCAS) subject matter expertise and incident data
- IMRO (Improved Multiple Runway Operations)
  - Approach: apply blunder model analysis and Airport Surface Detection Equipment Model X (ASDE-X) acquired flight data to validate design and performance of improved operations procedures
- Low Visibility Operations
  - Approach: support taxi routing and taxi conformance procedure development, based on surface incident analysis and subject matter expertise

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

This research includes expanding information sharing and data analysis to identify and mitigate risks before they lead to accidents. New automated processes are required to facilitate advanced analysis of comprehensive data which will unlock new insight about potential safety risks. ASIAS is developing the only industry-wide integrated analytical, forecasting, and decision support capabilities to address NextGen evolutionary procedures. Analyses, using these advanced safety analytical capabilities, can be performed that would not be available to individual stakeholders performing similar analysis. Safety information discovered through ASIAS analytic activities will be used across the FAA and industry to drive improvements and support Safety Management Systems (SMS). Stakeholders will leverage insight to identify risk-reducing alternatives or changes to operations or processes.

ASIAS information and capabilities support FAA activities by:

- Modeling of intersecting flight paths and altitudes that could result in a TCAS Traffic Advisory/Resolution Advisory (TA/RA) event in support of the development and operational implementation of the Area Navigation Standard Instrument Departure (RNAV SID), Standard Terminal Arrival Routes (STARs) and approaches
- Tracking the percentage of operations that exceed the "un-stabilized" approach criteria in support of the development of low-visibility/ceiling approach operations for NextGen
- Developing a compilation of real-time operational performance data that can be used to model and simulate real-world interactions in developing automation support for a mixed environment
- Assisting in identifying the most efficient airport configuration that will maximize safety and the departure/arrival rate in support of NextGen operational improvements of arrival, surface, and departure flow operations
- Supporting in tracking the TCAS TA/RA alert rates on proposed and implemented changes to the NAS such as improved closely spaced parallel runway operations and/or changes in airspace and procedures

The ASIAS approaches will be instrumental in detecting the impacts of system performance anomalies around the NAS. Without the ASIAS program, manual processes would be required for detection of safety-significant events. Many of these events would grow in severity before they are detected, since some of the data that ASIAS collects cannot be manually processed, such as FOQA and surveillance data from radars, and therefore precursors would go undetected. Integration of the impacts of NextGen changes on safety likewise would not be facilitated using current methodology within FAA.

How Do You Know The Program Works?

During the early development, ASIAS has discovered potential safety issues in the NAS that should be addressed in the near-term through procedural and airspace design. These issues have been provided to the NextGen Review Board to assist in prioritization of NextGen systems to mitigate risk, to the OAPM program office and to the Commercial Aviation Safety Team (CAST). Coordination efforts have ensured that throughout the NextGen evolution planning process ASIAS results can be integrated into the airspace and design process and inform design tools. Below are examples of such successes that have and will continue to improve the overall operations within the NAS.

- Results of analyses of TCAS and TAWS events were transmitted to the CAST for the development of safety mitigations
  - CAST developed and approved two safety enhancements for TCAS and four safety enhancements for TAWS, designed to mitigate safety issues identified
- Results of an analysis of potential safety issues associated with the implementation of RNAV departures were transmitted to the CAST for the development of safety mitigations
- ASIAS team members briefed the Northern and Southern California Study Teams on TCAS and TAWS hot spots before they started problem identification
- OAPM Study Team created a new route to Oakland International Airport (OAK) near Mt. Diablo based on the awareness of TAWS concerns
  - OAPM Study Team proposed two solutions to address Burbank Airport/Van Nuys Airport (BUR/VNY) TCAS alerts identified during the ASIAS study
- Florida Study Team has ASIAS data integrated into OAPM Reference Package
- Study Team training will include available safety metrics from ASIAS

Why Do We Want / Need To Fund The Program At The Requested Level?

$15,000,000 is required to continue work in ASIAS in FY 2014. Achievement of the ASIAS mission of a proactive data-driven approach to aviation safety will require development of capabilities to acquire access to existing and previously unattainable information sources, enhanced analytical methodologies and technical advancements to support the monitoring and identification of system level safety risks.

Detailed Justification for - 3A12 National Test Equipment Program (NTEP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – National Test Equipment Program (NTEP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
National Test Equipment Program	$0	$2,000	$3,000	+$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Hardware and Software Engineering Program Support	---	$100.0
b. Corrective Maintenance	---	2,400.0
c. Program Planning and Control	---	500.0
Total	Various	$3,000.0

For FY 2014, $3,000,000 is requested to replace obsolete test equipment. The funding provided will be used for engineering support required to evaluate new products, to procure replacement test equipment used to accomplish corrective maintenance/installation, contractor support to administer the program, and disposing of obsolete test equipment.

What Is This Program?

The National Test Equipment Program (NTEP) supports the replacement of obsolete and non-functional Test Equipment (TE) used in maintaining NAS systems. TE is defined as portable, stand-alone (not a component of a system) electrical and electronic equipment that is required to perform functional checks, alignment or troubleshooting on a NAS system. TE is essential for conducting required maintenance actions to restore NAS equipment to an operational state.

DOT Strategic Goals – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The lack of TE affects NAS availability due to extended equipment outages. For example, in 2009, a need to share TE between Austin and New Orleans caused a four-day unscheduled Mode-S delay. Since out-of-service NAS systems cannot be returned to service without proper TE, the lack of adequate equipment impacts systems and programs across the NAS, such as Communication, Automation, Surveillance, Power, Navigational, and Weather systems. The NTEP supports test equipment items used at nearly 27,000 facilities across the NAS and no other FAA initiative addresses supportability requirement.

How Do You Know The Program Works?

Nearly one-quarter of the roughly 77,000 pieces of FAA TE are estimated to need to be replaced within Three years. TE is a cruciall component to certify NAS systems before they are restored as operational. The key metric impacted by TE is Mean Time to Repair (MTTR). A significant investment in test equipment will have a substantial impact on MTTR because it will eliminate the technician's need to travel to different locations in order to find the appropriate functioning test equipment.

Why Do We Want / Need To Fund The Program At The Requested Level?

The level of requested funding will allow the FAA to incrementally replace obsolete test equipment and continue to support the FAA's mission until NextGen is fully implemented.

Detailed Justification for – 3A13 Mobile Assets Management Program

What Is The Request And What Will We Get For The Funds?

FY 2014– Mobile Asset Management Program
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Mobile Assets Management Program	$0	$4,700	$3,000	+$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Execute options on Mobile Towers Contract to acquire a minimum of two Mobile Air Traffic Control Towers (MATCTs) with electronic equipment	2	$1,900.0
b. Continue to upgrade/perform technical refresh of existing mobile assets	---	500.0
c. Continue establishment and outfitting of the Service Area Deployment Center(s)	---	350.0
d. Complete architectural studies for FAA mobile assets to determine the type and quantities of mobile assets needed by the FAA	---	150.0
e. Decommission assets that are beyond their useful life	---	100.0
Total	Various	$3,000.0

For FY 2014, $3,000,000 is requested to ensure that a sufficient number of the FAA's mobile assets are available to maintain/restore continuity of aviation operations, such as:

- Meet emergency or special event requirements
- Temporarily replace facilities destroyed by natural or man-made disasters
- Support scheduled maintenance and modernization programs

What Is This Program?

The Mobile Asset Management Program (MAMP) was established in response to a visible inability to support the continuity of National Airspace Systems (NAS) operations in the event of natural or man-made disasters. The MAMP provides NAS operations continuality/restoral and risk mitigation at FAA operational facilities, such as air traffic control towers (ATCT), terminal radar approach control facilities (TRACON), remote transmitter/receiver (RTR) sites, remote communications air/ground (RCAG) sites, and other sites that experience unexpected or planned system outages. The program will acquire new, operational mobile facilities to replace existing assets that have exceeded their useful life and to fill capability gaps in the existing inventory. The program will provide lifecycle support that will consist of equipment repairs and needed upgrades to ensure conformance to FAA operational standards. Additionally, mobile assets provide temporary facilities to support air traffic operations when a fixed facility must be taken down during modernization projects and major equipment outages.

DOT Strategic Goals – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The FAA has established the MAMP because there is no centralized national program to manage mobile assets. As a result, the FAA's mobile assets, specifically the Mobile Air Traffic Control Towers have deteriorated to the point where many are not operational as a result of inconsistent preventative, pre-deployment, or post deployment maintenance and insufficient funding and management oversight. The procedures that are currently followed for lifecycle support and management are not standardized across the FAA's Service Areas, leading to varying degrees of readiness and availability between the three Service Areas. This funding will help to ensure that mobile assets will be available and ready to meet emergency or special events requirements when they occur.

How Do You Know The Program Works?

The MAMP will be determined to work when the FAA is able to respond to NAS outages on short notice and is able to restore air traffic control operations within hours of arriving on-site. The program will be working when it is able to ensure the availability of mobile assets to maintain or re-establish continuity of air traffic operations in response to emergencies and natural disasters. The FAA's mobile assets have been deployed to support relief efforts during natural disasters like the recent earthquake in Haiti or the hurricanes that hit the Gulf coast each year. These assets have played a significant role during disasters such as the recovery efforts following the space shuttle Columbia tragedy and forest fires on the West Coast.

Why Do We Want/Need To Fund The Program At The Requested Level?

$3,000,000 is required to ensure that a sufficient number for the FAA's mobile assets are available to maintain/restore continuity of aviation operations, such as:

- Under FAA Order 6000.15, the agency is required to procure and maintain mobile assets that are capable of providing and supporting tactical ATC services that include communication, navigation, surveillance, infrastructure support (e.g., Engine Generators), and mission support (e.g., Command Centers)
- Meet emergency or special event requirements
- Temporarily replace facilities destroyed by natural or man-made disasters

Detailed Justification for - **3A14 Aerospace Medicine Safety Information System (AMSIS) Program**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aerospace Medicine Safety Information System (AMSIS) Program ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aerospace Medicine Safety Information System (AMSIS)	$0	$3,000	$3,900	+$3,900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aerospace Medicine Safety Information System	---	$3,900.0

For FY 2014, $3,900,000 is requested to begin Phase 2, a risk-based approach to an iterative development cycle. The highest priority core components of functionality will be delivered in shortened cycle times of six to nine months. Initial operational capability will occur early in the life cycle. A transitional roadmap will be developed to decommission and dispose legacy components and to integrate into the targeted Enterprise Architecture. An aggressive strategy of artifact reuse such as external standards, business process models, architectural structures and coded configuration items will be applied to manage risk associated with cost, schedule and technological issues.

What Is This Program?

The Office of Aerospace Medicine (AAM) is responsible for: the medical certification of airmen; the medical clearance of air traffic control specialists; oversight of aviation industry drug and alcohol testing programs; designation, training and oversight of aviation medical examiners; FAA employee substance abuse testing; airmen aviation physiology and survival training and education; the FAA Employee Health Awareness Program; and aerospace medicine and human factors research. These programs are carried out by AAM at FAA Headquarters, the Civil Aerospace Medical Institute, in the regional Aerospace Medicine divisions and at the three Industry Drug Abatement Compliance and Enforcement Centers. AAM has designed, developed and implemented information systems to efficiently process and manage safety, health and research information collected by FAA's regulatory programs. However, to ensure that these systems are maintained and kept up-to-date and/or replaced as necessary, lifecycle funding is needed. Over the past 20 years AAM received F&E funding to support information systems development and procurement through the Aviation Safety Analysis System (ASAS) program. The last year of F&E funding received from ASAS was 2008. The information systems developed under ASAS are effective, mature systems, but the technology and architecture of these systems will, over time, no longer be supportable and will become obsolete.

AAM requires future systems life-cycle funding to re-engineer AAM safety program business processes; design and develop new information systems architecture; and to design, procure and deploy next generation information systems. To support existing systems, technology, and develop replacement systems in the future, AAM proposes to establish the Aerospace Medicine Safety Information System (AMSIS) Program.

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

Why Is This Particular Program Necessary?

The Medical Systems have the following performance gaps and mission shortfalls, which must be remedied for the continued support of the regulatory programs that support aviation safety, employee health programs, and research programs:

- Data and Information Accessibility/Knowledge Management: Lack of ability to easily access all information sources for current and historical safety-related data and workforce knowledge
- Collaboration between AVS, Designees, and Applicants: Geographically dispersed personnel, designees, and applicants unable to work effectively together based on standard business processes
- Collaboration with International Aviation Community: No capability to interact with peers in the international community in real-time
- Data Analysis: Lack of automated analysis tools to manipulate data; identify trends, and problem areas
- Information Quality and Standards: Lack of record/audit tracking as required by medical or security record keeping demands
- Strategic Resource Optimization: Limited, inconsistent, cumbersome, and time consuming methods to track and allocate resources
- Technical Knowledge Transfer: Vast amount of information only available on paper or in local computer systems

The AMSIS program will address the following Mission Shortfalls within the current AAM subsystems:

- Electronic Medical Records: The Federal Government and private medical entities are moving towards electronic medical records. The AAM Subsystems are not architecturally equipped to be part of this network.
- Technical Process Re-engineering: The processes used within AAM are mature. An independent assessment of AAMs Business Processes is needed to redesign the way things are done to better support the organization's mission and reduce costs. This will include:
  - Discovering methods that simplify current processes and eliminate wasted efforts
  - Incorporating both technical and medical industry standards
  - Cutting operation costs
  - Improving customer service
- Social Security Matching**:** Ability to cross-reference AAM data with other government agencies, such as the SSA, Veterans Administration (VA), and the Department of Labor (DOL).
- Outdated Pathology Coding Methodology: AAM is using a non-standard pathology coding methodology. To be consistent with the rest of the international medical community, AAM needs to update its current pathology coding method to match the International Statistical Classification of Diseases and Related Health Problems (ICD) standard.

How Do You Know The Program Works?

The information technology will be aligned with OMB/DOT/FAA information systems architecture and security standards.

Because these are medical information systems AAM must also align these systems with the national health information technology standards and security requirements for medical information systems developed by the Federal government, private sector and voluntary standards organizations, including the International Organization for Standardization (ISO).

The systems will successfully and securely interface with approximately 4,500 health care providers designated by the FAA, known as Aviation Medical Examiners, who perform pilot and ATCS medical examinations.

Why Do We Want / Need To Fund The Program At The Requested Level?

The information systems currently in use today were developed in the 1990's. These information systems are becoming obsolete. The business processes that support the medical certification of airmen, and the other aviation safety programs, need to be re-engineered. The information technology must be aligned with OMB/DOT/FAA information systems architecture and security standards. AAM must also align these systems with the national health information technology standards and security requirements for medical information systems developed by the Federal government, private sector and voluntary standards organizations, including the International Organization for Standardization (ISO). The systems must successfully and securely interface with approximately 4,500 health care providers designated by the FAA, known as Aviation Medical Examiners, who perform pilot and ATCS medical examinations. AMSIS proposes to implement these changes in a 'Phased' approach.

Detailed Justification for: 3B01 Aeronautical Center Infrastructure Modernization

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aeronautical Center Infrastructure Modernization
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aeronautical Center Infrastructure Modernization	$16,500	$14,500	$12,300	-$4,200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Relocate ASR-9/Mode S, ARSR-3, CARSR and ASR-8 Radars	4	$6,620.0
b. Replace Major Building Systems	---	1,140.0
c. Building 24 Type A Renovation Design	1	540.0
d. Telecommunications Replacement	---	2,500.0
e. NAS Integration and Technical Support Services	---	1,500.0
Total	Various	$12,300.0

For FY 2014, $12,300,000 is requested for the following:

- $6,620,000 to design and relocate four radars (ASR-9/Mode S, ARSR-3, Common Air Route Surveillance Radar (CARSR) and ASR-8) to a radar area on the west campus. The small structures associated with the radars are deteriorated and require replacement after re-siting
- $1,140,000 to replace major building systems within leased and owned buildings that includes heating, ventilation, air conditioning, electrical, plumbing, replacement of finishes due to installations, asbestos abatement/removal, utilities infrastructure (water, gas, sewer, high voltage, storm water), roofing, stairs, fire protection, elevators, roadways, parking lots, sidewalks, and paved surfaces to address a backlog of deferred requirements
- $540,000 for Architectural and Engineering (A&E) Type A renovation design of Building 24. The building was constructed in 1972 and after 40 years, is in need of renovation to replace mechanical systems, upgrade electrical wiring, plumbing, and provide energy efficiencies in lighting and insulation
- $2,500,000 to replace telecommunications at the Aeronautical Center. Funding will replace components of the Cisco network for redundancy, reliability, security and availability in Buildings 22, 29, 5, 215, 117, 123, 136, 166, 167, 185 (34 of 61 buildings). Router backplanes will be replaced to support increased bandwidth required by FAA data centers and personnel, single mode fiber will increase redundancy of core routers on the network, hardware/software will be upgraded, security assessments, and disaster recovery testing conducted on north campus fiber for network redundancy
- $1,500,000 to provide NAS Integration Support Services and Technical Support Services Construction inspectors for construction renovation

What Is This Program?

The Aeronautical Center Infrastructure Modernization program funds renovation and restoration of leased and owned facilities at the Aeronautical Center in Oklahoma City to ensure they remain viable for the mission of present and future FAA employees, students, and contractors. Funding from this program allows renovation of facility space used by Air Operations, Engineering Training (Radar/Navaids), NAS Logistics, Airmen/Aircraft registration, Safety, and Business Services. Program funding will be used for facility renovation, building system and telecommunications infrastructure replacement.

The Aeronautical Center is the FAA's centralized location that supports FAA National Airspace Systems (NAS) and comprises 1,100 acres of leased land with approximately three million square feet of space under roof, supporting the work of 7,300 FAA employees, students, and contractors on a daily basis; and approximately 11,000 visitors annually; a larger concentration of FAA personnel than Washington D.C. Many buildings are approximately 50 years old and in need of renovation and building system replacement.

Anticipated accomplishments to be completed by the end of FY2013:

- Renovation type A design complete, type B design awarded, to replace exterior metal panels on the Thomas. Stafford Building, a 222,000 square foot, 20 year old building whose panels are separating from the building and fail to provide a weather-tight seal to the building. Water is leaking into basement Air Traffic Control training laboratories and some classes have been cancelled due to water on console scopes
- Complete Phases 2, 3, and 4 storm sewer renovation construction of a 4 Phase project
- Complete installation of building system replacements from contracts awarded in prior year
- Complete network design, test, reconfiguration, security assessments, firewall upgrades, disaster recovery testing and duct banks/fiber installation for approx one quarter of the campus

DOT Strategic Goal - Organization Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

This program extends the service life of Aeronautical Center buildings through renovation and major building system replacement where FAA missions are performed: Eighty percent of the space at the Center directly supports the ATO. Thirteen percent of Center space supports DOT and FAA Business Services and includes DELPHI/Prism, Castle Data Center Operations, Accounting Operations, Acquisition, the ATO Data Center, and Aviation Safety/Research.

Some NAS support functions are conducted in outdated structures and in buildings that do not meet current building codes. Delays to renovation and replacement of building systems have consequences that include leaking roofs, deteriorating plumbing, malfunctioning heating, ventilation, air conditioning, and non-compliance with life safety codes that can disrupt work, cause NAS automation and technology failures, risk occupant health and safety, require emergency repairs, and loss of productivity.

The aging infrastructure, in combination with growth and improvements to the NAS and business services, affects Aeronautical Center personnel and facility requirements in which they work. This program extends the useful life of facilities at the Center for current and future generations.

How Do You Know The Program Works?

Renovating aging facilities at the Aeronautical Center allows space efficiencies for additional functionality, personnel, and systems. 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 - 30 years, ensuring a viable future for FAA at these facilities. 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.

This program benefits the NAS and avoided $14.6 million in FAA costs during FY 2012 through the following:

- Lower lease and operating cost (includes utilities (gas, water, electric), janitorial, cleaning, security) costs in FY 2012 than other alternates: $17.51 per net square footage (nsf) at MMAC, when compared with Oklahoma City General Services Administration (GSA) leased facilities at $25.20 per nsf
- Allowing flexibility and growth to support NextGen airspace requirements
- Supporting NAS operations/maintenance, current and future ATO initiatives
- Decreasing energy and repair operations costs
- Enables ATO initiatives by providing infrastructure that supports new NAS facilities funded from other sources that include AOS Precision Runway Monitor (PRM), Instrument Landing System (ILS), and Terminal Automation Modernization Replacement (TAMR)

Why Do We Want/Need To Fund The Program At The Requested Level?

There is a significant backlog of facility improvements that need to be addressed to prevent further deterioration of buildings. The backlog can be addressed with systematic funding to improve facility conditions and assure the aging infrastructure remains viable in future years.

Detailed Justification for - 3B02 Distance Learning

What Is The Request And What Will We Get For The Funds?

FY 2014 – Distance Learning ($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Distance Learning	$1,500	$1,500	$1,000	-$500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Services to Support CBI Platform Procurement	---	$300.0
b. Purchase and Install CBI Platforms	---	700.0
Total	Various	$1,000.0

For FY 2014, $1,000,000 is requested to fund contract services and Computer-Based Instruction (CBI) Platform Hardware.

What Is This Program?

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.

The Distance Learning program will provide for technology refresh of CBI Delivery Platforms at all CBI Learning Centers, increase connectivity, and upgrade network multimedia support and services. The system consists of about 1,100 Learning Centers located at virtually every FAA facility around the world. The FAA is providing the technology refresh of the CBI Platforms for two reasons: (1) to support high-performance media and simulations required in many lessons; and (2) to replace hard to obtain, obsolete parts for current platforms.

The technology refresh is accomplished in a phased, multi-year approach. The FY 2013 technology refresh will complete the current refresh cycle (FY 2009 - FY 2013). A new technology refresh cycle will begin in FY 2014 and will run through FY 2017.

This program reduces the cost of training to maintain and operate the NAS and to perform Air Traffic operations. This program provides the infrastructure to deliver simulations and training to all FAA employees via CBI and FAA Academy Aviation Training Network (ATN). The largest groups of CBI users are Tech-Ops technicians and Air Traffic controllers. This program provides productivity improvements for ATO employees by shortening the time to achieve full performance and certified employees and to maintain performance and certification. The time reduction for training is based on reduced time for training and by delivery of training at the job site thus avoiding travel time to the Academy or factory schools.

Anticipated FY 2014 Accomplishments:

- Award contracts to support the development of software image and to maintain configuration control
- Procure and install 600 Technology Refresh CBI Platforms at field sites(ATO and Federal Contract Towers)

DOT Strategic Goal - Organizational Excellence
- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

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 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 CBI, ATN, and web delivery systems are required to deliver initial operator, transition, and maintenance training for many NAS programs.

All Air Traffic Controllers accomplish refresher/initial training on the CBI Platforms. For example, at the En-Route facilities, the CBI systems provided for approximately 300,000 course completions in FY 2011. Many facilities require a monthly refresher for specific local issues that are accomplished on the CBI systems. Most of the ATO Tech Ops Technical Training Resident courses offered at Mike Monroney Aeronautical Center (MMAC) require CBI courses as prerequisites.

The FAA requires cost-effective distance learning alternatives to reduce the current resident-based training load, 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. The requested funding is for the scheduled Technology Refresh cycle to replace CBI Platforms at the Air Traffic Terminal field sites and CBI system support.

How Do You Know The Program Works?

This program reduces the cost of training required to maintain and operate the NAS and to perform Air Traffic operations. This program provides the infrastructure to deliver simulations and training to all FAA employees. The CBI program is currently providing well over $10 million per year in savings. The Aviation Training Network (ATN) is providing an additional $8 million in cost avoidance per year. The $8 million ATN figure was derived by averaging the last 12 years of savings in student travel costs.

Why Do We Want/Need To Fund The Program at the Requested Level?

The requested funding is needed to replace CBI Platform equipment for the scheduled life cycle upgrades to replace unsupportable equipment used for the CBI Training field sites. The Distance Learning Resource Center data shows hardware-related calls increase significantly in the last few months of a system's warranty period, which would likely continue past warranty expiration. If the program were to be funded at a lower level, CBI platforms would not be upgraded and system degradation would occur, resulting in a lack of available field training to employees and an increase in travel and per diem cost in order for training to be accomplished.

CBI platforms must be replaced when warranties expire for the following reasons:

- To decrease the risk of extended training platform downtime at field sites (75 percent of field sites are single CBI Platform sites)
- Less overall maintenance support cost vs. maintaining a stock of spare parts

Executive Summary – Facilities and Equipment, Activity 4.

What Is The Request And What Will We Get For The Funds?

The Facilities and Equipment (F&E) Activity 4 program is requesting $231,650,000 for FY 2014, a decrease of $8,650,000 (4 percent) below our actual FY 2012 level. Of this funding, $9,050,000 is requested to continue to transform current digital aeronautical information in conformance with international standards and NextGen objectives. This transformation will enable the near real-time processing of such data to improve mapping and flight planning, as well as the accuracy and timeliness of ATC instructions.

Key outputs and outcomes expected to be achieved in budget year with the requested resources:

- Program Leases – Funds over 2,800 facility and land leases in support of essential NAS requirements.
- Mike Monoroney Aeronautical Center Leases – Funds warehouse, administrative office space, and training facilities that support the mission of 7,100 employees, contractors, and students training of 90,000 students annually.

Activity 4 funding provides mission support services for the modernization of air traffic control, and safety, regulation, and security, and information security requirements. The funding for Activity 4 programs support:

- Major support contracts that cross programmatic, functional, and organizational lines
- System-engineering, logistics, requirements analysis, and systems management for the overall NAS, and safety, security functions throughout the FAA.

What Is This Program?

This Activity provides mission support services that cross FAA organization and functional lines. Over 90 percent of the funding supports ATO programs and initiatives. Funding for MITRE's Center for Advanced Aviation System Development (CAASD), one of FAA's Federally Funded Research and Development Center (FFRDC), is provided under Activity 4.

We request Activity 4 funding for leasing ATC facilities and related research and laboratory facilities (including those located at the Mike Monroney Center in Oklahoma City, Oklahoma and the William J. Hughes Technical Center in Atlantic City, New Jersey).

Activity 4 efforts contribute to the following DOT Strategic Goals:

- Safety: Reduction in transportation-related injuries and fatalities
- Economic Competitiveness: Maximum economic returns on transportation policies and investments
- Organizational Excellence: Diverse and collaborative DOT workforce

Why Is This Particular Program Necessary?

Activity 4 funds many of the mission support activities that FAA must perform to effectively operate and maintain its Air Traffic Control operation. FAA will use the funding to procure the additional systems engineering skills and lease facilities and equipment required to complete mission. Activity 4 can be viewed as an overhead account for the overall F&E budget.

How Do You Know The Program Works?

This program has been successfully implemented for over 15 years. We have demonstrated that this is an effective way to allocate program costs across functional and organizational lines. Under this approach, we have achieved management efficiencies while obtaining the expertise needed to augment in-house resources.

For example, FAA revalidates MITRE/CAASD requirements annually. Funding on various initiatives will change based on FAA priorities and requirements. MITRE has demonstrated a unique ability to quickly reallocate resources to support FAA needs based on its extensive knowledge and understanding of the overall mission and, in particular, the ATC operation.

Why Do We Want / Need To Fund The Program At The Requested Level?

We request funds for a variety of activities under Activity 4 including equipment installation; research, development and demonstration of new technologies; facility leases; systems engineering support; and program management services. In many cases, it is more efficient for FAA to contract for a portion of support services and lease facilities to obtain the personnel and infrastructure needed to meet current requirements than to hire additional permanent staff and procure land and buildings. Activity 4 funding enables the agency to flexibly procure the additional resources needed to meet current demand while not substantially increasing fixed operating costs. As in the case of Activity 3 funding, FAA would prioritize reductions in Activity 4 programs with respect to the ATC operational requirements identified in Activity 1 and 2 programs. Activity 4 level-of-investment programs would be reduced in a manner that would enable FAA to sustain ATC safety and services at levels expected by the public, the military, and our other stakeholders. Further reductions would require larger funding cuts in mission support activities.

Detailed Justification for - 4A01 System Engineering (SE2020) and Development Support

What Is The Request And What Will We Get For The Funds?

FY 2014 – System Engineering (SE2020) and Development Support
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
System Engineering and Development Support	$32,900	$40,000	$35,600	+$2,700

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. System Engineering (SE2020) Contract	---	$28,300.0
b. System Architecture/Other 8A Support	---	1,900.0
c. Program Evaluation	---	500.0
d. Computer Services	---	1,900.0
e. ATC/ANF Systems Support	---	3,000.0
Total	Various	$35,600.0

System Engineering (SE2020) and Development Support continues to provide an innovative, cost-effective, diverse workforce which supports FAA's agency-wide goal to enhance the National Airspace System (NAS) and improve the overall efficiency of the air traffic control system increasing capacity of the NAS by 2015. For FY 2014, $35,600,000 is requested to provide technical contract support services which will ensure sound systems engineering practices and business case development processes instrumental to the safety, efficiency, and securing the NAS.

What Is This Program?

The Systems Engineering 2020 will complement Next Generation Air Transportation System (NextGen) programs. Vendors will research emerging procedures and technologies, and perform systems engineering to determine the best way to deploy the NextGen initiatives on a wide scale demonstrating NextGen procedures will work on a large scale within the current and evolving air traffic system.

The FAA will issue tasks to SE2020 vendors covering a variety of research and engineering activities. These tasks will be carefully designed to advance multiple facets of aviation modernization efforts for the NextGen and other FAA missions.

The engineering support required will consist of disciplines ranging from systems requirements and system modeling to transition and human resource planning. In addition, automated data processing and information resource support will be required to provide for the development and/or enhancement of computer simulation models, miscellaneous software upgrades, databases, and program management tools. Program management, financial management and investment analysis support will be provided to assist with planning, decision-making, and budgetary oversight of the activities involved in implementing newly acquired systems, components, and equipment in existing operational NAS facilities.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The System Engineering 2020 contract will procure the necessary technical expertise in order to provide Research, Systems Engineering, and Program management support to enhance the NAS in today's rapidly changing technology environment. The request will support air traffic control specialists, system engineers, acquisition specialists, computer operation/simulation operators, configuration management specialists, engineers, financial analysts, program analysts, human factors specialists, technical editor/writers, web designers, and information specialists. This unique knowledge and expertise will assist FAA in improving aviation safety, security, and efficiency of the air traffic control system while increasing the capacity and reliability of the National Airspace System.

How Do You Know The Program Works?

The System Engineering 2020 provides continuity, innovation, and cost-effective workforce necessary to support the agency's goals of improving aviation safety, security, and efficiency while increasing capacity and productivity reducing overall operating costs resulting in a cost savings. The System Engineering 2020 creative and innovation workforce will develop and enhance software tools to help improve the efficiency of the agency's NAS.

Why Do We Want/Need To Fund The Program At The Requested Level?

The System Engineering 2020 contract support provides future enhancement of the Air Traffic System by establishing and documenting the FAA's Enterprise Architecture (EA) requirements. The National Airspace System EA is the blue print for the future air transportation system and for complete, accurate, clear and concise roadmaps and views that must be identified and documented in the architecture. System Engineering 2020 assists in developing, delivering, and implementing guidance to move forward the engineering and prototyping effort for NextGen; establishing a NextGen Service Level Agreement Planning Group to assist in the identification of RE&D requirements necessary for the transition to NextGen; and provides support for the System Wide Information Management (SWIM) Evolution Strategy.

In addition, contract support services have ensured sound systems engineering practices and business case development processes. Also, the contract provides support to FAA's planning and budgetary processes ensuring consistent application of the AMS process.

Detailed Justification for - 4A02 Program Support Leases

What Is The Request And What Will We Get For The Funds?

FY 2014 – Program Support Leases
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Program Support Leases	$40,000	$40,900	$42,100	+$2,100

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Operational Leases	---	$42,100.0

For FY 2014, $42,100,000 is requested to pay the annual rent on leases for real estate (both land and space) to house facilities required to operate the National Airspace System (NAS). This program funds more than 2,800 leases along with other real estate requirements and will include:

- Payment of rents for land and space leases that directly support navigation, communication, weather observation and reporting, air traffic control, and other functions that support the NAS
- 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
- Funds for conversion of existing leases to fee ownership or perpetual easements
- Payments for condemnation (leasehold or fee) of real property interests
- 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
- Fund the downsizing, consolidation, or combination of multiple offices when technically feasible and economically advantageous
- Fund the development of business tools to enhance real estate acquisition and management activities and for implementing program efficiency practices
- Funding for costs associated with real property lease terminations and equipment disposals
- Funding for testing and studies (environmental, suitability, sustainability, cost-effectiveness, etc.) in connection with the leasing, purchasing, usage, management, and disposal of real property
- Funding for real property costs associated with the transition to Next Generation (NextGen) facilities

What Is This Program?

This program secures the funding for the payment of the required real property rights by providing the payments for more than 2,800 leases covering both land and space for operational facilities.

DOT Strategic Goal – Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

To operate the NAS, FAA requires utilizes more than 2,800 rentable real estate leases. Without these property rights, FAA could not operate the NAS since the majority of its facilities reside either on leased land or in leased building space. Leases for building space include those for planned, constructed, and newly finished Air Traffic Control Towers. The FAA must also obtain clear zones to prevent interference with electronic signals at certain facilities, such as very high frequency omni-directional ranges, airport surveillance radars, and air route surveillance radars.

The real property leases are legally binding contracts that usually require rents to be paid each year. The total rent amount for the leases portfolio increases each year due to the addition of leases for new facilities and the renegotiation of expired leases.

How Do You Know The Program Works?

Sufficient funding is available to make rent payments for all the real estate leases for NAS operational facilities. The significant savings have been achieved through the implementation of the co-location, consolidation, and oversight measures which are an integral part of this program.

Why Do We Want/Need To Fund The Program At The Requested Level?

$42,100,000 is required to fund rent payments for the projected total real estate lease portfolio, pending judgments for fee condemnation court awards, and costs associated with real property lease terminations and equipment disposals.

Detailed Justification for - 4A03 Logistics Support Services (LSS)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Logistics Support Services (LSS)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Logistics Support Services (LSS)	$11,700	$11,500	$11,500	-$200

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Real Estate Acquisition, Materiel Management Contract	Various	$11,500.0

For FY 2014, $11,500,000 is requested to fund contractor-supplied logistics services.

What Is This Program?

Through the LSS program, the agency utilizes contractor-supplied services to perform real property acquisition, materiel management, contracting activities in support of FAA Capital Investment Plan (CIP) projects, and 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 LSS resources will continue to be used for asset tracking and documentation efforts to obtain and maintain a clean audit opinion.

The LSS program directly supports improved financial management while delivering quality customer service. Specifically, the program provides key support functions which enable the FAA to manage real property assets, maintain a clean audit opinion, and plan the execution of acquisition activities supporting the NAS. These functions are performed throughout the three Logistics Service Areas, FAA Technical Center, and FAA Aeronautical Center.

Related project management goals include:

- Complete 80 percent of the annual real property inventory validation effort
- Designate 75 percent of the disposed real property assets as "retired" within 30 days of the date the disposal forms are received from ATO
- Capitalize 85 percent of all personal and real property capital assets within 65 days of date placed in service
- Award at least 90 percent of all formal contracts (over $100,000) in less than 180 calendar days (Office of Acquisition Services) and in less than 120 days (Logistics Service Areas) from the time a purchase request is received from the requiring organization

DOT Strategic Goal - Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

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 strategic 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 accounting standards set by the Government Accountability Office (GAO) that could put the achievement of a clean audit opinion at risk.

How Do You Know The Program Works?

An example of the effectiveness of the LSS contract is the success of the 2010 and 2011 clean audit opinions achieved by FAA. During this time period, LSS resources were utilized across the nine regional offices, Aeronautical Center, and FAA Headquarters to provide the technical support to process capitalized assets, which successfully supported the achievement of a positive outcome of the financial audit. It was as a direct result of the LSS staffing support that allowed FAA to process these assets in a timely and accurate manner. Without such support, FAA might have missed the specified processing metric of 80 percent of the assets within 65 days potentially impacting the overall audit opinion rendered by the DOT IG.

Why Do We Want/Need To Fund The Program at the Requested Level?

Any funding reduction would directly impact recently achieved processing efficiencies within acquisition, real estate, and materiel management, significantly reducing or even eliminating the improvement gains made over the last several years.

Detailed Justification for - 4A04 Mike Monroney Aeronautical Center Leases

What Is The Request And What Will We Get For The Funds?

FY 2014 – Mike Monroney Aeronautical Center Leases
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Mike Monroney Aeronautical Center Leases	$17,000	$17,500	$17,900	+$900

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aeronautical Center Lease Payment	1	$17,900.0

For FY 2014, $17,900,000 is requested to continue the Aeronautical Center Leases.

What Is This Program?

The Aeronautical Center is the FAA's centralized location that supports FAA National Airspace Systems (NAS) Air Operations/flight checks, engineering, system testing, training (Radar/Navaids), NAS logistics, aviation regulation, registration, certification, aviation and transportation safety research, and Business Services in Oklahoma City.

The Center provides facilities that support the work of 7,100 employees, students, and contractors on a daily basis and is the largest concentration of FAA personnel outside of Washington D.C. In addition 10,000 to 11,000 visitors come to the Aeronautical Center Annually.

The Aeronautical Center leases provide leased land/building rent and insurance that comprise approximately 80 percent of Aeronautical Center space: 2.8 million square feet of leased space and 1,100 acres of land, having a replacement value of $710 million.

The lease is comprised of:

- Master Lease land/building rent, sustainment and insurance
- Thomas Road warehouse lease
- Tower space for Terminal Doppler Weather Radar (TDWR) target generators
- Grounds Maintenance Building

The Aeronautical Center requires large parcels of land as NAS test sites for surveillance radar, communications, weather, and navigation/landing systems, as well as warehouse, administrative office space, and training facilities. It is a Level IV security site based on numbers of employees, facility square footage, sensitivity of records, volume of public contact, and mission essential facilities whose loss, damage, or destruction may have serious or catastrophic impact on the NAS.

Anticipated FY 2014 Accomplishments

- Annual rent for Mike Monroney Aeronautical Center real property leases
- No FAA personnel work stoppage due to unsafe/unusable facilities. Average age leased buildings: 46 years

Funding for this program assures continuity of the Aeronautical Center facility and that it remains viable for current and future generations of FAA employees.

DOT Strategic Goal - Organization Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

Leased Aeronautical Center facilities support FAA missions that include:

- Aviation training for 90,000 FAA and international students per year in resident and distance learning, including approximately 1,000,000 hours of distance learning delivered annually
- Logistics services and supply support to the operational NAS to all FAA Airway Facility locations, Air Traffic, and approximately 70 DoD and international organizations
- Engineering services for NAS systems modification and repair
- Aviation research: medical and human factors for aviation personnel
- Standards and flight inspection services
- Regulation certification of safety related positions and equipment, airmen and aircraft records and registration
- Business services that include DOT/DELPHI/Prism/Castle Data Center Operations, Accounting Operations, Acquisition Services, ATO Data Center, Aviation Safety/Research

How Do You Know The Program Works?

This program, combined with the Aeronautical Center Infrastructure Modernization, benefits the NAS and avoided $14,600,000 in FAA costs during FY 2012 through the following:

- Lower lease and operating cost (includes utilities (gas, water, electric), janitorial, cleaning, security) costs in FY 2012 than other alternates: $17.51 per net square footage (nsf) at MMAC, as compared with OkC General Services Administration (GSA) leased space in Oklahoma City at $25.20 nsf, a cost avoidance of $14,600,000 in FY 2012
- Allowing flexibility and growth to support NextGen airspace requirements
- Supporting NAS operations/maintenance, current and future ATO initiatives
- Decreasing energy and repair operations costs
- Enables ATO initiatives by providing infrastructure that supports new NAS facilities funded from other sources that include AOS Precision Runway Monitor (PRM), Instrument Landing System (ILS), and Terminal Automation Modernization Replacement (TAMR)

No work stoppages have been identified due to unsafe/unusable facilities even though the average age of leased facilities at the Center is 46 years.

Why Do We Want/Need To Fund The Program At The Requested Level?

Funding at the current level is necessary to pay rent under the long-term lease agreement.

Detailed Justification for - 4A05 Transition Engineering Support

What Is The Request And What Will We Get For The Funds?

FY 2014 – Transition Engineering Support
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Transition Engineering Support	$13,000	$15,000	$16,500	+$3,500

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
A. NAS Integration Support Contract (NISC)		
a. NISC Program Support		$2,500.0
b. NISC Contract Management	---	12,500.0
Total	Various	$15,000.0
B. Configuration Automation Management (CMA)	--	$1,500.0

For FY 2014, $16,500,000 is requested for the following:

A. (NAS) Integration Support Contract (NISC): $15,000,000 is requested for to support the modernization schedules for NAS programs.

B. Configuration Management Automation (CMA): $1,500,000 is requested for CMA, to begin replacement of the outdated configuration management legacy systems (WebCM and Replacement Documentation and Configuration Identification System (RepCON)) currently used to provide NAS Change Proposal (NCP) process and provides users with visibility into the case file/NCP/CCD process, and delivers status accounting information relative to change activity for all configuration items in order to add, modify and decommission equipment into the NAS.

CMA is a vital component of the FAA's lifecycle management effort to proficiently manage the complexity of today's physical and virtualized IT environments. Properly managed CM is also essential to the ongoing effective success of the Agency's transition to the Next Generation Air Transportation System (NextGen). The successful implementation of the CMA solution will deliver to the Agency a closed-loop lifecycle management environment, with full lifecycle traceability, reportable business transactions based upon complete and accurate data, timely decision-making, and continuous process improvement opportunities.

What Is This Program?

NISC provides engineering and technical resources to FAA organizations responsible for NAS Transition and Implementation. The NISC team, working in partnership with these organizations, ensures that capital investments and regional projects are implemented in the most effective manner to support the NAS mission. The Transition Engineering Services program maps to organizational excellence by providing a highly skilled and experienced workforce at cost effective rates.

DOT Strategic Goal – Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

This program provides technical support to assist FAA's technical workforce in handling the surge in demand for short-term programs/projects that are vital to managing the volume of diverse systems and equipment associated with NAS modernization. As a result, FAA will experience significant NAS modernization scheduling delays if additional support services are not available to complete these projects.

How Do You Know The Program Works?

NISC will provide FAA organizations with supplemental staff hours to support transition, implementation, and integration activities that cannot be accomplished by the FAA technical workforce because of personnel and expertise shortfalls. It affords the FAA flexibility in obtaining the technical expertise required to meet demand surges with minimal lead time and without the need for long term commitments. All work is based on documented FAA requirements. Under this contract, NISC cannot provide inherently governmental functions with the oversight of NAS programs.

Since the award of NISC-I in 1991 and its successor contracts, this program has supplied from 500 to more than 1,000 supplemental personnel annually to various programs throughout the FAA in support of NAS modernization, transition planning, implementation, and integration. This level of support has varied significantly in amount of support as well as in skill type as FAA priorities and direction has changed. Additionally, the contractor supplying these services consistently received technical performance award fees in the 90 percent and above range. This support integrates equipment and systems into the NAS and ensures that the equipment functions properly once delivered. It improves facility reliability and availability to the NAS, which results in safe, efficient, and cost effective air traffic services.

Why Do We Want/Need To Fund The Program At The Requested Level?

$16,500,000 is required for Transition Engineering Services to support the modernization schedules for NAS programs by providing a cost effective contractual vehicle for meeting Capital Investment Plan (CIP) projects and FAA organizational technical requirements.

Detailed Justification for - 4A06 Technical Support Services Contract (TSSC)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Technical Support Services Contract (TSSC)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Technical Support Services Contract (TSSC)	$22,000	$25,000	$25,000	+$3,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Contractor Program Management		$10,700.0
b. Planning, Quality Control, Security, Safety	---	4,900.0
c. Award Fee	---	4,000.0
d. Program management Support Contract	---	2,400.0
e. Defense Contract Audit Agency	---	500.0
f. Management Systems Support	---	2,500.0
Total	Various	$25,000.0

For FY 2014, $25,000,000 is to continue the Technical Support Services Contract infrastructure so other programs can use their funds to buy its services to accomplish more than $140 million of project work each year (893,000 support/sub-contract work costs).

What Is This Program?

- The Technical Support Services Contract (TSSC) Program is the Agency's primary vehicle to provide a work force multiplier to install equipment and to support the myriad of Capital Budget improvements to the National Airspace System (NAS) in a timely, cost-effective manner. These activities include work planning, quality control, subcontracting, the contractor safety program, and award fee paid under the contract as well as the usual rent, telecomm and utility costs incurred under the contract
- 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 exists in insufficient numbers for a specific type of installation need
- The TSSC program allows FAA to avoid hiring additional employees for a limited duration to handle surge demand such as when new equipment is installed at multiple locations and during compressed schedule periods

TSSC infrastructure activities include program and site specific work planning, quality control and assurance, legal compliance with subcontracting law, contractor safety programs, as well as invariable costs like office space rent, supporting telecommunication and utility costs. The TSSC program is used to fund DCAA audits of contractor accounting systems, labor invoices, and other processes to ensure technical and legal compliance.

TSSC infrastructure funding pays for:

- Project implementation safety, security and quality control which helps avoid worker's compensation claims and increased insurance costs that would be passed on to the FAA, and avoids costs to the FAA for rework that would be required to correct defects that occur when quality control efforts fail due to a lack of adequate funding

- The contractor's subcontractor administration capability which accomplishes award of construction subcontracts for public works projects of approximately $65 million of annual public works effort that is accomplished through TSSC sub-contracts

DOT Strategic Goal – Organizational Excellence

- Diverse and collaborative DOT workforce.

Why Is This Particular Program Necessary?

This program provides technical support to assist FAA's technical workforce in handling the surge in demand for short-term programs/projects that are needed to managing the volume of diverse systems and equipment associated with NAS modernization. As aresult, FAA will experience significant NAS modernization scheduling delays if additional support services are not available to complete these projects.

- In a typical year, the vehicle is used to purchase more than $75 million in labor and accomplish more than $65 million in non-labor cost activities such as site preparation and other public works construction
- TSSC directly supports modernization of the NAS that ensures operational availability by replacing old equipment and sustaining the infrastructure
- TSSC supports activities such as the installation of electronic equipment to support the NAS infrastructure modernization to infrastructure work, for fiber optic installation and construction management, as part of the continuous investment of the FAA

How Do You Know The Program Works?

The Technical Support Services Contract (TSSC) program has an award fee, performance based acquisition contract vehicle to promote efficiency and FAA customer satisfaction. The TSSC customer award fee evaluation survey participation return rate is typically greater than 90 percent. Direct FAA customer award fee feedback rated contractor performance greater than 90 percent (out of 100 percent) in the excellent and good range across several hundred individual contractor performance evaluations in the past years of TSSC performance.

In a typical year, the TSSC vehicle is used to purchase more than $75 million in labor and accomplish more than $65 million in non-labor cost activities such as site preparation and other public works construction.

Based on a program of $25 million and $140 million invoiced for work performed, the TSSC program provides a leveraging multiplier of 5.6. In other words, the funding provided for TSSC infrastructure enables FAA to accomplish $140 million in NAS project efforts.

Why Do We Want / Need To Fund The Program At The Requested Level?

$25,000,000 is required to fund continuing contract operations. These operations, referred to as infrastructure costs, sustain FAA's basic national capability to supplement and leverage federal skills during site specific NAS implementation efforts. TSSC is the Agency's primary installation support service vehicle, and it is used by a myriad of Capital Budget improvement program customers to achieve timely and cost effective NAS modernization. Through TSSC, implementation of capacity and safety enhancements are achieved via approved and funded NAS capital projects that would otherwise be delayed.

A reduction would impact the program by:

- Disrupting funding for Program Management Support Contracts. Those contracts are used to assist the Program Office in its cost, schedule, and scope oversight on the national Technical Support Services Contract (TSSC)
- Significantly impacting the number of projects that are completed, the timeliness of completion, increase cost, and would degrade safety and quality assurance capabilities. The $140 million dollars of NAS implementation efforts TSSC staff support every year would be jeopardized by delay and associated cost increases
- Significantly impacting the contractor's subcontractor administration capability which would cause unacceptable delays in award of construction subcontracts for public works projects issued under the contract
- Delaying subcontracts will cause schedule delays for NAS project implementation which will adversely impact approximately $65 million of effort that is accomplished through TSSC subcontracts. Every delayed project equates to delays in capacity or safety enhancements and planned cost benefits

Detailed Justification for - 4A07 Resource Tracking Program (RTP)

What Is The Request And What Will We Get For The Funds?

FY 2014 – Resource Tracking Program (RTP)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Resource Tracking Program (RTP)	$4,000	$6,000	$4,000	$0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Program/Project Management	---	$4,000.0

For FY 2014, $4,000,000 is requested to continue to keep hardware and software licenses current, program/project management support in the National Airspace System (NAS), maintain Technical Support Services Contract (TSSC) and NAS Implementation Support Contract (NISC), upgrade training documentation, and continue to provide training to users and data administrators.

What Is This Program?

The RTP is a computer management system (including hardware, software, development, training, and support) used by the FAA Service Centers, the William J. Hughes Technical Center, and the Mike Monroney Aeronautical Center for identifying requirements, internal budget preparation, implementation planning, resource estimating, project tracking, and measuring performance of projects. The Corporate Work Plan (CWP) process is the Air Traffic Organization's method to implement approved projects and to standardize National Processes in support of the National Airspace System (NAS). The CWP system, which falls under the RTP program, enables users to share FAA's project data during the various stages of implementation (i.e., planning, scheduling, budgeting, execution, and closeout). The CWP toolset and its supporting data are continuously used for reporting project metrics to project managers, responsible engineers, program offices, and various other customers.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

The hardware and software for the CWP TOOLSET which is the key tool that makes up the Corporate Work Plan must be constantly maintained and upgraded, to support FAA and the processes that will be impacted as it continues to evolve into the Air Traffic Organization (ATO). The CWP TOOLSET is used to track all ATO Capital projects from cradle to grave. This system is also used to develop the CWP and work releases for the TSSC.

This system interfaces with DELPHI and Fund Control Module (FCM) and various other systems. The CWP TOOLSET is a centralized system with load-balanced servers residing in Oklahoma City, OK.

How Do You Know The Program Works?

The CWP TOOLSET continues to meet the FAA performance goal of Improving Efficiency of Mission Support. Three of the primary achievements are:

- 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 are reached by providing enhanced program and project management capabilities with cost accounting of capital expenses to FAA Managers and engineers have up-to-date reliable data on capital projects through CWP TOOLSET
- Improving productivity by more than 20 percent when a standardized project management process is supported and emulates current operating procedures
- Providing earned value management capability

Why Do We Want/Need To Fund The Program At The Requested Level?

$4,000,000 is required to keep current the CWP TOOLSET software and hardware. 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 the Headquarters, Atlantic City and Oklahoma City sites. Documentation that is used to provide training to users and administrators of the system will also be maintained.

A reduction could result in licenses expiring which could result in increased costs for future upgrades. Also it could result in reduction of contractor support which would cause delayed in future enhancement of the CWP Toolset and support of the hardware maintenance.

The CWP system provides end-to-end management of programs and projects.

Detailed Justification for - **4A08 Center for Advanced Aviation System Development (CAASD)**

What Is The Request And What Will We Get For The Funds?

FY 2014 – Center for Advanced Aviation System Development (CAASD)
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Center for Advanced Aviation System Development (CAASD)	$78,000	$78,000	$70,000	-$8,000

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. CAASD (Air Traffic Organization)	---	$57,638.0
b. CAASD (Non-Air Traffic Organization)	---	12,362.0
Total	Various	$70,000.0

For FY 2014, $70,000,000 is requested to fund technical, engineering, as well as research and development support for the CAASD program. The FY 2014 funding will support approximately 224 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 600 MTS.

What Is This Program?

The Center for Advanced Aviation System Development (CAASD) is a Federally Funded Research and Development Center (FFRDC), operating under a Sponsoring 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 National Airspace System (NAS) requirements. MITRE has developed a broad and deep understanding of the entire installed NAS, including NAS systems and their interdependencies. MITRE's unique experience and expertise has been indispensable to the FAA in helping define and validate key concepts and evolutionary paths to achieve NextGen. The CAASD Product Based Work Plan and FAA CAASD Long Range Plan (FY 2012 – 2016), approved by the FAA's FFRDC Executive Board, define an outcome-based program of technically complex research, development, and system engineering assignments designed to support the goals and requirements of the NAS and the NextGen. CAASD activities include:

NAS and NextGen System Integration and Evolution: Improve understanding of the future environment, including anticipated demand at airports and for airspace; anticipate the impact of planned improvements on future capacity; develop and integrate the NextGen enterprise architecture, operational concepts, capability action plans, and roadmaps to ensure an integrated evolution and align agencies' enterprise architectures. Analysis of the NAS-wide strategic issues will ensure their alignment with the evolving NextGen architecture. Conduct research to gain better understanding of late mid-term NextGen operational concept elements and how to transition to them.

Communications Modernization: Conduct engineering analysis, communications network definition, and transition strategy studies for the FAA's Voice Communications and System-Wide Information Management (SWIM) programs; conduct spectrum analysis focusing on strategic issues related to the availability of adequate spectrum resources to support aeronautical communications for NextGen operational concepts.

Contribute to the development of integrated communications portfolios that support late mid-term NAS-wide communications services. Develop strategies and plans for the evolution of the SWIM architecture to support NextGen net-centric services in consideration of NextGen Implementation Plans.

Performance-Based NAS: Conduct analyses that enable FAA to meet the Performance-Based Navigation (PBN) goals, milestones, and benefits identified in Destination 2025, Aviation Safety Work Plan for NextGen, and the NextGen Implementation Plan. Perform technical and operational analysis, research, and concept exploration that advance FAA's PBN implementation for Integrated Airspace and Procedures and Metroplex applications. Contribute to prototype performance case analyses to validate Flight Standards procedure development tools; analyze and model aspects of navigation assets, including Wide Area Augmentation System, Local Area Augmentation System, divestiture of navigation aids, modernization of Global Positioning System, and interoperability with other Global Navigation Satellite Systems.

En Route and Oceanic Evolution. Perform system engineering analyses for new technologies, capabilities and procedures for the En Route and Oceanic system architectures and operational applications that enables NextGen technologies to increase capacity and improve operational safety; conduct analyses to identify and mitigate key technical and operational risks for specific NextGen mid-term capabilities. Perform Analyses of NextGen capabilities for the late mid-term and far-term timeframes that are expected to change the role and responsibilities of the controller to enable them to handle increased traffic levels defined under the NextGen Concept of Operations (CONOPS). Define requirements and assess benefits of key NextGen operational capabilities for the far-end that may be candidates for application to En Route design and implementation.

Terminal Operations and Evolution: Provide technical and operational insight into terminal systems and operations that can be used to safely permit reduced separation standards and/or significantly increase overall system capacity and productivity. Conduct technical analyses of automation capabilities targeted for NextGen Segment Bravo to identify integration issues that will need to be addresses by the Terminal domain. Conduct analyses of Segment Bravo Terminal concepts and capabilities to assess the technology transfer potential of applying Intelligent Training Systems to NextGen training requirements and capabilities.

Airspace Design and Analysis: Structure and execute technical analyses that will inform FAA and Industry decisions on airspace design and management; 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 technical analyses and design management efforts to provide a national, system-wide optimization of airspace. Provide analyses to evaluate the operational issues associated with Unmanned Aircraft Systems (UAS) including safety, efficiencies, and integration of airspace security capabilities.

NAS System Operations: Assess system operations performance; develop improved analytic techniques and capabilities for system operations analysis; develop improved measurement techniques for assessing operations. Develop and evaluate new metrics to measure overall NAS operational performance; improve the FAA's responsiveness to customer issues and improve traffic management strategies; design, model, and assess new system operations procedures for new capabilities and airspace changes that will be implemented in the near future. Analyze commercial space flight and Unmanned Aircraft Systems identified issues and their potential operational impacts on NAS performance.

Traffic Flow Management (TFM) Operational Evolution: Conduct activities supporting the technology transfer of TFM mid-term concepts and capabilities to NextGen. Provide detailed assessments of concept maturity, operational feasibility and implementation risks, including identification of cross-domain dependencies. Model and prototype the flight day analysis environment and flow contingency management processes to develop and refine flow strategy tool requirements.

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. Extend technical analyses and system engineering efforts to the development of standards and policy for integration of UAS operations into the NAS.

Mission-Oriented Investigation and Experimentation (MOIE): Develop tools and techniques for studying system capacity, throughput, performance, system dynamics and adaptation to technology and policy driven change; strengthen the systems engineering skills and tools of the FFRDC.

NAS-Wide Information System Security: Develop technical guidance to engineer security capabilities into the NAS; provide guidance on security threats, technology, standards, and practices to evolve Information System Security (ISS) to adapt to changing threats and technology advances; create an IT infrastructure that will be resilient, flexible, and adaptable, and provide a defense-in-depth strategy. Update the NAS ISS Enterprise Architecture and develop recommendations for a Far-term NAS Enterprise ISS Architecture strategy, controls and security practices.

Broadcast and Surveillance Services: Research Automatic Dependent Surveillance-Broadcast (ADS-B) ground and cockpit-based solutions; prototype basic and advanced ADS-B applications that will result in improved efficiency and capacity in the NAS and improve airspace access and national security; assess the impact of ADS-B on safety, capacity, and efficiency benefits. Develop domestic and international requirements and engineering standards for future ADS-B applications.

Special Studies, Laboratory and Data Enhancements: Provide an integrated research environment that ensures individual research activities, prototypes, and capabilities can be brought together with the appropriate mixture of fidelity and flexibility to facilitate integrated investigations, compressed spiraling of operational concepts and procedure development. Develop and sustain the Aviation Integrated Demonstration and Experimentation for Aeronautics (IDEA) laboratory infrastructure for expanded cross-domain scenario generation tools to support real-time Human-in-the-Loop as well as enable fast-time capabilities.

Interdependencies: FAA relies heavily on CAASD's integrated knowledge of the National Airspace System (NAS) and long-term experience with ongoing efforts to plan and implement NextGen. The challenges the FAA faces in meeting established goals and charting an achievable course for the development and implementation of NextGen and the achieving of Destination 2025 goals are extensive and technically complex. Without CAASD, the FAA cannot address NAS and NextGen complexity challenges effectively. CAASD provides a unique system-wide integrated understanding, tools, labs, and other capabilities that are fundamental to FAA's ability to address these challenges. The required development of system architecture and comprehensive research, development, and system engineering services can only be provided by an FFRDC whose charter permits special access to sensitive Agency and Aviation Industry information and data, not normally available to support contractors. Numerous elements of the CAASD work program are highly specialized research and systems engineering activities that require extensive knowledge of the present and planned NAS systems. These capabilities are fundamental to the FAA's ability to meet its Destination 2025 and NextGen Implementation Plan goals and objectives.

DOT Strategic Goal - Economic Competitiveness

- Maximum economic returns on transportation policies and investments.

Why Is This Particular Program Necessary?

CAASD's integrated knowledge of the National Airspace System (NAS) and its ongoing efforts to plan and implement NextGen are vital to the FAA's meeting established Destination 2025 Goals and to ensure NAS system capacity and user demands are matched to ensure reliable, predictable and cost effective air navigation and airport services. Without CAASD, the FAA cannot address NAS and NextGen complexity challenges effectively.

The FAA, along with its aviation partners, faces a broad range of technically complex challenges to achieve the NextGen. 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 requires highly specialized simulation and computer modeling capabilities that it does not have in-house and are only available through an FFRDC that has unique knowledge, skills, and capabilities in aviation research, systems engineering and analysis. 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 essentiall to FAA in transforming the nation's air transportation system in an effective and timely manner.

Benefits of CAASD work are described in the CAASD Long Range Plan's (LRP) accomplishments for each Outcome. A web-based copy of the CAASD LRP is available at: https://employees.faa.gov/org/linebusiness/ato/nextgen_ops_plan/programs/caasdpmo/program_documents/media/CAASD_LRP_2012-2016.pdf

How Do You Know The Program Works?

While the relationship between the FAA and CAASD can be described as a well-functioning partnership, the FFRDC entity must be managed and focused to perform the most important work of the agency, while conserving scarce resources. Periodic program assessments are employed and a structured management framework is in place to ensure that completed work yields effective and efficient results. A major review is conducted every five years to validate and justify the continued need for the FFRDC as well as to assess its efficiency and effectiveness.

Two key components of the FAA's CAASD management program are the FAA's FFRDC Executive Board (FEB) and the Outcome Management Team (OMT). The FEB meets semi-annually to approve Outcomes, formulate and review goals and objectives of CAASD Outputs, and determine broad policy matters. The OMT is chaired by the Chief Scientific and Technical Advisor for Architecture and NextGen Development. The OMT is comprised of senior managers responsible for ensuring the optimal allocation of resources, maximizing benefits from CAASD products and ensuring that work performed by CAASD is consistent with the mission and criteria approved for the FFRDC. This senior management involvement illustrates the importance the FAA places on CAASD. The OMT has added an agency-wide corporate view with the focus on integrating FAA planning activities and focusing them on achieving NextGen success.

CAASD's technical performance is assessed in a structured manner on several levels, including semi-annual technical evaluations of overall outcome performance by Outcome Managers, individual product assessments by stakeholders, monthly CAASD Program Office contract cost and technical performance management reviews and documentation, Quarterly Product Review Boards, and semi-annual FFRDC Executive Board oversight reviews. Frequent interactions between the FAA and the MITRE CAASD team also occur through the FAA CAASD PM participation in periodic CAASD planning meetings, Outcome Manager-sponsored program coordination meetings, and regular dialogue between FAA Outcome Managers and CAASD Outcome Leaders.

The semi-annual Outcome Performance Evaluations, conducted by Outcome Managers and their stakeholders, provide an overall assessment with respect to technical management, schedule management, and resources management. Cost management is assessed by the PM. Final evaluation ratings are presented to the FEB semi-annually. The product reviews provide stakeholder feedback on specific individual products. Comments and feedback from these assessments provide important feedback and input to CAASD management and decision making.

In addition to formal scheduled reviews, frequent, informal interaction is on-going throughout the year between the FAA and CAASD to ensure thoroughness, responsiveness, efficiency, and accuracy of CAASD products. These ambient factors are used in the evaluation process and serve to facilitate communications among all responsible personnel.

MITRE is routinely required to explain any significant variances between budgeted and actual operating results. The Defense Contract Audit Agency (DCAA) supplements internal FAA audits and reviews MITRE Corporate compliance with formal periodic audits. DCAA also evaluates the pricing of all MITRE FFRDCs; the most recent DCAA compliance audit was completed in June 2011.

Why Do We Want / Need To Fund The Program At The Requested Level?

CAASD FFRDC support over the past decade has proven to be an invaluable strategic asset to the Department of Transportation, Federal Aviation Administration, and the U.S. Government as a whole. The establishment of a stable source of funding, along with a long-term contractual relationship, is in the best interest of the public and the FAA because it permits economies that can only be supported with an established work force and provides continuity of services for an efficient and effective use of an experienced professional staff.

MITRE/CAASD conducts high quality research, systems engineering, and analytical capabilities help FAA meet the technically complex challenges in the NAS. CAASD efforts support all strategic plan goals across the board and the FFRDC continues to play a key role in defining NextGen. Its expertise is essential to FAA's efforts to transform the nation's air transportation system in an effective and timely manner. The CAASD program provides detailed reports, analyses, briefings, and concept demonstration systems for use in the evaluation of new Air Traffic Management (ATM) and control operating concepts and/or infrastructure replacements. These products are important elements in the development of a more efficient, more available, and safer next generation ATM and control systems of the NAS. CAASD provides new technology research for applications for global air traffic management, including new developments in traffic flow management, navigation, communication, separation assurance, surveillance technology, and system safety.

The FAA, sponsor of the CAASD, entered into a new five year Sponsoring Agreement in December 2010 and a new contract with the MITRE Corp. in January 2011 to run the CAASD for the FAA through 2020. The new Sponsoring Agreement states that: "The FAA needs to provide sufficient physical and financial resources for CAASD to maintain and develop its personnel's technical skills and laboratory infrastructure, as well as sufficient financial resources to maintain a reasonably stable and effective staffing level." The establishment of a stable source of funding, along with a long-term contractual relationship, is in the best interest of the public and the FAA, because it permits economies that can only be supported with an established work force and provides continuity of services for an efficient and effective use of an experienced professional staff. Funding must be at a rate sufficient to accommodate inflation and necessary salary and COLA increases to retain this highly talented and professional workforce. CAASD, as an FFRDC, provides unique technical capabilities that are vital to the FAA in meeting Destination 2025 and Next Generation Air Transportation System (NextGen) Implementation Plan goals and objectives. CAASD support is playing an instrumental role in the achievement of the NextGen. Its experienced cadre of scientists and engineers has proven indispensable to the FAA in transforming the nation's air transportation system in an effective and timely manner.

Detailed Justification for - 4A09 Aeronautical Information Management Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aeronautical Information Management Program
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Aeronautical Information Management Program	$20,200	$7,871	$9,050	-$11,150

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
a. Prime Mission Product	---	$4,160.0
b. Program Management	---	1,500.0
c. System Engineering	---	2,038.0
d. Integrated Logistic Support	---	452.0
e. Implementation	---	900.0
Total	Various	$9,050.0

For FY 2014, $9,050,000 is requested to continue design, development and implementation of the Aeronautical Information Management Modernization Segment 2 (AIMM S2) program. AIMM S2 will provide Aeronautical Information Management (AIM) technologies and tools for Aeronautical Information exchange via the Aeronautical Common Services (ACS) infrastructure. ACS will support accuracy and timeliness of special activity airspace (SAA) and airport data and will deliver information across the National Airspace System (NAS) using standard System Wide Information Management (SWIM) compliant protocols. AIMM S2 will continue design and development efforts to support an Initial Operating Capability in the fourth quarter of FY 2015.

What Is This Program?

The AIM Modernization program provides aviation users with digital aeronautical information that conforms to international standards and supports NextGen objectives and meets the needs of AIM's customers, both in the short term, and in the future. Digital aeronautical data enables the timely processing of data to improve mapping, flight planning, and the timeliness and accuracy of air traffic control instructions. The program will re-engineer the business processes for the management and provision of key aeronautical information using digital technology that is consistent with FAA and international architecture standards. AIMM S2 will implement a Cloud Computing solution and with FY 2014 funding will include working with the selected vendor to design the Cloud solution via system engineering, security and safety activities.

AIMM S2 builds on pre-implementation efforts in the NextGen Common Status and Structure Data (CSSD) program (Part of the Collaborative ATM solution set) to baseline and implement suitably mature AIM technologies and tools for Aeronautical Information (AI) exchange.

AIMM S2 will:

- Provide ACS as the single trusted source of aeronautical information
- Expand the distribution of Notices to Airman (NOTAMs) included as part of the Federal NOTAM System
- Support the future global air traffic management environment, expanding access to authorized NAS users by leveraging SWIM Common Support Services infrastructure

- Initial Customer: TFMS
- Follow-On Connections: TFDM, ERAM, and CCS-Wx
- Enable AI to be made available to all NAS users utilizing web services based system-to-system interfaces and a single portal
- Provide a fully compliant SOA to facilitate efficient development and implementation of enhancements

DOT Strategic Goal – Safety

- Reduction in transportation related injuries and fatalities.

AIMM S2 received Investment Analysis Readiness Decision approval from the Joint Resources Council (JRC) in the second quarter FY 2013. The Final Investment Decision (FID) is schedule for approval in the second quarter FY 2014.

Why Is This Particular Program Necessary?

AIMM S2 is necessary because it delivers the solution development and implementation phase for services that deliver common status and structure data. These services are necessary to improve the accuracy and timeliness of SAA and airport information management and flow. They are realized through the development of the ACS and the integration of information flows, leveraging SWIM Core Services infrastructure. The ACS is a NextGen common service identified in the NextGen segment implementation plan to support multiple NextGen operational improvements. Most notably is the dependency of the On Demand NAS Information portfolio on the development and implementation of the SAA, NOTAM, and airport data services for consumption by NAS systems. In addition, this program standardizes and centralizes services for aeronautical data within the NAS to ensure improved quality and access of data.

How Do You Know The Program Works?

AIMM S2 utilizes the SWIM Core Services infrastructure. The AIMM S2 solution development and implementation efforts depend on planning efforts in the NextGen CSSD program (plan activities to support NextGen Operational Improvements including On Demand NAS and other Collaborative ATM initiatives). An AIM Community of Interest has been created and systems engineering/investment analysis is being performed in the FY 2010, FY 2011 and FY 2012 timeframe to develop relationships and agreements with the stakeholders on requirements for the flow of aeronautical information. These sessions have and will continue to produce operational threads, shortfalls, key concepts of operation and use, performance and functional requirements and a robust business case for AIMM S2. In February 2013, the AIMM S2 acquisition program received approval at the Investment Analysis Readiness Decision to enter the investment analysis phase. The IID is scheduled for September 2013 and the FID milestone is slated for March 2014.

Why Do We Want/Need To Fund The Program At The Requested Level?

$9,050,000 is required to continue design, development and implementation efforts to support an Initial Operating Capability in the fourth quarter of 2015 and meet NextGen Operational Improvements milestones.

Detailed Justification for – 5A01 Personnel and Related Expenses

What Is The Request And What Will We Get For The Funds?

FY 2014 – Personnel and Related Expenses
($000)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
Personnel and Related Expenses	$475,000	477,907	$482,000	+$7,000

For FY 2014, $482,000,000 is requested to pay the personnel, travel and related expenses for the FAA F&E workforce performing work essential to FAA's efforts to modernize the National Airspace System (NAS).

This program funds the personnel, travel and related expenses of the Federal Aviation Administration (FAA) Facilities and Equipment (F&E) workforce. The FAA F&E workforce includes electronic, civil and mechanical engineers; electronics technicians; quality control and contract specialists; and flight inspection personnel. F&E personnel and related expenses are distributed across FAA Organizations as follows:

FTE

Organization	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ATO	2,017	1,963	1,963	-54
AVS	79	82	82	3
ANG	629	611	611	-18
AFN	182	177	177	-5
Total	2,907	2,833	2,833	-74

(Dollars in Thousands)

Organization	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
ATO	$331,559	$336,226	338,631	7,072
AVS	13,788	14,024	14,124	336
ANG	95,905	93,366	94,711	-1,194
AFN	33,748	34,291	34,534	786
Total	$475,000	477,907	482,000	7,000

What Is This Program?

This program sustains the current Facilities and Equipment (F&E) workforce and related expenses.

Why Is This Particular Program Necessary?

The F&E workforce ensures that new system enhancements, such as the Next Generation Air Transportation System (NextGen), contribute to 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.

How Do You Know The Program Works?

The F&E workforce succeeds in delivering F&E programs on specification and ensures that programs are completed successfully.

Why Do We Want / Need To Fund The Program At The Requested Level?

For FY 2014 the agency requests, $3,143,000 for the FY 2014 payraise, $1,000 increase to the Working Capital Fund for e-gov initiatives and $294,000 for non-pay inflation.

A program increase of $3,562,000 is requested to support execution of NextGen Project Level Agreements (PLAs) supporting integration and implementation activities. The required increase also supports human-in-the-loop research efforts at the Technical Center supporting demonstration activities. Examples include ADS-B, System-Wide Information Management, Data Communications, and Terminal Flight Data Manager.

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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, $166,000,000, to be derived from the Airport and Airway Trust Fund and to remain available until September 30, 2016: 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: Provided further, That no amounts may be cancelled from amounts that were designated by the Congress as an emergency requirement pursuant to the Concurrent Resolution on the Budget or the Balanced Budget and Emergency Deficit Control Act of 1985, as amended. Note.—A full-year 2013 appropriation for this account was not enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 112-175). The amounts included for 2013 reflect the annualized level provided by the continuing resolution.

PROGRAM AND FINANCING
($ in Millions)

Identification code: 69-8108-0-7-402	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
Obligations by program activity:			
0011 Improve aviation safety	88	82	87
0012 Economic competitiveness	38	29	31
0013 Environmental sustainability	40	32	29
0014 Improve the efficiency of mission support	6	26	20
0801 Reimbursable program	7	13	13
0900 Total new obligations	179	182	180
Budgetary resources available for obligation:			
1000 Unobligated balance brought forward, Oct 1	77	76	76
1021 Recoveries of prior year unpaid obligations	5	.....	.....
1050 Unobligated balance	82	76	76
New budget authority (gross), detail:			
Discretionary:			
1101 Appropriation (trust fund)	168	169	166
1160 Appropriation, discretionary (total)	168	169	166
1700 Spending authority from offsetting collections: collected	2	13	13
1701 Change in uncollected payment, Federal sources	4	.....	.....
1750 Spending auth from offsetting collections, disc (total)	6	13	13
1900 Budget authority (total)	174	182	179
1930 Total budgetary resources available	256	258	255
Memorandum (non –add) entries:			
1940 Unobligated balance expiring	-1	.....	.....
1941 Unexpired Unobligated balance, end of year	76	76	75
1951 Unobligated balance expiring	1	.....	.....
1952 Expired Unobligated balance, start of year	6	6	6
1953 Expired Unobligated balance, end of year	5	6	6
1954 Unobligated balance canceling	2	.....	.....
Change in obligated balances:			
3000 Unpaid obligations, brought forward, Oct 1 (gross)	158	143	130
3010 Obligations incurred, unexpired accounts	179	182	180
3011 Obligations incurred, expired accounts	1	.....	.....
3020 Outlays (gross)	-188	-195	-193
3040 Recoveries of prior year unpaid obligations, unexpired	-5	.....	.....
3041 Recoveries of prior year unpaid obligations, expired	-2	.....	.....
3050 Unpaid obligations, end of year	143	130	117
3060 Uncollected pyments, Federal Sources, brought forward, Oct 1	-6	-8	-8
3070 Change in uncollected payment, Federal sources, unexpired	-4	.....	.....
3071 Change in uncollected payment, Federal sources, expired	-2	.....	.....
3090 Uncollected payments, Federal sources, end of year	-8	-8	-8
3100 Obligated balance, start of year	152	135	122
3200 Obligated balance, end of year	135	122	109
Budget Authority and outlays, net:			
4000 Budget authority, gross	174	182	179
4010 Outlays from new discretionary authority	60	87	86
4011 Outlays from discretionary balances	128	108	107
4020 Outlays (gross)	188	195	193

	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4030	Federal sources..	-4	-13	-13
4050	Change in uncollected pymts, Fed sources, unexpired	-4	. . . . .	. . . . .
4052	Offsetting collections credited to expired accounts	2	. . . . .	. . . . .
4060	Additional offsets against gross budget authority only (total)	-2	. . . . .	. . . . .
4070	Budget authority, net (discretionary)...	168	169	166
4080	Outlays, net (discretionary)...	184	182	180
4180	Budget authority, net (total)..	168	169	166
4190	Outlays, net (total)..	184	182	180

This account provides funding to conduct research, engineering, and development to improve the national airspace system's capacity and safety, as well as the ability to meet environmental needs. The proposed funding is allocated to the following performance goal areas of the Federal Aviation Administration: improve safety, economic competitiveness, and environmental performance of the National Airspace System. The request includes funding for several research and development activities of the Next Generation Air Transportation System (NextGen), as well as the Joint Planning and Development Office which coordinates the interagency NextGen efforts, including activities related to unmanned aircraft systems.

OBJECT CLASSIFICATION
($ in Millions)

Identification code: 69-8108-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2013 Estimate
	Direct obligations:			
	Personnel compensation			
11.1	Full-time permanent	28	28	28
11.3	Other than full-time permanent	......	1	1
11.9	Total personnel compensation	28	29	29
12.1	Civilian personnel benefits	8	8	8
21.0	Travel and transportation of persons	2	2	2
25.1	Advisory and assistance services	35	36	37
25.2	Other services from non-Federal sources	53	51	45
25.3	Other goods and services from Federal sources	2	2	2
25.4	Operation and maintenance of facilities	1	......	....
25.5	Research and development contracts	22	21	23
25.7	Operation and maintenance of equipment	2	2	2
26.0	Supplies and materials	2	2	3
31.0	Equipment	2	1	1
41.0	Grants, subsidies, and contributions	15	15	15
99.0	Subtotal, obligations, Direct obligations	172	169	167
	Reimbursable obligations:			
25.5	Research and development contracts	7	13	13
99.0	Subtotal, obligations, Reimbursable obligations	7	13	13
99.9	Total obligations	179	182	180

Employment Summary

Identification code: 69-8108-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2013 Estimate
	Direct:			
1001	Civilian full-time equivalent employment	255	260	260

EXHIBIT III-1

RESEARCH, ENGINEERING & DEVELOPMENT
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2012 ACTUAL	FY 2013 CR ANNUALIZED	FY 2014 REQUEST	CHANGE FY 2012 - FY 2014
Safety	89,314	89,860	90,921	1,607
Economic Competitiveness	34,174	34,383	35,822	1,648
Environmental Sustainability	38,574	38,810	33,521	-5,053
Mission Support	5,494	5,528	5,736	242
TOTAL	**167,556**	**168,581**	**166,000**	**-1,556**
FTEs				
Direct Funded	255	260	260	5
Reimbursable, allocated, other	0	0	0	0

Program and Performance Statement

This account provides funding for establishing and overseeing FAA's Research and Development (R&D) policies and plans. Its diverse scientific, engineering and technical workforce supports all aspects of aviation from research on materials to development of new products and procedures.

In partnership with both domestic and international entities within the aviation community, the FAA RE&D programs provide world leadership by conducting high-priority research and developing innovative technologies to support a safe, efficient, and environmentally acceptable global aviation system.

EXHIBIT III-1a

RESEARCH, ENGINEERING & DEVELOPMENT
SUMMARY ANALYSIS OF CHANGE FROM FY 2012 TO FY 2014
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

Item	Change from FY 2012 to FY 2014	Change from FY 2012 to FY 2014
	$0	FTE
FY 2012 Actual	**167,556**	**255**
Annualization of FY 2013 FTE	0	0
Annualization of 2013 Pay Raise	0	
FY 2014 Pay Raise	289	
Non-pay Inflation	645	
Subtotal, Adjustments to Base	**934**	**5**
New or Expanded Programs		
Safety	1,087	
Economic Competitiveness	1,467	
Environmental Sustainability	-5,253	
Mission Support	209	
Subtotal, New or Expanded Programs Increase/Decrease	**-2,490**	
Total FY 2014 Request	**166,000**	**260**

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Detailed Justification for
A11.a Fire Research and Safety

What Is The Request and What Will We Get For The Funds?

FY 2014 – Fire Research and Safety

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.a Fire Research and Safety	$7,158,000	$7,202,000	$8,313,000	+$1,155,000

For FY 2014, $8,313,000 is requested for Fire Research and Safety. Major accomplishments planned include:

Improve Aircraft Fire Protection and Occupant Fire Survivability

- Evaluate methods for the safe shipment of lithium batteries.
- Develop cost-effective fire suppression systems for the main deck cargo compartment of freighter aircraft.
- Determine viable and environmentally safe agents/systems to replace halon in cargo compartment fire suppression systems.

Improve Flammability Standards for Aircraft Materials

- Use full-scale cabin fire models to demonstrate the effects of material improvements and substitutions on post-crash fire survivability and the likelihood of in-flight fires.
- Support development of Advisory Circulars (ACs) for new fire test methods for interior materials (wiring, ducting, composite fuselage and magnesium seat components) and improved FAA-required material fire test methods.

Advanced Fire Research

- Develop numerical analysis of material hazards and survivability of in-flight fires in passenger and cargo compartments.
- Demonstrate a milligram-scale laboratory test to measure the effectiveness of environmentally friendly, halogen-replacement flame retardants for aircraft cabin materials.

Research activities related to fire protection and occupant survivability focus on in-flight fire safety with an emphasis on freighter (all cargo) aircraft and the safe transport of lithium batteries. This includes practical and cost-effective fire detection and suppression systems; development of fire-hardened containers to ship large format lithium batteries; and, identifying environmentally-friendly replacement agents for halon based on effectiveness demonstrated under full-scale fire test conditions in cargo compartments. Researchers will study the source and location of the large number of "unknown" in-flight smoke and odor incidents in passenger-carrying aircraft. The goal is to differentiate between fire and non-fire smoke/odor sources.

Research activities related to aircraft materials focus on new and improved flammability tests that support Advisory Circulars that aim to reduce the risk from an uncontrollable in-flight fire. The work will follow a paradigm shift towards risk-based activities that create new, or improve and simplify existing, flammability requirements and standards for materials. Effective fire test procedures and performance criteria are needed for hidden area materials (wiring, ducting), fuselage structural composites, and the novel application of magnesium alloy in seat structure.

Research in support of improving the flammability standards for aircraft materials will focus on numerical analysis of the hazards and survivability of in-flight fires, development of computational models to predict the impact of material substitutions, and ultra-fire resistant materials on cabin fire safety and occupant survivability. Research will also evaluate containment strategies for lithium battery fires in cargo compartments and fire models that support analytical compliance methods. Researchers will also continue to develop and evaluate a laboratory test to evaluate new halogen-replacement flame retardants for aircraft cabin materials and non-hazardous ultra-fire resistant materials for a fire proof cabin. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

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. The Program provides industry with state-of-the-art safety products, publications, and government-owned patents on new materials, fire test instrumentation, and analytical methodologies.

The Program develops technologies, procedures, test methods, and material performance criteria that can prevent accidents caused by hidden cabin or cargo compartment in-flight fires and fuel tank explosions, and improve survivability during a post-crash fire. Systems fire protection and materials fire safety focuses on near-term improvements in fire test methods and materials performance criteria, fire detection and suppression systems, and hazardous materials fire safety with emphasis on the evolving fire hazards posed by lithium batteries. Fire research addresses fundamental issues of how materials burn in a fire, the impact of new fire suppression agents and flame retardant chemicals on the fire and health hazards of cabin materials, and the impact of materials flammability on the initiation of in-flight fires and post-crash survivability.

The Program works closely with the aviation industry and foreign regulatory authorities. The main industry participants are the large aircraft manufacturers (Boeing, Airbus) and fire extinguishment companies and agent suppliers (Kidde Aerospace and American Pacific). The venues for reporting on and discussing research results are the International Aircraft Material Fire Tests Working Group and the International Aircraft Systems Fire Protection Working Group. Both working groups are chaired and administered by the FAA Fire Safety Branch. Research findings are presented by FAA and industry at working group meetings held in the US and abroad five times a year. The Cabin Safety Research Technical Group (CSRTG) works closely with foreign regulatory authorities, particularly Transport Canada, Civil Aviation Authority United Kingdom (CAAUK), and European Aviation Safety Agency (EASA). The CSRTG shares expertise and helps define, prioritize, and fund research. FAA and CAAUK also cooperate in cabin and fire safety research through a Memorandum of Cooperation (MOC). For example, this MOC recently produced training videos for the safe shipment of lithium batteries for personnel involved in the packaging, handling and shipment. The Program also shares resources with EASA to develop improved fire test methods for powerplant components. FAA's expertise is employed by the National Transportation Safety Board in the investigation of fire accidents and incidents, sometimes resulting in cooperative testing that is not specific to the accident but is of a general fire safety nature. FAA also works with the Pipeline and Hazardous Materials Safety Administration to develop safe methods for the shipment of compressed oxygen cylinders and chemical oxygen generators and, more recently, on the safe shipment of lithium batteries.

In FY 2013, major accomplishments planned include:

Improve Aircraft Fire Protection and Occupant Fire Survivability

- Defined fire safety performance criteria for cargo containers used for the bulk shipment of lithium batteries.
- Determined the effectiveness of Halon 1301 in controlling bulk shipments of rechargeable lithium batteries under full-scale cargo compartment fire test conditions.
- Developed a standard test procedure for lithium battery fire suppression in the Minimum Performance Standard (MPS) for halon replacement agents in cargo compartments.
- Evaluated the effectiveness of FAA certification criteria to prevent cockpit smoke build-up during an in-flight fire.

Improved Flammability Standards for Aircraft Materials

- Developed a flammability test method for seat structure incorporating potentially combustible materials such as magnesium alloys.
- Upgraded the Aircraft Materials Fire Test Handbook in support of rulemaking to revamp FAA flammability regulations.

Most of the research is conducted in-house by internationally recognized experts in aircraft fire safety and research. The FAA operates the world's most extensive aircraft fire test facilities.

The Fire Research and Safety program supports the Department of Transportation (DOT) strategic goal of Safety by reducing the number of accidents associated with aircraft fires and by mitigating the effects of a post-crash ground fire.

Why Is This Particular Program Necessary?

The consequences of fire in commercial aviation may be severe, including the potential for large loss of life. Research is necessary to reduce the risk of in-flight fires in passenger-carrying aircraft (e.g., over 900 incidents of odor and smoke occur each year in the United States); to understand the fire resistance of new structural composite fuselages (e.g., B787) and other interior materials such as magnesium alloys for seats; to address the growing risk of lithium batteries in cargo shipments (more than half of the 40-50 lithium battery fire incidents in aviation occur in cargo and, in 2012, about half of the 4.8 billion lithium ion batteries manufactured in Asia were shipped by air to the United states); and to evaluate environmentally-acceptable and practical replacements for halon extinguishing agents.

How Do You Know The Program Works?

Over the past 30 years, every major improvement in aircraft fire safety that has been implemented by FAA through the regulatory and advisory process was a product of this program. A recent analysis of world-wide accidents has shown that the probability of dying in an aircraft fire has been reduced (improved) by a factor of three. Major recent examples of these regulatory products are (1) in-flight fire resistant thermal acoustic insulation (effective 9/2/05), (2) explosion prevention fuel tank inerting systems (effective 9/19/08), and (3) burnthrough resistance thermal acoustic insulation (effective 9/2/09). The future benefit of the first two rules was projected by FAA to be the prevention of two to three catastrophic aircraft accidents, which would have caused many hundreds of fatalities. Also, in FY 2011, based on FAA fire safety R&D, (1) a Safety Alert for Operators (SAFO 10017) was issued entitled "Risks in Transporting Lithium Batteries in Cargo by Aircraft", (2) a revised advisory circular (AC 20-42D) "Hand-Held Fire Extinguishers for use in Aircraft' was published in the Federal Register, and (3) an Airworthiness Directive on lavatory oxygen systems was issued because of a security vulnerability demonstrated during fire safety tests. Most recently, in February 2012 International Civil Aviation Organization (ICAO) adopted improved technical instructions for the safer shipment of lithium batteries, which was driven by FAA fire tests demonstrating the unusual hazards of lithium battery bulk shipments.

Why Do We Want / Need To Fund The Program At The Requested Level?

Reductions to program funding will delay improvements in fire safety. The source of over 900 smoke and odor incidents may not be determined before the next in-flight fire. New composite structures or magnesium seat components may be introduced without optimal safeguards. The risk of a fire caused by the shipment of hazardous cargo such as lithium batteries may continue to grow without commensurate safety precautions. More specifically reductions in funding will delay the research necessary for timely implementation of the following fire safety improvements:

- Safe methods for shipping large format lithium batteries
- Efficacy of Halon 1301 replacement agents during cargo compartment fire suppression

- Cost effective fire suppression system for the main cargo compartments of freighter aircraft
- Preventing the accumulation of visibility-impairing smoke in the cockpit during an in-flight fire
- Flammability test method for magnesium alloy seat structure
- Standardization of more stringent and realistic fire test methods for aircraft wiring and ducting, and improved FAA-required material fire test methods
- Improved fire test methods for fireproof or fire resistant powerplant components
- Numerical cabin fire models to predict the hazards of in-flight fires on cargo and passenger compartments and for predicting the impact of material substitutions on cabin fire safety and survivability

Detailed Justification for
A11.b Propulsion and Fuel Systems

What Is The Request and What Will We Get For The Funds?

FY 2014 – A11.b Propulsion and Fuel Systems

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.b Propulsion and Fuel Systems	$2,300,000	$2,314,000	$1,974,000	-$326,000

For FY 2014, $1,974,000 is requested for Propulsion and Fuel Systems. Major accomplishments planned include:

Incorporate Damage Tolerance into the Safe Life Rotor Design Process

- Develop capability for Design Assessment of Reliability with Inspection (DARWIN®), to account for residual stresses.

The Program addresses material and manufacturing anomalies that can increase the risk of failure of critical rotating turbine engine parts. This Program enhances predictive capabilities by advancing DARWIN®, the probabilistically-based turbine engine rotor design and life management code. These enhancements map directly to future Advisory Circulars (ACs) planned by the FAA's Engine and Propeller Directorate (ANE). Benefits will accrue in the form of a reduced risk of engine failures and fewer accidents, which in turn will lead to fewer injuries and fatalities. The research will focus on development of additional capabilities for DARWIN® (Design Assessment of Reliability with Inspection) to treat surface defects at blade slots and on turned surfaces for all rotor materials. This requires research in a number of topic areas: high temperature crack growth, near-surface residual stresses, zoning surfaces and edges in 3D models, cracks at non-normal corners, in-service and maintenance induced defects, and small cracks. The Program also contributes to the continued airworthiness of turbine engines by developing additional fleet assessment capabilities within DARWIN®.

Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

FAA establishes rules for the certification and operation of aircraft engines, fuels, and airframe fuel management systems enhance the airworthiness, reliability, and performance of propulsion and fuel systems. The Propulsion and Fuel Systems Program provides the technical information, R&D resources, and technical oversight necessary for the agency regulatory products and various other forms of technical information detailing acceptable means of compliance to guide certification and airworthiness specialists and inspectors.

The primary goal of the Propulsion and Fuel Systems Program is to ensure the structural integrity and durability of critical rotating engine parts in turbine engines throughout their service life. This research is providing analytical tools to meet the requirements of 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.

Propulsion research activities are coordinated with and supported by the Aerospace Industries Association (AIA) Rotor Integrity Sub-Committee (RISC).

In FY 2013, major accomplishments planned include:

Incorporate Damage Tolerance into the Safe Life Rotor Design Process

- Released an enhanced version of DARWIN®, the probabilistic rotor design and life management code.

The Propulsion and Fuel Systems program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation.

Why Is This Particular Program Necessary?

The history of turbine engine operation in commercial aviation is a safe one, but the risk of an engine failure is always present and the potential consequences are enormous – the large loss of life in accidents and the destruction of the aircraft. Although they are very rare, accidents such as United Airlines Flight 232 on July 19, 1989 in Sioux City, Iowa, and Delta Airlines Flight 1288 on July 6, 1996 in Pensacola, Florida are noteworthy because they were caused by the failure of turbine engine components that caused catastrophic loss of life. Turbine engine research studies the causes of these failures and how to prevent them in the future.

Propulsion research, conducted in conjunction with the manufacturers, has shown that the primary failure modes in these accidents resulted from the presence of material and manufacturing anomalies that can degrade the structural integrity of high energy turbine engine rotors. The primary failure mode of the Sioux City accident was a fatigue crack that originated from an undetected titanium alloy melt-related defect. From the research, the FAA made recommendations related to the improvement of titanium metallurgical quality, nondestructive inspection, and turbine rotor structural design and lifing standards. This research yielded a probabilistic damage tolerant rotor design and life management code (DARWIN®) that determines the risk of fracture of turbine engine rotor disks containing undetected material anomalies. It is used by many of the major engine manufacturers.

How Do You Know The Program Works?

The initial version of the DARWIN® code was developed to address the subsurface defect known as hard alpha and to meet the requirements of AC 33.14-1 "Damage Tolerance for Turbine Engine Rotors". Another version of DARWIN® addressed surface damage in bolt holes and provided the basis for AC 33.70-2, "Damage Tolerance of Hole Features in Turbine Engine Rotors". DARWIN® is an acceptable means of compliance to both of these new ACs.

Why Do We Want / Need To Fund The Program At The Requested Level?

New versions of DARWIN® will provide the basis and an acceptable means of compliance for new ACs on surface damage in blade slots and on turned surfaces of turbine engine rotors. A reduction will delay implementation of these new ACs.

Detailed Justification for
A11.c Advanced Materials/Structural Safety

What Is The Request and What Will We Get For The Funds?

FY 2014 – Advanced Materials/Structural Safety

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.c Advanced Materials/Structural Safety	$2,534,000	$2,550,000	$2,607,000	+$73,000

For FY 2014, $2,607,000 is requested for Advanced Materials/Structural Safety. Major accomplishments planned include:

Advanced Materials

Damage Tolerance of Composite Structures

- Develop tests and certification standards to assure designs are resistant to damage.

Composite Maintenance Practices

- Evaluate field bonded and bolted repair practices to provide recommended updates of related guidance and training materials for composite aircraft structures.

Environmental and Aging Effects for Composite Structures

- Develop information on the effect of environmental and heat exposure on structural properties and durability of composite structures.

Structural Integrity of Adhesive Joints

- Provide documentation and background data for regulatory action to assure reliable processing of adhesively bonded structures.

Crashworthiness Issues Unique to Composite Materials

- Review composite crashworthiness safety awareness training course and ensure it is up-to-date.
- Develop dynamic test methods to determine composite material properties.
- Access loading rates for emergency landing conditions including strain rates, typical material response rates at the component and system level, and occupant survivability.
- Identify issues and limitations associated with structural scale and boundary effects.

The Advanced Materials program focuses on damage tolerance and fatigue issues of composite structures, including the assessment of impact damage threats (e.g., in-flight hail, ground vehicle collisions), and aging effects of composite materials to structural strengths. The program explores composite control surface degradation on transport airplanes; quality control procedures for adhesive joints; important field variables for bonded and bolted repairs; and the properties of new materials and applications used in primary aircraft structures. The program develops safety awareness training for advanced composite materials and manufacturing processes for related workforces.

The Structural Safety program performs research to evaluate analysis and test procedures used by the industry to meet crashworthiness regulations. These regulations are evolving and are supplemented with special conditions for transport aircraft with composites in the fuselage and wing structures. The program goal is to ensure composite aircraft structures demonstrate levels of safety equivalent to existing metal aircraft structures subjected to survivable crash conditions. The program develops dynamic test methods to determine composite material properties, accesses loading rates for emergency landing conditions including strain rates, typical material response rates at the component and system level, and occupant survivability; identifies issues and limitations associated with structural scale and boundary effects, and keeps the crashworthiness safety awareness training course up-to-date. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

FAA establishes rules for the certification of aircraft designed and constructed using a variety of materials and design methods. The Advanced Materials/Structural Safety program conducts research activities to support the FAA regulatory activities, such as rulemaking, guidance, and advisory circulars, in promoting aircraft safety, particularly in the technical areas of composite materials in compliance with the FAA regulatory standards. This program is divided into two related research areas: Advanced Materials and Structural Safety.

Advanced Materials

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) 20-107B, "Composite Aircraft Structure" is current, advances in technologies and materials require periodic updates and revision of safety information. These updates are derived from workshops and reports that provide timely information to the aviation community. The FAA Aviation Safety Office Aircraft Certification Services disseminates technical information developed in this program to certification engineers through technical reports, handbooks, guidance, policy, and related training courses. This data exchange allows regulatory processes to keep pace with industry advances and benefit from state-of-the-art technology and design.

The program works with industry to maintain the Composite Materials Handbook 17, CMH-17, facilitating the statistical characterization data of current and emerging composite materials. This international reference tool provides the best available data and technology source for testing and analysis, guidance on data development, design, inspection, manufacturing, and product usage. Material data contained in the handbook are acceptable for use in the FAA certification process. The program also coordinates with standards organizations for advanced materials (e.g., Committee P-17 for composite materials specifications, the Commercial Aircraft Composite Repair Committee (CACRC), ASTM, and Society for the Advancement of Material & Process Engineering).

The program coordinates all current and future advanced composite research programs with other Government agencies to coordinate research activities and leverage resources by interchanging information, identifying and filling technical gaps, and avoiding duplication. This is done through the Interagency Advanced Structures Working Group that includes FAA, NASA, and the Department of Defense.

Structural Safety

The FAA revises or updates crashworthiness-related regulations to enhance safety of airframe structures and the passengers by studying and developing new information for overhead stowage bins, auxiliary fuel tanks and fuel systems, aircraft configurations, seat and restraint systems, and human tolerance injury criteria. It supports development of alternative methods to improve the certification process (i.e., certification by analysis and component tests in lieu of full-scale tests).

The Advanced Materials/Structural Safety program has partnered with aircraft manufacturers (e.g. Boeing, Airbus, Bombardier, Cessna, Cirrus, Lancair) to assure that research efforts are focused on relevant topics. The Boeing, European Aviation Safety Agency (EASA), Airbus, and FAA working group is an example of a collaborative effort to address certification issues and guidance. In addition the FAA has partnered with NASA, through joint project reviews, workshops, and participation in research activities, to apply advanced technologies developed to actual airframe structures. Through the FAA Joint Advanced Materials and Structures Center of Excellence (COE), the FAA continues taking advantage of facilities and expertise of participating academic institutions.

In FY 2013, major accomplishments planned include:

Advanced Materials

- Damage Tolerance of Composite Structures
  - Characterized and quantify the threats to composite aircraft structures while at the service gate and on the flight line.
  - Documented accepted certification methodology for damage tolerance and fatigue, including full-scale test and analysis protocols for repeated loads and damage threats.
  - Developed criteria for damage tolerance assessments of stiffened laminated composite structures.
- Composite Maintenance Practices
  - Developed training and conduct workshops to review progress in damage tolerance, adhesive joints, and maintenance.
- Environmental and Aging Effects for Composite Structures
  - Developed information on the effect of environmental and heat exposure on structural properties and durability of composite structures.
- Structural Integrity of Adhesive Joints
  - Provided detailed background research addressing gaps testing and validation of durability of bonded structures.
  - Gained consensus from industry and regulators from around the world on standard durability substantiation methodology certification and continued airworthiness.

The Advanced Materials/Structural Safety program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation.

Why Is This Particular Program Necessary?

The use of new materials, processes, and forms on aircraft continues to push the knowledge base for certification to provide safe aircraft for civilian applications. In the last decade, this has been accelerated due to the rapid expansion of the use of composites in increasingly larger structures. Dominating the rapid expansion has been the use of fiber-reinforced polymers to provide lighter, fuel efficient airframe components including, in recent applications, full fuselage barrels and wings. Understanding these emerging technologies is paramount to assure the safety of the civil aviation and the flying public. The current certification process for many advanced materials and structures was established for smaller, less critical components and service conditions. In addition to operational issues, changes in materials, construction methods, and processes have altered the response of these structures to dynamic crash events. The difference in structural characteristics should be understood and incorporated in certification and operational plans to assure safety for new aircraft that incorporate these advances.

Advanced Materials/Structural Safety research requirements are driven by industry advancements in construction of airframes and related components presented for certification. The FAA must assure that the changes maintain an equivalent or improve the level of safety compared to that achieved with currently operational aircraft. Requests from the Aircraft Certification Offices and from the aircraft manufacturers seeking Type Certification (TC) approval are major influences that shape research requirements, as the FAA seeks to evaluate the safety of new concepts using advanced materials, processes, and forms. Additional requirements are developed from assessments of existing techniques, protocols, and service histories of previous advanced products to determine if modifications are required for the ever expanding materials, processes, and forms that are being introduced on civil aircraft. The National Transportation Safety Board review of accidents (AA587, R22, etc.) involving these structures provides additional impetus for research required to understand these emerging technologies.

How Do You Know The Program Works?

Research results from this program equipped FAA certification engineers with the knowledge required to support Part 23, 25, 27, and 29 aircraft design and airworthiness certification programs and is being used in support of continued airworthiness. FAA participates with industry to identify the needs and priorities for updating policy, guidance (e.g. AC 20-107B), and training. This input is used by the FAA to identify and prioritize R&D requirements.

During the past decade, the program developed guidelines for various aspects of composite structures concerning certification and safety issues. Research results are well documented in over 75 technical reports that are used as the basis for policy and guidance on materials and processing control and bonded structure guidance. It has also provided guidance information for certification programs. The program developed a benchmarking on industry practices in control of bonding processing that was used to create a FAA policy on bonded structures for civil aviation structures (PS-ACE100-2004010030).

Why Do We Want / Need To Fund The Program At The Requested Level?

A reduction in funding to the Advanced Materials/Structural Safety program would undermine the effectiveness of the program. This program depends on a combination of individuals from industry, academia, and regulators to develop focused research efforts where the products of the research are usable immediately in certification and other related safety programs. The engagement of industry in the process is contingent on the research reaching a specific level of development before industry review. If the program funding were to be reduced, the industry might not make their resources available due to a perceived reduced return on their investment. The program also is responsible for maintaining a momentum that keeps all parties engaged without over burdening any of the partners. Lower funding levels would compromise the ability to determine the adequacy of the current composite structural certification protocols for the continued operational safety of the current fleet and the designs, materials, and processes of future aircraft certification projects.

Detailed Justification for
A11.d Aircraft Icing/Digital System Safety

What Is The Request and What Will We Get For The Funds?

FY 2014 – Aircraft Icing/Digital System Safety

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.d Aircraft Icing/Digital System Safety	$5,404,000	$5,437,000	$7,582,000	+$2,178,000

For FY 2014, $7,582,000 is requested for Aircraft Icing/Digital System Safety. Major accomplishments planned include:

Aircraft Icing

Research on Ice Crystal and Supercooled Large Droplet (SLD) [14 Code of Federal Regulations (14 CFR) Part 25 Appendix C Exceedance] Icing Conditions in Support of Rulemaking

- Complete second phase of fundamental research work on ice crystal physics studies to determine physical parameters of importance for ice accretion formation mechanisms that will support simulating these conditions inside engine compressors.
- Complete processing of data from high ice water content (HIWC) flight research, satellites, and radar in preparation for analysis that will allow evaluation of an updated engineering standard for convective weather ice crystal icing conditions.

Safe Operations and Take-off in Aircraft Ground Icing Conditions

- Complete report on sloped surface testing of fluid behavior on flaps, slats, and main elements of aircraft and on flat plates at angles simulating angles of aircraft surfaces.

Simulation Methods Development and Validation to Support Appendix C Icing Certification and Continued Operational Safety

- Complete testing of simulated ice shapes with roughness on swept wing model at low to moderate Reynolds number.

Digital System Safety

Onboard Network Security and Integrity

- Provide technical information to support national policies, guidance, processes, and methods addressing airborne cybersecurity issues for aircraft safety.

Software Development Techniques and Tools

- Identify technical issues and propose mitigation techniques when using revised industry standards for software process assurance.
- Identify issues and propose mitigation strategies when neural networks and artificial intelligence are used in safety-critical aircraft systems.

Airborne Electronic Hardware (AEH) Design Techniques and Tools

- Assess alternative approaches to AEH design assurances for complex custom micro-coded devices.
- Conduct safety assessment and evaluate mitigation approaches of AEH designs and tools used.

The Aircraft Icing program will improve existing capabilities and develop new engineering tools to support means of compliance and new guidance material for engine and airframe rulemaking for aircraft certification and operations in SLD, mixed-phase, and ice crystal icing conditions. The outputs will feed into new guidance materials for advisory circulars. Research will continue to understand the performance effects of ground icing conditions, including mixed conditions, the aerodynamic effects of fluids, and the performance of new technology fluids such as non-glycol fluids and ice phobic applications. Continued development of ice detection for ground applications is required. The outcome of this research will be new operational guidance, and data packages in support of guidance and standards. Finally, the FAA will enhance icing simulation methods for means of compliance: develop and conduct swept wing ice accretion experiments for a validation database and to better understand three-dimensional (3-D) iced aerodynamic flow phenomena around the ice shape and over the wing. The outcome of this R&D will be to provide new test methods, analysis tools, and a 3-D ice accretion database to support validation of computer codes and means of compliance for certification.

Digital System Safety researchers evaluate onboard network security and integrity, software development techniques and tools, and AEH design techniques and tools. Research activities include studies of airborne network security vulnerabilities, mitigation strategies, and potential safety impacts; partnering with industry and other Government agencies to assess and identify network security threats in airborne network environment; and assessment, validation, and clarification of software development standards, DO-178C. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The FAA establishes rules for the certification and operation of aircraft that encounter icing conditions and for the use of digital systems. The agency uses research results to generate Advisory Circulars (ACs) and other forms of technical information to guide certification and airworthiness specialists and inspectors on acceptable means for meeting requirements.

The Aircraft Icing program develops and tests technologies that detect frozen contamination, predicts anti-icing fluid failure, and ensures safe operations both during and after flight in atmospheric icing conditions. 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 an icing envelope that includes SLD and ice crystal icing conditions. The program's researchers have contributed to the development of technical data and advisory materials to assist in certification. A study by the Engine Harmonization Working Group indicates that over 100 in-service engine events, many resulting in power loss and at least 6 in multiple engine flameouts, occurred in HIWC environments from 1988 to 2003. A current collaborative research effort between the FAA, NASA, Transport Canada, Environment Canada, and the Australian Bureau of Meteorology is addressing this issue. This joint effort brings together the expertise and facilities needed to conduct the research and also facilitates harmonization of the resulting guidance and regulatory material. Other collaborative efforts include work with various committees and working groups within the Aerospace Industries Association. Partnering with industry provides as avenue for their inputs into potential FAA standards, guidelines, and means of compliance which expedites industry acceptance. In a similar vein, the FAA works with several committees within SAE International to take advantage of the members' technical expertise in developing standards and to expedite industry acceptance. For example, SAE G-12 Aircraft Ground Deicing Committee assists in updating holdover time guidelines and establishing standards for de/anti-icing methodologies, deicing fluids, and ground ice detection.

The Digital System Safety program supports developing new guidelines for testing, evaluating, and approving digital flight controls, avionics, and other systems for the certification of aircraft and engines. Additionally, the program supports development of policy, guidance, technology, and training needs of the Aircraft Certification Service and Flight Standards Service on airborne digital system safety and their safe applications to aircraft systems, such as fly-by-wire flight controls, augmented manual flight controls, navigation and communication equipment, autopilots, and so on.

The program works with industry, Government agencies, and aviation standards development bodies, such as RTCA, EUROCAE, and SAE, to establish consensus based standards and improve the effectiveness of the FAA rulemaking and policy issuances in digital systems and other digital aviation areas. The program studies the airworthiness requirements of airborne cybersecurity and provides technical information in support of the FAA participation in the Certification Authorities Software Team, an international group of Civil Aviation Authorities (CAAs) harmonizing certification and regulatory positions on software and digital systems.

In FY 2013, major accomplishments planned include:

Aircraft Icing

- Research on Ice Crystal and Other Appendix C Exceedance Icing Conditions
  - Conducted field campaign to collect atmospheric data for high fidelity facility and analytical simulation of HIWC ice crystal conditions (Note: Funding under A11.d supplements funding provided under the A11.k Weather Program. Effective simulation, the primary goal of the activity listed here, is not possible without high quality atmospheric data, so the two efforts are intimately intertwined).
- Simulation Methods Development and Validation to Support Appendix C Icing Certification and Continued Operational Safety
  - Completed design and construction of 3-D model for testing of ice accretion/aerodynamic effects of ice on 3-D lifting surfaces.
- Safe Operations and Take-off in Aircraft Ground Icing Conditions
  - Completed final report on Aerodynamic Testing in National Research Council of Canada Propulsion Icing Wind Tunnel of an airfoil model or models clean, with uncontaminated fluids and contaminated fluids.
  - Completed data and information package needed to update annual winter notice providing guidance for formulation of ground de-icing plans as required by airlines in CFR 121.629.
- Rotorcraft Flight in Known Icing Compliance Criteria
  - Identified candidate minimum required icing instrumentation requirements and flight and wind tunnel test points required for verification of ice protection systems on rotorcraft.

Digital System Safety

- Onboard Network Security and Integrity
  - Provided initial (Phase 1) input for the development of RTCA SC-216 Subgroup 3 Aircraft Systems Cyber Vulnerability-Prevention Recommended Practices.
  - Performed an additional phase of work in the development of the airborne network security simulator that integrates industry and government aeronautical simulators to assess and identify network security threats in an airborne network environment.
- Software Development Techniques and Tools
  - Identified safety issues and proposed mitigation approaches for when software development techniques and tools are used in airborne systems.
  - For Phase 1, determined assurance case applicability to digital systems by developing preliminary argument evaluation criteria based on existing development assurance standards, RTCA/DO-178C and RTCA/DO-248C).
  - For Phase 1, assessed, validated, and clarified DO-178C preliminary criteria for model-based development.

- Airborne Electronic Hardware Design Techniques and Tools
  - Investigated airborne electronic hardware (AEH) design assurance methods in the initial category of commercial off-the-shelf (COTS) electronic hardware.

The Aircraft Icing/Digital System Safety program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation. The program develops and assesses ways to ensure airframes and engines can safely operate in atmospheric icing conditions and while using digital systems.

Why Is This Particular Program Necessary?

Aircraft Icing

Aircraft icing due to the freezing of supercooled water on aircraft surfaces is a continuing concern in all realms of aviation, due to the insidious nature of icing problems for takeoff, cruise, holding, and landing. Fatal accidents fall into two major categories: takeoff accidents due to failure to properly de-ice or anti-ice prior to takeoff, and accidents due to accretion of ice while in-flight. The latter class affects all phases of flight, but particularly holding and approach and landing. Since 1980, takeoff icing accidents have claimed many hundreds of fatalities, while in-flight icing accidents have claimed at least 200 fatalities. Icing problems due to flight in ice crystals in HIWC environments were not fully recognized as posing a serious safety hazard until recent years. Although ice crystals bounce off aircraft surfaces, when ingested into engine cores and pitot tubes, the crystals have resulted in serious events. The FAA, working with industry, has identified 140 ice crystal turbine engine power loss events (a power-loss event is a surge, stall, rollback, or flameout of one or more engines) in reviewing 16 years of recent data. There were also 11 total power loss events from flameout and 1 forced landing due to ice crystals. The FAA has also received recent feedback on pitot tube ice crystal events where the probe stopped working.

Digital System Safety

As the rapid advancement of electronic and computer technologies continues, their applications in aircraft systems and air traffic management (ATM) are getting more and more complex and dynamic. The implementation of various types of networks to support different airborne functions, such as flight controls, air navigations, digital communications, flight plans, on-board entertainment, and passenger Internet services, have further complicated the FAA certification requirements, airworthiness determinations, and their safety risk assessments. This research supports the FAA aircraft certification process that includes work to assure digital systems function properly, reliably, and safely. Research outputs include technical data, reports, compliance methods, verification methods, and certification techniques that aid development of policy, guidance, and training materials.

How Do You Know The Program Works?

Ground icing research results are used every year to develop guidance that is published annually in the FAA's ground deicing notice for use by airlines to formulate their required plans for the coming winter. In-flight atmospheric research results supported development of the envelopes included in the notice of proposed rulemaking, issued in June 2010, for supercooled large droplet (freezing drizzle and freezing rain aloft in and out of clouds and at the surface) conditions. A Government Accountability Office (GAO) report entitled "Improved Planning Could Help FAA Address Challenges Related to Winter Weather Operations" in July 2010, praised the FAA's research investment strategy with its icing research partners, NASA and National Center for Atmospheric Research.

The Digital System Safety research program is an integral part of the FAA Aviation Safety Office Aircraft Certification Services Program Management Plan for software and airborne electronic hardware (SW & AEH). Past research results have directly contributed to the development and issuance of a wide range of FAA SW & AEH policies, guidelines, and continued airworthiness initiatives. Some of these include FAA Order 8110.49 Software Approval Guidelines, Order 8110.49, FAA Notice 8110.110 Software Approval Guidelines, and AC 20-156 for Aviation Databus Assurance.

Why Do We Want / Need To Fund The Program At The Requested Level?

Any reduction in funding would restrict the FAA's ability to conduct a full HIWC ice crystal field campaign. This would likely result in a shortened campaign or less support from our research partners, who are partially dependent on FAA for funding support for their participation. This could result in a substantially smaller ice crystal atmospheric database than is needed to develop high fidelity facility and analytical simulation tools. A reduction could also adversely impact the testing to determine ground anti-icing allowance times and other guidance for ice pellet conditions, including ice pellets mixed with other forms of precipitation.

If funding for Digital Systems Safety were reduced, the ability of the FAA and industry to evaluate emerging, highly-complex, digital hardware and software for use in advanced flight controls and aircraft systems would be negatively impacted. Consequently, certification specialists would find it difficult to properly assess proposed aircraft and systems designs which employ this technology for flight-essential and flight-critical applications. Further, the FAA would not be able to determine if certification policy, criteria, or training would be needed to accommodate new technologies or methodologies. A further risk of not performing this research is the reduced ability to develop, validate, and improve certification methods and the inability to reduce time and cost to both FAA and industry in certifying aircraft employing advanced digital airborne systems.

Detailed Justification for
A11.e Continued Airworthiness

What Is The Request and What Will We Get For The Funds?

FY 2014 – Continued Airworthiness

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.e Continued Airworthiness	$11,600,000	$11,671,000	$8,167,000	-$3,433,000

For FY 2014, $8,167,000 is requested for Continued Airworthiness. Major accomplishments planned include:

Flight Critical Systems Design Assurance

- Develop categorization of the faults in Flight Critical Systems that have resulted in accidents or incidents.

Preventing Loss of Control in Part 23 with Sensed Angle of Attack (AOA) and Better Automation

- Initiate investigation of new aircraft technologies to improve low speed awareness, stall prevention and recovery, and automated systems and controls.
- Develop report of results from accident study of past loss of control accidents to quantify how affordable sensed and derived AOA systems could have prevented loss of control accidents. Also perform a study of the feasibility and accuracy of derived AOA data from existing military and experimental systems.

Continued Airworthiness of Composite Structures

- Assess the performance of both conventional and advanced inspection techniques to detect and characterize ground handling impacts on composite laminate aircraft panels.
- Assess the performance of consistent composite laminates above minimum porosity levels, and inspection methods to detect varying degrees of porosity in composite laminates for the purpose of relating detectability for inspection assurance, damage tolerance requirements, and aging phenomena.
- Develop repeatable methods for generating weak bonds in various types of bonded joints to assist in the development and testing of bond strength inspection methods.

Nondestructive Evaluation (NDE) for Critical Engines Components

- Initiate second phase of Machining Process Monitoring research work on broaching and turning processes.

Health and Usage Monitoring Systems (HUMS)

- Provide technical data to validate and enhance the HUMS AC29-2C, MG-15 for a usage credit.

Risk Assessment and Risk Management Methods for Small and Transport Airplane Continued Operational Safety (COS)

- Draft a report on use of probabilistic risk approach for transport airplane corrosion problems.
- Study probabilistic based fatigue management program for small aircraft.

Metallic Materials Properties Development and Standardization (MMPDS) Support and Design Values for Emerging Materials

- Develop, maintain and distribute update to the MMPDS Handbook and derivative products.

Damage Tolerance and Durability Issues for Emerging Technologies

- Develop technical data to assess the application of advanced aluminum-lithium alloys for aircraft primary structure
- Conduct testing and analysis to assess the fatigue and environmental durability of bonded repairs to metallic airframe structure

In FY 2014, the above planned accomplishments focus on five technical areas: Flight Controls and Mechanical Systems (FCMS), Maintenance and Inspections (M&I), Propulsion Systems (PS), Rotorcraft Systems (RS), and Structural Integrity Metallic (SIM). Additionally, funding will provide for engineering, technical, and management support of overall research activities.

In the FCMS effort, the research will focus on providing AOA information to the pilot to help reduce the number of fatal general aviation accidents. The research will investigate how sensed and derived angle of attack systems can be incorporated into general aviation cockpits and also address potential future certification requirements. The research will also examine all known fly-by-wire accidents and develop a process to ensure that causes of these events will not occur in the future.

The M&I research will evaluate current and advanced nondestructive inspection (NDI) methods for composite structures. It will include evaluation of NDI methodologies for determining bond strength, generation of reliability data on capabilities of various NDI methods, and support updating training materials as required by relevant parts of the rules for maintenance and repairs.

The engine nondestructive evaluation (NDE) research effort in the PS technical area will develop and evaluate inspection methods for critical engine components. It will generate technical information to support the development, validation, and issuance of standards for various NDE techniques to improve inspection and monitoring capabilities on manufacturing induced anomalies on critical high energy rotating components.

The RS research will focus on HUMS, in particular on the development of methodologies to determine usage credits for rotorcraft dynamic components and/or mechanical systems. Advanced technologies will be evaluated and methods developed following the guidance of the Advisory Circular (AC) 29-2C, MG-15. Additionally, recommendations and enhancements may be made to the AC based on research findings.

The SIM research area consists of research for both transport and small airplanes. Research will focus on emerging technologies such as damage tolerance and durability issues of new aluminum-lithium alloys, new and emerging alloys to be studied for inclusion in MMPDS, and risk management methods to support the Aircraft Certification Services Monitor Safety/Analyze Data (MSAD) initiative, which is a data-driven, risk-based continued operational safety decision-making process. Research effort also includes studies of control surface free play limits and predictive analytical methods, and investigation of active flutter suppression systems using existing fly-by-wire technology to actively eliminate and suppress flutter.

What Is This Program?

FAA issues rules and advisory materials for regulating aircraft design, construction, operation, modification, inspection, maintenance, repair, and continued operational safety. Further understanding of the technologies, procedures, technical data, and analytical models produced by the Continued Airworthiness Program provide a major source of technical information used in developing these regulations and related information. Through this research, the FAA also works with industry and other government agencies to provide the aviation community with critical safety technologies and data.

The Continued Airworthiness Program promotes the development of 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 long-term maintenance of 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), flight control systems, and mechanical systems.

In FY 2013, major accomplishments planned include:

Risk Assessment and Risk Management Methods for Small and Transport Airplane COS

- Published a report on feasibility and applicability of Probabilistic Risk Analysis (PRA) approach for transport airplane corrosion problems.
- Developed data and methodologies for structural life evaluation of small airplanes.
- Developed a predictive methodology and tools for damage tolerance risk assessment and risk management for continued operational safety of small airplanes.

MMPDS Support and Design Values for Emerging Materials

- Led the Metallic Materials Properties Development and Standardization (MMPDS) steering group in updating the metallic materials properties handbook.

Damage Tolerance and Durability Issues for Emerging Technologies

- Conducted surveys and testing to assess application of advanced aluminum-lithium alloys for aircraft primary structure.
- Conducted testing and analysis to assess the fatigue and environmental durability of bonded repairs of metallic airframe structure.

NDE for Critical Engines Components

- Developed aeronautical material specification (AMS) specification for industrial ultrasonic forging inspection for critical engine components.
- Completed work on Dual Grain Microstructure Characterization of Engine Disks and Blisks. This study showed the reliability of the engine disks and blisks can be improved by developing a nondestructive method which can ensure proper target grain sizes and shapes. The results from this work will be readily implemented with existing inspection hardware in use by the engine OEM

Advanced NDI Methods for Composite Structures

- Developed and published the protocol for the validation of legacy and advanced NDI methods for detection of hidden flaws in complex, solid composite laminates.

Health Monitoring of Structures and Complex Flight Critical Systems

- Evaluated the safety impact and other potential benefits related to the more wide-spread application of health usage monitoring technology across all air vehicle systems.

Stall Departure Identification, Recognition, and Recovery

- Developed criteria to categorize and quantify stall departure characteristics for transport category airplanes.

Envelope Awareness and Protection Legacy Transport Airplanes

- Gathered incident, accident, and research data, to quantify the required timeliness of low speed alerting system, necessary for in flight recovery of transport category airplanes.

Emerging Technology – Active Flutter Suppression

- Initiated a survey of flutter and aeroservoelastic research involving active flutter suppression systems, including military application of the technology and NASA/industry research.

Development of Control Surface and Stabilizer Freeplay Limits to Preclude Flutter

- In collaboration with other aerospace stakeholders, including the U.S. Air Force (USAF), NASA, Navy and Industry, initiated a joint research plan to establish modern freeplay limits.

Advanced Control Systems

- Investigated and defined new and unique rotorcraft hazards associated with advanced control systems incorporating non-traditional control methodologies.

Health and Usage Monitoring Systems (HUMS)

- Developed methods with direct and indirect evidence approaches guided by Advisory Circular 29-2 MG15 for the certification of HUMS for rotorcraft usage credits.
- Developed technical data on rotorcraft to establish more detailed guidance for certification of HUMS for usage credits.

The Continued Airworthiness Program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation. The program goal 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 in developing technologies and processes, and assesses current practices to eliminate or mitigate the potential failures related to aircraft aging, thereby reducing the number and severity of accidents. The research also supports development of methodologies for both inspection and maintenance protocols to assure the continued airworthiness of advanced composite aircraft.

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 research on NDI technologies being developed 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.

Why Is This Particular Program Necessary?

Although research results from this research program have been implemented to support the issuances of aging aircraft related rules, policies, and guidance materials, recent in-flight incidents, such as Southwest Airlines flights 2294 in 2009 and 812 in 2011, demonstrate the technical challenges of maintaining continued airworthiness, predicting potential failures, and determining inspection intervals.

The program focus is on the continuing safety of all aircraft (new and in-service) throughout their lifetime. It is based on requirements developed by the FAA Office of Aviation Safety. The requirements reflect the need of the regulatory office for technical data and information to support regulatory activities or for possible solutions to real world questions and problems. For example, the inspection of composite, metallic, and bonded structures in an accurate and reliable way is challenging. The program's research looks at improved inspection technologies and procedures, as well as quantifiable measures to describe the accuracy. A research output might be a feasibility demonstration of an inspection technology, a characterization of new inspection methods and procedures, or a proposed inspection standard for the aviation industry. There is almost always cooperation and sometimes even partnerships with aircraft manufacturers, systems manufacturers, air carriers, and academic researchers. A similar description can be applied over the full range of research areas within the Continued Airworthiness program. In certain areas the partners include NASA and elements of the Department of Defense (DoD). Finally, the research program provides a core technical competency as well as a unique test facility to serve the interests of FAA and the safety of flying public.

How Do You Know The Program Works?

Since the inception of the program in 1988, then known as the National Aging Aircraft Research Program, research results allowed the FAA to work with industry to complete several key rulemaking and regulatory initiatives, which include the implementation of damage tolerance concept to manage structure fatigue and aging airplanes, the widespread fatigue (WFD) rule, the electrical wiring interconnection system rule, and various guidelines and ACs. The Program worked with aircraft and engine manufacturers, airlines, maintenance and repair organizations, as well as FAA certification and flight inspection offices to apply new technologies and to develop standards to support safety management systems (SMS) implementation.

Why Do We Want / Need To Fund The Program At The Requested Level?

Reduction in funds would delay parts of the maintenance and inspection program, particularly affecting the assessment performance of an advanced inspection system for identifying environmental damage of composite structures, an area of increasing importance in today's aircraft.

Detailed Justification for
A11.f Aircraft Catastrophic Failure Prevention Research

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aircraft Catastrophic Failure Prevention Research

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.f Aircraft Catastrophic Failure Prevention Research	$1,147,000	$1,154,000	$1,652,000	+$505,000

For FY 2014, $1,652,000 is requested for Aircraft Catastrophic Failure Prevention Research. Major accomplishments planned include:

Advanced Analysis and Risk Assessment Methods for Rotor Burst and Blade Release

- Develop and verify new material models for aluminum and titanium.
- Conduct Inconel 718 material testing to populate the tabulated material model.

The program conducts material characterization tests on titanium, aluminum and Inconel 718 to develop unique, state of the art tabulated material models in LS-DYNA, a general-purpose finite element program. LS-DYNA is widely used by industry and government for impact analysis and risk assessment related to engine containment and uncontainment problems. The material models greatly improve the accuracy of the analysis and the safety of aircraft designs. The process for developing these unique material models is used by automotive companies and aircraft companies in crash analysis studies.

The program also develops an Uncontained Engine Debris Damage Assessment Model (UEDDAM) to mitigate damage from uncontained engine events. Research will develop improvements to the UEDDAM model to address certification issues for the large numbers of small jet powered aircraft with special challenges for engine rotor burst mitigation. These aircraft have composite fuselage sections with diameters on the same order as the engine diameters, limiting the traditional approach of using system separation to minimize the rotor burst effects.

The program will continue collaborating with NASA and the LS-DYNA Aerospace Users Quality Assurance Group to improve the aerospace guidelines and models used by the aircraft industry. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The program develops data and methods for evaluating aircraft vulnerability to uncontained engine failures and provides analytical tools for engine containment systems and for protecting identified critical systems that may need shielding from uncontained engine debris. Through the LS-DYNA Aerospace Users Group, FAA works with industry to establish standards for finite element analysis and guidance for use in support of aircraft engine certification. The program provides technical information to establish certification criteria for aircraft and support for certification of new technologies and supports development of Advisory Circulars that outline acceptable means of compliance in meeting regulatory mandates.

The program collaborates with other Government agencies and industry to establish an aircraft material database used by industry in aircraft modeling of engine contained and uncontained failures. Demonstrating the process in detail provides regulators and original equipment manufacturer (OEM) applicants greater insight into the development of tabular databases for material classification. The FAA/NASA/Industry Quality Control Aerospace Working Group develops aerospace guidelines for dynamic modeling used in engine containment design, bird strikes, uncontained engine debris, etc., that will further enhance aviation safety and greatly benefit the industry and the FAA in assessing new aircraft designs.

For FY 2013, major accomplishments include:

Advanced Analysis and Risk Assessment Methods for Rotor Burst and Blade Release

- Issued Aerospace Guidelines for LSDYNA through the LSDYNA Aerospace Users Group.
- Developed improvements to the existing UEDDAM to address industry feedback.
- Developed and verified a generalized damage and failure model with regularization for aluminum (MAT 224) and titanium materials impacted during engine failure events.

The Aircraft Catastrophic Failure Prevention Research program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation.

Why Is This Particular Program Necessary?

The Aircraft Catastrophic Failure Prevention Research program is largely driven by accidents, incidents, National Transportation Safety Board (NTSB) recommendations, and the introduction of new technologies. This program was initiated after the 1989 DC-10 Crash landing at Sioux City, Iowa. The major thrust of the program started in engine containment and uncontained engine failures mitigation. The program works closely with the Aviation Rulemaking Advisory Committee, Aerospace Industry Association (AIA) focus groups, Department of Defense (DoD), NASA, and academia to leverage existing work and develop data, analytical methods, and processes that make up the foundation for improved policy, regulation and advisory material.

Standardized methods and numerical tools to analyze effects of both engine rotor burst and fan blade releases assist the FAA certification offices and industry applicants in gaining a common understanding in demonstrating compliances of regulatory requirements. The current regulatory demonstration requirement by full-scale destructive tests of a single blade failure at the most critical location needs more robust and accurate analytical methods and predictive tools to assess safety risks and the possible need for increased margin of safety. With these methods and tools validated and available, the option for standardized compliance by analysis (for specified rules) for derivative designs of already certified engines will be possible. The analysis tools developed in this program will also help to mitigate aircraft damage from an uncontained engine failure and prevent potential aircraft catastrophic failures. It also allows FAA engineers validate proprietary tools currently used by engine manufacturers, streamline the certification process, and help mitigate fatalities and injuries when these events occur.

How Do You Know The Program Works?

The program has a long history of achieving technical results that led to regulatory actions, issuances of improved guidance, and updates of advisory circulars related to uncontained engine rotor burst and blade release.

The UEDDAM tool kit, developed under the program, has been used to analyze new aircraft designs for vulnerability to uncontained engine fragments and can be used to demonstrate a means of compliance for multiple fragment vulnerability. UEDDAM is now available to industry and will continue to be improved by incorporating feedback from users. Currently, the military uses UEDDAM in the design of new aircraft and for engine retrofit programs, and there have been several requests from commercial business jet manufacturers for the code.

The program also produces products that include improved design tools that enable safer aircraft through development of aircraft material models that improve the state of the art and better represent impacts from engine failures to allow for standardized certification by analysis and enhanced safety.

The LS-DYNA Aerospace Quality Control System has identified several problems and solutions in the LS-DYNA software and compatibility with different computer platforms and compilers that were causing errors in the results. In addition, an LS-DYNA aerospace user's guideline manual has been developed by the group which provides guidance to LS-DYNA aerospace users to use correct industry practices in the modeling. Strong industry and FAA certification support for this group is evidence that the program is working.

The new material models developed under this research program are extremely valuable to industry and the FAA in modeling impacts from engine uncontained failures. The MAT224 material model in LS-DYNA that was developed in this program is considered by government and industry alike as a major breakthrough in predictive capabilities for impact analysis. When used in conjunction with the UEDDAM model (or similar vulnerability model), the new material models can be used to better predict impact resistance in specific areas identified and needing protection. The new models are being used by industry and are gaining popularity in the automotive world which is a strong indication that the models are working well and are very useful.

Why Do We Want / Need To Fund The Program At The Requested Level?

The funding requested will fund multiple universities and subcontractors to develop the material models necessary to support FAA certification. All of the universities and subcontractors work as a team to deliver parts of the models and/or testing to support the models.

Detailed Justification for
A11.g Flightdeck/Maintenance/System Integration Human Factors

What Is The Request And What Will We Get For The Funds?

FY 2014 – Flightdeck/Maintenance/System Integration Human Factors

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.g Flightdeck/ Maintenance/System Integration Human Factors	$6,162,000	$6,200,000	$5,000,000	-$1,162,000

For FY 2014, $5,000,000 is requested for the Flightdeck/Maintenance/System Integration Human Factors Program. Major accomplishments planned include:

Enhancing Aviation Safety through Advanced Procedures, Training and Checking Methods, to Include Jet Upset

- Complete draft research report documenting the results of jet upset/loss of control simulation model development and evaluation

Human Factors Maintenance Risk Management

- Develop report summarizing recommendations for hours of service limits, fatigue risk management system requirements, and design/use of maintenance technical documentation

What Is This Program?

The Flightdeck/Maintenance/System Integration Human Factors program provides the research foundation for FAA guidelines, handbooks, orders, advisory circulars (ACs), Technical Standards Orders (TSOs), and regulations that help 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.

A major goal of the program is to improve pilot, inspector, and maintenance technician task performance. Research results support enhanced methods for training and evaluating performance especially associated with new technologies and aircraft systems. Performance and evaluation capabilities are also enhanced through research that facilitates an improved understanding and application of risk and error management strategies in flight and maintenance operations.

In FY 2013, major accomplishments planned include:

Flight Training Methods for Jet Upset Prevention, Detection and Recovery

- Drafted report defining training scenarios and performance standards that can be used for training the minimum set of maneuvers for jet upset/loss of control.

ADS-B Human Factors – Aircraft Certification Service and Flight Standards Service Equipment Design, Evaluation, and Operational Approval Guidance

- Drafted report documenting findings on symbology issues.

A Multi-Disciplinary Approach to Fatigue Risk Management in Maintenance

- Drafted technical report on current scheduling practices and fatigue related maintenance accidents. This effort will help Flight Standards Service (AFS) to develop recommendations and oversight guidance of industry fatigue management systems.

UAS Control Station

- Developed human factors regulatory and guidance material for FAA inspectors and engineers who must evaluate and approve UAS ground control station designs and "pilot"/operator training programs.

Pilot System Interface and Human Factors Issues, and Guidance for the Certification of Advanced Autopilots & Related Automation Technologies in General Aviation Airplanes

- Conducted literature and product review and preliminary simulator evaluations of basic alerting strategies for advanced autopilots and flight management automation systems. This effort helped the Central Region - Flights Standards Division (ACE) and the Aircraft Certification Service (AIR) to develop test and evaluation criteria for these advanced autopilots and flight management automation systems for GA aircraft.

Flight Crew Error and Inadvertent Operation Means of Compliance

- Provided recommendations for issues and recommended practices for flight deck systems complying with new flight crew error regulation 14 CFR 25.1302.

The Flightdeck/Maintenance/System Integration Human Factors program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carriers and in general aviation.

Why Is This Particular Program Necessary?

Human error continues to be a major contributor to aircraft accidents and incidents both in commercial and general aviation.

The Flightdeck/Maintenance/System Integration Human Factors program focuses on the needs of pilots, inspectors, and aircraft maintainers. Flightdeck design and operational practices are experiencing a revolution in digital avionics, enabling new head up displays, surface moving maps, electronic flight bags, advanced controls, communications, navigation, surveillance systems, and tools for aircraft system management. With these advances come important human performance and human factors implications which must be understood and applied in the appropriate guidance material developed for policy, procedures, operations, and training. The research supports the development of these products. History has taught us that the introduction of new automation to the flight deck has resolved some human error tendencies but also introduced new ones. One goal of current research is to try to be proactive in identifying error tendencies and thereby enhance the safe and effective introduction of new technologies and procedures into the NAS.

How Do You Know The Program Works?

This research program has, over the years, identified human factors issues and developed training, mitigation, and guidance material used by government and industry to address problem areas. For example, Crew Resource Management (CRM) research supported the development of an FAA Advisory Circular as well as training for air carriers. The research program has provided substantial support for the FAA's Voluntary Safety Programs. One of these programs, the Line Operations Safety Audit, was a direct result of our research and is now mandated by ICAO as a worldwide safety monitoring requirement for airlines. Additionally, the Human Factors Aircraft Certification Job Aid provides guidance to the Aircraft Certification Flight Test Pilots, Engineers, and Human Specialists who must evaluate new aircraft and old aircraft with new displays and/or controls. The Job Aid compiles over 100 human factors research and reference reports and tied them to the regulations. This database tool is instrumental in providing a structured way to evaluate systems submitted for FAA approval. Similarly, the outputs of the electronic flight bag research provide a structured way to identify human factors issues with EFBs submitted for approval and provide the basis for human factors input to FAA regulatory and guidance material. Thus, the outputs of the Flightdeck/Maintenance/System Integration Human Factors research have provided human factors and human performance data on which FAA staff can make approval decisions.

Why Do We Want / Need To Fund The Program At The Requested Level?

This program directly supports the engineers, test pilots, human factors specialists, and inspectors within FAA Aviation Safety who are responsible for approving flight deck systems, equipment, procedures, and maintenance and also responsible for developing the regulatory and guidance material in these areas. The research ensures that the critical FAA decisions to approve a given system, operation, procedure, etc. are made based on data. Human error routinely appears as a critical safety risk. The research is aimed at identifying and mitigating the human factors issues. The research results feed into the Aviation Safety's regulatory and guidance material. Any current or future reduction in funding to the Flightdeck/Maintenance/System Integration Human Factors program would negatively impact the FAA's ability to identify and mitigate risks in the area of human factors, which directly impact Aviation Safety's ability to make key decisions on projects and policy.

Detailed Justification for
A11.h System Safety Management

What Is The Request And What Will We Get For The Funds?

FY 2014 – System Safety Management

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.h System Safety Management	$10,027,000	$10,088,000	$11,583,000	+$1,556,000

For FY 2014, $11,583,000 is requested for System Safety Management. Major accomplishments include:

System Safety Management

- Aviation Safety Information Analysis and Sharing (ASIAS)
  - Develop anomaly and risk detection approaches that will allow for the incorporation of new ASIAS communities (general aviation (GA), helicopter, airport authorities, and manufacturers), as required by studies and vulnerability and risk assessment.
  - Develop speech recognition technology and customized text mining and information extraction methods for use with voice data sources to determine things such as hearback/readback errors.
  - Create new automated monitoring capabilities and several basic event detection capabilities along broad topic areas (undesirable states or precursors), such as loss of control and loss of airborne/ground separation.
  - Develop automated methods to detect and flag anomalies such as high event rates, rapidly increasing event rates and anomalous change in event rates.
- GA Flight Operations Quality Assurance (FOQA) Data Gathering and Analysis for ASIAS
  - Expand GA FOQA program to other segments of the GA and rotorcraft population.
  - Conduct analysis of other GA safety data programs including the potential need for a GA Aviation Safety Action Program (ASAP).
  - Begin the development of a stand-alone GA ASIAS in which directed studies, known risk monitoring and safety benchmarks can be conducted for issues specifically related to the GA community.
  - Develop web-based tools that allow a GA pilot or operator to upload their flight data, conduct pre-defined analysis, return the results of the analysis to the submitter and upload de-identified flight data to ASIAS.
- Transport Airplane Risk Analysis Evaluative Metrics
  - Complete the development of transport airplane operational maintenance related conditional probabilities into a form best suited for efficient use in risk analysis.
- Facility Risk Assessment Tool (FRAT)
  - Develop a user interface and trend analysis capability that monitors National Airspace System (NAS) operational safety with respect to risk and other off-nominal occurrences for use by FAA field and headquarters safety inspectors to more economically identify facilities with higher safety risks.

- Integrated Domain Assessment of Future Systems (referred to as Operational Safety Measurement of Future Systems in FY 2013)
  - Develop a methodology and parametric tool that focuses on aircraft separation and assesses the probability of risk for future NAS improvements for all operational domains or phases of flight (e.g., surface, departure, tower, Terminal Radar Approach Control Facilities (TRACON), en-route, arrival, tower, surface) and in a given time period.
  - Conduct a test of the parametric tool with a case study application.

Terminal Area Safety

- Develop Models that Enhance the Ability to Use Advanced Flight Simulators for Advanced Maneuvers
  - Develop modeling techniques that result in changes to the math model structure to match flight data in aerodynamic stalls.
- Determining Runway Friction from Airplane Data
  - Identify an acceptable method to efficiently estimate the runway friction level or slipperiness condition from airplane data recorded during landing.
- Simulator Motion Cueing Criteria
  - Collect simulator motion data at five training centers for three aircraft types per International Civil Aviation Organization (ICAO) Standard 9625 testing method.
- Development of Stable Approach Criteria
  - Complete review of accident databases to summarize path and track deviations for which a go-around was not conducted and ultimately led to an accident.

Research projects in the System Safety Management program are designed to increase system safety through the use of safety information. This will occur with the development of enhanced methods of data collection and analysis spanning a wide range of operational areas (e.g., 14 Code of Federal Regulations (14 CFR) Parts 121, 135, 91), aircraft types (e.g., 14 CFR Parts 23, 25, 27, 29). This allows the FAA to (a) identify system-level vulnerabilities through evaluating and developing aggregate level data and metrics, (b) determine indicators of performance (safety metrics) and processes to reliably identify potential risk, and (c) identify and assess risks associated with anticipated changes in procedures or technologies. In addition, the research will produce tools that identify and prioritize risk areas of the NAS warranting further analysis and intervention strategies.

Terminal Area Safety research improves the safety of operations near an airport. For example, the leading cause of fatalities in the worldwide commercial jet fleet is loss-of-control, and 70% of these accidents occur in the terminal area. The Advanced Maneuver Model project is developing alternative simulation stall models for training pilots to apply the appropriate recovery techniques to reduce loss-of-control. Two companion studies, Runway Friction and Stabilized Approach Criteria, aim to develop solutions to reduce accidents of runway excursion, abnormal runway contact, and overshoot/undershoot the third leading cause of fatalities. Research will be carried out to evaluate the collection and transmission of airplane landing performance data to estimate landing and braking performance during poor weather operations to reduce runway accidents, which bridges the gap with future system-wide information management research in data link transmission. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

In 2013, an infrastructure (software, hardware, and data gathering requirements) was released under System Safety Management research that enabled the free sharing and analysis of de-identified safety information that is derived and protected from government and industry sources. In the near future, this infrastructure will be enhanced with additional capabilities, such as vulnerability discovery, improved data fusion and expanded data sources and users. The research outputs include methodologies, case studies, and guidance material that provide the capabilities of systematically assessing potential safety risks and applying proactive solutions to reduce aviation accidents and incidents.

Terminal Area Safety research efforts will provide the FAA with (1) feasible flight simulator stall models for upset recovery training; (2) feasible methods to determine and transmit real-time runway slipperiness from landing airplanes; (3) objective flight simulator motion criteria to minimize inappropriate simulator training; and (4) assessments of refined stabilized approach criteria for supporting further rulemakings.

As a means to effectively leverage resources to meet the research objectives and implement research products, the program partners with several aviation organizations. For example, Commercial Aviation Safety Team (CAST), an FAA/industry collaborative effort to develop and implement data-driven safety initiatives, provides guidance, resources and voluntary-submitted safety data for use in the ASIAS directed studies, safety metrics, anomaly detection capabilities and text mining capabilities. Results feed into the development and tracking of safety enhancements. The collaboration with industry assists in the implementation of the findings of the research studies.

In FY 2013, major accomplishments planned include:

System Safety Management

- ASIAS
  - Expanded ASIAS to new aviation communities (e.g., GA, rotorcraft, corporate, and military).
  - Incorporated new digital sources, such as Automatic Dependent Surveillance-Broadcast (ADS-B) and air traffic control (ATC) voice data.
  - Developed a modeling capability that is able to assess potential vulnerability of anomalous behavior discovered from the databases using a knowledge-based approach.
  - Developed advanced infrastructure and laboratory for conducting and sharing analysis tools and aggregated safety information that allow industry stakeholders to perform standardized data analysis and limited vulnerability discovery on a wide variety of diverse sets of data.
- Transport Airplane Risk Analysis Evaluative Metrics
  - Completed the development of transport airplane flight crew related conditional probabilities into a format best suited for efficient use in risk analysis.
- Prognostic Air Traffic Analysis Capability for Operational Safety
  - Developed a capability that integrates air traffic databases and permits prognostic trend analysis of air traffic safety performance for operational oversight.
- Operational Safety Oversight of NAS Facilities
  - Completed the development of a user interface and trend analysis capability for equipment performance.
  - Tested the equipment module for facility performance.
  - Explored the benefit-cost trade-offs of hosting tool on available organizational platforms.
- Operational Safety Measurement of Future Systems
  - Conducted safety impact analysis of the NAS due to the future improvements for each NAS operational domain, such as tower, TRACON, and enroute, or for each phase of flight, such as taxi, departure, climb, cruise, approach, and landing.

Terminal Area Safety (TAS)

- Develop Models that Enhance the Ability to Use Advanced Flight Simulators for Advanced Maneuvers
  - Determined an initial set of data requirements to improve the mathematical models of stalls, and conducted research on damping values and control effectiveness in the roll and yaw axis to match the in-flight values.
- Determining Runway Friction from Airplane Data
  - Evaluated methods to determine the runway friction level or runway slipperiness condition by using data obtained from an airplane's flight data or quick access recorder.
- Simulator Motion Cueing Criteria
  - Investigated errors across simulators by replicating testing conditions with same sensors and their placement for developing criteria for achieving more uniform training across today's fleet of simulators.

The System Safety Management program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities for both commercial air carrier and GA operations. In addition, the program responds to the "Next Level of Safety" goal identified in the FAA Destination 2025.

Why Is This Particular Program Necessary?

The System Safety Management program has two primary goals. First, the program is designed to identify and analyze emerging threats in a cooperative nature with the aviation industry. Working cooperatively with aviation stakeholders provides the ability to analyze trends across the aviation community that is much more effective than monitoring individual airlines. Thus, the aviation community and FAA must have regular access to safety information to move toward a risk-based safety management approach. By creating a safety baseline and benchmarks, the program will produce products that regularly monitor safety enhancements to ensure the incorporation of new capabilities does not impact current levels of safety. Therefore, the program has direct impact in several areas that affect the incorporation of new technologies, NextGen capabilities, and evolution of the National Airspace System.

Along these lines, the System Safety Management program addresses issues identified in several GAO studies that call for the FAA to collect better data and improve its effort to identify and address safety issues. For FY 2014, research will continue to enhance ASIAS by developing capabilities, tools, and software that will improve safety oversight of the NAS, and through conducting analytical studies and safety assessments using ASIAS and other safety aviation data. Research will also continue developing empirically-derived transport airplane data for use by the Transport Airplane Directorate in developing safety metrics.

Secondly, the program is conducting research to improve the safety of operations near an airport. This effort aims to develop training solutions to reduce the accident rate due to loss of control and runway excursions/overruns, the number one and three leading causes of fatality in the worldwide commercial jet fleet. To minimize inappropriate simulator training, research will collect and analyze motion data on existing platforms and evaluate simulator motion criteria against subjective assessment. The TAS projects also addresses the aviation safety research gaps identified in the National Transportation Safety Board (NTSB) Safety Recommendations A-01-69, A-04-62, A-07-003, and A-07-64.

How Do You Know The Program Works?

Through ASIAS, the FAA has been able to promote system-wide access and sharing of aviation safety data and analysis tools within the aviation community, providing safety resources that are integrated with operations of aviation industry stakeholders. Directed studies commissioned by CAST have led to the development and implementation of intervention strategies that are currently being monitored for effectiveness.

Recent research outputs from the transport airplane risk analysis project include the development of injury ratios that are used by aircraft certification engineers in conducting risk assessment of manufacturers' proposed designs. This responds to the Aircraft Certification implementation of a safety management system program entitled "Monitor Safety Analyze Data".

Recent landing distance studies were reviewed and used by the Takeoff and Landing Performance Analysis Rulemaking Committee in preparing their recommendations regarding a landing distance safety matrix.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding at the requested level is necessary to enable FAA to fully address safety issues. If funding was not possible at the requested level, the following initiatives may be compromised:

- A reduction in the System Safety Management budget will delay the completion of the FRAT tool , an automated capability that would optimize FAA resources in support of safety in the NAS. This would force the FAA Office of Aviation Safety to continue a more costly, less effective manual process of analyzing both operational and safety data with respect to NAS facilities.
- Within the TAS research, a reduction in funding will postpone research that would reduce motion deficiencies, which were identified as a contributor to fatal accidents such as USAir 427 and American Airlines 587.
- Funding reductions could also impact FAA's ability to conduct the required research in response to the third leading category cause of fatal accidents in an NTSB recommendation from the American 1440 Little Rock accident in 1999; a recommendation that is still open.

Detailed Justification for
A11.i Air Traffic Control/Technical Operations Human Factors

What Is The Request And What Will We Get For The Funds?

FY 2014 – Air Traffic Control/Technical Operations Human Factors

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.i Air Traffic Control/Technical Operations Human Factors	$10,364,000	$10,427,000	$6,000,000	-$4,364,000

For FY 2014, $6,000,000 is requested for Air Traffic Control/Technical Operations Human Factors. Major accomplishments planned include:

Advanced Air Traffic Systems

- Complete design standard for Airport Traffic Control Tower Alerts
- Develop human factors applications for air traffic systems increasing controller efficiency

Individual and Team Performance

- Analyze air traffic human factors safety issues and data to mitigate loss of separation incidents
- Conduct research and analyses and recommend mitigations regarding human factors aspects of the Top 5 ATC safety issues of FY 2014 to reduce their negative consequences to operations.
- Analyze the impact of controller aptitudes on training success
- Conduct research to evaluate OJT Instructor training and causes of attrition from field training to recommend activities to positively influence training success
- Define profiles of the impact of selected levels of workload and time-on-task on controller performance

Advanced Technical Operations (Tech Ops) Systems

- Complete a Tech Ops Graphical User Interface Standard
- Develop electronic technical manual/interactive electronic technical manual standard for technical publications used in technical operations

As the National Airspace System (NAS) moves toward modernization under NextGen, this program will emphasize reaching out to the operational safety community to form an alliance with the objective of reducing the probability of human error in the NAS and supporting NAS operations as new capabilities are introduced. The program will continue to make progress on sponsor requirements in the areas of Advanced Air Traffic Systems, Advanced Technical Operations Systems, and Individual and Team Performance. There will be continued emphasis on the development of human factors design standards for ATC systems. In the domain of technical operations, the program will continue the development of standards for multi-media maintenance publications and documentation to enhance maintenance procedures, avoid an increase in labor costs during maintenance of new systems, and reduce the probability of human error during maintenance. Finally, the program will continue to validate and improve methods to help reduce the costs to the agency of training Air Traffic Control Specialists (ATCS).

For FY 2014, the program will develop a the concept of human-system integration (HSI) and safety aspects of the functions performed by air traffic controllers and technical operations (maintainer) personnel. The HSI concept will address the interactions between human error/safety, workstation design, and training. The effort to develop a HSI road map for the technical operations domain will continue through FY 2014. The new working environment will drive a need for alterations in organizational structure, training, and management of human error as the consequences of errors become more far-reaching in terms of NAS availability. Related to this effort is a project to revise the maintainer job task analysis to determine if there is a need and valid basis to add medical screening (e.g., color vision) and basic skill requirements (advanced computer use) to the training process. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The Air Traffic Control/Technical Operations (ATC/TO) Human Factors program generates requirements for human interface characteristics of future air traffic and technical operations workstations and enhances our understanding of the role that system design plays in mitigating human error, a major contributor to loss of separation events, runway incursions, and errors that result in NAS equipment outages. Researchers are developing methods to train new air traffic controllers and maintainers to minimize cost, increase the probability of success in training and on the job, and also to improve HSI in the maintenance arena to increase reliability and availability of the NAS. The ATC/TO Human Factors program includes the following research outputs:

- Mitigations for human error related to air traffic safety
- Assessments of the effectiveness of fatigue-risk-management strategies
- Air traffic workstations and concepts that increase workforce productivity by identifying key workload factors and mitigation principles that must be mitigated to enable the humans in the system to manage the future NAS traffic flow
- Guidelines and standards for design of computer-human interfaces used in Technical Operations

The research program works to improve safety by:

- Improving:
  - Effectiveness of safety analyses that concentrate on detecting the potential for human error during the concept and research phases of system development
  - Developing human factors safety mitigations during operations.
  - Methods to train new controllers and maintainers.

The program works to improve the ATC and Tech Ops contributions to economic competitiveness:

- Developing:
  - Integrated workstations that allow Tech Ops specialists to meet increased availability and service demand.
  - Methods to assess the value of proposed changes to workstations to determine if human-in-the-loop performance and efficiency is enhanced.
  - Advanced concepts for maintenance workstations that use automation and advanced technology to increase availability of the NAS, and decrease the probability of system outages.
- Improving:
  - HSI in a manner that allows controllers and pilots to cooperatively manage traffic loads as cockpit technology and air traffic workstations are more closely connected to efficiently move air traffic in the NAS.
  - Allocation and sharing of roles and responsibilities between controllers and pilots as technology evolves to meet future demands.

The ATC/TO Human Factors Program receives requirements from internal FAA sponsoring organizations that commit to providing resources and to incorporating the research into products and processes. Sponsoring organizations generate human factors research requirements: 1) for developing human factors standards, guidance, and recommendations to be applied in system design; 2) to identify needs involving fatigue, safety culture, human error hazard identification, age, operational errors, and runway incursion prevention; and 3) NAS infrastructure operational and maintenance research, including ATC system maintenance displays, controls, and maintainability features specifications.

In FY 2013, major accomplishments planned include:

Advanced Air Traffic Systems

- Developed human factors color guidance for air traffic control displays that can be used in the acquisition of future ATC systems. This guidance is synchronized with aeromedical testing of color vision for controllers.
- Revised five chapters of the Human Factors Design Standard.
- Generated human factors evaluation of current Air Traffic Control Tower Alerts.

Individual and Team Performance

- Conducted an experiment to measure the effects of time on task, workload intensity on mental fatigue and associated decrements in air traffic control task-related performance.
- Developed an evaluation methodology for the fatigue mitigation strategies that educate air traffic controllers and managers about the factors that affect fatigue.
- Developed a plan for a field study leading to better management of fatigue risk from air traffic controller job tasks that may increase susceptibility to fatigue.

Personnel Selection and Training

- Implemented Air Traffic Color Vision (ATCOV) test revision at Regional Flight Surgeon offices that incorporates ERAM requirements.
- Completed a study to verify the validity of the Air Traffic Selection and Training (AT-SAT) test battery including an estimate of potential cost avoidance
- Conducted an analysis of air traffic control specialist barriers to hiring and selection
- Responded to the Department of Transportation OIG recommendation "Evaluate the current AT-SAT test and redesign it so that it results in air traffic controllers being placed at locations according to their skill sets"
- Defined the role of AT-SAT in hiring graduates of an air-traffic collegiate training initiative program and documented results in an FAA report

Advanced Technical Operations Systems

- Developed technical operations Symbols and Markings Standard.
- Generated a Standard that will be used to guide the development of abbreviations for future technical operations systems.

The ATC/TO Human Factors Program supports the Department of Transportation (DOT) strategic goals of Safety and Economic Competitiveness by developing human factors research products applied during the development of air traffic systems to assure a human-centered design that achieves desired performance objectives, generating human factors maintenance standards and concepts to enhance the reliability and availability of NAS infrastructure, providing methods to mitigate human error in the NAS, and developing cost-effective methods to deliver air traffic training.

Why Is This Particular Program Necessary?

The safety and performance of the NAS is directly linked to the performance of human operators. Among the most complex problems facing aviation today are those involving human error. To achieve quantifiable improvements in aviation safety and economic competitiveness, increasing emphasis is being placed on the human operator and those involved with the safe and efficient conduct of flight (e.g., supervisors, air traffic controllers, maintenance technicians).

Enhancing safety will require a reduction in human error and increasing economic competitiveness will involve the development of techniques and tools that increase controller efficiency. Some of these tools and techniques involve augmenting the human decision maker with a recommendation generated by automation. This program addresses the required balance between reliance on the automation and assuring that the human, who has a much better ability to make decisions in the presence of unforeseen situations, incomplete information or multiple simultaneous competing priorities.

FAA Human Factors R&D for ATC/TO is motivated by a need to reduce the potential for human error and increase the efficiency of ATC operations. To meet these challenges, the FAA is focused on integrating the human into the development cycle. The major areas of human system integration are in effective workstation design, human error reduction, and efficient training. The requirement to include the human component in the development of the NAS is being addressed by this research program.

The ATC/TO Human Factors program provides a valuable service for the Air Traffic Organization and other FAA organizations. The program gathers the various organizations' research requirements and develops integrated research products. The personnel and laboratories funded by this program are unique national assets and not available elsewhere. FAA strives to include human factors research early and often in the development and implementation of new technologies in order to avoid cost and schedule overruns, particularly from unplanned changes to requirements. The application of our personnel selection and training products has resulted in a more efficient screening process that reduces the time and cost of controller selection and training. The AT-SAT screening test for controllers is a product of this research program, as is the ATCOV test to assure that candidates with job-related color vision deficiencies do not enter the workforce.

How Do You Know The Program Works?

The over-arching theme of this research program is "Research to Practice". Examples include:

- Every candidate for a controller position entering the workforce from the general public or Collegiate Training Initiative is required to take the Air Traffic Selection and Training (AT-SAT) screening test. Research has shown that applicants who score higher have a statistically higher probability of successfully becoming certified professional controllers compared to applicants having lower scores.

- The ATCOV test is now in use during the medical screening process to assure that new controllers with job-related color vision deficiencies are selected out of the workforce.

- The Front Line Manager Quick Reference Guide that is a recent output of this program has been strongly endorsed by the ATO service units and has been distributed by the ATO Safety organization to every front line manager in the ATO. It is also being used as course material in the FAA academy and other FAA management courses.

- The Human Factors Design Standard is a robust document containing human factors design criteria that is cited in every FAA acquisition contract that has a human interface.

- The results of our controller fatigue research are being implemented by the FAA fatigue risk management group to assure that safety is not compromised as a result of scheduling pressures.

Why Do We Want / Need To Fund The Program At The Requested Level?

The human component of the NAS (i.e., the people in the ATO) is arguably the most important, most complex, and most expensive element and the most critical portion of the NAS to accomplish the mission.

Without our controllers, maintainers, traffic flow coordinators and other people in the NAS it would be impossible to deliver services to users of the airspace. This program is dedicated to enhancing human performance in the conduct of our mission. A reduction in the requested level of funding will cancel major elements of the program. For example, important research on controller fatigue would be cancelled, and fatigue research data collection for the Technical Operations maintainer would be stopped. The area of controller fatigue is a high visibility topic and our sponsors in ATO Safety have recently generated a large number of research requirements to respond to recent initiatives for fatigue countermeasures. This research program recently invested substantial resources into a survey of the state of fatigue of the controller work force (which was initiated prior to the recent controller fatigue-related events) to support the ATO Fatigue Risk Management System. The Air Traffic Control/Airway Facilities Human Factors program would stop making investments in fatigue research, The Human Factors Design Standard used during acquisition programs to reduce human factors risk is in need of update due to advances in technology. This update would be stopped and force major ATC systems acquisition programs to use an outdated document. A reduction will require cancellation of the Human Factors Design Standard for Display Symbology and eliminate a study regarding Preventive Maintenance Tasks Vulnerable to Human Error requested by Technical Operations to improve NAS system availability.

One of the critical elements of this program relates to the human performance aspects of safety in the NAS. A review of the FAA ATC "Top Five" safety concerns shows that all the issues involve controller performance. Decisions on the acquisition of new systems to enhance safety and the application of new or modified procedures to reduce the likelihood of human error should be based on human performance research that is the output of this program. A reduction of funding to this program will have a negative impact on our ability to support these decisions and respond to the safety and human factors engineering needs of our sponsors in the ATO.

Detailed Justification for
A11.j Aeromedical Research

What Is The Request And What Will We Get For The Funds?

FY 2014 – Aeromedical Research

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.j Aeromedical Research	$11,000,000	$11,067,000	$8,672,000	-$2,328,000

For FY 2014, $8,672,000 is requested for Aeromedical Research. Major accomplishments planned include:

Aeromedical Systems Analysis

- Assess the aeromedical, accident investigation, and other safety issues related to civil aviation pilots with diabetes - application of the Scientific Information System (SIS) III.
- Evaluate the use of over-the-counter antihistamines by general aviation pilots involved in fatal aircraft accidents and the implications to aviation safety – application of the Aircraft Accident Medical Review Workflow System (AAMRWS).

Accident Prevention and Investigation

- Develop more comprehensive and sensitive screening methodology for the identification of pain management drugs. New pain medications are more potent and efficient, yet may cause significant flight performance decrements.
- Examine the prevalence of abused drugs by region, drug type, pilot certificate type, and other factors to support rulemaking on drug abatement.
- Identify biomarkers for disqualifying pathologies to aid the development of methods to facilitate disease diagnosis and development of decision support tools for medical certification and accident investigation processes.

Crash Survival

- Support the certification of innovative aircraft unique child restraints. The project includes impact tests and model development. It will investigate and develop test procedures for unusual devices (e.g., straps) towards standardizing testing methodologies.
- Evaluate the state-of-the-art inflatable flotation device performance and alternative water landing survival strategies. (e.g., different markings, handles, functional testing, floatation characteristics, and assembly parts).

Aviation Physiology

- Develop a model of the kinetics of metabolic rundown in loss of consciousness resulting from hypobaric anoxia and a positive gravitational force that is applied to the vertical axis of the body, (i.e., +Gz acceleration).
- Develop a version of CARI (CARI-NAIRAS) that uses NASA's near real time Nowcast of Atmospheric Ionizing Radiation System.

Evacuation Analytical Tools

- Develop and maintain analytical tools, empirical data, and scientific expertise to support regulatory actions, standards development, accident investigations, and enhanced safety of airplane interior arrangements and emergency equipment and operations, as they relate to the ability to evacuate an airplane.

The Aeromedical Research program will conduct aeromedical research pertaining to the human aspects of protection and survival from exposure to hazardous conditions relative to civil aerospace operations. Research activities will develop new and innovative ways to support FAA regulatory and advisory missions to improve the safety, security, health, and survivability of aviators, cabin crew, and the flying public.

What Is This Program?

The Aeromedical Research program supports FAA's 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 (a) evacuation and egress of humans from aerospace craft, (b) dynamic protection and safety of humans on aerospace craft, and (c) safety, security, and health of humans on aerospace craft.

Research program outcomes include:

- Improving safety, security, protection, survivability, and health of aerospace craft passengers and aircrews
- 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, health, 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

In FY 2013, major accomplishments planned included:

- Aeromedical Systems Analysis
  - Assessed accident investigation cases involving atrial fibrillation relative to aeromedical decision making processes.
  - Conducted an updated review of aircraft accidents involving pilot suicide to assist medical certification review processes in identifying mental disease.
  - Evaluated aeromedical hazard trends in fatal accidents based on the integrated aeromedical review of individual cases assessing forensic toxicology, autopsy, and medical records information.
- Accident Prevention and Investigation
  - Evaluated frequency of the presence of tricyclics (used to treat mood disorders) in pilots involved in fatal aviation accidents to determine whether their use was a contributing factor to the accident.
  - Investigated the feasibility of hypoxia biomarkers in rapid decompression studies to clarify the effects of this stressor on gene expression and further develop mitigation strategies.
- Crash Survival
  - Developed anthropometric test dummy calibration methods and dummy modifications that will ensure consistent lumbar load measurements during seat certification tests.

- Aviation Physiology
  - Developed educational materials for suborbital flight crew concerned with the radiation environment during suborbital space travel.

The Aeromedical Research program supports the DOT strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation.

Why Is This Particular Program Necessary?

The human components of aviation systems are simultaneously the strongest and the weakest links in aerospace safety. Thus, the Aeromedical Research program conducts research to maximize the strengths of the human link and minimize inherent human weaknesses to prevent accidents and improve safety and health in both commercial and general aviation aircraft. The Aeromedical Research program investigates and analyzes injury and death patterns in civilian flight accidents and incidents to determine their cause and develop preventive strategies. This research supports FAA regulatory and medical certification processes that develop safety and health regulations covering all aerospace craft occupants and their flight environments. The program combines toxicological and medical aspects of all fatal and high priority aircraft accidents to provide accident investigators, medical certification managers and researchers with near real time data to rapidly identify issues and support for safety information systems.

The Aeromedical program recommends and develops equipment, technology, and procedures for optimal (a) evacuation and egress of humans from aerospace craft and (b) crash protection and safety. National Transportation Safety Board reports show the survivability of commercial aircraft accidents including serious accidents is quite high – greater than 94 percent; thus, research to ensure occupants can survive crash impact and safely evacuate the aircraft is essential. The implementation of this research was evidenced on January 15, 2009 by the successful water evacuation of all occupants in U.S. Airways Flight 1549 in the Hudson River.

How Do You Know The Program Works?

The Aeromedical Research program is exclusive in its focus of the most important aspect of the National Airspace System: the human operator and the public which s/he serves. Evidence of the Aeromedical Research program's success includes advances in four critical human safety areas:

- Aeromedical Systems Analysis - Aeromedical reviews of fatal accidents in direct real time support of accident investigators; assessments of very large datasets concerning aircrew, their appropriate medical certification, and their involvement in aviation accidents and incidents.

- Accident Prevention and Investigation - CAMI serves as the primary national site for toxicology testing relative to accident investigation fatalities and is at the forefront of functional genomics research in the identification of biomarkers for environmental stressors, disease, and other factors that affect human performance (e.g., alcohol, fatigue, and hypoxia).

- Crash Survival – Aeromedical assessed crash environments including head impact, seat deformation, occupant restraint performance, and emergency procedure effectiveness; all key issues in aircraft certification processes and protection of human life.

- Aviation Physiology – Aeromedical assessed human performance at altitude, adequacy of protective breathing equipment, aircraft environmental control systems, cabin air quality, and methods of detection and protection from chemical, biological, and radiological threats.

Why Do We Want / Need To Fund The Program At The Requested Level?

A reduction in funding will extend research time to assess critical human protection and survival aeromedical issues that affect the safety and health of airline crewmembers and the flying public.

A11.k Weather Program

What Is The Request And What Will We Get For The Funds?

FY 2014 – Weather Program

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.k Weather Program	$16,043,000	$16,141,000	$15,279,000	-$764,000

For FY 2014, $15,279,000 is requested for the Weather Program. Major accomplishments planned include:

Aviation Weather Forecasting

- In-Flight Icing
  - Complete experimental version of Alaska Icing Forecast and Diagnosis capability for evaluation.
- Model Development and Enhancement
  - Complete enhancements to High Resolution Rapid Refresh resulting in improvements to ceiling and visibility (C&V), convective weather, turbulence and icing forecasts.
- Turbulence
  - Complete prototype development of turbulence forecast capability for Alaska.
- Convective Weather
  - Complete development of initial prototype to provide oceanic convective weather hazard guidance.
  - Complete development of initial probabilistic 2-12 hour forecast of large-scale convective initiation.
- Ceiling and Visibility
  - Complete concept of operations for utilization of Runway Visual Range (RVR) data to enhance C&V forecasts.
- Volcanic Ash
  - Complete assessment of performance and operational requirements as a basis for model improvement.
- Quality Assessment
  - Complete development of verification plans and data sets for Alaska icing forecast and diagnosis capabilities.
- Advanced Weather Radar Techniques.
  - Complete development of initial Terminal Doppler Weather Radar (TDWR) data quality control algorithm
- Aviation Weather Demonstration and Evaluation Services
  - Complete capability evaluation of verification and validation toolsets targeting operational impact and meteorological verification of aviation weather forecasts.
  - Complete concept evaluation of turbulence forecast.

AVS Weather Research and Development

- Safety-Driven Weather Requirements for Wake Mitigation
  - Complete quantification of wake vortex encounter probabilities as a function of weather parameter observations.
- Terminal Area Icing Weather Information System
  - Complete initial laboratory development and prototype field tests of capabilities needed for research system based on TAIWIS conceptual model/definition.
- Mitigating the Ice Crystal Weather Threat to Aircraft Turbine Engines
  - Complete processing of ice crystal data from research flights, satellites, radar, etc., to support verification of nowcasting capability.
- Lower Visibility for CAT 1 Approaches and RVR Conversion
  - Complete report on adequacy of simulator data to validate equivalency of visibility measurements to specific RVR values.
- Using Data Linked Aircraft Sensed Weather Information to Determine Probability of Icing Conditions Aloft
  - Complete concept of use and system design documents.
- Mountain Pass Weather in the United States (CONUS)
  - Obtain and document actual reports of icing and turbulence conditions to conduct a comparative study of observed/sensed weather data to known or reported conditions.

The Weather Program will continue to develop and enhance forecast capabilities and meet emerging NextGen requirements and operational improvements. This will include applied research in naturally occurring atmospheric hazards including turbulence, severe convective activity, icing, and restricted visibility. Additional turbulence forecast capabilities to address mountain-waves will be developed to enhance en route safety and capacity. In-flight icing analysis and forecast capabilities and convective weather uncertainty needs for NextGen will also be developed.

The FAA will continue to partner with the National Aeronautics and Space Administration (NASA), Transport Canada, Environment Canada, and the Australian Bureau of Meteorology to address mitigation of ice crystal weather threats to aircraft turbine engines.

What Is This Program?

The Weather Program provides new and improved weather products that support legacy National Airspace System (NAS) systems, National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS), and NextGen capabilities as well as enablers necessary for mid-term and far-term benefits. Weather products are enhanced by upgrading algorithms for existing NAS platforms such as the Corridor Integrated Weather System (CIWS). NOAA/NWS platforms and forecasters also use the algorithms developed to provide regulatory forecast products and NAS decision aids. Research is an integral element in providing the advanced forecast information that can be integrated into aviation decision-support tools. The FAA's Reduce Weather Impact (RWI) portfolio will transition the advanced forecast information into aviation decision-support tools. The weather information will be universally accessible through net-centric capabilities.

The Weather Program will develop advanced forecast capabilities as stated in the NextGen Implementation Plan. To support transition of these advanced capabilities to operations, the Weather Program will evaluate these scientific advancements to verify their performance. The advanced capability requirements for NextGen include the following:

- Advanced convective weather forecast - high-resolution, deterministic and probabilistic 0 to 12+ hour forecasts of convection for air traffic management (ATM) to enhance capacity.
- Hourly (nowcasts) and 0- to 18-hour probabilistic forecasts of turbulence for use by ATM, Aviation Operations Centers (AOC), and the pilot in the cockpit to enhance safety and capacity.
- Hourly (nowcasts) and 0- to 12-hour probabilistic forecasts for in-flight icing, including its severity for use by ATM, AOC, and the pilot in the cockpit for preflight planning to enhance safety and capacity.
- Analysis and 0- to 12-hour probabilistic forecasts of ceiling, visibility, and flight category for use by ATM, AOC, and the pilot in the cockpit, and to support estimation of capacity resources at airports as well as increased general aviation safety.

The weather capabilities developed by the 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 NOAA/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 and capacity.

The Weather Program leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

The Weather Program partners with the NOAA Earth System Research Laboratory (ESRL) and the NOAA National Centers for Environmental Prediction (NCEP) Environmental Modeling Center to develop high resolution rapid refresh models that have and continue to be implemented operationally into NOAA/NWS operations. These modeling efforts result in enhanced diagnosis and forecasts of weather hazardous to aviation, including en route turbulence, convective weather, ground and in-flight icing and more. Future model development and implementation efforts in partnership with NOAA are planned to address these hazardous aviation weather phenomena on a global scale which will include coverage of oceanic airspace operations. Weather Program radar technique development efforts, in partnership with the NOAA National Severe Storms Laboratory (NSSL) have developed radar applications implemented onto NexRad that are enhancing in-flight icing, turbulence, and convective weather forecast capabilities. The Weather Program in partnership with NSSL is developing a multi-radar multi-sensor capability that provides high resolution 3-D radar grids for advanced weather detection and aviation forecast applications.

AWRP icing efforts have developed in-flight and ground diagnosis and forecast capabilities, including the capability to differentiate between freezing rain and freezing drizzle. These results are being used in current research efforts to develop a terminal area ground and in-flight capability to provide icing and precipitation type information for use by air traffic management. These efforts are being coordinated and leveraged with radar technique development at NOAA NSSL as well as the NASA Glenn Research Center (GRC) Icing Remote Sensing System program. Development of a global in-flight forecast capability is being coordinated with the NOAA Meteorological Development Laboratory.

AWRP turbulence research efforts have developed en-route CONUS turbulence forecast capabilities. These efforts have been coordinated with the radar technique development efforts at NOAA NSSL. Planned efforts will address the expansion of the turbulence capabilities over the global domain.

Additionally, the FAA is coordinating and leveraging with NOAA/NWS to populate the 4D weather cube with gridded weather information from the above collaborative research efforts.

In FY 2013, major accomplishments planned include:

Aviation Weather Forecasting

- In-Flight Icing
  - Completed enhancements to in-flight icing analysis and forecast capabilities.
- Model Development and Enhancement
  - Completed enhancements to Rapid Refresh (RAP) model resulting in improvements to ceiling & visibility, and icing forecasts.
- Turbulence
  - Completed development of mountain-wave turbulence forecast capability for all flight levels.
- Convective Weather
  - Finalized report documenting convective storm forecast uncertainty needs for NextGen.
- Ceiling and Visibility
  - Completed assessment of the value-added to NOAA/NWS Localized Aviation MOS Program (LAMP) forecasts with the inclusion of the FAA Ceiling and Visibility forecast capability.
- Volcanic Ash
  - Completed concept of operations including performance and operational requirements; conducted assessment of modeling capabilities required with consideration to performance metrics.
- Quality Assessment
  - Completed assessments of enhanced in-flight icing analysis and forecast capabilities and mountain-wave turbulence forecast capability for all flight levels.
- Advanced Weather Radar Techniques
  - Completed development of enhanced ground clutter filter maps and clutter mitigation scheme for the Multi-Radar Multi-Sensor system.
- Aviation Weather Demonstration & Evaluation Services
  - Implemented operational impact metrics capability.

AVS Weather Research and Development

- Safety-Driven Weather Requirements for Wake Mitigation
  - Completed definition and testing of safety analysis method to quantify relationship between wake vortex encounter rate and quality of weather data.
- Terminal Area Icing Weather Information System
  - Developed final concept of operations and identified key technologies.

- Mitigating the Ice Crystal Weather Threat to Aircraft Turbine Engines
  - Conducted ice crystal research flight campaign.
- Lower Visibility for CAT 1 Approaches and RVR Conversion
  - Completed report on confidence that demonstrated visibility measurements are statistically equivalent to specific RVR values.

The Weather Program supports the DOT strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation flights. To reduce the number and severity of accidents, or potential accidents associated with hazardous weather, the Weather Program provides accurate, accessible, and high resolution advanced weather forecast information that can be used by Air Traffic Management, dispatchers, and pilots, and to meet current and planned regulatory requirements.

Why Is This Particular Program Necessary?

Weather has been identified as a causal factor for 70 percent of delays and 20 percent of accidents. The NextGen Implementation Plan and Weather Functional requirements documents identify improvements needed in the areas of weather detection and forecasting as well as product creation and dissemination. Accidents have also influenced research prioritization in the Weather Program; as an example the Roselawn Halloween accident (American Eagle, 68 fatalities, 1994) led to the capability to forecast the location, severity, and probability of in-flight icing conditions with sufficient accuracy to allow proactive planning of previously denied airspace to uncertified aircraft. There have been an average of 348 weather-related accidents (general aviation, air taxi, and air carrier) per year, over the 5-year period ending in 2007, resulting in more than $1B in fatalities, injuries, aircraft damage, as well as 42,000 air carrier delay hours in 2008, resulting in more than $100M in delay costs. Continued evolution of improved forecasting algorithms with applicability to achieving higher aviation safety and capacity during hazardous weather is needed. The key is to be able to provide high quality weather forecasts uniquely designed to allow for rapid and effective decision making by traffic managers, air traffic control, and air crews to proactively select safe and optimal reroutes. In the view of the JPDO, and as espoused in the NextGen Concept of Operations, weather is an essential element to be integrated into traffic flow management safety and capacity tools.

How Do You Know The Program Works?

Forecast capabilities as a result of the development of in-flight icing, turbulence, ceiling and visibility, and convective weather algorithms have been transitioned into operational or experimental use and have led to improved short-term and mid-term forecasts of these naturally occurring atmospheric hazards. Specifically the Graphical Turbulence Guidance 2 (GTG2), which was operationally implemented at the NOAA Aviation Weather Center in FY 2010, is providing 0-12 hour forecasts of turbulence above 10,000 feet enhancing NAS safety and capacity. GTG2 also uses as an input, in-situ eddy dissipation rate (EDR) data downlinked from aircraft which provides enhanced forecast accuracy. The EDR metric, a result of AWRP funded efforts, was approved as an International Civil Aviation Organization standard. Additionally the Forecast Icing Product with severity, which was operationally implemented at the AWC in FY 2011, provides 0-12 hour forecasts of atmospheric conditions conducive to inflight icing including severity and the probability of supercooled large drops, enhancing NAS safety and capacity.

The Weather Program has developed an advanced storm forecast capability known as CoSPA. During the summers of 2010 and 2011, CoSPA was used and evaluated in a live operational setting by air traffic managers at the Air Traffic Control System Command Center, as well as multiple other FAA facilities and airlines. CoSPA forecasts were found to be equal or better than current operational forecast capabilities and provided information critical for air traffic management. It has been estimated that CoSPA will save 10,000 hours of delay annually, which equates to $26.8 million in delay cost savings. CoSPA will continue to be available to the air traffic management community, via a web-based portal, during the summer of 2012.

Why Do We Want/Need To Fund The Program At The Requested Level?

A reduction in the Weather Program budget would impact the program's ability to move forward effectively and provide capabilities needed to meet safety and capacity requirements. Specific impacts are as follows:

Funding for Turbulence research would be reduced. There were more than 4,000 encounters of severe turbulence in 2011. Implementation of a probabilistic turbulence forecasting algorithm for all flight levels has been estimated to provide annual safety benefits in excess of $35M. Reducing turbulence funding will delay completion of a turbulence probabilistic forecast for all flight levels resulting in continued high numbers of encounters with severe turbulence and passenger/flight attendant injuries.

Funding for Ceiling and Visibility (C&V) research would be reduced. There are more than 60 accidents per year due to adverse C&V conditions within the general aviation and Air Taxi communities resulting in more than $400M per year in fatalities, injuries, and aircraft damage. A national ceiling and visibility probabilistic forecast capability is currently under development in collaboration with the National Weather Service. This funding reduction will delay completion of the C&V probabilistic forecast and delay the anticipated reduction in the high rate of fatalities, injuries, and aircraft damage due to adverse C&V conditions.

Funding for In-flight Icing research would be reduced. The in-flight icing accident rate for GA and Air Taxi operations in Alaska is four times higher than in the CONUS (based on the accident rate/million hours of operations) and results in more than $1M per year in fatalities, injuries and aircraft damage. Forecast and diagnosis capabilities for Alaska are currently under development. This funding reduction will delay completion of an Alaskan in-flight icing capability and delay the anticipated reduction in the high rate of fatalities, injuries, and aircraft damage.

Funding for Convective Weather research would be reduced. Convective weather is the leading cause of weather delays in the NAS (75%). Avoidable delays due to thunderstorms provide a $16 billion (FY 2009 dollars) benefits pool for a 20-year life cycle. Reduced funding in FY 2014 would delay the development of a probabilistic forecasting capability that is critical to enhanced ATM decision making.

Funding for the Volcanic Ash research effort would be reduced. Assessment of performance requirements in coordination with NOAA and ICAO, critical to the development of improved warning and forecast tools for enhanced safety and capacity, would be delayed. This will impact the capability to decrease the safety risk to enroute aircraft during a volcanic eruption and to increase the efficiency/capacity by minimizing restricted airspace.

Funding for the Lower Visibility for CAT 1 Approaches research effort would be reduced. This would delay completion of the research and consequently reduce the incentive for operators to equip with Head-Up Guidance Systems and Enhanced Flight Vision Systems due to the FAA's inability to provide visibility credits for use at runways not equipped with RVR. These advance technologies enhance safety in all aspects of flight, not just low visibility scenarios. Any delay in providing incentive to operators to equip with these expensive technologies could delay any increase in reduced visibility safety in the runway environment.

Funding for the Mountain Pass Weather Study would be reduced. After weather camera installations throughout Alaska, general aviation accidents in Alaska have decreased an average of 15% below FAA safety targets (2008-2011 accident statistics). Additionally, the FAA expects an NTSB safety recommendation asking for mountain wave cameras, similar to the Alaska program, in both the CONUS and Hawaii. This funding reduction would delay possible mountain camera installation in the CONUS and a missed opportunity to provide increased general aviation safety in hazardous mountain terrain regions.

Detailed Justification for
A11.l Unmanned Aircraft Systems Research

What Is The Request And What Will We Get For The Funds?

FY 2014 – Unmanned Aircraft Systems Research

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.l Unmanned Aircraft Systems Research	$3,504,000	$3,525,000	$7,500,000	+$3,996,000

For FY 2014, $7,500,000 is requested for Unmanned Aircraft Systems Research. Major accomplishments planned include:

Sense and Avoid (SAA) System Certification Obstacles

- Develop a comprehensive list of operational and airworthiness approval issues based on 14CFR 91 compliance.
- Identify and document examples from other systems that have been approved for use in the NAS to determine similarities.

Sense and Avoid (SAA) System – Certification Considerations for Requirements-based Testing and Validation of Non-deterministic Data Processing

- Research and evaluate accepted testing and validation methods for nondeterministic data processing systems.
- Document generally accepted testing and validation for systems most similar to SAA systems using nondeterministic data processing.

Evaluation of UAS Communications Strategies

- Conduct assessment of research and literature related to ground-to-ground communications architectures within the context of UAS operations. Determine challenges, risks, and/ or limitations these may impose on UAS operations.
- Conduct a human-in-the-loop (HITL) experiment to assess lost link procedures and impacts of UAS lost link events on the NAS.

Sense and Avoid System Multi-sensor Surveillance Data Fusion Strategies

- Recommend data fusion strategies based on review (and validation where necessary) of existing SAA research and documentation.
- Identify a representative mix of surveillance sensors and data fusion strategies to be considered in next phase of research.

UAS System Safety Criteria

- Review available literature on UAS hazard severity studies to determine applicability of previous research to current task.
- Document key UAS safety characteristics and the method(s) proposed to identify criteria to determine whether or not a particular UAS would be incapable or unlikely of causing harm in the air or on the ground.

Simulating Oversight of UAS in NAS Operations

- Conduct literature review of current status of UAS and safety issues.
- Select and acquire software to build base capability of simulation model.
- Conduct simulation(s) to exercise and assess model.

FY 2014 funding will support the UAS program to conduct research on UAS technologies which directly impact the safety of the NAS. The FY 2014 portfolio of work will be focused on sense and avoid, command and control (C2), system safety criteria, modeling and simulation requirements, and research that will support the integration of UAS in the NAS within the 14 CFR regulatory framework. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The UAS Research program supports FAA efforts in implementing the Next Generation Air Transportation System (NextGen) by studying safety implications of new aircraft operational concepts and technology to the NAS and supporting the development of new and modified regulatory standards to support these new technologies. The program's research activities focus on new technology assessments, methodology development, data collection and generation, laboratory and field validation, and technology transfer.

Researchers are developing methodologies and tools to establish regulatory standards on UAS design and performance characteristics while operating in the NAS. 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, operational requirements, inspection and maintenance processes, and safety oversight responsibilities. Policies and guidance materials are also being published to provide FAA certification engineers and safety inspectors with the knowledge and tools they need to ensure the safe integration of UAS into the NAS.

Safe, efficient, and timely integration of UAS into the NAS requires the FAA to partner with other agencies, academia, and industry to support the FAA's mission and allow the FAA to leverage our partner's research.

The FAA has partnered with NASA to determine how UAS research, expertise, and assets can be leveraged between the two agencies and duplication of effort can be minimized. The FAA is providing subject matter experts to support NASA's UAS Integration in the NAS Project to review research objectives and assumptions. The FAA and NASA have shared UAS research project plans and analysis results. Several team meetings have already been held and are scheduled to continue on a recurring basis. FAA and NASA established an umbrella Interagency Agreement for UAS Research that will allow the FAA to centralize and focus its collaboration with NASA while leveraging expertise across all NASA research centers.

The FAA is collaborating with the Department of Defense (DoD) Office of the Secretary of Defense (OSD) Technology & Logistics (AT&L) on the DoD Unmanned Aircraft Systems – Airspace Integration (UAS – AI) Joint Test (JT) and Quick Reaction Test (QRT) projects. These projects will provide an excellent opportunity for the FAA and the DoD to collaborate on the evaluation of the DoD Joint Concept of Operations (CONOP) for UAS-AI which focuses on near-term advanced accommodation of the UAS into the NAS. The suite of proposed flight profile tests will potentially serve as an incremental step to inform the FAA's roadmap for integration.

FAA researchers continue to establish and build dialogue with industry (e.g. Insitu and AAI) and academia through Cooperative Research and Development Agreements (CRDAs), grants, and Other Transaction Agreements (OTAs) to leverage UAS research collaboration and opportunities.

In FY 2013, major accomplishments planned include:

Sense and Avoid System Certification Obstacles

- Identified the major SAA system certification obstacles, including systems and equipment requirements for an alternate means of compliance to 14 CFR Part 91 to replace pilot see and avoid operational requirements certificated through knowledge testing, practical test standards and flight evaluations of pilot performance.

UAS Control and Communication (C2) – Time Critical Low Latency Control Response for UAS with Low Levels of Autonomy

- Modeled and simulated UAS C2 architectures to assess ability to safely manage trajectory of aircraft.
- Modeled and simulated various UAS operational scenarios to validate TT95 for non-critical pilot control actions.
- Performed operational safety, hazard and performance analyses along with interoperability assessments to determine the impact on safety and efficiency of UAS in the NAS with the TT95 validated through other modeling and simulation analyses as noted above.

Sense and Avoid System – Certification Considerations for Requirements-Based Testing and Validation of Non-deterministic Data Processing

- Determined certification considerations for SAA requirements-based testing and validation of non-deterministic surveillance data processing, tracking, threat declaration, and maneuvering logic.

UAS Acceptable Communication Delay Values Associated with Step-ons

- Evaluated impact of C2 technologies on UAS communication and delay values associated with "step-ons" for both line of sight and beyond line of sight communication architectures.

Evaluation of UAS Communications Strategies

- Identified notional communications architectures and/or requirements that require detailed assessment in the context of UAS operations.
- Identified existing procedures for lost link events.
- Gathered and reviewed existing data from prior FAA UAS studies which may be used in developing simulation.

The Unmanned Aircraft Systems Research program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation. To safely integrate UAS into the NAS, FAA needs to conduct research to develop airworthiness standards, devise operational requirements, establish maintenance procedures, and conduct safety oversight activities.

Why Is This Particular Program Necessary?

Safe, efficient, and timely integration of UAS into the NAS poses substantial technical challenges not only to the FAA, but also to the aviation industry as a whole. UAS use the most advanced technologies to achieve operational capabilities far exceeding the expectations of current NAS users. These unique capabilities have demonstrated potential commercial applications as well as scientific research needs. Data from the recently completed UAS technology survey initiated within the UAS Research program shows that integrating UAS in the NAS will potentially affect the entire NAS due to the various sizes of UAS (less than a foot up to the size of a commercial jet), wide ranges of maximum take-off weight (less than a pound to the weight of a large jet), large performance disparities in reference to the existing certificated aircraft, and capabilities of operating in all classes of airspace (even the ones weighing less than 100 pounds are capable of operating in Class A airspace), which could potentially disrupt normal aircraft traffic flow and induce unknown safety hazards while interacting with other NAS users.

Research activities within the UAS Research program will generate technical information to support development of policies, guidance materials, and advisory circulars on using advanced technologies to demonstrate regulatory compliances while operating UAS in the NAS. UAS-specific technical issues, such as sense and avoid, control and communications with air traffic control, and emergency response requirements, will also require research. UAS will also be integral to NextGen development.

How Do You Know The Program Works?

The research sponsor, the AVS UAS Integration Office, and the research performer, the UAS matrix team within the NextGen R&D Integration Division, conduct monthly program management reviews to report progress of research execution and to make adjustments to task execution plans as needed. Each research area includes detailed milestones, schedules, and success criteria that are tracked and reported on a monthly basis. Each research area includes an implementation plan that describes how results may be implemented into usable products that support the safe, efficient, and timely integration of UAS in the NAS. Furthermore, research reports are distributed to the FAA's UAS research partners to ensure that the UAS community is informed of results, and that the research is considered in the development of UAS standards, guidance, and regulatory products.

Why Do We Want/Need To Fund The Program At The Requested Level?

Delays in FAA UAS safety research will impede the safe, efficient, and timely integration of UAS into the NAS and jeopardize the congressionally-mandated UAS integration schedule. Such delays or reductions in funding will impact planned research and procurements necessary to meet congressional mandates. Demand for NAS access is growing from multiple operators including DoD, public use agencies, and the private sector. To standardize the certification processes and ultimately limit restrictions associated with UAS certification, the FAA needs to determine the parameters, operations, and procedures that define acceptable UAS behavior while maintaining the highest level of safety. Many challenges remain that must be overcome before the basis for certification and operations of UAS are standardized and made routine. This includes developing methods to support the integration of UAS into the NAS without causing delays, capacity reduction, or placing the public at risk. Extensive research is required to produce the appropriate safety case evidence.

Detailed Justification for
A11.m NextGen – Alternative Fuels for General Aviation

What Is The Request and What Will We Get For The Funds?

FY 2014 – NextGen – Alternative Fuels for General Aviation

Activity/Component	FY 2012 Enacted	FY 2013 Request	FY 2014 Request	Difference from FY 2013 Request
A11.m NextGen – Alternative Fuels for General Aviation	$2,071,000	$1,995,000	$5,571,000	+$3,576,000

For FY 2014, $5,571,000 is requested for NextGen – Alternative Fuels for General Aviation. Major accomplishments planned include:

- Develop standardized test procedures to evaluate laboratory and fit-for-purpose (FFP) properties for candidate fuels.
- Develop standardized rig test procedures to evaluate FFP properties for candidate fuels.
- Develop standardized test procedures to evaluate candidate fuel material compatibility with key airplane and engine fuel system components
- Develop standardized test procedures to evaluate toxicological effects of candidate fuels.

The cost of this research program is increased from the previous level of $2 million per year to approximately $5.5 million per year. The cost increase is a direct result of the FAA transitioning from the search for a drop-in replacement fuel for 100LL that looked at detonation performance to the FAA taking the lead role in transitioning to an unleaded replacement fuel that will have the least impact on the fleet. The Unleaded AVGAS Transition Aviation Rulemaking Committee (UAT ARC) plan defined a process for the fuel transition called the Piston Aircraft Fuel Initiative (PAFI). The PAFI process defines a framework to evaluate potential candidate fuels in two distinct phases. In Phase 1, up to ten fuels will be evaluated for laboratory and fit for purpose properties. In Phase 2, in depth engine and airframe testing will be conducted on the two best candidate fuels. This approach requires a greatly increased scope of testing. Many of the current laboratory methods are not applicable to new fuels, and additional fit-for-purpose (FFP) issues arise with use of new fuels. To evaluate all candidate fuels equally, standardized test procedures to evaluate these laboratory and FFP issues have to be developed. To ensure robust test procedures, which will be the basis of testing in later years, and from which data can be useable in FAA airworthiness approvals and standard specification development, iterative rig and laboratory testing has to be performed. This testing includes development of standardized laboratory and fit-for-purpose test procedures, such as: cold fuel flowability, flame speed, heat of combustion, fuel nozzle spray patterns, fuel and oil interaction, co-mingling with current fuels, lubricity, engine emissions, toxicology, and materials compatibility. The increased costs reflect increased in-house labor support, establishment of test rigs and iterative testing to ensure development of robust test procedures, expanded fuel property laboratory capabilities and testing to establish repeatable and reproducible test procedures, independent subject matter expert contracts for material compatibility and toxicology procedures development, and independent laboratory contracts. Some of the costs will also establish some of the Phase 2 engine test capabilities to continue developing Phase 2 standardized engine and aircraft test methods. Because the specific chemical composition of the candidate fuels is not known at this time, it is not possible to predict the exact testing required, and similarly the exact costs associated with the testing.

Research is focused on developing the Phase 1 standardized test procedures to be used to evaluate candidate fuels laboratory, rig, and FFP properties. The candidate fuels to be tested are to be developed by industry and represent the best possible options having the least impact on the general aviation (GA) fleet. Depending upon the chemical composition of successful candidate fuels, significant testing may be required on all phases of the fuel from production, distribution, storage in bulk form to the aircraft issues relating to materials compatibility and fuel handling. The research will be used to support the determination of the portion of the fleet that could transparently operate on the replacement unleaded aviation gasoline (avgas).

FY 2014 research will begin addressing Phase 1 and 2 recommended research tasks from the Preparatory Stage of the Unleaded AVGAS Transition Aviation Rulemaking Committee (UAT ARC) final report, dated February 17, 2012. The research program will also continue to develop Phase 2 standardized engine and aircraft test methods for candidate test fuels and begin establishing Phase 1 test facilities. Engine detonation testing in FY 2014 will continue in support of detonation test method development. Research will also support the development of standardized test methods to evaluate candidate fuel compatibility with aircraft and engine materials, toxicological issues, and engine–out exhaust emissions.

The standardized FFP properties test methods and procedures will consist of current American Society for Testing and Materials (ASTM) D910 specification laboratory test methods and newly developed specific fuel-related laboratory and rig tests. These procedures will support the evaluation of an expanded set of fuel properties necessary to determine the performance of candidate fuels. The procedures may address issues related to cold fuel flowability, flame speed, heat of combustion, fuel nozzle spray patterns, fuel and oil interaction, co-mingling with current fuels, and lubricity. Novel fuels with unique properties may require additional FFP test procedures. These standardized test procedures will be used in FY 2015 to conduct standardized FFP testing and those results will be compared to the corresponding data for the currently approved ASTM D910 100 low lead (100LL) fuels.

Replacing the current avgas poses a significant challenge to maintaining the safety of the legacy fleet. The impact on performance, operability, handling, and compatibility with fuel system materials must be carefully evaluated before approving any fuel. Work will begin on enhancing the existing laboratory capabilities and developing new standard test methods. This will be followed in the out years by laboratory, rig, engine, and aircraft testing on alternatives to the current 100LL avgas to develop test data to support industry qualification and FAA certification of the tested fuel. Additionally, funding will provide for engineering, technical, and project support of overall research activities.

What Is This Program?

Previous research attempted to find a drop-in, unleaded replacement fuel for the current leaded avgas 100LL with no impact to the existing fleet. The approach was to facilitate industry evaluation of the anti-detonation performance of unleaded avgas alternatives by investigating the interaction of various chemical and metal additives with various base fuel formulations. Over 279 formulations were evaluated for their octane properties in laboratory experiments and anti-detonation performance in test engines. While none met the criteria to be a drop-in replacement for 100LL, valuable data was collected on the interaction of the tested additives and base fuels, on the performance differences between leaded and unleaded fuels, and on the actual octane levels of commercial fuel. The prior research resulted in the development of industry standard detonation analysis techniques, including sensor equipment, data acquisition systems, and analysis algorithms that will be incorporated into standard detonation testing procedures. Knowledge gained regarding the detonation performance between leaded and unleaded fuels will be used in the development of test methods, procedures, and standards to evaluate and certify new candidate fuels.

The research has now shifted from the search for a drop-in fuel to developing solutions that will minimize the impact of a new fuel on the existing fleet. In response to the rapidly increasing concerns regarding the future availability of 100LL avgas expressed by the GA community, the UAT ARC was chartered on January 31, 2011, by the Federal Aviation Administration (FAA) Administrator to investigate, prioritize, and summarize the current issues relating to the transition to an unleaded avgas; and to recommend the tasks necessary to investigate and resolve these issues. The committee was also tasked to provide recommendations for collaborative industry-government initiatives to facilitate the development and deployment of an unleaded avgas with the least impact on the existing piston-engine aircraft fleet. The committee was comprised of key stakeholders from the GA community including aviation trade and membership associations, aircraft and engine manufacturers, petroleum and other fuel producers, the Environmental Protection Agency (EPA), and the FAA.

The UAT ARC Final Report provided 5 key recommendations and 14 additional recommendations to facilitate the transition to a fleet-wide replacement avgas. The five UAT ARC recommendations are:

1. Implementation of the "Fuel Development Roadmap – AVGAS Readiness Levels (ARL)" developed by the UAT ARC that identifies the key milestones in the avgas development process and the

information needed to support assessment of the viability of candidate fuels in terms of impact upon the existing fleet, production and distribution infrastructure, environment and toxicology, and economic considerations.

2. Centralized testing of candidate unleaded fuels at the FAA William J. Hughes Technical Center funded by government and industry in-kind contributions. Centralized assessment and testing would generate standardized qualification and certification data that can be used by the fuel developer/sponsor to support both ASTM specification development and FAA fleet-wide certification eliminating the need for redundant testing.
3. The establishment of a solicitation and selection process for candidate unleaded aviation gasolines for the centralized fuel testing program. This process should include a FAA review board with the technical expertise necessary to evaluate the feasibility of candidate fuels.
4. Centralized FAA fuel certification office with sufficient resources to support unleaded aviation gasoline projects.
5. Establishment of a collaborative industry-government initiative referred to as the Piston Aviation Fuels Initiative (PAFI) to implement the UAT ARC recommendations in this report to facilitate the development and deployment of an unleaded AVGAS with the least impact on the existing piston-engine aircraft fleet. The overall objective of this initiative is to identify candidate unleaded aviation gasolines, to provide for the generation of qualification and certification data on those fuels, and to support fleet-wide certification of the most promising fuels.

The FY 2014 request will support the implementation of UAT ARC Recommendation 2, and the funding will also support the development of candidate fuel standardized test procedures, followed by laboratory testing, rig testing, engine testing, and aircraft testing with unleaded avgas candidates. The testing will evaluate the safety impacts of deviating from the current leaded avgas specification and FFP properties. It will also provide data to support the industry qualification and FAA certification of the tested fuel. Research will address any safety impacts from using fuels that deviate from the traditional experience of the GA fleet including the reduction and removal of lead additives in avgas.

The research program will also provide data, knowledge, and support to update or create new certification methodologies, standards and Advisory Circulars (ACs) that promote continued airworthiness of aircraft engines, fuels, and airframe fuel management systems.

In FY 2013, major accomplishments planned include:

- Developed test methods to correlate in-flight detonation testing with ground-based engine test cell testing and comparison of industry and FAA TC detonation systems to support testing and evaluation of candidate unleaded fuels.
- Conducted detonation test of limiting engine using UL94 to support ASTM Task Force on UL94 production specification approval and to support verification of parametric model.
- Established capability to perform engine testing including test support equipment, instruments, contractor support, and independent lab support.
- Established capability to measure lead, NOx, CO, CO2, and THC emissions from piston aircraft engines.

The NextGen – Alternative Fuels for General Aviation Program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation. The FAA will work with the GA community and the EPA to evaluate the safety and environmental impacts and the performance of alternatives to conventional GA fuel. Near-term research will evaluate the safety and performance of reduced lead and unleaded aviation gasoline and provide data and research to support the qualification and certification of candidate unleaded fuels.

Why Is This Particular Program Necessary?

Approximately 167,000 aircraft in the United States and 230,000 worldwide rely on 100LL avgas for safe operation. 100LL is also the only remaining transportation fuel in the United States that contains the additive tetraethyl lead (TEL). TEL creates the very high octane levels required to prevent detonation (engine knock) in high power aircraft engines. Operation with inadequate fuel octane can result in engine failure and aircraft accidents.

Petitions and potential litigation from environmental organizations regarding lead-containing avgas have called for the EPA to consider regulatory actions to eliminate or reduce lead emissions from aircraft. Similar regulatory actions are being considered around the world. In response to rapidly increasing concerns expressed by the GA community, the FAA Administrator chartered the UAT ARC in January 2011. The UAT ARC issued their findings in a final report dated February 17, 2012. The UAT ARC was tasked with investigating, prioritizing, and summarizing the current issues relating to the transition of the GA community to an unleaded avgas and to recommend tasks necessary to investigate and address these issues. The UAT ARC was also tasked to provide recommendations for collaborative industry-government initiatives to facilitate the development and deployment of an unleaded avgas with the least impact on the existing piston-engine aircraft fleet.

The UAT ARC identified the following issues that they felt must be considered in any effort to transition the aviation industry to an unleaded avgas:

- An unleaded replacement fuel that meets the needs of the entire fleet does not currently exist.
- No program exists that can coordinate and facilitate the fleet-wide evaluation, certification, deployment, and impact of a fleet-wide replacement avgas.
- No market driven reason exists to move to a replacement fuel due to the limited size of the avgas market, diminishing demand, specialty nature of avgas, safety, liability, and the investment expense involved in a comprehensive approval and deployment process.
- No FAA policy or test procedures exist to enable fleet-wide assessment and certification of a replacement unleaded fuel.

Research is needed to develop standardized test procedures to evaluate proposed unleaded fuels and to understand and mitigate any safety impact on the existing fleet. Further, test methods and procedures necessary to support legacy fleet recertification on a new avgas do not exist.

How Do You Know The Program Works?

The proposed research program supports the comprehensive plan developed by the UAT ARC and is considered the most viable path towards addressing this pressing national environmental issue by all the stakeholders who participated in the committee. The success of the program relies on partnerships with industry consultants and subject matter experts, aviation technical research groups and standards bodies, and GA industry companies. These industry groups, many of whom participated in the UAT ARC, include the GA AVGAS Transition Coalition, CLEAN 100, the Coordinating Research Council Aviation Fuels Committee, the American Petroleum Institute, the Society of Automotive Engineers committees, and the ASTM D0.J aviation fuels committees. Members of these industry groups will contribute expert knowledge, test fuels, engines, parts, technical documentation, and access to engineering personnel to support the successful completion of the research. Cooperative research and development agreements (CRDAs) will be used to share resources between fuel manufacturers and engine and airframe manufacturers for successful completion of research. Future close working relationships with the GA industry will be necessary to ensure successful outcomes from the research program.

Why Do We Want / Need To Fund The Program At The Requested Level?

The requested funding level has resulted from a thorough review of the UAT ARC final report and recommendations by the FAA. The funding level has been determined to be the minimum necessary to meet the recommendations of UAT ARC and to also meet the FAA Destination 2025 performance metric for avgas. The FAA funding requested in this program is a complementary element of a wider-scope industry initiative that depends on the FAA participation. Consequently, the success of the industry program to develop and deploy an unleaded replacement avgas with the least impact on the existing fleet depends on the FAA successfully completing the research program at the requested level of funding.

A reduction in funding for the NextGen - Alternative Fuels for General Aviation Program could delay the empirical testing and assessments needed to produce data to determine the certification impact and safety assessment of whether the near term reduction in lead content of aviation gasoline could meet the estimated EPA target. Reductions in funding will also delay the completion of standardized test procedures and testing needed to support fleet-wide certification and will result in FAA's inability to meet the Administrator's Destination 2025 performance metric to have a replacement fuel available for leaded aviation gasoline that is usable by most GA aircraft by 2018.

Detailed Justification for
A11.n NextGen - Advanced Systems and Software Validation

What Is The Request and What Will We Get For The Funds?

FY 2014 – NextGen - Advanced Systems and Software Validation

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A11.n NextGen - Advanced Systems and Software Validation	$0	$0	$1,021,000	+$1,021,000

For FY 2014, $1,021,000 is requested for NextGen - Advanced Systems and Software Validation. Major accomplishments planned include:

System Complexity Effects on Aircraft Safety

- Identify effects of system complexity on aircraft safety margins and investigate highly integrated, complex airborne systems being difficult to validate and verify and the potential for a reduction in aircraft safety margins with highly integrated, complex airborne systems.
- Define complexity, investigate quantification of complexity beyond the usual metrics, and determine if an aircraft can become too complex to certify.

Assessment of the Current Safety Process

- Identify possible issues with the current process used by the commercial aviation industry regarding requirements' definition, validation, and verification for aircraft digital system requirements to ensure their applicability to NextGen systems.

Component-based Approval

- Examine safety issues associated with, and potential approaches to, safely approving independently-verified components when part of a larger non-federated system.

Integration of Complex Digital Systems

- Identify specific proposals to address what specific tasks are necessary to ensure complex digital systems have been fully integrated.

The program will evaluate system considerations for aircraft systems relative to the increasing levels of airborne and ground systems integration in the NextGen environment. Research activities include studies of mitigation strategies and potential safety impacts of avionic systems; partnering with industry and other Government agencies to assess and identify electronic systems; assessment, validation, and clarification of system development standards, SAE ARP-4754a and SAE ARP-4761; and studies of the electromagnetic spectrum, such as signal event effects due to cosmic rays and electromagnetic compatibility of airborne systems that may cause safety events. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The FAA establishes rules for the certification and operation of aircraft. The agency uses research results to generate Advisory Circulars (ACs) and other forms of technical information to guide certification and airworthiness specialists and inspectors on acceptable means for meeting requirements.

This program supports development of policy, guidance, technology, and training needs for highly integrated and complex systems expected to operate in a NextGen environment that relies on digital systems and is tightly integrated across airborne and ground-based components. The program includes research to identify possible issues and shortcomings with the current processes used by the commercial aviation industry regarding requirements definition, validation, and verification for complex airborne digital systems; determine acceptable means to analyze, integrate, validate and verify airborne systems; and investigating electromagnetic compatibility and the system safety analysis process for complex systems.

The FAA works with committees within SAE International and RTCA to take advantage of the members' technical expertise in developing standards and to expedite industry acceptance. For example, FAA participates in SAE S-18 Committee which recently updated ARP-4754a "Guidelines for Development of Civil Aircraft and Systems". This document and was recognized in FAA Advisory Circular AC 20-174.

The NextGen - Advanced Systems and Software Validation program supports the Department of Transportation (DOT) strategic goal of Safety by reducing transportation related injuries and fatalities on commercial air carrier and general aviation. The program develops and assesses ways to ensure advanced airborne systems can safety operate.

Why Is This Particular Program Necessary?

As the rapid advancement of electronic and computer technologies continues, their applications in aircraft systems as well as NextGen air traffic management (ATM) are getting more and more complex and dynamic. The implementation of various types of networks to support different airborne functions, such as flight controls, air navigations, digital communications, flight plans, on-board entertainment, and passenger Internet services, have further complicated the FAA certification requirements, airworthiness determinations, and their safety risk assessments. This research supports the FAA aircraft certification process that includes work to assure digital systems function properly, reliably, and safely as we move towards NextGen. Research outputs include technical data, reports, compliance methods, verification methods, and certification techniques that aid development of policy, guidance, and training materials.

How Do You Know The Program Works?

This program is beginning in FY 2014. The program will be an integral part of the FAA Aviation Safety Office Aircraft Certification Services Program Management Plan for software and airborne electronic hardware (SW & AEH). The program reflects continuous improvement and risk management and includes areas of research, policy and guidance development, training, and harmonization and standardization. The FAA will measure the success of this program on the extent aircraft safety is promoted through the implementation of the research results, and by its impact on timely certification of key emerging, highly-complex, advanced flight control system and other aircraft systems anticipated in NextGen.

Why Do We Want/Need To Fund The Program At The Requested Level?

If funding for this program is reduced, the ability of the FAA and industry to evaluate digital, emerging, highly-complex, advanced flight control system and other aircraft systems would be negatively impacted. Consequently, certification specialists would find it difficult to properly assess proposed aircraft and systems designs which employ this technology for flight-essential and flight-critical applications. Further, the FAA would not be able to determine if certification policy, criteria, or training would be needed to accommodate new technologies or methodologies. A further risk of not performing this research is the reduced ability to develop, validate, and improve certification methods and the inability to reduce time and cost to both FAA and industry in certifying aircraft. These risks may impact implementation of key NextGen capabilities.

Detailed Justification for
A12.a Joint Planning and Development Office

What Is The Request and What Will We Get For The Funds?

FY 2014 – Joint Planning and Development Office (JPDO)

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A12.a Joint Planning and Development Office	$5,000,000	$5,031,000	$12,057,000	+7,057,000

For FY 2014, $12,057,000 of funding is requested for the JPDO. Major accomplishments planned include:

National Goals for Unmanned Aircraft Systems (UAS) Integration

- Execute the strategic National program plan for UAS integration.

Interagency Data Exchange Definitions and Policies

- Identify existing Net-Centric capabilities to support interagency requirements.
- Use the virtual test capability, that the JPDO transferred into FAA's R&D environment, to demonstrate information exchange capabilities and validate interoperability issues without impact to the National Airspace System (NAS). Incorporate the results and provide recommendations to interagency programs.

NextGen Research Priorities

- Continually identify, define, and coordinate research gaps related to UAS and Trajectory Based Operations (TBO) needed to obtain full NextGen capabilities.
- Review technology development and innovation to identify opportunities for technology transfer among Federal entities and/or industry.

Federal Requirements for Surveillance Data and Sensors (Integrated Surveillance)

- Complete an initial architecture to describe the federal air surveillance enterprise. Base the high-level architecture on the capabilities outlined in the Integrated Surveillance Concept of Operations.
- Continue to define and conduct a series of forums to identify independent activities of the surveillance mission partners that should be synchronized.
- Conduct technical and policy analyses to support governance of joint surveillance capabilities. These activities will ultimately result in Federal surveillance systems that communicate with each other thereby ensuring common situational awareness that avoids conflicting efforts and costs.

JPDO will identify major risks, propose mitigations, and gain ownership commitments for goals and activities in the UAS Comprehensive Plan and adjust the plan, as needed, based on progress and the changing environment.

Safe integration of UAS into the NAS is a national priority. To initiate a collaborative, national approach to UAS integration, in FY 2013 the JPDO prepared the UAS Comprehensive Plan. This strategic Plan included six national goals, highlighted the Federal Aviation Administration (FAA) roadmap for UAS integration and provided a framework for prioritizing UAS research. This strategic view sets the groundwork for more detailed analysis, coordination and implementation in FY 2014.

JPDO will identify information data sharing requirements, processes and applications that can be applied within specific functional areas (such as surveillance) that can then be shared for use by all NextGen partner agencies. The research will emphasize interagency data sharing standards and policies.

Although FAA is developing and deploying some particular aspects of TBO in the midterm, research is required to test and prove the benefits for more automated capabilities. JPDO will establish the research priorities needed for the safety case for TBO for the future, 2025 and beyond. TBO will provide additional capacity and increase flexibility through precision performance against agreed to and predictable flight paths that are managed by automation to ensure safety. Automation will monitor aircraft performance against a known flight path and detect and resolve potential conflicts, freeing the human from detecting and correcting these situations as they arise. The automated nature of this approach will enable more predictable flights thereby increasing capacity. JPDO's FY 2014 effort will build upon our prior modeling, financial analyses, and studies that identified the upcoming NextGen challenges documented as "Targeted NextGen Capabilities for 2025," and will set the future path for interagency TBO investment.

JPDO will continue to coordinate partner agency investments to develop technical plans that will lead to a formal interagency coordination process for research and development, requirements development and validation, and acquisition of Integrated Surveillance capabilities. Specifically, the JPDO will develop a high-level enterprise architecture through 2035, when the Common Air Route Radar is approaching its planned life-cycle limit, which describes the needed capabilities to support a national air surveillance strategy.

What Is This Program?

The JPDO executes collaborative processes to ensure efficient coordination between all Federal partners whose decisions impact NextGen, namely the FAA, NASA, and the Departments of Defense, Homeland Security, and Commerce (DoD, DHS, and DOC). The JPDO provides a National "big picture" perspective that encompasses a broad Federal view of NextGen. The Office is developing a framework for NextGen planning and development, identifying and prioritizing key multi-agency concerns, and driving consensus in the development of investment choices and decisions thereby improving efficiencies, ensuring cross-Federal compatibility, and reducing costs.

In the completion of its work, the JPDO conducts and disseminates a wide variety of studies including cost, benefit and risk assessments; policy analysis; modeling and simulation; and program management and integration. The FAA Modernization and Reform Act of 2012 includes all original responsibilities of the JPDO and Senior Policy Committee (SPC) set forth in the organic statute known as Vision 100 (P.L. 108-176) which established the JPDO in 2003. The 2012 Act adds responsibilities for the JPDO and its interagency partners, and requires the SPC to meet two times per year. Maintaining the NextGen vision and facilitating a public/private partnership to manage critical collaborations needed to make NextGen a reality are among the JPDO's responsibilities.

The JPDO convenes the SPC to provide strategic policy guidance for NextGen. The SPC is chaired by the Secretary of Transportation and its members include the heads of the participating departments and agencies, as well as the Director of the Office of Science and Technology Policy and the Office of the Director of National Intelligence (ex officio). In support of the SPC, the JPDO governance structure has a Board, chaired by the JPDO Director, whose members are executives from each department/agency who meet quarterly and work continuously to resolve issues directed by the SPC.

The JPDO is comprised of employees from FAA and the other Federal partners. This ensures that all the partners may benefit from a multi-departmental perspective when developing future plans, contract requirements, technical specifications, etc. The JPDO workforce actively facilitates and engages researchers, program managers and executives from among the partner agencies to formulate the interagency view.

The private sector is also an integral part of JPDO's work. In 2006, the NextGen Institute was established as an alliance of major aviation stakeholder communities to ensure industry engagement. The Institute, together with nine government/industry Working Groups, helped formulate the vision for NextGen. Today, the Institute continues to host public/private forums, support study teams and bring the right experience and range of viewpoints to inform NextGen analyses. With the Institute, the JPDO has taken steps to ensure NextGen will work seamlessly with other global aviation systems focusing on stakeholder priorities.

In FY 2013, accomplishments planned include:

- Formulated the Comprehensive Plan for UAS integration
- Refined NextGen partner agencies' requirements for UAS operation
- Conducted cost, benefit, and risk assessments using modeling and simulations of relevant scenarios to establish possible transition steps and milestones
- Analyzed policy options and implications for UAS integration
- Identified information data sharing requirements, processes, and applications that can be applied within specific functional areas (such as surveillance) which can then be shared for use by all NextGen partner agencies.
- Used the virtual interagency test environment to address the UAS information sharing and infrastructure requirements, policies, and standards of all agencies (Federal, Local, and State) without impacting the operational environment upfront
- Performed analysis on national surveillance sensor capabilities for non-cooperative aircraft
- Performed analysis on software that will enable all mission partners to share a common operating picture
- Identified, defined, and coordinated research gaps related to UAS and TBO
- Reviewed technology developments and innovation to recommend opportunities for technology transfer among Federal entities and/or industry
- Applied program management and integration to ensure research content (needs and priorities) is updated within the Joint Planning Environment, a database framework that supports interagency decision-making and plans
- Engaged industry stakeholders via the NextGen Institute
- With the NextGen Institute, developed, tested, reviewed, and documented stakeholder perspectives on NextGen concepts and analyses including the TBO safety case, weather, and harmonization of global implementation of air transportation
- Defined and conducted a series of stakeholder engagement forums to formulate the UAS program plan across Federal entities
- Convened the Senior Policy Committee (SPC) for the Secretary of Transportation

The JPDO's work directly links to the Department of Transportation (DOT) strategic goal of Economic Competitiveness and the FAA's Destination 2025 goals.

Why Is This Particular Program Necessary?

The JPDO is Congressionally-mandated to provide the multi-agency governance that guides the development of the Nation's air transportation system. The JPDO convenes the Senior Policy Committee, comprised of Cabinet-level Secretaries, to develop goals, align resources, and ensure that stakeholders are involved in decision-making. This dialogue will help prevent duplication and will ensure NextGen systems will work with those of the other Federal partners. The JPDO ensures research coordination with the international community so that NextGen will work seamlessly with other global aviation systems.

The JPDO is future focused and provides coordination among all the Federal partners affected by NextGen decisions. In the future, use of airspace will be more integrated, considering civil aviation, defense and homeland security. This need for integration will make airspace more complex while all missions must operate together. Further, the pace of technology is unfolding rapidly requiring all departments to have full situational awareness of new developments. The JPDO provides the common view.

The JPDO, working together with partner agencies and industry, defines the capabilities and mechanisms that enable the national air transportation system to accommodate a wide range of customers. The JPDO has a strategic view, assessing needs for research, technologies and policies in a dynamically changing global environment. Because the JPDO is not a research performer, implementer or operator, its role is well-suited to analyze a range of possible solutions and guide the Federal partners to one successful solution that best meets the needs of all the partners.

In recent studies, the Government Accountability Office (GAO) and Office of the Inspector General (OIG) have reported the need for technology transfer, research into human factors and weather, development of integrated surveillance capabilities and integration of UAS. The JPDO's work plan is actively emphasizing these key areas with government and industry partners.

How Do You Know The Program Works?

The following items are recent examples to illustrate how JPDO efforts translate into technology transfer and agency action:

- The SPC, a cabinet-level decision-making body chaired by DOT, relies on JPDO support. In 2010, the SPC endorsed the JPDO's Integrated US Air Surveillance Governance Report and called for its expedited implementation as part of the Air Domain Awareness initiative led by DHS. During 2012 and 2013, the JPDO held a series of technical interchanges where surveillance experts identified emerging capabilities. This coordination gives agencies the opportunity to leverage each other's work and enhances the efficiency of Integrated Surveillance efforts, ensuring that duplication does not occur.
- The JPDO used a collaborative approach to create the UAS Comprehensive Plan during 2012 and 2013. The JPDO engaged industry and all five NextGen partner agencies to create a framework and reveal an evolving capability for successfully achieving safe integration beginning in 2015. This strategic view includes a set of national goals and objectives, an FAA concept of operations, and an initial assessment of UAS research. Through a series of one-on-one sessions and stakeholder workshops, the JPDO developed scenarios and diagrams to depict UAS operations in the 2025 timeframe allowing a common viewpoint for discussion and deliberation of UAS integration in a NextGen environment.
- The JPDO works with DOC, FAA, and DoD on developing a vision for aviation weather management that is focused on the aviation user. The JPDO regularly facilitates a senior executive panel, known as the NextGen Executive Weather Panel, who oversaw the development of a joint program plan. Aligned with the joint plan and its weather information governance structure, during FY 2011 the FAA and the National Weather Service demonstrated the ability to share and discover many types of weather data within an interagency, net-centric environment.
- In 2012, NASA successfully transferred their research results to define and validate the Efficient Descent Advisor concept to the FAA. The JPDO, FAA, and NASA established the Research Transition Team, who completed this work, in 2008. Through the joint efforts between the FAA, NASA, industry and airlines, the Three Dimensional-Path Arrival Management (3D-PAM) technology was delivered to the Air Traffic Organization for potential operational use following additional evaluation. The 3D-PAM technology is an initial implementation of Trajectory-Based Operations, a key component of NextGen. The benefits are fuel and emissions savings due to flying a more efficient profile, and reduced workload for air traffic controllers.
- In 2012, the JPDO published the National Aviation Safety Strategic Plan which defines national goals, objectives, and strategies for aviation safety improvements. It provides a basis for NextGen partners to plan their aviation safety resources and a way for the Office of Management and Budget (OMB) to align budgets. This plan was developed and vetted over several years with government partners, subject matter experts and industry stakeholders.

Why Do We Want / Need To Fund The Program At The Requested Level?

Without the requested funding, the JPDO will not be able to accomplish its Congressionally-mandated objectives to oversee NextGen research, coordinate aviation and aeronautics research programs, and maintain a multiagency integrated NextGen plan.

The JPDO ensures efficient coordination and collaboration among NextGen partner agencies. It addresses key interagency priorities identified by the SPC for NextGen. Without the benefit of a dedicated, co-located interagency entity, the Nation can expect increased costs due to both the duplication of systems and the development of systems that will not work together for all missions (civil, defense and homeland security). The JPDO maintains a future focus and is able to provide the broader perspectives and insights that are necessary for Department decision-makers to review and assess NextGen investment and policy decisions. For example:

- Demand for UAS access to the NAS is increasing rapidly with the US Government expected to invest more than $19 billion for UAS through 2015. JPDO is leading efforts with the NextGen partners to develop a comprehensive plan that identifies the National goals for UAS integration into the NAS including agency requirements, transition steps, coordinated activities and milestones.
- Every agency needs data and sensors to see all aircraft (cooperative and threats) to meet its own mission. JPDO is working to ensure there is an understanding of individual agency mission needs, capabilities, and requirements, resulting in coordinated solution decisions. Without cross-agency requirements and implementation plans, duplication, inefficiency and gaps will exist resulting in individual and uncoordinated solutions. Consequently, there is an increased risk to national security.
- Information is the backbone of NextGen. The capabilities detailed in the NextGen Concept of Operations will not be successful without ensuring that the right parties have the right information at the right time. The JPDO is coordinating with partner agencies to identify information exchange requirements which will reduce the cost of having multiple stove-piped systems that cannot quickly communicate.
- National aviation-related policy issues that the partner agencies have identified as important in NextGen implementation will not be addressed without this program, leading to uncoordinated FAA NextGen decisions which will have a negative impact on other Federal systems.

Detailed Justification for
A12.b NextGen – Wake Turbulence

What Is The Request and What Will We Get For The Funds?

FY 2014 – NextGen - Wake Turbulence

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A12.b NextGen - Wake Turbulence	$10,674,000	$10,739,000	$9,267,000	-$1,407,000

For FY 2014, $9,267,000 is requested for NextGen - Wake Turbulence research. Major accomplishments planned include:

Wake Standards for New Aircraft Designs

- Complete work with European Aviation Safety Agency and the Airbus Company on recommendations for the Airbus A-350 series aircraft.

Analysis of Airports for Characteristics That Allow Reduction of Required Wake Separations between Aircraft

- Approval of capacity enhancing wake turbulence mitigation procedures for the Phoenix and Las Vegas airports' closely spaced parallel runways (CSPR).

Development of NextGen Wake Procedure/Decision Support Tool Concepts

- Complete a functional design of a wind prediction algorithm for use with the Wake Turbulence Mitigation for Single Runways decision support tool feasibility prototype.

Determination of Statistical Wake Encounter Frequency/Severity

- Deliver an aircraft flight data recorder screening tool capable of detecting likely wake encounters (minor or less) that occur during an aircraft's flight. This data will be used for further study to help establish the statistical frequency of wake encounters occurring in today's operating environment.

Develop Models, Data Bases and Data Sources

- Complete FAA infrastructure design concept for acquiring and integrating aircraft derived performance and observed weather information into air traffic control (ATC) wake turbulence mitigation decision support tools.

The program provides solutions to support the nation's airspace structure and airports in meeting today's and NextGen's air traffic capacity demands. Development of more capacity-efficient ATC wake separation mitigation procedures and processes for terminal area and en-route operations will enable more flights in today's constrained, high demand airspace and increase the operational capacity of our present airport runways.

Development of capacity-efficient ATC wake turbulence mitigation separation minima, procedures, and processes along with associated ATC decision support tools (DSTs) will directly fill some of the gap between expected demand and National Airspace System capacity. High level analyses have indicated that some additional runway capacity could be obtained at airports if the wake turbulence separation processes could be optimized to consider the performance characteristics of the aircraft generating the wake, the weather conditions along the approach and departure paths to and from the runway, and the wake encounter performance characteristics of the aircraft following the generating aircraft. NextGen enhanced aircraft surveillance, positioning, and data sharing infrastructure will allow less required separation between aircraft in constricted en-route airspace – allowing more flights through that airspace. The outputs from this R,E&D program will provide various levels of separation standard, procedure complexity, and technology application to help meet the runway and high demand airspace needed capacity. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The NextGen - Wake Turbulence program conducts applied research to improve, in terms of flight efficiency and safety, aircraft separation processes associated with today's generalized and static air navigation service provider (ANSP) wake turbulence mitigation separation standards. For example, during periods of less than ideal weather or visibility conditions, implementation of an ANSP DST that adjusts required wake separations based on wind conditions would allow the ANSP airport to operate at arrival rates closer to their visual flight rule arrival capacity. Additionally, the research program is developing wake-mitigation application solutions that safely enable reduced aircraft separations in congested air corridors and during arrival and departure operations at our nation's busiest airports.

This research addresses the needs of the FAA Air Traffic Organization and works with the agency's Aviation Safety Organization to ensure new capacity-efficient 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 research program works with controllers, airlines, pilots, and aircraft manufacturers to include their recommendations and ensure training and implementation issues are addressed in the program's research from the start. Customers include pilots, air traffic control personnel, air carrier operations, and airport operations. Stakeholders include the Joint Planning and Development Office, commercial pilot unions, FAA unions, other International Civil Aviation Organization (ICAO) air navigation service providers, and aircraft manufacturers.

The requested funding for FY 2014 will support the accomplishment of the following NextGen Operational Improvements:

- Automated Support for Separation Management
- Wake Turbulence Mitigation for Departures (enhancement)
- Improved Parallel Runway Operations (7110.308)
- Efficient Metroplex Merging and Spacing
- Wake Turbulence Mitigation for Arrivals – System
- Single Runway Departure and Arrival (Wake Turbulence Mitigation – Single Runway – WTMSR)
- Reduce Separation- High Density Terminal Less Than 3-miles
- Dynamic, Pairwise Wake Turbulence Separation
- Reduce Horizontal Separation Standards, En Route – 3 miles

These Operational Improvements all need safe reductions in wake separations currently applied between aircraft to gain flight capacity in the National Airspace System. The NextGen – Wake Turbulence research FY 2014 projected accomplishments listed above are the first incremental steps required to achieve these desired separation reductions.

In FY 2013, major planned accomplishments include:

Wake Standards for New Aircraft Designs

- Worked with the European Aviation Safety Agency and the Airbus Company, and developed initial wake separation recommendations for the Airbus A-350 series aircraft. Initial recommendations began a coordination and revision process that will complete in FY 2014.

Analysis of Airports for Characteristics That Allow Reduction of Required Wake Separations between Aircraft

- Developed capacity enhancing wake turbulence mitigation procedures and associated Safety Risk Management Document and supporting analyses for the Phoenix and Las Vegas airports' closely spaced parallel runways (CSPR).

Development of NextGen Wake Procedure/Decision Support Tool Concepts

- Completed detailed statistical crosswind versus wake transport for the approach and departure corridors for airports that are candidates for the Wake Turbulence Mitigation Single runway DST.

Determination of Statistical Wake Encounter Frequency/Severity

- Completed initial validation testing of an aircraft flight data recorder screening tool that that is able to detect for further study likely wake encounters (minor or less) that occurred during an aircraft's flight. Will be used to help establish the statistical frequency of wake encounters occurring in today's operating environment.

Develop Models, Data Bases, and Data Sources

- RTCA published the Operational Services and Environmental Description for "Aircraft Derived Meteorological Data via Data Link for Wake Vortex, Air Traffic Management, and Weather Applications". Development of this document was led by the FAA Wake Turbulence Research team with the support of aircraft manufacturers, air carriers, FFRDCs, and avionics manufacturers.

The NextGen - Wake Turbulence program supports the Department of Transportation (DOT) strategic goal of Economic Competitiveness as well as the FAA's Destination 2025 goals of Delivering Aviation Access through Innovation and Improved Global Performance through Collaboration through obtaining greater flight capacity.

Why Is This Particular Program Necessary?

Wake turbulence research provides the data, analysis, modeling and aircraft wake turbulence information collection systems that are needed to "bring to market" wake turbulence mitigation standards, procedures, and processes that allow safe but more capacity efficient aircraft-to-aircraft wake separations. The research has produced airport specific procedures and safety analyses to bring a new air traffic control wake mitigation capacity enabling procedure into everyday operation at airports with closely spaced parallel runways (CSPR). More airports are requesting similar analysis support to allow their use of the dependent 1.5 nm diagonal approach procedure on their CSPR when instrument approach procedures are required.

In FY 2014 NextGen - Wake Turbulence research will further explore using predicted and monitored approach corridor crosswinds to allow reduced wake separations between aircraft landing behind each other onto a single runway. This is the next development step after the research's prior work on capacity enabling wake separation solutions for airport CSPR. A solution for safely reducing wake separation during instrument flight rule operations to a single runway will allow more operations at an even greater number of the nation's busiest airports.

How Do You Know The Program Works?

The NextGen – Wake Turbulence R,E&D program has produced validated concepts for applying aircraft performance characteristics and runway crosswind information to reduce the required wake mitigation separations applied to aircraft arriving to and departing from an airport's runways. The research products have been transitioned into the FAA F&E NextGen - Wake Re-Categorization, Wake Turbulence Mitigation for Departures, and Wake Turbulence Mitigation for Arrivals programs. These F&E programs, when implemented, will provide air traffic control with decision support tools that will allow them to safely reduce the wake separations between aircraft when crosswinds blow the wakes out of the way of trailing aircraft. Reduced wake separations equate to more airport operations per hour when the airport is busiest. Aircraft manufacturers, airports and air carriers agree that squeezing in more operations onto an airport's existing runway structures results in major savings in flight delays during bad weather and time period directly following a major weather event.

Recent evidence that the research program works are the following:

- The publishing of FAA Order 7110.308, "1.5-Nautical Mile Dependent Approaches to parallel Runways Spaced Less than 2,500 Feet Apart" in CY2008 with subsequent changes (change 2, September 2010) that allows airports with certain CSPR configurations to use this airport capacity enhancing wake separation procedure when weather and/or visibility conditions require the use of instrument flight rule operations. Use of the procedure could add up to 10 more flight operations per hour. The order is based on this program's wake data collection and analysis work at Lambert – St. Louis International Airport and other airports in the US and Europe.
- NextGen – Wake Turbulence research constructed the operational concept for the decision support tool plus generated the crosswind prediction and monitoring logic for the decision support tool. This tool will also begin operation at Memphis International Airport and at the San Francisco International Airport in FY 2013.
- FAA adopted revised, safe, and more capacity-efficient wake separation standards at Memphis International Airport on November 1, 2012. These more capacity efficient standards are highly desired by air carriers, with FedEx realizing a 10+% reduction in departure delays at Memphis International Airport when they are running their peak departure operation.
- The FAA working with the Boeing Company and the European Aviation Safety Agency (EASA) determined the ATC wake separations to be applied to the new Boeing 747-8 series aircraft and the Boeing 787 series aircraft. All the aircraft performance data was furnished by the Boeing Company to the FAA and EASA. The FAA's NextGen – Wake Turbulence research project provided the analysis and modeling required to validate Boeing's provided data and establish the required wake separation for the aircraft series. The wake separation recommendations were then provided to ICAO who then transmitted them to its member states in FY 2011. These wake separation standards determinations were needed for the aircraft to enter global operational service.

Why Do We Want / Need To Fund The Program At The Requested Level?

The NextGen – Wake Turbulence research addresses the FAA's near term need (capacity enhancing wake mitigation procedures/processes) for enhancing current operations and developing wake mitigation solutions that will be required as FAA transitions to trajectory based and flexible terminal operations. The FY 2014 requested funding will provide the needed wake solution concepts and underlying technology, collected data and analysis in a feasible time frame. Developing wake separation capacity is a research priority because it enhances today's air traffic control operational environment. A significant reduction in funding would delay programs that rely on these wake separation standards, such as development of the concepts and supporting technology for reducing the wake separations applied by ATC during instrument flight rule operations to and from a single runway.

Detailed Justification for
A12.c NextGen - Air Ground Integration Human Factors

What Do I Need To Know Before Reading This Justification?

NextGen - Self Separation Human Factors budget item has been merged into this budget item. Since these budget items were started in FY 2009, the research efforts have evolved along with the NextGen portfolio such that they are now focused primarily on the human factors aspects of air-ground integration. To more efficiently and effectively manage the research, the FAA is merging these two programs into one. This will allow the FAA to better manage the research and reduce duplicative program management efforts.

What Is The Request and What Will We Get For The Funds?

FY 2014 – NextGen - Air Ground Integration Human Factors

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A12.c NextGen – Air Ground Integration Human Factors	$10,500,000*	$10,564,000*	$10,329,000	-$171,000

*includes the previous NextGen – Self-Separation Human Factors budget item

For FY 2014, $10,329,000 is requested for NextGen - Air Ground Integration Human Factors. Major accomplishments planned include:

Data Communications - Guidance for certification and flight standards personnel

- Initiate follow-on research to provide recommendations for displays, alerts, procedures and training associated with data communications.

Error Detection and Correction - Guidance for certification and flight standards personnel

- Complete draft research report describing internal and external non-normal checklist design factors, common errors committed by flight crews during non-normal checklist and procedure execution with proposed recommendations for the ways in which checklist design might mitigate these errors.

Information Requirements - Guidance for certification and flight standards personnel

- Initiate research to identify issues associated with information automation and develop recommendations for mitigating these issues.

Automatic Dependent Surveillance – Broadcast (ADS-B) Applications

- Provide human factors guidance material including recommendations for NextGen applications.

Advanced Vision Technologies for Low Visibility Operations

- Conduct human factors evaluation of current low visibility procedures for approach, landing, and takeoff to identify operational and human performance issues and recommendations for mitigation.

Instrument Procedure Design and Use

- Complete report documenting results of research on electronic chart usability and recommended certification guidance.
- Develop plans for research to develop guidance on charting of taxi routes for low visibility operations, depiction of area navigation (RNAV) airways, and continue research to develop recommended design and evaluation guidance for flight crew procedures for Performance Based Navigation (PBN) operations.

The FY 2014 NextGen – Air Ground Integration Human Factors research program will continue to generate scientific and technical information that will lead to recommended guidance for aircraft certification and flight standards approval of technologies and procedures that enable NextGen operations. The research results and associated recommendations are the foundation for human factors advisory material and standards for flight deck equipment and procedures as well as flight crew operations and training. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The research develops guidance to implement NextGen capabilities with the changes in roles and responsibilities between pilots and controllers and between humans and automation. Human and system performance requirements are defined and guidance for the approval of design and operation of aircraft are developed. Scientific and technical information related to flight crew information needs, human capabilities, interface design, and systems integration issues is developed. Research also produces risk and error management strategies, mitigating risk factors, and guidance for approval of flight deck systems and operating recommendations to reduce the likelihood of human error in NextGen.

The research program develops human factors scientific and technical information to address human performance and coordination among pilots and air navigation service providers (air traffic controllers), human system integration, and error management strategies to implement NextGen capabilities. Human factors technical information also supports the development of standards, procedures, training, policy, and other guidance material required to implement the operational improvements leading to delegated separation and other applications of ADS-B/CDTI technologies. By addressing human factors issues, this research generates guidance that helps prevent unsafe displays of traffic information and helps prevent unsafe operational use of these displays, so that the intended safety benefits of ADS-B can be realized.

In addition, the instrument procedures research results inform regulatory guidance and orders such as FAA Order 8260.3 (TERPS) and associated guidance material for flight checking and operational approval documents (AC 90-100 and AC 90-101), and charting guidelines. The guidelines address known difficulties with use of instrument procedures, and also address future instrument procedure requirements.

In FY 2013, major accomplishments planned include:

Data Communications - Guidance for certification and flight standards personnel

- Displays and User Interface: Recommended minimum requirements for alternative and supplemental data communication displays and controls in the flight crew forward field of view to reduce head-down time.
- Procedures and Operations: Evaluated and recommended pilot-air traffic control (ATC) procedures for negotiations and shared decision making NextGen activities.
- Message Set: Provided recommended human factors improvements to the RTCA SC-214 message set and recommended International Civil Aviation Organization (ICAO) training requirements for non-native English speaker proficiency in reading and writing to ensure comprehension and compliance with ATC clearances and instructions transmitted via data communications.

Error Detection and Correction - Guidance for certification and flight standards personnel

- Developed draft research report identifying alerting issues and alerting philosophies related to non-normal situations.

Information Requirements - Guidance for certification and flight standards personnel

- Completed literature review on information automation including an analysis of human factors issues and recommendations for mitigating those issues.

- Completed initial research to address human-automation integration issues regarding the certification of pilots, procedures, training and equipment necessary to achieve NextGen capabilities.

ADS-B Applications

- Recommended flight deck display and operational approval requirements based on NextGen human factors research to address CDTI.

Advanced Vision Technologies for Low Visibility Operations

- Conducted human factors simulation and flight trials to evaluate and recommend safe decision height and flight crew qualification and training requirements to allow operations beyond current 14 CFR 91.175 use of Enhanced Flight Vision Systems (EFVS) for approach below minimums to 100 ft., such as operational credit for EFVS for approach to touchdown and operational credit for use of Synthetic Vision Systems (SVS) to 100 ft. in low visibility conditions.
- Applied human factors techniques to determine minimum characteristics for aircraft equipage and operational procedures for approval to use EFVS and SVS technologies for additional operations, including surface movement, rollout and takeoff, merging and spacing, or in lieu of certain infrastructure requirements.

Instrument Procedure Design and Use

- Through human factors analysis, identified and evaluated instrument procedure design factors leading to flight crew error in RNAV departures and arrivals.
- Conducted human factors analytical techniques to recommend instrument procedure design guidance, and flight crew procedural and training approaches to mitigate flight crew errors related to characteristics of instrument procedures.

Research supports development of policy, standards and guidance required to design, certify and operate NextGen equipment and procedures. Additionally, this research will include integrated demonstrations of NextGen procedures and equipment in the context of ongoing NextGen - Air Ground Integration Human Factors research.

The NextGen - Air Ground Integration Human Factors program supports the Department of Transportation (DOT) strategic goal of Safety and addresses flight deck and air traffic service provider integration for each operational improvement or NextGen application considered, with a focus on those issues that primarily affect the pilot side of the air-ground integration challenge. Through use of modeling, simulation, and demonstration, the program assesses interoperability of tools, develops design guidance, determines training requirements, and verifies procedures to support certification, flight standards, and Air Traffic Organization (ATO) service units for ensuring safe, efficient and effective human system integration in transition of NextGen capabilities.

Why Is This Particular Program Necessary?

NextGen involves implementation of new complex systems and flight crew procedures. The NextGen - Air Ground Integration Human Factors program supports the FAA Aviation Safety (AVS) certification and operational approval processes and also provides tools to address flight crew procedures, maintenance procedures, training development, and continuous safety monitoring. Specific human factors research activities in this R&D program address advanced flight deck automation and air ground digital data communications technologies.

Planned human factors R&D efforts are addressing flight deck displays, message content, and procedures for disseminating data communications to support transfer of routine ATC clearances, route clearances and negotiations, reroute requests, transfer of voice frequency channels, exchange of near term hazardous weather information, and flight crew reports for appropriately equipped aircraft. Specific research plans are developed in coordination with FAA stakeholders including those in the AVS line of business including

Aircraft Certification Service and Flight Standards Service, and ATO program offices such as Data Communications, Surveillance and Broadcast Services, and offices within the NextGen organization (ANG).

NextGen involves implementation of new complex systems and flight crew procedures. FAA's aviation safety mission dictates that we ensure those systems are reliable and safe, even when they fail, and that we address the operational aspects of these systems. The research program supports the AVS certification and operational approval processes and also provides tools to address flight crew procedures, maintenance procedures, training development, and continuous safety monitoring. Specific human factors research activities in this R&D program address NextGen procedures such as RNAV and required navigation performance (RNP), and NextGen capabilities such as those derived from the use of ADS-B.

How Do You Know The Program Works?

The success of this program is measured by the amount of research (reports and findings) that is incorporated into the FAA's regulatory and guidance material. Each research project is requested to provide data needed to update specific FAA regulatory and guidance documents to ensure human factors issues are identified and addressed. For example, the research requested by FAA groups responsible for evaluating and approving new NextGen avionics (the Avionic Systems Branch, the Technical Programs and Continued Airworthiness Branch, and the Flight Technologies and Procedures Division) ensure that the key human factors issues with electronic flight bags (EFB), DataComm, etc., are identified and addressed. The results of previous years' research have been directly folded into the respective FAA Advisory Circulars (ACs) (e.g. the EFB AC 120-76B and for DataComm AC 20-140). Each research requirement submitted by the FAA end-users/sponsors clearly identifies the FAA regulatory and guidance documents that will benefit from the research.

Why Do We Want / Need To Fund The Program At The Requested Level?

This research provides human factors recommendations using scientific and technical information to assist Aircraft Certification Service and Flight Standards Service personnel in their evaluation of new technology and operational procedures that are necessary to achieve flight deck and integrated air-ground capabilities supporting NextGen applications. A reduction in funding to the NextGen - Air Ground Integration Human Factors program would defer and disrupt the ability to provide this essential information and would interfere with planned timelines for aircraft equipage and flight crew qualifications necessary to achieve scheduled Initial Operating Capabilities (IOCs) for NextGen applications. A funding reduction could impact or delay anticipated ADS-B, Data Communications, and Synthetic and Enhanced Vision Systems efficiencies.

Detailed Justification for
A12.d NextGen – Weather Technology in the Cockpit

What Is The Request And What Will We Get For The Funds?

FY 2014 – NextGen - Weather Technology in the Cockpit

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A12.d NextGen - Weather Technology in the Cockpit	$8,000,000	$8,049,000	$4,169,000	-$3,831,000

For FY 2014, $4,169,000 is requested for NextGen - Weather Technology in the Cockpit (WTIC). Major accomplishments planned include:

Flight Deck Information

- Complete wind quality and forecasting simulations using high fidelity models, complex environmental metrics, and matured NextGen applications and procedures (i.e., multiple Required Time of Arrival (RTAs))
- Complete simulation analyses to identify wind information quality metrics and required values to optimize realized benefits under varying wind scenarios for simulated NextGen applications and operations.
- Complete analysis detailing a concept for presenting uplinked or cross linked meteorological (MET) information on a legacy display and for use of this information by flight crews.
- Collect data to fill gaps identified in the WTIC concept of operations (ConOps) for direct integration into decision support tools, thereby providing their full capability to support MET-related decisions.
- Complete cloud top data flight demonstration, including assessment of the impacts of this data on pilot decision making in oceanic and remote regions.
- Complete development of concepts for filling cockpit decision support tool information gaps and for making that information ready of direct integration.

Human Factors Standards

- Develop guidance standards for airmen training and evaluation criteria for the use of probabilistic forecast products and pilot decision making support tools.
- Developed a recommended rule set (standardized guidance) for general aviation (GA) pilots on how to avoid adverse weather in congested (and other selected) airspace.

Air/Ground Integration

- Complete benefits and feasibility assessments of providing selected adverse weather (i.e., icing, turbulence, etc.) alerts to pilots.
- Complete analysis comparing various concepts for formatting and "geo carving" 4D Cube MET information to enable efficient use of existing data like bandwidth to uplink MET information to support NextGen operations. Develop preliminary "geo carving" requirements. "Geo carving" is used to cover the entire process of formatting, compressing, and segmenting data and information for dissemination over a data link. It is anticipated that "geo carving" (pre-processing) will be required to enable efficient use of the commercial data links.
- Complete mobile application studies with prototype mobile application tool to identify system parameters and targeted users for development of a mobile MET application beta-test release. Complete research of innovative capabilities to be included in beta release.

Many of the research projects in FY 2014 in the WTIC portfolio will be transitioning to end-to-end demonstrations and evaluations, but others will continue to perform research related to assessing the impacts of specific weather conditions (i.e., icing) on various NextGen operations and the associated information needs in the cockpit to reduce these impacts. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

Weather-related goals of NextGen include reducing weather delays via increasing capacity and efficiency under adverse weather conditions, enhancing air traffic management (ATM) and aircraft re-routing flexibility to avoid adverse weather, reducing the number of weather-related accidents and incidents, and reduction of emissions through lower fuel consumption resulting from optimized routing and rerouting during adverse weather. WTIC will develop, verify, and validate requirements to support airworthiness standards for enabling availability and improving the quality and quantity of MET information available to the aircraft to enhance safety and efficiency in commercial, business, and GA operations. The specific goals of the WTIC Program are:

- Reduce pilot/flight crew/ATM workloads to support efforts to increase National Airspace System (NAS) capacity.
- Support NextGen and other near-, mid-, and far-term programs needs for the availability of enhanced MET information.
- Eliminate MET information gaps and meet user needs.
- Make more efficient use of existing data link bandwidth for disseminating MET information to and from aircraft.
- Reduce ambiguity and latency in transmitted MET information.
- Support increased NAS efficiency via timelier decisions in adverse weather, and more optimum routes from enhanced wind and temperature information.
- Reduce the likelihood of recurrence of specific weather-related incidents.

The WTIC program addresses the need to enable better weather decision making and use of MET information in the transformed NAS. This includes identifying MET information requirements and a recommended architecture for disseminating that information to aircraft for pilot use or direct integration into NextGen cockpit decision support tools and systems. The project will define the necessary MET information and its presentation to safely and efficiently incorporate it into collaborative decision making relative to adverse weather decisions. WTIC requirements to support airworthiness standards will establish common situational awareness between pilots, controllers, air traffic managers, local aircraft, etc. The project will define Human Factors guidance for effective rendering of MET information to pilots and define required MET-related pilot training. The WTIC program will work closely with multiple Radio Technical Commission for Aeronautics (RTCA) special committees and SAE G10 to further the project objectives. Through the efficient use of data links, the project will provide a request/reply and contract capability. Demonstrations will also be conducted to verify and validate WTIC-developed airworthiness standards requirements.

In FY 2013, major accomplishments planned include:

- Completed WTIC ConOps for Part 121, 95 and 135 and an associated avionics industry perspective study on the philosophies of providing weather information to the cockpit and on the state of related standards (e.g., gaps, overly stringent, clarity, etc.).
- Performed feasibility study and initial benefits identification of providing a virtual weather presentation (i.e., weather radar) to aircraft lacking that information/system for display on a legacy or mobile display device.
- Completed Human in the Loop evaluation of Convective Weather Avoidance Model (CWAM) displays using CWAM models based on Corridor Integrated Weather System (CIWS) forecasts.
- Performed initial flight demonstrations with real time uplinked presentations of cloud tops and turbulence.

- Completed human in the loop (HITL) verification of MET symbology set developed by the SAE Aerospace G-10 Committee for Aerospace Behavioral Engineering Technology.
- Supported RTCA Special Committee 206 (SC-206) by modeling and analyzing performance of three generic commercial data links in Opnet.
- Completed the maturation and refinement phase of the Wind Diagnosis and Forecasting simulations and performed the associated analyses.
- Performed initial HITL flight simulations to assess the decision-making impacts of providing probabilistic information to pilots using selected presentations.
- Completed interviews with GA pilots who experienced close encounters with weather-related danger (Callbacks) and analysis of 100 weather-related incident reports in the Aviation Safety Reporting System (ASRS).
- Completed planning for Eddy Dissipation Rate (EDR) uplink assessment, equipped aircraft, and began simulator trials and flight assessment on selected aircraft.

The NextGen - WTIC Program supports the Department of Transportation (DOT) strategic goal of Economic Competitiveness by creating a competitive air transportation system which is responsive to customer needs through NAS on-time arrivals.

Research will enable the development of policy, standards, and guidance needed to safely implement weather technologies in the cockpit to provide shared situational awareness and shared responsibilities.

Why Is This Particular Program Necessary?

Numerous NextGen operational improvements have identified a need for additional or higher quality MET information in the cockpit or integrated with decision support tools to enable them to achieve their full benefits or to minimize the reduction in benefits in adverse weather conditions.

The WTIC program research will enable the adoption of cockpit, ground, and communication technologies, practices, and procedures that will enhance common situational awareness by reducing latency in cockpit MET information, standardizing MET information presentations, and recommending an efficient architecture to improve dissemination of MET information for uplink, downlink, and crosslink so that ground and air users will have access to the same information. The enhanced common situational awareness supports NextGen goals for improved NAS efficiency. WTIC research on providing probabilistic weather to the cockpit is also intended to support efficiency improvements in the NAS by improving pilot decision making for adverse weather avoidance. The lack of standardized MET information and standardized presentation of MET data results in susceptibility to misinterpretation of information and ambiguities resulting in reduced common situational awareness. WTIC research and research efforts supporting SAE G-10, to develop MET symbology standards will also enhance common situational awareness while also reducing the potential for safety issues resulting from interpretation errors due to the lack of standardized MET symbologies and presentations.

WTIC is necessary to support meeting NextGen capacity goals. This support will be provided by reducing avoided-airspace currently resulting from turbulence reports via research to uplink Eddy Dissipation Rate (EDR). The data link architecture standards being researched by WTIC also support the necessary NextGen capacity improvements by enabling more efficient reroutes around adverse weather and improved aircrew weather impact mitigation planning.

How Do You Know The Program Works?

The primary indication that this program is working is the incorporation of WTIC requirements and research into guidance documents, standards, and other regulatory documents. In conjunction with this measure is the implementation of these requirements into operational aircraft. Depending on the specific WTIC project, success may also be confirmed by the transition of the WTIC-research to a technical transfer package for acquisition or fielding of associated technology, information, or procedures.

The WTIC program plans to conduct end-to-end demonstrations of WTIC technology, information, and policy to verify that program goals and goals of supported NextGen programs are met. These end-to-end evaluations will be conducted in coordination with any associated NextGen program to assess both the WTIC portion and the overall NextGen OI performance under adverse weather. An example of this indicator would be demonstrated improvement in trajectory based operations in the terminal area under adverse wind conditions compared to earlier flight trials and demonstrations.

Why Do We Want / Need To Fund The Program At The Requested Level?

A reduction in the WTIC FY 2014 funding will impact at least 14 NextGen Operational Improvements (OIs). If WTIC is not funded to the requested level, the program will have to reduce the scope of its goals and objectives resulting in incomplete or insufficient research inputs to the OIs supported by the program.

A reduction in WTIC FY 2014 funding will also put at risk the ability of WTIC to conduct end-to-end demonstrations to verify performance of WTIC technology, information, and policy in supporting NextGen OIs. By not conducting these end-to-end demonstrations, there is a risk that the WTIC concept will not be integrated properly with the associated NextGen OI and there will be no means to fully verify that the WTIC concept performs as anticipated in the NextGen application since most of the WTIC portfolio projects are conducted using fixed-base simulators and computer models.

One of the main goals of the WTIC program is to provide for a common MET situational awareness between the air and ground. A reduction in funding and the resulting reduction in program scope and goals could result in a divergence of MET situational awareness that may prove to be more costly, and potentially unsafe, in the future.

Lower funding would lead to delays in WTIC' research efforts. This could lead to the internal customers (such as various supported Solution Set groups) conducting their own MET information-related research efforts.

Detailed Justification for
A13.a Environment and Energy

What Is The Request And What Will We Get For The Funds?

FY 2014 – Environment and Energy

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A13.a Environment and Energy	$15,074,000	$15,166,000	$14,542,000	-$532,000

For FY 2014, $14,542,000 is requested for Environment and Energy. Major accomplishments planned include:

Noise and Emissions Analyses and Interrelationships

- Release the Aviation Environmental Design Tool (AEDT) publicly with capability to perform integrated fuel burn, noise, and emissions analyses from airport to global scales.
- Forecast future aircraft emissions and noise.
- Enhance communication among and interconnectivity of aircraft design and environmental impact assessment tools such as the Environmental Design Space (EDS), Global and Regional Environmental Aviation Tradeoff (GREAT), AEDT, and the Aviation environmental Portfolio Management Tool (APMT).
- Perform integrated environmental analyses using aircraft design and environmental impact assessment tools such as EDS, GREAT, AEDT, and APMT.
- Develop generic fleet for aircraft noise, fuel burn, and emissions assessment.
- Refine air quality and climate change impact computation methodologies.
- Assess the requirement basis for simulation-based environmental models.

Aircraft Noise

- Assess technological and scientific basis to support future International Civil Aviation Organization (ICAO) aircraft noise standards.
- Collect data to support socio-economic and welfare noise impacts and metrics to guide mitigation options and policy making.
- Update guidance and policies in support of current noise standards and to improve the certification processes.
- Complete annual assessment of noise exposure.
- Conduct studies to better quantify human and social welfare impacts of aircraft noise.
- Advance analytical methods for propagation of aircraft noise for all phases of flight.
- Identify effective methods for source- and receptor level aircraft noise mitigation.

Aircraft Emissions

- Assess technological, scientific, environmental, and economic bases to establish aircraft emissions standards, related metrics, and certification requirements.
- Assess metrics and methodologies to evaluate the impact of aviation emissions on climate change, air quality, and health impacts.
- Update guidance and policies in support of current aircraft standards and to improve the certification process.

- Develop measurement/sampling protocol and expand database for aircraft engine emissions.
- Develop annual aircraft fuel burn inventory.
- Refine multi-scale pollutant dispersion and transformation capability.

In FY 2014, the Energy and Environment (E&E) program will continue to focus on multiple fronts to support the Destination 2025 goal of sustaining our future. These include (1) develop and enhance analytical capability for integrated aviation environmental assessment for noise, emissions, and fuel burn; (2) compile and collect necessary data and develop data interconnectivity across analytical tools; (3) perform analyses for noise and emissions standard setting, streamline certification, sampling, and measurement processes; (4) research aviation noise and emissions related environmental, human, and welfare impacts and develop measures of associated risks; and (5) develop annual inventory of noise exposure and fuel burn. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The program is developing and validating methodologies, models, metrics, and tools to characterize and assess the effects of aircraft noise and aviation emissions while considering all interdependencies and tradeoffs. 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 and characterization of the impacts of aircraft noise and aviation emissions.

The E&E program helps achieve the FAA's environmental compatibility goal and supports the FAA Destination 2025. The program also provides fundamental knowledge and tools to support the NextGen Implementation Plan. The efforts complement activities in aircraft technology, alternative fuels, and efficient operations-based mitigation solutions, environmental operational assessments, and environmental management systems development that are being carried out under NextGen investments.

The E&E program specifically supports the following five performance metrics for Destination 2025:

- The U.S. population exposed to significant aircraft noise around airports has been reduced to less than 300,000 persons.
- A replacement fuel for leaded aviation gasoline is available by 2018 that is usable by most general aviation aircraft.
- Improve NAS energy efficiency (fuel burned per miles flown) by at least two percent annually.
- Aviation emissions contribute 50 percent less to significant health impacts and are on a trajectory for carbon neutral growth using a 2005 baseline.
- One billion gallons of renewable jet fuel is used by aviation by 2018.

Specific activities include:

- Conducting research and development on analytical tools to better understand the relationship among noise fuel burn and emissions, and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision-making.
- Leveraging a broad cross-section of stakeholders through the Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) to foster breakthrough scientific, operations, policy, and work force advances to mitigate noise and emissions impacts.
- Minimizing the impact of aircraft noise and emissions with actions that include: advancing the state of science/knowledge concerning effects of aircraft noise and emissions; and assessing the need to refine noise and emissions impact criteria and metrics; and improving operational procedures and technical guidance for aircraft noise and emissions certification standards.

The E&E program fosters international environmental standards, recommended practices, and guidance material which are technically feasible and economically reasonable to provide a measurable environmental benefit while taking interdependencies between noise and emissions into account. Specific activities include:

- Working with the international aviation community to reduce aircraft noise and emissions.
- Improving aircraft noise and engine exhaust emissions certification standards and operational procedures.
- Promoting compatible land use.
- Characterizing the benefits of abatement measures to reduce population impacted by aircraft noise and analyzing measures to improve fuel efficiency and reduce aviation emissions, and the potential to reduce health and climate impacts.
- Assessing the interrelationships and tradeoffs between measures to reduce aircraft noise and engine exhaust emissions.

The E&E program also contributes to the foundation for the NextGen investments that help achieve and manage the NextGen goal to promote environmental stewardship by reducing significant community noise and 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:

- Developing fundamental knowledge to aid in better science-based understanding of impacts of aircraft noise and aviation emissions on air quality and climate change to enable the NextGen goal of sustained aviation growth as envisioned by Destination 2025, while reducing significant community noise and air quality emissions in absolute terms
- Achieving carbon neutral growth by 2020 relative to aviation CO_2 emissions in year 2005 as the base year
- Developing tools to assess the ability of technologies for airframes, more efficient engines, advanced propulsion concepts, alternative fuels, new materials, market-based options, environmental standards and policies to reduce source noise and emissions

FAA works closely with other federal agencies, industry, academia, and international governments and organizations (e.g. ICAO/CAEP (Committee on Aviation Environmental Protection)) to design research and development efforts that can mitigate the environmental impact of aviation. This unified regulatory approach to research identifies and influences technologies, models, regulations, certification criteria, and policies that can improve our present and future global environment. The E&E program activities are closely coordinated with support from other FAA program offices (e.g., the Air Traffic Organization and the NextGen Office) and federal agencies (the National Aeronautics and Space Administration (NASA), the Department of Defense (DoD), and the Environmental Protection Agency (EPA)) to understand and mitigate aviation noise and emissions. The E&E program also supports the close working relationship of FAA with FICAN (Federal Interagency Committee on Aviation Noise), which comprises all federal agencies concerned with aviation noise, to better understand, predict and control the effects of aviation noise. In addition to government coordination, research is coordinated via the NextGen Joint Planning and Development Office Environmental Discussion Group (JPDO EDG) and a number of E&E projects are executed by the PARTNER Center of Excellence (an FAA/NASA/Transport Canada/DoD/EPA-sponsored Center of Excellence). The PARTNER Advisory Board brings together industry, academia, local government, and community groups.

The E&E Program also supports the close working relationship of FAA with FICAN (Federal Interagency Committee on Aviation Noise) to better understand, predict and control the effects of aviation noise. FICAN offers a forum for partnership, as it comprises all federal agencies concerned with aviation noise.

In FY 2013, major accomplishments planned include:

Noise and Emissions Analyses and Interrelationships

- Evaluated and expanded model architecture for noise, emissions, and fuel burn modules interfaces.

- Evaluated and validated methodologies used in environmental analysis tools for noise exposure, and aviation emissions and their impact on air quality.
- Forecasted future global aircraft emissions and noise.
- Expanded environmental analysis capability of AEDT, APMT, and EDS.
- Harmonized AEDT, APMT, and EDS databases and integrated cost and socioeconomic data.
- Evaluated AEDT for its public release in 2014.
- Performed integrated noise and emissions impacts analysis.

Aircraft Noise

- Assessed technological and scientific basis to support future ICAO aircraft stringent noise standards.
- Developed alternative, simplified aircraft noise certification test procedures and related implementation guidance materials.
- Assessed land use practices and investigated mitigation strategies beyond 65 dB DNL.
- Developed noise modeling capability for all phases of aircraft operations.
- Developed protocols to acquire noise exposure data for noise effects field studies.
- Conducted pilot studies to develop relationships between noise exposure and health and welfare impacts.
- Investigated metrics for noise exposure from non-conventional open rotor and supersonic aircraft.
- Updated noise research roadmap.

Aircraft Emissions

- Assessed technological and scientific basis to support future ICAO aircraft and engine emissions standards.
- Developed alternative, simplified engine exhaust emissions certification test procedures and related implementation guidance materials.
- Developed measurement and sampling protocol and expanded database for aircraft engine emissions.
- Validated modeling capability for dispersion of chemically reactive aircraft plume.
- Developed methodologies to quantify and assess the impact of aircraft emissions on climate.
- Assessed air quality and health impacts due to full flight emissions.
- Used data directly measured from aircraft Hazardous Air Pollutants (HAPs) and Particulate Matter (PM) emissions to replace, to the extent possible, approximation methods and factors used in modeling tools.

The E&E program supports the DOT strategic goal of Environmental Sustainability by reducing transportation related pollution and impact on ecosystems through the mitigation of noise exposure.

Why Is This Particular Program Necessary?

Despite the technological advancements achieved during the last 40 years, aircraft noise still affects people living near airports, and aircraft emissions continue to be an issue at local, regional, and global scales. While energy efficiency and local environmental issues have traditionally been primary drivers of aeronautics innovation, the current and projected effects of aviation emissions on our global climate are a serious long-term environmental issue facing the aviation industry. Aside from their associated health and welfare impacts, aircraft noise and aviation emissions are a considerable challenge in terms of community acceptance of aviation activities and this challenge is anticipated to grow. Environmental impacts are often the number one cause of opposition to airport capacity expansion and airspace redesign. We must deal with these impacts if aviation is to meet increased demand while operating with flexibility and efficiency.

To efficiently mitigate the environmental health and welfare impacts associated with aviation, policymakers need to understand the potential environmental impacts of aviation and to have these impacts quantified. The research funded by this program will ensure issues are identified, impacts measured, and appropriate mitigation measures instituted. In the 1990s, this research effort was focused on regulatory issues regarding noise and later on emissions. However, these were treated as separate subjects. In trying to assess health and welfare impacts of aviation while also optimizing energy efficiency and developing environmental mitigation strategies, it has become evident there are important interrelationships and potential trade-offs. Taking an interdisciplinary approach to enhance energy efficiency and minimize aviation environmental impacts by developing data, analytical tools and models that characterize and quantify the interdependencies between energy use, aircraft noise, and various air pollutant emissions is a key element for this research program. The goal is to develop a more complete understanding of the complex interdependencies that exist among aircraft noise, fuel burn, and emissions as well as their health and welfare impacts such that this knowledge can be used for designing and regulating aircraft.

How Do You Know The Program Works?

The Environment and Energy program has had considerable success in advancing our scientific understanding of the environmental impacts of aviation, developing tools to quantify these impacts, and then using the tools to inform policy making regarding the environmental impacts of aviation. Much of the research in this program to improve the underlying science is carried out via the PARTNER Center of Excellence (http://web.mit.edu/aeroastro/partner/), a leading aviation cooperative research organization, with a broad portfolio of contributions as highlighted in their 10 year Symposium (http://web.mit.edu/aeroastro/partner/reports/public-symposium-2013.pdf).

The program has enabled the development of AEDT, which can quantify the integrated fuel burn, noise, and emissions consequences of aviation as well as APMT, which can convert these consequences into impacts on the community. AEDT version 2a was released in March 2012 and is now the FAA's standard regional noise model replacing the Noise Integrated Routing System (NIRS). During the ICAO CAEP/8 and CAEP/9 meetings, which took place in 2010 and 2013, respectively, AEDT and APMT were used to inform the U.S. positions on the internationally negotiated NOx and noise stringencies, respectively.

Why Do We Want / Need To Fund The Program At The Requested Level?

A reduction in funding to the Environment and Energy program would delay the release of a model capable of computing greenhouse gas emissions at the airport level. This model is needed to address Council on Environmental Quality requirements for environmental assessments; absent this capability, projects to enhance capacity would be delayed. A budget reduction would also limit our understanding of source level aircraft noise and emissions as well as their impacts which will in turn compromise our ability to inform international standard settings for noise and emissions as well as development of environmental mitigation solutions.

Detailed Justification for
A13.b NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics

What Is The Request And What Will We Get For The Funds?

FY 2014 – NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A13.b NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics	$23,500,000	$23,644,000	$18,979,000	-$4,521,000

For FY 2014, $18,979,000 is requested for NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics. Major accomplishments planned include:

Technology Maturation

- Characterize and test aircraft and engine technologies for noise, fuel burn, and emissions reduction.
- Develop plans for demonstration and environmental assessment of additional aircraft and engine technologies in a potential second phase of Continuous Lower Energy, Emissions and Noise (CLEEN).

Alternative Turbine Fuels

- Conduct engine demonstrations for additional drop-in alternative fuels.
- Complete environmental feasibility assessment of drop-in alternative fuels.

Metrics, Goals, and Targets

- Refine metrics that more accurately capture aviation emissions health and welfare and climate impact and goals to facilitate Environmental Management System (EMS) implementation.
- Refine estimates of interim Destination 2025 environmental targets and perform gap analyses.
- Improve estimates of aviation climate impacts through second phase of the Aviation Climate Change Research Initiative (ACCRI).

In FY 2014, the NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics program will continue to advance system design, integration, and testing of CLEEN aircraft technologies for accelerated progress towards flight demonstration and system-wide assessments. Work will also start on developing plans for the second phase of the CLEEN program. For alternative fuels, activities will focus on safety, performance, and environmental assessments for qualification of renewable alternative fuels to secure ASTM International approval. Activities will also be initiated to assess production capacity and fleet infusion of alternative fuels. On the Metrics, Targets and Goals front, activities will continue to refine and evaluate metrics for NextGen environmental impacts, advance capability for and assessment of environmental noise, air quality, and climate impacts. This will also include improved climate impacts assessment under the second phase of ACCRI activities. The work will also continue to refine estimates of environmental targets and assess gaps towards meeting Destination 2025 environmental goals. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

The program is protecting the environment by reducing significant aviation environmental impacts associated with noise and exhaust emissions, and increasing energy efficiency and availability to enable mobility and scalable capacity growth. Collaborating with industry, the program will advance and mature engine and airframe technologies to reduce aviation noise, air quality impacts, greenhouse gas emissions, and energy use. It will also provide data and methodologies to assess environmental sustainability including life-cycle environmental impact and support certification of alternative aviation fuels that could serve as drop-in replacements for today's petroleum-derived turbine engine fuels. This will lead to faster deployment of these fuels, and accompanying reductions in greenhouse gas emissions and aviation emissions that impact air quality. 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 improving 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 impacts 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 enhanced metrics to enable sound analyses. Ultimately, the program will enable the refinement of goals and targets to support the NextGen EMS to better manage and reduce aviation's environmental impacts to enable mobility and scalable capacity growth.

The NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics program helps achieve NextGen goals to increase mobility by reducing environmental impacts of aviation in absolute terms, including significant community noise, air quality and global climate change. The program is focused on reducing current levels of aircraft noise, air quality and greenhouse gas emissions, and energy use and advancing sustainable alternative aviation jet fuels.

The Program supports the following five performance metrics for Destination 2025:

- The U.S. population exposed to significant aircraft noise around airports has been reduced to less than 300,000 persons.
- A replacement fuel for leaded aviation gasoline is available by 2018 that is usable by most general aviation aircraft.
- Improve NAS energy efficiency (fuel burned per miles flown) by at least two percent annually.
- Aviation emissions contribute 50 percent less to significant health impacts and are on a trajectory for carbon neutral growth using a 2005 baseline.
- One billion gallons of renewable jet fuel is used by aviation by 2018.

The program specifically supports the following outcomes:

Demonstrate aircraft and engine technologies that reduce noise and air quality and greenhouse gas emission at the source level, to a developmental level that will allow quicker industry uptake of these new environmental friendly technologies to produce a fleet that will operate more efficiently with less energy usage and permit expansion of airports and airspace capacity in a scalable manner consistent with the environmental goals of the NextGen plan.

Specific activities include developing and demonstrating:

- Certifiable aircraft technology that reduces aircraft fuel burn by 33 percent compared to current technology, reducing energy consumption and greenhouse gas (CO_2) emissions.
- Certifiable engine technology that reduces landing-and-takeoff-cycle nitrogen-oxide emissions by 60 percent, without increasing other gaseous or particle emissions, over the International Civil Aviation Organization (ICAO) standard adopted at the sixth meeting of the ICAO Committee on Aviation Environmental Protection.
- Certifiable aircraft technology that reduces noise levels by 32 decibels at each of the three certification points, relative to Stage 4 standards.
- 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 air quality and greenhouse gas emissions and increase energy supply security for NextGen.

Specific activities include developing and demonstrating:

- The feasibility of the use of alternative fuels in aircraft systems, including favorable environmental qualification, successful demonstration and quantification of benefits, and internationally agreed criteria to quantify relative carbon content.
- Processing capability and technical data to support certification and assured safety of a drop-in replacement for petroleum-derived turbine engine fuels.

Determine the appropriate enhancements of goals and metrics to manage NextGen aviation environmental impacts that are needed to support EMSs and achieve environmental protection that enables sustained aviation growth.

Specific activities include:

- Evaluate, establish, and implement advanced metrics to better assess and control noise, air quality impacts, and greenhouse gas emissions that may influence climate impacts from anticipated NextGen commercial aircraft operations.
- Evaluate and refine required technology and operational goals and targets to mitigate the environmental impact of NextGen and support NextGen EMS implementation.

The Federal Aviation Administration (FAA) works closely with other federal agencies, industry, federal Aeronautical Science and Technology Subcommittee, academia, and international governments, organizations (e.g. ICAO/CAEP (Committee on Aviation Environmental Protection)) and coalitions (e.g. CAAFI, Commercial Aviation Alternative Fuels Initiative) to design research and development (R&D) efforts that can mitigate the environmental impact of aviation and explore alternative jet fuels. The program uses a series of Memoranda of Agreements to work closely with the National Aeronautics and Space Administration (NASA), the U.S. Department of Agriculture (USDA), the Department of Defense (DoD), and the Environmental Protection Agency (EPA). FAA is also pursuing collaborative agreements with the Department of Energy to leverage resources to address aviation's environmental impact. Through the JPDO, the program supports the EDG comprising FAA, NASA, EPA, DoD, Department of Commerce (DOC), Council on Environmental Quality, and the Office of the Secretary of Transportation (OST), as well as industry, academia, local governments, and community groups.

In FY 2013, major accomplishments planned include:

Technology Maturation

- Performed system level assessment of CLEEN aircraft technologies.
- Performed aircraft level noise and emissions reduction performance of CLEEN aircraft technologies.
- Identified technical issues impacting commercialization of CLEEN technologies.
- Performed detailed design review of system components and configurations.
- Performed ground and flight level testing and demonstration of selected CLEEN aircraft technologies.

Alternative Turbine Fuels

- Conducted fuel characterization testing and environmental assessments of additional drop-in renewable alternative fuels.
- Conducted sustainability analysis of renewable fuels.
- Assessed mechanisms for increasing commercial use of aviation alternative fuels.
- Initiated process for ASTM International approval of additional alternative fuel blends.

Metrics, Goals and Targets

- Refined and evaluated noise and emissions impacts metrics for use in NextGen environmental analysis.
- Reduced key uncertainties in climate impacts of aviation.
- Conducted evaluation of advanced analytical approaches for noise and emissions impacts assessment.
- Refined intermediate targets towards meeting NextGen environmental goals performance targets for Destination 2025 and performed gap analysis.

The NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics program supports the Department of Transportation (DOT) strategic goal of Environmental Sustainability by increasing the use of environmentally sustainable practices in the transportation sector. Those practices will improve capital projects that include environmental management systems, context sensitive solutions, or use a sustainable transportation project evaluation to manage the environmental impacts of construction and operations.

Why Is This Particular Program Necessary?

The NextGen environmental strategy includes efforts to better understand the extent of the problem associated with aviation emissions and the development and fielding of new operational enhancements, aircraft and air traffic management (ATM) technologies, alternative fuels, and policies to achieve near-term and long-term solutions. The NextGen Environmental Research – Aircraft Technologies, Fuels, and Metrics program supports research to develop new aircraft technologies and sustainable fuels and to develop metrics to quantify NextGen's environmental impacts and inform performance targets.

The vast majority of improvements in environmental performance over the last three decades have come from enhancements in engine and airframe design. Although major contributors, improved technologies and air traffic management will not be enough to reduce aviation's carbon dioxide (CO_2) footprint. Sustainable alternative fuels with lower overall carbon foot prints are critical to reducing aviation's climate impact to enable mobility. The main focus of this R&D effort is the CLEEN program. The CLEEN program is focused on technology maturation to reduce current levels of aircraft noise, emissions that degrade air quality, GHG emissions, and energy use while also advancing sustainable alternative fuels for aviation use.

Embedded in energy and environmental issues are several scientific uncertainties concerning aviation energy issues and aviation environmental impacts, particularly on climate. There are large uncertainties in our present understanding of the magnitude of climate impacts due to aviation non-CO_2 emissions. Understanding the relative impacts of different emission (including impacts of emissions produced during cruise on surface air quality) is vital for informing NextGen EMS's implementation. ACCRI is an element of the R&D program focused on addressing these uncertainties. In addition, noise is the most immediately objectionable impact of aviation, and an impact demanding considerable Federal resources (e.g., AIP grant set aside of up to $300 million annually). Research is outdated that underpins determinations of aircraft noise impacts, land use compatibility guidelines, and federally funded noise mitigation. New noise metrics research effort is needed to reflect public sensitivity and current air traffic conditions, guide mitigation funding and local land use planning near airports, and assure the U.S. response to aircraft noise keeps pace with NextGen needs and international efforts.

How Do You Know The Program Works?

The NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics program has had considerable success in transitioning technologies that will reduce the environmental impact of aviation. In the area of alternative jet fuels, this program has directly contributed to the certification by ASTM International of alternative jet fuels made using Fischer-Tropsch (F-T) synthesis and the Hydroprocessed Esters and Fatty Acids (HEFA) fuel process. It has also funded the development of research that quantified the life cycle greenhouse gas emissions benefit of alternative jet fuels made from these processes. This research was subsequently used by the EPA as a part of their rulemaking to include HEFA fuels within their

Renewable Fuel Standard (RFS) Program. Finally, this program also provides funding to the Commercial Aviation Alternative Fuels Initiative (CAAFI), which is focusing the efforts of commercial aviation to engage the emerging alternative fuels industry. It enables its diverse participants - representing all the leading stakeholders in the field of aviation - to build relationships, share and collect data, identify resources, and direct research, development and deployment of alternative jet fuels.

In the area of technology maturation, the CLEEN Program, which is a key component of the NextGen – Environmental Research – Aircraft Technologies, Fuels, and Metrics Program, has matured numerous technologies to Technology Readiness Level (TRL) 6 and demonstrated them in engine ground tests. These include the demonstration of Boeing's ceramic matrix composite core exhaust nozzle for reduced weight and fuel burn; General Electric's TAPS II advanced lean burn combustor, which exceeded goals for landing and takeoff nitrogen oxide emissions reduction; and high temperature engine core components from Honeywell that will enable more efficient engine design. Additionally, the CLEEN Program has demonstrated Boeing's wing adaptive trailing edge technology at a TRL of 7 through flight testing, demonstrating aerodynamic benefits that will lead to fuel burn savings and potentially aircraft noise reduction. Efforts continue in CLEEN's development of technologies to enhance the benefits of Pratt & Whitney's geared turbofan architecture through continued fan model wind tunnel testing. Finally, CLEEN has completed wind tunnel testing with General Electric to mature the blade designs for open rotor engine architectures, which hold large fuel burn reduction potential. These successful maturation and demonstration efforts have moved each of these technologies closer to successful transition into commercial products that will provide environmental benefit in the fleet.

Why Do We Want / Need To Fund The Program At The Requested Level?

Any reduction in the requested budget would slow our ability to mature aircraft technologies to reduce noise, emissions, and fuel burn. It would also slow qualification of alternative fuels for commercial aviation as well as limit our efforts to quantify their environmental benefit. Further, it would also delay the development of metrics including reducing climate impact uncertainties under ACCRI. Delays in these areas would severely limit our ability to meet NextGen environmental goals, prepare for international negotiations, and develop sustainable and secure alternative sources of jet fuel. Finally, reductions would cause delays in developing proven technology-based environmental mitigation solutions which will result in billions of dollars of operational, human health, welfare, and opportunity costs to government, industry and the public.

Detailed Justification for
A14.a System Planning and Resource Management

What Do I Need To Know Before Reading This Justification?

The funding for the System Planning and Resource Management program has increased due to the inclusion of FAA personnel costs for the efforts associated with this budget item, which includes preparation of the R,E&D budget submission, support of the Research, Engineering and Development Advisory Committee, and preparation of the National Aviation Research Plan. As part of the creation of the new NextGen (ANG) organization, we assessed the allocation of R,E&D FTEs. This budget item now includes all FTEs associated with its tasks. There has been no increase in total number of FTEs or total budget of the R,E&D portfolio due to the reorganization or the increase in funds for this budget item.

What Is The Request and What Will We Get For The Funds?

FY 2014 – System Planning and Resource Management

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A14.a System Planning and Resource Management	$1,717,000	$1,728,000	$2,289,000	+$572,000

For FY 2014, $2,289,000 is requested for System Planning and Resource Management. Major accomplishments planned include:

R &D Portfolio Development

- Prepare the FY 2016 R,E&D budget submission.
- Manage FAA's R,E&D portfolio to meet efficiency goals.
- Obtain Research Engineering, and Development Advisory Committee (REDAC) recommendations on planned R &D investments for FY 2016.
- Support the REDAC in its preparation of other reports, as requested by the FAA.
- Deliver the 2014 National Aviation Research Plan (NARP) to the Congress with the President's FY 2015 Budget.

Research Collaboration

- Conduct the 2014 International Conference on Research in Air Transportation (ICRAT)

FAA will continue supporting the work of the REDAC in its task to advise the Administrator on the R&D portfolio. In particular, it will seek the counsel and guidance of the committee for the FY 2016 R&D portfolio, review the proposed FY 2016 portfolio prior to submission of the budget requirements to the DOT, and seek the committee's guidance during the execution of the R&D portfolio. The agency will publish, as required by Congress, the NARP and submit it to Congress concurrent with the FY 2015 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. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

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); and provides program advocacy and outreach.

Ongoing activities will manage FAA's Research, Engineering and Development (R,E&D) portfolio, meet the President's criteria for R&D, increase program efficiency, and maintain management and operating costs.

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, 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.

In FY 2013, major accomplishments planned include:

R &D Portfolio Development

- Prepared the FY 2015 R,E&D budget submission.
- Managed FAA's R,E&D portfolio to meet efficiency goals.
- Obtained Research Engineering, and Development Advisory Committee (REDAC) recommendations on planned R,E&D investments for FY 2015.
- Supported the REDAC in its preparation of other reports, as requested by the FAA.
- Delivered the 2013 National Aviation Research Plan (NARP) to the Congress with the President's FY 2014 Budget.

Research Collaboration

- Conducted the 2013 U.S.A./Europe Air Traffic Management R&D Seminar on NextGen and Single European Sky Air Traffic Management Research (SESAR).

The System Planning and Resource Management program supports the Department of Transportation (DOT) strategic goal of Economic Competitiveness in maintaining cost control and audit on R&D budget portfolio.

Why Is This Particular Program Necessary?

This program provides the support for the FAA to formulate their annual R,E&D portfolio and submit the mandatory plan for the FAA research and development to Congress each year.

How Do You Know The Program Works?

The FAA maintains an R,E&D management workforce of no more than 10 percent of the total R,E&D workforce, sustains the System Planning and Resource Management budget at 2 percent or less of the total R,E&D budget, and operates the REDAC at 0.1 percent of the total R,E&D budget. The program has consistently met these criteria.

Additionally, each year the program conducts lessons learned sessions where we evaluate the processes used for developing the NARP and annual FAA R,E&D budget submission. In the lesson learned process we obtain comments and feedback from our stakeholders on areas for process improvements, assess the comments, and implement their suggestions as appropriate. The number of comments identifying needed improvement has been decreasing each year. In the last cycle, there were no problem areas identified.

Why Do We Want / Need To Fund The Program At The Requested Level?

Funding decreases would jeopardize the timely delivery of the NARP to Congress. Any funding decreases would also negatively impact the support of the REDAC, possibly cutting the number of REDAC and subcommittee meetings held during the year in half.

Detailed Justification for

A14.b William J. Hughes Technical Center Laboratory Facility

What Is The Request and What Will We Get For The Funds?

FY 2014 – William J. Hughes Technical Center Laboratory Facility

Activity/Component	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 President's Request	Difference from FY 2012 Actual
A14.b William J. Hughes Technical Center Laboratory	$3,777,000	$3,800,000	$3,447,000	-$330,000

For FY 2014, $3,447,000 is requested for the William J. Hughes Technical Center (WJHTC) Laboratory Facility. Major accomplishments planned include:

Simulation Facilities

- Demonstrate distributed simulation capability over Aviation Simnet between Cockpit Simulation Facility and Target Generation Facility

Flight Program's Airborne Laboratories

- Perform 100 hours of R&D Flight Tests in support of NextGen - Alternative Fuels for General Aviation research program
- Perform over 400 hours of RDT&E flight tests in support of programs such as Advanced Collision Avoidance System, Ground Based Augmentation System, Automatic Dependent Surveillance-Broadcast (ADS-B), etc.

Concepts and Systems Integration – Human Factors

- Perform the NextGen Terminal Radar Approach Control (TRACON) Project Human-in-the-Loop overall validation simulation
- Complete data collection and analysis on four NextGen related human-in-the-loop simulations in support of Human Factors Group

The Simulation Branch supports development and test programs at the WJHTC by generating realistic traffic in support of engineering, operational, and human factors evaluations of NAS equipment, procedures, and operations. The Target Generation Facility (TGF) simulates air traffic equipment at the radar interface for end-to-end configuration controlled test capability. TGF generated targets can operate under pilot control or prescribed paths depending on study needs. Simulation pilots are provided by the Simulation Branch and include a cadre of current and retired airline and commercial pilots. The Simulation Branch also maintains several cockpit simulators of transport category and general aviation aircraft. At present, simulators for the B-737-800 and A-321 are operational, and a simulator for an Embraer 175 aircraft is being developed.

The Flight Program Branch accepts flight test missions from various research, development, test, and evaluation (RDT&E) Agency programs. These efforts include aircraft modifications, testing equipment integration, aircraft maintenance, data collection, detailed flight test planning, and mission risk analysis; along with actual flight test.

The FAA R&D Flight Program serves many customers throughout the FAA and encompasses aircraft operations, aircraft maintenance, aircraft engineering and modifications, and aircraft tracking. The program currently operates, modifies, and maintains six aircraft that act as airborne laboratories. These aircraft are operated under Federal Aviation Regulations (FAR) 91 and maintained by an in-house FAA certificated repair station. The Flight Program is equipped to perform flight test anywhere in the United States and can and has, under the appropriate circumstances, conducted flight tests anywhere in the world.

The R&D Flight Program has and continues to support the multiple programs, including, but not limited to: NextGen, ADS-B, Global Positioning System (GPS), GPS-SBAS, GPS-GBAS, Unmanned Aircraft Systems (UAS), Aircraft Surveillance, Navigation, Communications, and Safety.

The Mission of the R&D Human Factors Lab (RDHL) is to perform research to acquire a better understanding of the part that a human plays in current and future aviation systems. This research environment is specifically designed to measure and assess human performance and workload. Additionally, the RDHFL investigates how new technologies should be integrated into air traffic control (ATC) and airway facilities (AF) systems.

The RDHFL supports a number of NextGen projects in many areas of research including NextGen TRACON (Human Factors Division), En Route Data Comm (Human Factors Division), Modular NextGen TRACON Facilities (NextGen Facilities Program), Separation Management (Advanced Operational Concepts Division), and Tower ground surveillance (HF Core R&D Program).

The Future TRACON Workstation/TRACON Data Communication simulation planned for 2013 has evolved into a multi-year NextGen TRACON Project. Started in 2012, the RDHL will support a three phase effort to design a new TRACON workstation culminating in an overall validation simulation in 2014. The final report will include a results brief and lead to the design of a new workstation by 2015.

Other human-in-the-loop simulations planned for 2014 include Separation Management 3, Generic Airspace 2, and a tower simulation. Additionally, funding will provide for engineering, technical, and management support of overall research activities.

What Is This Program?

R&D programs require specialized facilities to emulate and evaluate field conditions. Human factors projects require flexible, high-fidelity laboratories to perform full-mission, ground-to-air human-in-the-loop simulations. Researchers measure baseline human performance using existing ATC configurations and changes in performance when new systems or procedures are introduced to evaluate human factors issues. These laboratories are comprised of integrated cockpit and ATC workstation simulators, and the performance issues they delve into reflect the perspectives of the pilot and flight crew. Airborne and navigation projects require flying laboratories, aircraft used for research and development, which are specially instrumented and reconfigurable to support a variety of projects.

The William J. Hughes Technical Center (WJHTC) Laboratory Facility program supports research facilities located at the WJHTC. These facilities consist of the Flight Program's Airborne Laboratories; Simulation Facilities, including the Target Generation Facility and the Cockpit Simulators; and the Concepts and Systems Integration Facilities, the Research and Development Human Factors Laboratory, and the Airborne Laboratories.

The WJHTC facilities directly support agency projects and integrated product teams in the following areas:

- FAA's Air Traffic Organization (ATO) – The WJHTC laboratories support the ATO in the areas of capacity and air traffic management; communications, navigation, and surveillance; NextGen concept validation; weather; airport technology; aircraft safety; human factors; information security; and environment and energy.
- Communications, Navigation, and Surveillance – The Flight Program Team supports on-site flight tests of the GPS Local Area Augmentation System (GBAS) in Newark to aid in the development of the precision landing system.
- NextGen – The WJHTC laboratories support concept validation and system integration.
- Automated Dependent Surveillance-Broadcast (ADS-B) – Numerous flight test hours have been expended in support of field testing the new ITT system in Louisville, KY. Each test leads to improvements made to enhance the overall system.
- Terminal Instrumentation Procedures (TERPS) – Routine flight tests are ongoing in the development of Global Positioning System (GPS) Helicopter precision approaches to a heliport.

- Wide Area Augmentation System (WAAS) – The Flight Program Team has been working with the WAAS program, Bombardier Aircraft, Canadian Marconi, and Honeywell to design, test and certify a WAAS installation into a Bombardier Global 5000 aircraft.
- Facilities supporting R&D goals at FAA's WJHTC and funded by this program are the Target Generation Facility, the Cockpit Simulation Facility, the Research and Development Human Factors Laboratory, and the Airborne Laboratories (actual R&D aircraft) located in the Hangar Facility.

In FY 2013, major accomplishments planned include:

Simulation Facilities

- The Simulation Team integrated the Target Generator Facility (TGF) with the AFTIL tower display.
- The Simulation Team developed Rotorcraft and lighter than air models for the TGF.
- The Simulation Team worked with Aircraft Intent Description (AIDL) and trajectory prediction in support of TBO.

Flight Program's Airborne Laboratories

- The Flight Program sought Final Investment Decision to replace two Convair Flight Test Aircraft.
- The Flight Program completed Flight Testing of Un-Leaded Aviation Fuel in support of the Alternate Fuel Program.
- The Flight Program designed, developed and fabricated a generic Data Acquisition System to support future programs without such capabilities.

Concepts and Systems Integration

- Separation Management 2 – Human-in-the Loop (HITL) Simulation - After the completion of the first separation management experiment (SepMan1), developed concepts and prototypes within the separation management project. The Human Factors Field Team created prototypes of separation management functions that included variable separation standards, lateral offset, and support for nonsurveillance areas, integration of conflict probe functions on the radar console, and integration of automation functions across the radar and data positions.
- Data Communication Failure HITL Simulation – Tested impact of data communication failure.
- Future TRACON Workstation/TRACON Data Communication HITL Simulation – Completed evaluation of NextGen concepts in the Tracon environment and using data communication.
- High Altitude Generic Airspace Project – Researched the generic airspace sector concept and what information the controller will need using En Route Information Display System.

The William J. Hughes Technical Center Laboratory Facility program supports the Department of Transportation (DOT) strategic goals of Safety, Economic Competitiveness, and Environmental Sustainability. Safety is supported through integration of the Target Generator facility for runway incursion testing, which reduces transportation related injuries and fatalities; Economic Competitiveness by leading U.S. transportation interest in target markets around the world through full-mission demonstrations on NextGen technology integration; and Environmental Sustainability through testing of transportation evaluation tools to manage the environmental impacts of construction and operations.

FAA will work to provide an integrated laboratory platform for the purpose of demonstrating operational procedures, defining human and system performance requirements, full-mission demonstrations integrating NextGen air and ground capabilities for pilot separation responsibility and controller efficiencies, and analysis, evaluation, and validation of R&D milestones.

Why Is This Particular Program Necessary?

The program sustains research facilities located at the WJHTC to support R&D program goals. These programs require specialized facilities to emulate and evaluate field conditions. The R&D programs require flexible, high-fidelity laboratories to perform full mission, ground-to-air, human-in-the-loop simulations. The R&D laboratories are comprised of a human factors laboratory, integrated cockpits and ATC workstation simulators, and flying laboratories consisting of aircraft specially instrumented and reconfigurable to support a variety of projects.

It is necessary to modify, upgrade, and sustain the R&D laboratory infrastructure and provide support services to support the R&D program goals.

How Do You Know The Program Works?

The RDHFL has performed numerous experiments on human factors issues affecting the performance of pilot, air traffic controller, and airway facilities maintenance work forces. This research is helping to decrease human error through user-centered evaluation activities and by an integrated consideration of the role humans play in the increasingly automated National Airspace System. The RDHFL has been instrumental in research supporting NextGen and continues to support NextGen projects.

From 2007 to 2012, the RDHFL conducted a series of human in the loop simulations looking at concepts for a Future En Route Workstation (FEWS). The Future En Route Workstation (FEWS) research program was designed on the principles of integrating currently independent automation tools, providing information when and where needed, and reducing the number of housekeeping tasks that controllers currently perform. The FEWS interface resulted in a near 50% reduction in the number of data entries that controllers must make with Display System Replacement and voice communications only. Findings from the FEWS simulations are currently being implemented as upgrades to ERAM.

Why Do We Want / Need To Fund The Program At The Requested Level?

Any reductions in funding provided to this program will delay the development of air traffic control simulation software which is vital to the human in the loop simulations done by the Concepts and Systems Integration – Human Factors team. Funding reductions will also delay the development of various air models for simulations used in the TGF high fidelity ATC simulation environment. Additionally, the TGF provides the connectivity for the laboratories at the William J. Hughes Technical Center to interface and work together. Any funding reduction to the support for the TGF will directly correlate to a reduction the availability and ability to support this underlying infrastructure for NextGen research.

GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(LIMITATION ON OBLIGATIONS)
(AIRPORT AND AIRWAY TRUST FUND)
(INCLUDING TRANSFER OF FUNDS)
(INCLUDING CANCELLATION OF FUNDS)

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, $3,200,000,000, 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 $2,900,000,000 in fiscal year 2014, 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 $106,600,000 shall be obligated for administration, not less than $15,000,000 shall be available for the Airport Cooperative Research Program, and not less than $29,500,000 shall be available for Airport Technology Research to remain available until expended.

(CANCELLATION)

Of the amounts authorized under sections 48103 and 48112 of Title 49, United States Code, $450,000,000 are hereby permanently cancelled from amounts authorized for the fiscal year ending September 30, 2014.

Note.—A full-year 2013 appropriation for this account was not enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 112–175). The amounts included for 2013 reflect the annualized level provided by the continuing resolution.

GRANTS-IN-AID FOR AIRPORTS
Program and Financing
(in millions of dollars)

Identification code: 69-8106-0-7-402	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
Obligations by program activity:			
Direct Program:			
0001 Grants-in-aid for airports	3,335	3,211	2,749
0002 Personnel and related expenses	100	102	107
0003 Airport technology research	29	29	29
0005 Small community air service	15	6	. . . .
0006 Airport Cooperative Research	15	15	15
0100 Total direct program	3,494	3363	2,900
0801 Reimbursable program	. . . .	1	1
0900 Total new obligations	3,494	3,364	2,901
Budgetary Resources:			
1000 Unobligated balance carried forward, start of year	13	15	2
1021 Recoveries of prior year unpaid obligations	146	. . . .	. . . .
1050 Unobligated balance (total)	159	15	2
Budget Authority: Appropriations, discretionary:			
1101 Appropriation (special or trust fund)	3,435	3,456	3,200
1137 Appropriation applied to liquidate contract authority	-3,435	-3,456	-3,200
1160 Appropriation (total discretionary)	. . . .	. . . .	. . . .
Contract authority, discretionary:			
1520 Contract authority and/or unobligated balance of contract authority permanently reduced	. . . .	. . . .	-450
1540 Contract authority, discretionary (total)	. . . .	. . . .	-450
Contract authority, mandatory:			
1600 Contract authority(mandatory)	3,350	3,350	3,350
1640 Contract authority, mandatory (total)	3,350	3,350	3,350
Spending authority from offsetting coll., Discretionary:			
1700 Collected	. . . .	1	1
1750 Spending authority from offsetting coll., disc (total)	. . . .	1	1
1900 Total budget authority (gross)	3,350	3,351	2,901
1930 Total Budgetary Resources Available	3,509	3,366	2,903
Memorandum (non-add) entries:			
1941 Unexpired unobligated balance, end of year	15	2	2
Change in obligated balances:			
Obligated balance, state of year (net):			
3000 Unpaid obligations, brought forward, Oct 1 (gross)	5,223	5,427	4,844
3010 Obligations incurred, unexpired account	3,494	3,364	2,901
3020 Outlays (gross)	-3,144	-3,947	-3,671
3040 Recoveries of prior year unpaid obligations, unexpired	-146	. . . .	. . . .
Obligated balance, end of year (net):			
3050 Unpaid obligations, end of year	5,427	4,844	4,074
Memorandum (non-add) entries:			
3100 Obligated balance, start of year	5,223	5,427	4,844
3200 Obligated balance, end of year	5,427	4,844	4,074
Budget authority and outlays, net:			
Discretionary:			
4000 Budget authority, gross	. . . .	1	-449
Outlays, gross:			
4010 Outlays from new discretionary authority	316	673	592
4011 Outlays from discretionary balances	2,828	3,274	3,079
4020 Outlays, gross (total)	3,144	3,941	3,671
Offsets against gross budget authority and outlays:			

	Offsetting collections (collected) from:			
4033	Non-federal sources	. . . .	-1	-1
	Mandatory:			
4090	Budget authority, gross	3,350	3,350	3,350
4180	Budget authority, net (total)	3,350	3,350	2,900
4190	Outlays, net (total)	3,144	3,946	3,670
	Memorandum (non-add) entries:			
5052	Obligated balance, SOY: contract authority	3,641	3,556	3,450
5053	Obligated balance, EOY: contract authority	3,556	3,450	3,150
5061	Limitation on obligations (Trust Funds)	3,350	3,371	2,900

Subchapter I of chapter 471, title 49, U.S. Code 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. The FY 2014 budget request proposes to lower funding for the airport grants program to $2.9 billion, offset in part by eliminating passenger and cargo entitlement funding for large hub airports. To assist those airports that need the most help, the Administration proposes to focus Federal grants to support smaller commercial and general aviation airports that do not have access to additional revenue or other outside sources of capital. The Budget also proposes to allow all commercial service airports to increase the non-Federal Passenger Facility Charge, thereby giving airports greater flexibility to generate their own revenue.

Eligible airports in all size categories will be able to compete for an additional $2.0 billion in one-time funding that will be made available under the President's Immediate Transportation Investments proposal targeting investments in roads, railways, and runways. The combination of these changes to the AIP and PFC programs will allow airports to effectively transition to a reduced AIP level without hindering their ability to meet existing capital needs of the national airport system.

Object Classification
(in millions of dollars)

Identification code: 69-8106-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Direct obligations:			
	Personnel compensation			
1111	Full-time permanent	59	63	65
1113	Other than full-time permanent	1	1	1
1115	Other personnel compensation	1	1	1
1119	Total personnel compensation	61	65	67
1121	Civilian personnel benefits	17	18	19
1210	Travel and transportation of persons	3	3	3
1232	Rental payments to others	1	1	1
1251	Advisory and assistance services	25	25	27
1252	Other services from non-fed sources	28	24	25
1254	Operation and maintenance of facilities	1	1	1
1257	Operation and maintenance of equipment	5	5	5
1260	Supplies and materials	1	1	1
1310	Equipment	1	1	1
1320	Land and Structures	1	1	1
1410	Grants, subsidies, and contributions	3,344	3,212	2,749
1940	Financial Transfers	6	6	0
1990	Subtotal, direct obligations	3,494	3,363	2,900
2990	Reimbursable obligations	. . . .	1	1
9999	Total new obligations	3,494	3,364	2,901

Personnel Summary

Identification code: 69-8106-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
1001	Direct: Civilian full-time equivalent employment	547	589	605
2001	Reimbursable: Civilian full-time equivalent employment	1	1	1

EXHIBIT III-1

GRANTS-IN-AID FOR AIRPORTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2012 ENACTED	FY 2013 CR ANNUALIZED	FY 2014 REQUEST	CHANGE FY 2014-2012
Grants-in-Aid for Airports*	3,198,750	3,218,326	2,748,900	(449,850)
Personnel & Related Expenses	101,000	101,618	106,600	5,600
Airport Technology Research	29,250	29,429	29,500	250
Airport Cooperative Research	15,000	15,092	15,000	0
Small Community Air Service**	6,000	6,037	0	(6,000)
TOTAL	**3,350,000**	**3,370,502**	**2,900,000**	**-450,000**
FTEs				
Direct Funded	589	589	605	16
Reimbursable	1	1	1	0

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.

**The $6 million for the Small Community Air Service is transferred to the Department of Transportation to administer.

Appropriations, Obligation Limitations, and Exempt Obligations
($000)

ITEM	Change from FY 2012 to FY 2014 ($000)	Change from FY 2012 to FY 2014 FTE
FY 2012 Enacted	**3,350,000**	**589**
Annualization of FY 2012 Enacted FTE's	1,781	13
Pay Inflation at 1%	652	
Non-pay inflation	292	
E-Gov - Integrated Acquisition Environment - Grants & Loans	637	
SUBTOTAL, ADJUSTMENTS TO BASE	**3,362**	**13**
NEW OR EXPANDED PROGRAMS		
NATCA Multi-Unit Contract Pay Raises	254	
Grants	(449,850)	
Decrease to ACRP Contracts	(76)	
Program savings	160	
Field Safety and Standardization Personal	450	3
SOAR redevelopment	1,700	
SCASDP	(6,000)	
SUBTOTAL, NEW OR EXPANDED PROGRAMS	**(453,362)**	**3**
FY 2014 REQUEST	**2,900,000**	**605**

Executive Summary: Grants-in-Aid for Airports

What Is The Request And What Will We Get For The Funds?

For Fiscal Year (FY) 2014, FAA requests $2.7 billion to fund the Grants-in-Aid for Airports program, also known as the Airport Improvement Program (AIP). The Budget focuses the traditional Federal grants to support smaller commercial and general aviation airports that do not have access to additional revenue or other outside sources of capital. At the same time, the budget proposes to increase the Passenger Facility Charge (PFC) limit from $4.50 to $8.00 and eliminates passenger and cargo entitlement funding for large hub airports but maintains discretionary eligibility. The Budget also proposes to allow all commercial service airports to increase the non-Federal Passenger Facility Charge, thereby giving airports greater flexibility to generate their own revenue. The grants-in-aid program enables FAA to advance important safety, capacity, efficiency, and environmental improvements at more than 500 airports supporting commercial service airports and more than 2,800 general aviation airports that provide critical functions at the national, regional, and local level.

In addition, the budget assumes a one-time appropriation of $2.0 billion from the President's Immediate Transportation Investment in FY 2014. Most of this funding would support preservation of existing airport infrastructure, enhancing safety, and preserving existing system capacity. Eligible airports in all size categories are able to compete for the additional $2.0 billion in one-time funding.

What Is The Program?

The AIP provides grants to local and state airport authorities to help ensure the safety, capacity, efficiency, and environmental stewardship of U.S. airports. Through the AIP, the agency funds a range of activities to assist in airport development, preservation of critical facilities, economic competitiveness, and environmental sustainability.

Why Is This Particular Program Necessary?

Through the AIP, the agency funds a range of activities to ensure the safety, security, capacity, and environmental mitigation of U.S. airports. The FAA identifies public-use airports for the national transportation system and the National Plan of Integrated Airport Systems (NPIAS). These public use airports support scheduled air carrier service at more than 500 commercial service airports. In addition to the scheduled passenger and cargo service, the airport system serves a diverse range of functions at approximately 2,800 general aviation airports that support emergency medical services and disaster response, flight training, law enforcement support, agricultural activities, and business/corporate activities. The proposed AIP funding level will provide sufficient funding for all high priority safety, security, preservation, capacity, and environmental projects.

How Do You Know The Program Works?

The FAA has a very high level of confidence in the effectiveness of the program. The investment of AIP funds in the National Airport System (NAS) improves the safety and enhances the capacity of the system. We work closely with airports and the state aeronautical agencies to monitor the condition of critical airfield infrastructure, and can draw direct connections between our efforts and improvements in safety, capacity, efficiency, and environmental responsibility.

Why Do We Want/Need To Fund The Program At The Requested Level?

The principal tool FAA uses to establish the Airports Capital Improvement Program (ACIP) is the 5-year development needs identified in the NPIAS. The latest NPIAS, which was published in September 2012, identified over $42.5 billion in capital needs over the 5-year period from 2013-2017. The FAA funds capital projects that support system safety, capacity, and environmental projects and the highest priority needs in the NPIAS. The NPIAS reflects a 19% decrease from the preceding NPIAS report (published in September 2010 and covering the 5-year period from 2011-2015).

At the requested AIP funding level in 2014, based on current law the FAA would be able to fund capital needs that support system safety, capacity, and environmental projects. This follows the assumption that the formula guidelines in the Authorization are permitted to take effect when the funding level is below $3,200,000,000. Should adjustments be made to preserve formula calculations similar to a program that is more than $3,200,000,000, it would have a detrimental impact to the amount of AIP Discretionary funds available. Subsequently, this would hinder FAA's ability to fund the highest priority needs in the NPIAS. The proposed approach is to reduce the funding level responsibly, by allowing the formula changes to take effect as currently written in law.

GRANTS-IN-AID FOR AIRPORTS

Grants-in-Aid for Airports (AATF)
($ in Thousands)

Item Title	Dollars	FTP	FTE
FY 2012 Enacted	**3,198,750**	**0**	**0**
Reduced Program Level with PFC reforms			
1. Grants-in-Aid for Airports	(449,850)		
Increases/Decreases	**(449,850)**	**0**	**0**
FY 2014 Request	**2,748,900**	**0**	**0**

Detailed Justification for Grants-in-Aid for Airports

What Is The Request And What Will We Get For The Funds?

FY 2014 Grants-in-Aid for Airports Budget Request ($000)

Program / Component	FY 2012 Enacted	FY 2013 CR Annualized	FY 2014 Request	Difference from FY 2012 Enacted
Grants-in-Aid for Airports, (AATF)	$3,198,750	$3,211,284	$2,748,900	$-449,850

For FY 2014, FAA requests $2.7 billion to fund the Grants-in-Aid for Airports program (AIP). This is a decrease of $450 million (14 percent) below the FY 2012 level.

The Budget focuses the traditional Federal grants to support medium hub, smaller commercial service and general aviation airports that have more limited access to additional revenue or other outside sources of capital. At the same time, the budget proposes to increase the Passenger Facility Charge (PFC) limit from $4.50 to $8.00 and eliminates passenger and cargo entitlement funding for large hub airports but maintains discretionary eligibility. The Budget proposes to allow all commercial service airports to increase the non-Federal Passenger Facility Charge, thereby giving airports greater flexibility to generate their own revenue. The grants-in-aid program enables FAA to advance important safety, capacity, efficiency and environmental improvements at more than 500 airports supporting commercial service airports and more than 2,800 general aviation airports that provide critical functions at the national, regional and local level.

In addition, the budget assumes a one-time appropriation of $2.0 billion from the President's Immediate Transportation Investment in FY 2014. Most of this funding would support preservation of existing airport infrastructure, enhancing safety, and preserving existing system capacity. Eligible airports in all size categories are able to compete for the additional $2.0 billion in one-time funding.

The request allows the agency to continue supporting the following key initiatives:

- Improve Runway Safety Areas (RSA) that do not conform to FAA standards;
- Reduce the risk of runway incursions by reconfiguring taxiways, perimeter service roads and other facilities;
- Preserve or enhance the safety of critical airfield and other airport infrastructure at airports nationwide;
- Preserve or enhance airfield capacity and efficiency at airports nationwide;
- Mitigate the environmental impacts of aviation including noise mitigation, land use compatibility planning and air quality improvements; and
- Continue to support airport security improvements where applicable.

The FAA continues to award AIP grants that enable airports to conform to our RSA standards. The agency's long-term goal is to eliminate airport conditions that contribute to accidents and enhance the margin of operating safety by improving RSAs. By the start of FY 2014, we will have brought 94 percent of the AIP funded RSAs and 30 percent of the F&E funded RSAs at certificated airports up to meet standards or to the extent it is practicable to meet the standard. Our goal remains to complete all the airport AIP funded RSAs improvements by the end of 2015 and the F&E funded RSA improvements by the end of 2018.. We are also working closely with the FAA units administering the Facilities & Equipment (F&E) budget to relocate FAA-owned Navigational Aid Systems (NAVAIDS) from RSAs or making them frangible.

We have a special emphasis to direct AIP investments to reduce accidents in Alaska for general aviation and all Part 135 operations[1]. AIP funding will be directed, where practical, to continue improving access-

[1] Part 139 Airports are regulated by federal airport certification regulation [Title 14, Code of Federal Regulations (CFR), Part 139]. This regulation establishes certification requirements for airports that serve scheduled air carrier aircraft with more than 9 seats and unscheduled air carrier aircraft with more than 30 seats.

deficient airports to provide 24 hour Visual Flight Rules (VFR) access at a minimum. An originally-identified list of 63 airports in Alaska were designated as access-deficient. Of those 63 airports, 30 have been provided 24-hour VFR access.

AIP will continue to support funding capacity and efficiency enhancements throughout the system, including the full range of commercial service (primary) airports and smaller (nonprimary) airports nationwide. AIP will accomplish this by providing financial and technical support to regional and metropolitan system plans, airport master plans and environmental reviews, and by directing funding toward the construction and preservation of runways, runway extensions, and airfield reconfigurations. We will also strive to increase the safety, security, and capacity of the global civil aerospace system in an environmentally sound manner.

AIP funds will continue supporting environmental mitigation measures including noise mitigation and emission reduction through:

- Residential and school sound insulation programs;
- Property acquisition;
- Land use compatibility planning; and
- Air quality improvement projects as part of the Voluntary Airport Low Emission (VALE) program.

Additional environmentally sustainable AIP activities include acquisition of vehicles and equipment that help reduce emissions including:

- Alternative fuel buses;
- Ground power systems that reduce the need for aircraft to use auxiliary power units; and
- Hydrant fuel distribution systems that reduce or eliminate the need for fuel tank trucks.

In FY 2014, the Office of Airports (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 the Aviation Reauthorization Act. Commissioning of new commercial service runways is dependent on the timely completion of environmental reviews.

Funding will be used to mitigate significant aviation noise impacts through the purchase and relocation of residences and businesses, soundproof residential homes or buildings used for educational or medical purposes, and purchase and install noise barriers or monitors.

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 Transportation Security Administration (TSA) representatives in identifying airport 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.

Funding in FY 2014 will support the following key outputs and outcomes:

- Improved 32 AIP funded RSAs and 82 F&E funded RSAs to increase the margin of operating safety in the event of runway excursions;
- Reconfigured taxiways, perimeter service roads and other facilities reduce the risk of runway incursions;
- Reconstructed and rehabilitated runways, taxiways and aprons will preserve the nation's critical aviation infrastructure and prevent the risk of foreign object debris damage to aircraft from cracked or broken pavement surfaces; and
- Air quality improvement and noise mitigation projects reduce air and noise pollution.

What Is This Program?

The Grants-in-Aid for Airports program supports the Department of Transportation's (DOT) State-of-Good Repair goal, contributing toward the outcome of an increased proportion of infrastructure assets in good condition. We also support DOT's Safety goal through our efforts to "reduce transportation-related injuries and fatalities." We additionally support DOT's Economic Competitiveness goal, with resources dedicated to two outcomes: "Maximum economic returns on transportation policies" and "A competitive air transportation system responsive to consumer needs." This program also significantly contributes toward DOT's Environmental Sustainability goal, contributing toward the reduction of transportation-related pollution and impacts on ecosystems.

State of Good Repair

The AIP provides grants to local and state airport authorities to maintain critical facilities, including runways, taxiways, aircraft parking areas (aprons) as well as many other airport facilities, systems and equipment. For example, AIP provides funds to ensure that no less than 93 percent of runways at more than 3,300 airports included in the NPIAS are maintained in excellent, good or fair condition.

Safety

The AIP provides grants to local and state airport authorities to help ensure the safety, capacity and efficiency of U.S. airports. Through the AIP, the agency funds a range of activities to assist in airport development, preservation of critical facilities, economic competitiveness, and environmental sustainability. The AIP also supports the DOT Safety goal by providing funding for safety-related development at airports that benefit both commercial service and general aviation operations. For example, AIP provides funds to airports to reduce runway incursions caused by vehicle/pedestrian deviations, to accelerate improvements to RSAs that do not meet current standards, supports research in airport technology to develop improvements in airport marking and lighting, airport rescue and firefighting, and mitigation of wildlife hazards near airports.

Economic Competitiveness

The AIP supports the DOT Economic Competitiveness through the following outcomes:

- Maximum economic returns on transportation policies and investments; and
- A competitive air transportation system responsive to consumer needs.

By funding airport infrastructure projects that provide access to the National Aviation System in order to maintain a competitive air transportation system responsive to consumer needs, AIP contributes to economic competitiveness. For example, the AIP directs funding investments toward capacity development projects at airports ranging from the largest and most congested airline hubs serving some of the largest metropolitan areas to smaller urban areas and down to airports that enable critical access for emergency medical services to isolated communities.

Environmental Sustainability

The AIP supports the DOT Environmental Sustainability goal, "Reduction in transportation-related air, water and noise pollution and impacts on ecosystems" outcome by funding projects and programs that help reduce transportation-related impacts on air quality, water quality, noise, and other impacts on ecosystems. For example, the AIP supports projects to reduce ozone emissions in Environmental Protection Agency-designated nonattainment areas; supports airport greening initiatives and developing sustainability best practices; implements Environmental Management Systems to ensure that FAA operations protect the environment and meet statutory and regulatory environmental requirements; and reduces the number of people exposed to significant noise. The FAA will also be taking steps to address energy reduction, solid-waste recycling and other enhancements to environmental sustainability.

Anticipated accomplishments for the AIP grant program in 2014 include:

- Improve 32 AIP funded nonstandard RSAs;
- Fund infrastructure development projects to meet airport safety and design standards;

- Ensure that 93 percent of runways at more than 3,300 airports in the NPIAS are maintained in excellent, good or fair condition;
- Continue progress on reducing runway incursions by 10 percent from the FY 2008 baseline within 5 years;
- Fund all approved Runway Safety Action Team (RSAT) recommendations identified in the ACIP;
- Fund capacity projects identified in the ACIP;
- Fund continued support of the Military Airport Program;
- Fund noise mitigation to benefit at least 10,000 residents within Day-Night average sound level (DNL) 65dB (decibels) or higher-impacted contours;
- Fund VALE program initiatives to improve air quality by helping airports reduce emissions from mobile and stationary ground sources; and
- Prepare Airport Layout Plan (ALP) updates for Nonhub primary airports in Airports Geographical Information System (AGIS) format as an electronic ALP.

Why Is This Particular Program Necessary?

The aviation system plays a critical role in the success, strength, and growth of the U.S. economy. Approximately 590,000 active pilots, 232,000 general aviation aircraft, and 4,520 air carrier jets rely upon the U.S. airport system. The economic impacts of the air traffic control system are well-documented in FAA's report on "The Economic Impact of Civil Aviation on the US Economy," published in August 2011. It states that, in 2009, aviation accounted for over 10 million jobs, $1.3 trillion toward the gross domestic product output, and 5.2 percent of gross domestic product.

Airport infrastructures, particularly airfield facilities, are exposed to constant heavy use and harsh environmental conditions. Runways, taxiways, and aprons are designed to withstand the heavy equipment that operates on them, but even so these facilities require frequent maintenance and rehabilitation in order to remain in good working condition. Runways and taxiways have to be kept clear of snow, ice, and ponding water that can jeopardize aircraft directional control or braking action. Chemicals and plowing, as well as freeze-thaw cycles, all take a toll on runways, taxiways, and other paved areas. The smallest bit of broken asphalt or concrete can represent a major safety hazard to aircraft accelerating on takeoff or maintaining directional control after landing.

The vast majority of public-use airports in the United States are owned and operated by municipal, county or state government agencies, or by independent public authorities. They are required to follow strict rules in establishing rates and charges for the airlines and other users in order to recover their operating and maintenance costs.

Through AIP, the agency funds a range of activities to ensure the safety and capacity of U.S. airports. The FAA identifies public-use airports that are important to the national transportation system, including those airports in the federal plan known as the NPIAS. These public use airports support scheduled air carrier service at approximately 500 airports (known as commercial service airports). In addition to the scheduled passenger and cargo service, the airport system serves a diverse range of functions at approximately 2,800 general aviation airports. These airports support emergency medical services and disaster response, flight training, law enforcement support, agricultural activities, and business/corporate activities.

The 64 Large and Medium hub airports account for about 88 percent of all passenger enplanements. Much of the delay to air traffic can be traced to inadequate capacity or efficiency at some of these airports. With the critical support of AIP, constructing new or extended runways, taxiways, and airfield reconfiguration continues to be an important part of FAA's NextGen Implementation Plan. 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. Since FY 2000, 16 new runways, 3 runway extensions, and 1 airfield reconfiguration have opened with another airfield reconfiguration two-thirds completed, allowing approximately 2 million more annual operations.

AIP supports 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. The AIP funding plan will reflect a special emphasis to increase capacity and improve the airport arrival efficiency rate. AIP funding of the following airport projects contributes to these projects:

- 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; and
- Construct new airports/heliports.

How Do You Know The Program Works?

The FAA works closely with commercial service airports and with state aeronautical agencies to monitor the physical condition of airport infrastructure, particularly the critical airfield facilities. This gives FAA real-time information about capital funding needs and priorities, the effectiveness of funded projects, and the utilization of the airports. One of the core performance objectives of AIP is to maintain at least 93 percent of the runways at NPIAS airports in good, fair or excellent condition. The FAA's funding decisions consider a number of factors including the physical condition of airport facilities as well as historical, current and projected activity levels. The FAA also reports annually to Congress on how the funds have been used and the benefits of those investments in terms of increased safety, capacity, efficiency, and environmental compatibility.

The investment of AIP funds in the NAS has direct benefits, improving the safety and capacity of the system. The AIP program also assists airports to become more environmentally friendly and reduces the impact of airport activities on its communities.

<u>Safety</u>
We have several metrics that show the AIP investment is improving or maintaining safety. In FY 2011, the number of total runway incursions decreased slightly from 966 in FY 2010 to 954 in FY 2011. Although serious runway incursions (Category A and B) are showing an increase in FY 2012, the overall number remains low. There were 6 Category A or B incursions in FY 2010, and 7 in FY 2011. In FY 2012, the runway incursion total was 552. Of those, 14 were Category A or B incursions. The Runway Safety Council's Root Cause Analysis Team is identifying root causes and developing mitigations for these serious incursions.

The installation of the enhanced taxiway centerline marking, the use of end-around taxiways, and improvements in surface geometry all are addressing the need to maintain a focus on reducing runway incursions. The investment in improving RSAs and installing Engineered Materials Arresting Systems (EMAS) beds has also shown to be effective in safely stopping aircraft when they overrun the runway. EMAS has already recorded seven successful overrun arrestments with minimal or no damage to the aircraft. The latest arrestment came at Key West International, Florida in November 2011 when an overrunning Cessna Citation was safely stopped. Several mid-term and long-term initiatives should reduce the risk of runway incursions. These initiatives include additional air traffic control procedural changes, deployment of Runway Status Lights by the end of 2015, development of low-cost ground surveillance by the end of FY 2013, and enhanced cockpit systems to improve pilot situational awareness.

<u>Economic Competitiveness</u>
Since FY 2000, 24 airfield projects have opened at 20 Large and Medium hub airports. These include 16 new runways, 3 taxiways, 3 runway extensions, 1 airfield reconfiguration, and 1 airfield reconfiguration two-thirds completed. The projects have provided these airports with the potential to accommodate about 2 million more annual operations and decrease average delay per operation at these airports by about 5 minutes.

<u>Environmental Sustainability</u>
AIP funds have assisted airports to become more environmentally friendly. AIP funds assist airport owners to improve land use compatibility near airports through the acquisition of non-compatible residences and sound insulation of residences, schools, and hospitals. From 2005 through 2011, nearly 115,000 people have benefited by their relocation from a noise impacted area or through sound attenuation programs designed to reduce the noise exposure on residences, schools, or hospitals.

The VALE Program addresses air quality by helping airports reduce emissions from all mobile and stationary ground sources. The FAA has funded 57 VALE projects through the AIP program from 2005 through 2012. A total of $116 million has been invested in VALE clean airport technology. Over the long-run, VALE initiatives will reduce ozone forming pollutants (Nitrous Oxides and Volatile Organic Compounds) at airports by 8,010 tons. The smog-reducing benefits of VALE projects are equivalent to removing over 20,600 cars and trucks from the road each year for the next decade.

Why Do We Want/Need To Fund The Program At The Requested Level?

Every other year, FAA is required to develop a five-year prospective analysis of capital needs and submit it to Congress as part of the NPIAS. The capital projects included in the NPIAS consistently exceed the annual available funding for the AIP. Projects are routinely broken into smaller phases or deferred to a future year until funding can be identified. The latest NPIAS, published in September 2012, identified over $42.5 billion in capital needs over the 5-year period from 2013-2017. The FY 2014 request of $2.7 billion would fulfill less than 7 percent of these identified capital needs.

At the requested level of AIP funding, FAA would be able to fund capital needs that support system safety, capacity, and environmental projects. Should this not occur, the primary impact would be on AIP Discretionary funds—the funding category over which FAA has the greatest degree of control to address the highest priority system needs. Any reduction would impact FAA's ability to fund the highest priority needs in the NPIAS.

Explanation of Funding Changes for Grants-in-Aid for Airports

	Dollars ($000)	FTE
Grants-in-aid for Airports (Net change from FY 2012)	**-449,850**	**0**
Overview: For FY 2014, the Associate Administrator for Airports requests $2.7 billion to meet the mission of planning and developing a safe and efficient national airport system. This represents a decrease of $450 million from the FY 2012 level.		
Discretionary increases/decreases		
Grants-in-Aid for Airports: The $2.7 billion requested for AIP will enable FAA to meet all national priorities for safety, security, capacity, and environmental mitigation across all size airports. The Budget focuses the traditional Federal grants to support Medium hub, smaller commercial service and general aviation airports that have more limited access to additional revenue or other outside sources of capital. At the same time, the budget proposes to increase the Passenger Facility Charge (PFC) limit from $4.50 to $8.00 and eliminates entitlement funding for large hub airports but maintains limited discretionary eligibility. Thereby, the Budget envisions giving the large hub airports greater flexibility to generate their own revenue and providing a PFC increase to all other commercial service airports as well. .	-449,850	

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Personnel and Related Expenses

($ in Thousands)

Item Title	Dollars	FTP	FTE
FY 2012 Enacted	**101,000**	**577**	**564.0**
Unavoidable Adjustments			
1. Annualization of FY 2012 Enacted FTEs and FTPs	1,781		13.0
2. Pay Inflation	626		
3. Non-pay Inflation	87		
4. Program adjustments for WCF	64		
5. E-Gov - Integrated Acquisition Environment - Grants & Loans	637		
Total Unavoidable Adjustments	**3,195**	**0**	**13.0**
New or Expanded Programs			
1. Contract Pay Raises	255		
2. Field Safety and Standardization Personnel	450	6	3.0
3. SOAR Redevelopment	1,700		
Total Discretionary Increases	**2,405**	**6**	**3.0**
FY 2014 Request	**106,600**	**583**	**580.0**

Detailed Justification for Personnel and Related Expenses

What Is The Request And What Will We Get For The Funds?

FY 2014 Personnel and Related Expenses Budget Request ($000)

Program / Component	FY 2012 Enacted	FY 2013 Annualized CR	FY 2014 Request	Difference from FY 2012 Enacted
Personnel and Related Expenses	$101,000	$101,618	$106,600	$5,600

For FY 2014, the Associate Administrator for Airports requests $106.6 million, 583 positions and 580 FTEs to cover the administrative expenses for the ARP, an increase of $5.6 million over the FY 2012 Enacted Budget. The request allows ARP to fulfill its mission of 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 consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment. The administrative request includes the following discretionary increases:

Redevelopment of System of Airports Reporting (SOAR) – One time funding of $1.7 million is requested for SOAR redevelopment. The FAA relies extensively upon SOAR to manage four critical program areas, including administration of the Air Carrier Activity Information (ACAIS), the NPIAS, and ACIP processes, the AIP and the PFC program (including both internal and external reporting activities required by statute and regulation). These programs combined represent roughly $5 billion annually, which is managed within SOAR.

Field Safety and Standardization Personnel – Funding of $0.45 million is requested for 6 additional positions, 3 FTEs in FY 2014. The 6 positions are requested to continue the phased staffing increase for frontline personnel to improve airport safety through implementation of SMS, conduct wildlife hazard assessments or site visits at general aviation airports, and improvements to runway safety areas.

What Is The Program?

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 consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment.

This program supports DOT's State-of-Good Repair goal (maintaining the percentage of airport runways in excellent, good, or fair condition); Safety goal (Reduction in transportation related injuries and fatalities), Economic Competitiveness goal (Maximum economic returns on transportation policies and investments and Competitive air transportation system responsive to consumer needs); and Environmental Sustainability goal (Reduction in transportation-related air, water and noise pollution and impacts on ecosystems).

ARP is responsible for the regulatory oversight and inspection of certificated commercial service airports. In FY 2014, we will continue emphasizing efforts to reduce runway incursions caused by vehicle/pedestrian deviations. This will require ensuring airports maintain effective driver training programs as well as implementing approved RSAT recommendations. We also have a special emphasis program to accelerate improvements to RSAs that do not meet current standards. Another significant initiative is implementation of SMS at airports to harmonize with International Civil Aviation Organization (ICAO) standards. Further, AIP provides priority consideration for funding safety-related development for airports that benefit both commercial service and general aviation operations.

ARP will continue to support capacity and efficiency enhancements throughout the system, including the full range of commercial service (primary) airports and smaller, nonprimary airports nationwide, by providing financial and technical support to regional and metropolitan system plans, airport master plans and environmental reviews, and by directing AIP funding toward the construction and preservation of runways, runway extensions, and airfield reconfigurations. In FY 2014, ARP expects to issue approximately 2,000 new AIP grants to airport sponsors and continues to administer the AIP to ensure the timely and efficient use of federal funds. ARP would also continue to administer the Passenger Facility Charge (PFC) program, which we anticipate will involve a significant increase in activity if the proposed PFC increase is approved. We will also strive to increase the safety, security, and capacity of the global civil aerospace system in an environmentally sound manner.

Anticipated 2014 accomplishments include:

- Administer the AIP by issuing new grants and continuing to administer existing grants at airports nationwide in support of safety, capacity, efficiency and environmental objectives;
- Administer the PFC program by monitoring the consultation process, reviewing applications and amendments for projects at commercial service airports nationwide in support of safety, capacity, efficiency and environmental objectives;
- Publish 12 Advisory Circular (AC) updates;
- Continue publishing and updating guidance on environmental sustainability initiatives;
- Improve 32 RSAs;
- Continue implementation of Airport SMS;
- Continue to support airports in conducting Wildlife Hazard Assessments and Wildlife Management Plans;
- Develop plans for improving airports with nonstandard geometry such as taxiway separation;
- Limit serious Runway Incursions by vehicles or pedestrians (category A and B) to 3 or less;
- Continue implementation of AGIS;
- Manage and execute Part 139 Airport Safety Certification program;
- Meet Part 16 compliance schedules;
- Integrate SMS into FAA airport planning and environmental processes and guidance;
- Support the President's initiative 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; and
- Maximize the return on AIP investments by increasing the disbursement rate for AIP grants.

Why Is This Particular Program Necessary?

ARP is 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. We also provide national airport planning and environmental requirements, airport grants, property transfers, Passenger Facility Charge (PFC) program administration, and ensure adequacy of the substantive aspects of FAA rulemaking actions relating to these programs. ARP ensures compliance with federal airport grant and surplus property obligations, economic regulatory oversight, and executive direction and oversight of regional activities. This office serves as the first level decision maker for adjudication of complaints filed against airports under 14 C.F.R. Part 16. Additionally, this office has oversight of strategic planning, performance and technical training for headquarters and field operations.

How Do You Know The Program Works?

ARP has established a number of measures to monitor and optimize performance and efficiency. We make extensive use of customized labor reporting codes in order to track how much time we spend on each of our technical programs and administrative responsibilities. Then we combine that labor data with other direct and indirect costs compared against key output measures in order to analyze our organizational efficiency. We periodically review our progress against efficiency goals, and we review the metrics and target levels to ensure that we are continuing to evaluate our own efficiency.

In addition, ARP actively monitors the actual outcomes of our various program areas. For example, we consistently see a strong correlation between our efforts related to runway safety and a reduction in runway incursions caused by vehicle or pedestrian deviations. As another example, we can draw a direct connection between the efforts of our personnel and the condition of critical airfield infrastructure (runways and taxiways).

Why Do We Want/Need To Fund The Program At The Requested Level?

The FY 2014 requested funding amount is required to 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.

The number of airports receiving AIP grants and PFC application and amendment approvals significantly increased while staffing levels remained constant. Staffing for field offices remained the same throughout that period and to accommodate, field operations have relied upon airport sponsors to complete grant documentation and maintain compliance with grant assurances. Compliance audits, user complaints, and sponsor action increasingly unearth problems leading to corrective action which may take years to complete and create additional work for both sponsors and FAA staff.

Our requests for discretionary increases are paramount to improving safety, security, and efficiency.

Funding an additional increase of $1.7 million for SOAR redevelopment is essential to maintaining a secure grants management system as well as reducing errors and inefficiencies in tracking and awarding grants.

The additional FTE's requested are also paramount to increasing safety and efficiency, enabling us to provide the necessary safety and efficiency oversight functions and complete the geographic balancing. Further, this will allow us to level the staffing among field offices, thus allowing an equal focus on safety and efficiency in all regions. With the requested FY 2014 positions, the Airports overall field staffing needs decreases from a high of 102 positions (needs projected in 2007-2008 staffing study) to 73.

Explanation of Funding Changes for Personnel & Related Expenses

	Dollars ($000)	FTE
Personnel and Related Expenses (Net change from FY 2012)	**5,600**	**16**
Overview: For FY 2014, the Associate Administrator for Airports requests $106.6 million, 583 positions and 580 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 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 $5.6 million from the FY 2012 Enacted level.		
Unavoidable Adjustments		
Annualization of FTE enacted in FY 2012: This adjustment represents the funding for the remaining half of the increase of the 26 positions enacted in FY 2012. Because the additional 13 FTEs (enacted as 26 FTP in FY 2012) were not funded during the FY 2013 CR, ARP has not been able to fully fund the additional positions as enacted in FY 2012.	1,781	
Pay Inflation: This 1.0 percent increase is required to provide for costs associated with base salary increases. (January to September)	626	
Non-Pay Inflation: This 0.5 percent increase is required to provide for inflationary cost increases.	87	
E-Gov - Integrated Acquisition Environment (IAE) – Loans & Grants: The Federal Funding Accountability and Transparency Act (FFATA) requires all agencies participating in the posting or awarding of Loans & Grants to disclose information on a publicly accessible website. This enhances the transparency of federal program performance information, funding, and loans & grants solicitation. OMB's IAE initiative allows agencies to meet the requirements of the FFATA by assigning a unique identifier, determining corporate hierarchy, and validating and cleaning up incorrect and incomplete data. The FAA has been making an annual contribution to this effort; however, the estimated contribution for FY 2014 has increased substantially. The increased level for this initiative is based on OMB's revised algorithm to calculate each agency's costs associated with the IAE portfolio. Previously, each agency's share was calculated based on discretionary awards. The new algorithm reflects both discretionary and mandatory grants. Because the DOT/FAA awards a significant share of mandatory grants, the revised algorithm resulted in a substantial increase in costs for this initiative.	701	
Discretionary Increases/Decreases		
NATCA Multi Unit Pay Raise: Cost associated with the National Air Traffic Controllers Associations Multi-Unit pay article that was awarded by an arbitrator in January 2011 and will run through December 31, 2014. The contract covers about 1,700 employees across six FAA offices (AVS, ATO, ARC, ARP, AGC, and ABA) and includes engineers, computer specialists, program analysts, budget analysts and other professionals. In FY 2014, the primary cost driver is a guaranteed basic pay raise of 3.75 percent in January 2014. This cost excludes pay inflation, Organizational Success Increase (OSI) and Superior Contribution Increase (SCI).	255	
Field Safety and Standardization Personnel: Funding of $0.45 million is requested for 6 additional positions, 3 FTEs in FY 2014. The	450	3

6 positions are requested to continue the phased staffing effort to improve airport safety. As the regional workload continues to increase, it has become increasingly challenging to pursue important safety initiatives. These positions will augment the front line staff in the field, therefore allowing a greater allocation of both new and existing resources towards increased safety. We have initiated an internal safety management system (SMS) processes in the field for ARP infrastructure projects at large hubs. SMS is very workload intensive as it requires conducting risk analyses on proposed projects to identify and mitigate risks to an acceptable level before making changes to airport infrastructure or procedures. Publication of an SMS rule is anticipated in FY 2015 requiring certain certificated airports to implement SMS. As a result, additional oversight by field personnel will be necessary to review and approve airport SMS plans, participate in airport generated SMS risk management meeting project reviews, and inspect airport SMS activities to verify that the airports are complying with the SMS rule. In FY 2014, ARP will continue the initiative for conducting wildlife hazard assessments or site visits at GA airports. These assessments will be submitted to our regions for review. In many cases, follow-up wildlife hazard management plans will be required, necessitating review and approval by regional personnel. This will be another workload intensive requirement. As a result of wildlife hazard assessments and SMS expansion, field office workload will also increase to issue and manage more safety related grants. Improvement of RSAs is another safety initiative that will be in a critical stage in FY 2014. By statute, airports must upgrade all RSAs at certificated airports to the extent practicable by the end of FY 2015. The remaining RSA upgrades in FY 2014 and FY 2015 are the most complex, expensive, and challenging. Many of the remaining RSAs have significant environmental issues to resolve as they include building near harbors and waterways.		
SOAR Redevelopment: Funding of $1.7 million is requested for SOAR redevelopment. The FAA relies extensively upon SOAR to manage four critical program areas, including administration of the NPIAS, the ACIP, the AIP and the PFC programs. These programs combined represent roughly $5 billion annually, which is managed within SOAR. SOAR is essential for several reasons, and also provides a centralized data management system that allows coordination among Regional and District Offices. The system is also used by both airports and airlines to fulfill their regulatory reporting requirements under the PFC program. The system was constructed in the early 2000's by combining several predecessor systems. SOAR was built using the best technology available at the time; however, 10 years later, the current system now requires extensive operating and maintenance (O&M) costs and has become increasingly prone to security vulnerabilities. In an effort to avoid investing limited resources in a system that is rapidly becoming obsolete, ARP conducted an extensive cost-benefit analysis for the redevelopment of SOAR, addressing the vulnerabilities and inefficiencies of the current system. This proposal received a favorable Investment Analysis Readiness Decision from the Joint	1,700	

Resource Council. The proposal requires a one-time, up-front investment of $1.7 million above the current base. The $1.7 million represents a longer-term solution in lieu of a $2 million maintenance cost to a system that will no longer be supported. The $1.7 million will also enable FAA to retain a qualified information technology contractor to redevelop SOAR using modern software, operating system and cyber-security platforms. This funding, combined with the ongoing O&M funding, will enable FAA to phase the redevelopment without impacting the critical programs that SOAR supports. The redeveloped system will address and correct all of the critical deficiencies with the current SOAR system as identified above. Moreover, the redevelopment of SOAR will reduce and eliminate workflow inefficiencies which will enable FAA's AIP grant administration personnel to shift a portion of their time to increased oversight, resulting in higher productivity and efficiency.		

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GRANTS-IN-AID FOR AIRPORTS

Airport Technology Research

($ in Thousands)

Item Title	Dollars	FTP	FTE
FY 2012	**29,250**	**23**	**23.0**
Unavoidable Adjustments			
1. Annualization of FY 2013 Pay Raises	0		
2. Pay Inflation	25		
3. Non-pay Inflation	130		
Total Unavoidable Adjustments	**155**	**0**	**0.0**
Discretionary Increases/ Decreases			
Program Adjustments	95		
Total Discretionary Adjustments	**95**		
FY 2014 Request	**29,500**	**23**	**23.0**

Detailed Justification for Airport Technology Research

What Is The Request And What Will We Get For The Funds?

FY 2014 Airport Technology Research Budget Request ($000)

Program / Component	FY 2012 Enacted	FY 2013 CR Annualized	FY 2014 Request	Difference from FY 2012 Enacted
Airport Technology Research	$29,250	$29,429	$29,500	$250

For FY 2014, the Associate Administrator for Airports request $29.5 million, 23 positions and 23 FTE to fund the Airport Technology Research program. The request will fund research in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, runway surface technology, and visual guidance. The results of this research are used in updating Advisory Circulars, manuals, and technical specifications that airports rely on when expending AIP grant funds. We will also continue the program to conduct noise measurements across airport communities and concurrent public surveys and sleep disturbance studies to collect data that will be used to guide national aviation noise policy, determinations of community impacts from aircraft noise, federal land use compatibility guidelines around airports, and noise mitigation funding.

The table below summarizes the research activities funded by this request.

FY 2014 ATR Research Projects ($000)

Research Project	FY 2014 Request
Advanced Airport Pavement Design	200
Pavement Design & Evaluation Methodology	2,000
National Airport Dynamic Tests	2,873
Airport Pavement Test Vehicle	1,100
Field Instrumentation & Testing	500
Improved Paving Materials and Lab	1,700
Non-Destructive Pavement Testing	1,875
Center of Excellence	50
Airport Planning	500
Airport Design	700
Operation of New Large Aircraft (NLA)	800
Composite Materials Firefighting	500
Airport Wildlife Hazards Abatement	2,500
Airport visual guidance/runway incursions reduction	2,400
Airport Technology Research Taxiway	1,530
Aircraft Braking friction	1,900
Innovative Measurement Techniques	1,540
Heated Pavements	1,000
Aircraft Noise Annoyance Data and Sleep Disturbance Around	1,500
Surface Operations	300
Rescue and Fire Fighting	700
Subtotal—Contracts	**26,168**
In-House (FTEs)	3,332
TOTAL	**29,500**

The FY 2014 request reflects completion of several projects, continuation of most projects, and modification in the research direction as necessary.

Funding in FY 2014 will support the following key outputs and outcomes:

- Complete the construction of the High Temperature Pavement Test Facility;
- Continue research to study the effects of high tire pressures on the pavement surface using the Airport Pavement Test Vehicle and the high temperature pavement test facility, and also develop pavement mix design procedures to produce mixes that can withstand very high tire inflation pressures;
- Upgrade of FAA PAVEAIR by integrating it with other FAA software programs;
- Continue to upgrade the FAA NextGen pavement materials research lab towards certification;
- Continue to evaluate green technologies for use in airfield pavements;
- Continue study of emerging technologies for detecting and deterring hazardous wildlife species on or near airports;
- Continue to implement habitat modification strategies for reducing and controlling hazardous wildlife species at airports;
- Continue to conduct research on new technologies and techniques that can improve airport lighting, signs, and markings to help improve situational awareness and help reduce surface incidents, accidents, and incursions while improving capacity;
- Conduct major effort on the pavement life extension project, started in FY 2013, as a core activity doubling the expected life of runway pavements at large hub airports from current standard of 20 years to 40 years;
- Continue rehabilitation of the decommissioned Taxiway C at Cape May County Airport as well as conduct testing of new lighting systems technologies and bring the taxiway into compliance for standard airport operations when not being utilized for research and development;
- Continuing surveying airport communities to collect noise annoyance and sleep disturbance data;
- Analyze the aircraft noise annoyance and sleep disturbance data and create new dose-response curves for annoyance;
- Continue to collect data for taxiway centerline deviation for airplanes in design group II and analyze data collected for airplanes in design group III;
- Continue to maintain the safety database and update the mitigation plan for the top 5 risk areas;
- Continue research into the performance of aircraft Anti-Skid Brake Systems (ASBS) on contaminated runway surfaces. This research will include utilizing the ASBS Simulation Lab, Braking Research Aircraft testing on contaminated runway surfaces, and Boeing 737-800 Full-Motion Simulator testing. The anticipated product from this research will be development of Mathematical Models capable of processing performance data from operating aircraft, landing on contaminated runways, for prediction of landing distances of follow-on aircraft;
- Continue research into development of technology for effectively heating of airport runway and taxiway surfaces to prevent snow and ice accumulation. This research will include continued evaluation of alternative power sources (e.g. geothermal and solar) and methods of heat transfer. The anticipated product from this research will be development of feasible and practical alternatives for heating of airport runways and taxiways for prevention of snow and ice accumulation; and
- Continue to improve aircraft rescue and firefighting tactics to combat fires involving aircraft with multiple passenger decks carrying up to 800 passengers. The product of this research will be a simulation model for predicting fuel dispersion in survivable accidents and improved firefighting agent discharge technologies. Provide improved Aircraft Rescue and Fire Fighting (ARFF) training material for firefighting tactics for the unique characteristics of cargo aircraft fires. The data from the full-scale live fire testing of cargo aircraft will be utilized to update the existing FAA produced training DVDs and Advisory Circulars.

What Is The Program?

Safety
The research conducted within the Airport Safety Technology Research Program directly supports FAA's Advisory Circular system, which is the principal means by which FAA communicates with the nation's airport planners, designers, operators, and equipment manufacturers. These Advisory Circulars commonly referred

to as an AC, present the standards used in the design, construction, installation, maintenance, and operation of airports and airport equipment. Additionally, the AC provides current advice on airport operational and safety topics. To date, the research conducted within the Airport Safety Technology Research Program has provided the necessary technical data to support hundreds of ACs that have been published on a wide range of technical subjects. These technical subjects include airport design standards, visual guidance aids such as lighting marking, or navigational aids, airport rescue and firefighting equipment and procedures, pavement surface conditions, wildlife mitigation and detection, airport capacity enhancements, pavement friction, and snow and ice mitigation. Some examples of the research include:

- **Foreign Object Debris** (FOD) detection research efforts will be conducted to evaluate new detection technologies, conduct a FOD characterization study, and also develop a national FOD database that can be used to track safety issues related to FOD.
- **Taxiway Deviation** research efforts will be conducted to better understand the behavior of larger design group aircraft on smaller airport design group airports, in support of the projected increase in levels of travel at smaller airports as part of the NextGen program.
- **Cargo Aircraft Interior Fire Suppression** research program will develop better tactical guidance for ARFF departments responding to interior fire emergencies on cargo aircraft. This will be accomplished through full-scale, live fire testing of various Unit Load Devices (ULDs) types and configurations in aircraft main deck and lower deck holds.
- **Advanced Composite Material Cutting** is a project to determine the effectiveness of the fire service rescue saw and a variety of available blades on traditional and new commercial aircraft skin materials. With this shift toward advanced material structures over traditional aluminum structures the tools firefighters use must be evaluated to ensure they will continue to be as effective as they are now.
- **New Airfield Lighting Infrastructure** is an effort focused on identifying an efficient and standardized airfield lighting infrastructure that supports the operation of new light sources including Light Emitting Diodes (LEDs). The new system architecture will provide potential resolutions to issues that have arisen with the implementation of the LED fixtures in the current airfield lighting infrastructure.
- **Low Cost Surface Surveillance Framework** is a research effort initiated to assess the efficacy of using localized surveillance sensors to provide real-time situational awareness of aircraft and vehicle movements in the non-movement area at airports without the use of Surface Movement Radars (SMR). This effort is focused on how these systems can be employed to enhance operational capability and safety.
- **Heated Pavements initiative** promises that if runway surfaces can be efficiently and economically heated, the buildup of snow can be avoided, thereby eliminating the need for snow removal operations. Promising methods include geothermal heat exchangers, solar energy, nano-technology, and other innovative techniques to generate heat.

Wildlife habitat management research results are published in a widely distributed manual. The FAA's wildlife strike database and website provides information about wildlife habitat management and hazardous species control and serves as a repository of incidents and accidents involving wildlife strikes around the nation. The FAA continues to evaluate emerging and adapted technologies, to detect and deter birds and provide timely alerts to airport personnel regarding hazardous bird activity. Research will continue to develop improved FOD detection and management techniques. Ongoing research is also conducted in aircraft rescue and firefighting technology leading to more efficient fire fighting techniques for post crash fire protection of both the conventional aluminum constructed aircraft as well as newer advanced composite material construction.

Past research also led to the development of EMAS that have been installed at more than 40 airports and have safely stopped overrunning aircraft in at least 5 separate instances.

<u>State of Good Repair</u>

The pavement research leads to updates in pavement design and constructions standards and improvements in pavement maintenance techniques that keep airport runways and taxiways in good or better condition.

The research conducted is producing significant benefits in increased safety and potential cost savings. In support of capacity, the research results from the NAPTF are providing technical data needed to validate new design standards and to assure compatibility between aircraft and airport runways worldwide. The cooperative research and development agreement and collaboration with international research organizations has led to the creation of many innovative, FAA-developed software programs that have changed the way airport pavements are designed and evaluated. Some examples include:

- **FAARFIELD**, or FAA Rigid and Flexible Iterative Elastic Layer Design, provides a simpler way for airport designers to determine the needed thickness of airport pavements. It also helps meet the standards for different airplanes, and models the thicknesses needed to handle the mix of aircraft traffic. It has the potential to save FAA and airport authorities tens of millions of dollars in airport pavement redesign efforts;
- **ProFAA**, a runway profile data analysis software program, is an innovative method that allows users to calculate roughness and simulate aircraft response to obtain a better understanding of overall pavement life and aircraft fatigue;
- **COMFAA** computes Aircraft Classification Numbers following the internationally mandated ICAO standard. A library of common aircraft types is provided and the user can also define arbitrary gear configurations. The program is valuable for computing the Pavement Classification Number (PCN) for any mix of aircraft traffic, which an airport may currently or in the future experience; and
- **BAKFAA** is a program designed to be used with falling-weight deflectometer (FWD) equipment as part of a pavement evaluation program. BAKFAA reads the data from a variety of FWD devices and returns back calculated layer properties. The computational engine in BAKFAA is LEAF (Layered Elastic Analysis – FAA). LEAF is built into FAARFIELD, but can also be downloaded and run separately under BAKFAA. The FAA has made the Visual BasicTM source code for BAKFAA and LEAF available for programmers to run LEAF from their own applications.
- **FAA PAVEAIR** is a web-based airport pavement management system that provides users with historic current information about airport pavement construction, maintenance and management. The program offers users a planning tool capable of modeling airport pavement surface degradation due to external effects such as traffic and the environment. The program can be used with other FAA pavement applications, such as BAKFAA and COMFAA, to give users input to determine repair scheduling and strategies. It has been developed for installation and use on a stand-alone personal computer, a private network, an intranet and the internet. An implementation of the internet version of FAA PAVEAIR is hosted and supported on a server at the William J. Hughes Technical Center and is accessible from the FAA PAVEAIR website.
- **High Tire Pressure Testing (HTPT)** - NAPTF has completed three cycles of testing the effects of tire pressure on asphalt pavement in conjunction with the Airport Technology group of Boeing Commercial Airplanes. The full scale tests determined that by increasing tire pressure from 210 psi (1.45 MPa) to 245 psi (1.66 MPa) had an insignificant effect on the amount of rutting caused by trafficking at two different wheel loads on two different asphalt mixes but increasing wheel load caused a significant increase in rutting on asphalt pavements. This testing is helping to support a revised tire pressure classification for ICAO standards.
- **Design of Pavements for 40-year Life** project – The current 20-year design life for pavements is specified in FAA AC. In order to accomplish the required extension of pavement life the R&D effort to modify the existing pavement design program, FAARFIELD, to accommodate the new pavement life standard. This modification will include better modeling of pavement remaining life, quantification of design reliability based on available pavement management data, estimation of fatigue life, and revised procedures for reporting PCN.

Environmental Sustainability

In FY 2014, FAA will continue to investigate the effects of aircraft noise near representative U.S. airports. The results of this work will be used to guide national aviation noise policy, determinations of community noise impacts, land use guidelines around airports, and mitigation funding. FAA will also advance guidance related to energy reduction and solid-waste recycling programs.

Anticipated 2014 accomplishments include:

- Complete evaluation to determine feasibility of implementing bird radar displays in Air Traffic Control towers;
- Continue collection of taxiway deviation data at a design group I airport;
- Complete research program on cargo aircraft interior fire suppression to include full-scale live fire testing;
- Complete Advanced Composite Material Cutting study;
- Conduct evaluation of proposed new lighting infrastructure utilizing the Airport Technology Research Taxiway;
- Conduct demonstration of baseline Low Cost Surface Surveillance Framework project;
- Continue analyzing full-scale data from the NAPTF;
- Continue improvements upon and update the pavement design procedures (FAARFIELD) based on full scale data from NAPTF and airport instrumentation sites;
- Continue conducting technical workshops of all FAA analysis tools (PROFAA, FAARFIELD, BAKFAA, LEDFAA and FAA PAVEAIR);
- Continue development of increasing pavement design life from 20 to 40 years for large hub airports;
- Continue full-scale tests on reflective cracking of flexible pavement at the NAPTF;
- Refine development of a web-based application for FAA APVEAIR as a suite of FAA analysis tools (PROFAA, FAARFIELD, BAKFAA, LEDFAA);
- Continue full scale testing of "green" paving materials with Accelerated Pavement Test (APT) machine;
- Complete construction of High Temperature Pavement Test Facility (HTPTF); and
- Complete Runway Roughness Index Scale for Pavement Evaluation and Ride quality Evaluation.

Why Is This Particular Program Necessary?

The Airport Technology Research Program is essential as it leads to improvements in airport safety and marking, airport design, airport lighting, aircraft rescue and firefighting, mitigation of wildlife hazards and improvements in pavement design and construction. The new technology developed from the research such as the EMAS and the penetrating firefighting nozzles have been implemented and are improving airport safety. EMAS technology alone has safely arrested six overrunning aircraft with no fatalities or injuries.

How Do You Know The Program Works?

The Airport Technology Research Program is reviewed every six months by FAA's Research, Engineering and Development Committee's (REDAC) Subcommittee on Airports. The Subcommittee has members from airports, aircraft manufacturers, Airline Pilots Association (ALPA) and airport associations. The Subcommittee is briefed on both ongoing research and planned research and offers recommendations to ensure the research program is responsive to the needs of FAA and the airport community.

Each research project is sponsored by a Headquarters engineer that prepares the research requirements, reviews the research plan, and approves the completed deliverables. The success of the research is reflected in our ability to issue updated and new program guidance. For example, based on research and evaluation we issued performance specifications for bird radars and FOD detection systems.

Why Do We Want/Need To Fund The Program At The Requested Level?

The funds are requested to continue the ongoing research and the new research activities programmed for FY 2014. A reduction in funding would mean decreased contract support and would defer some project activities.

Explanation of Funding Changes for Airport Technology Research (ATR)

	Dollars ($000)	FTE
Airport Technology Research (Net change from FY 2012)	**71**	**0.0**
Overview: For FY 2014, the Associate Administrator for Airports requests $29.5 million, 23 positions and 23 FTE to conduct research in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, runway surface technology, and visual guidance. The results of this research are used in updating Advisory Circulars, manuals, and technical specifications that airports rely on when expending AIP grant funds.		
Unavoidable Adjustments		
Pay Inflation: This 1.0 percent increase is required to provide for costs associated with base salary increases. (January to September)	25	
Non-Pay Inflation: This increase is required to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2014 GDP price index (year over year) of 0.5 percent.	130	
Discretionary Increases/Decreases		
Program Adjustments: Net impact of costs and savings between FY 2012 and FY 2014	95	

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GRANTS-IN-AID FOR AIRPORTS

Airport Cooperative Research

($ in Thousands)

Item Title	Dollars	FTP	FTE
FY 2012	**15,000**	**2**	**2.0**
Unavoidable Adjustments			
1. Pay Inflation	1		
2. Non-pay Inflation	75		
Total Unavoidable Adjustments	**76**	**0**	**0.0**
Discretionary Increases/ Decreases			
1. Decrease in contracts	(76)		
Total Discretionary Adjustments	**(76)**	**0**	**0.0**
FY 2014 Request	**15,000**	**2**	**2.0**

Detailed Justification for Airport Cooperative Research Program

What Is The Request And What Will We Get For The Funds?

FY 2014 Airport Cooperative Research Program ($000)

Program / Component	FY 2012 Enacted	FY 2013 CR Annualized	FY 2014 Request	Difference from FY 2012 Enacted
Airport Cooperative Research Program	$15,000	$15,092	$15,000	$0

For FY 2014, FAA requests $15 million, 2 positions and 2 FTE. Pay and non-pay inflation will be absorbed within the requested level.

Funding in FY 2014 will support the following key outputs and outcomes:

- Airport Cooperative Research Program (ACRP) will select approximately 30 research topics to fund in FY 2014. Research reports will be for research studies that develop handbooks and best practices and other research that will provide information for airport owners, operators, and consultants in the areas of airport safety, airport management and financing, airport environmental and sustainability, airport planning.

What Is The Program?

This program supports DOT's Safety goal (Reduction in transportation-related injuries and fatalities), Economic Competitiveness goal (Maximum economic returns on transportation policies and investments), and Environmental Sustainability goal (Reduction in transportation-related air, water and noise pollution and impacts on ecosystems).

ACRP was authorized by section 712 of Vision 100 – Century of Aviation Reauthorization Act. The Secretary of Transportation signed a Memorandum of Agreement among DOT, FAA, and National Academy of Sciences to implement the ACRP. The Secretary also appointed the 13 members of the ACRP Oversight Committee. The Transportation Research Board (TRB) of the National Academy administers the program. The ACRP Oversight Committee has met every six months to review progress and select additional topics to fund. Over 100 submitted topics will be reviewed at the July 2012 meeting and the most promising topics selected for subsequent contract award. The ACRP Oversight Committee 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.

ACRP conducts research studies that provide information to airports in the form of handbooks and best practices among other research on issues of interest to airports in the areas of safety, airport management, airport financing, airport sustainability, and airport planning. Recent ACRP reports published included such studies as:

- Common Airport Pavement Maintenance Practices;
- Guidebook for Developing and Managing Airport Contracts;
- Guidebook of Practices for Improving Environmental Performance at Small Airports;
- Planning for Offsite Airport Terminals;
- Resource Guide to Airport Performance Indicators; and
- Impact of Jet Fuel Price Uncertainty on Airport Planning and Development; and
- Published a Guidebook on Airport Irregular Operations Contingency Planning.

Anticipated FY 2014 accomplishments include:

- ACRP awards contracts for the topics selected for funding in FY 2013;
- ACRP Board of Governors will meet to select projects to fund in 2015; and
- TRB will appoint project technical panels for new projects selected in FY 2014.

Why Is This Particular Program Necessary?

The ACRP was established by Congress to conduct research on issues common to airports but that is not being done under other federal research programs and is not capable of being done by individual airports. The research is selected from topics submitted by airports and the aviation community. The ACRP Oversight Committee consists of airport executives, airport associations, and federal agencies that ensure the projects selected will benefit airports and will not duplicate ongoing federal research.

How Do You Know The Program Works?

We know the program works by the interest of the airport community that submits over 100 topics for research each year. We also track the ACRP performance by the number of research studies underway and the number of reports published. We have also initiated a dissemination project to improve the methods used to make the published reports available to airports and consultants using electronic methods and web based availability, and to develop statistics on the number of requests for ACRP reports.

Why Do We Want/Need To Fund The Program At The Requested Level?

The airport community and the airport associations have been strong supporters of ACRP. Congress approved increasing ACRP in FY 2009 by $5 million to a total of $15 million with the additional money being focused on airport environmental research.

Each year ACRP receives approximately 150 suggested topics for research. Each study costs on average about $300,000. Reducing funds below the $15 million request will result in fewer studies.

Explanation of Funding Changes for Airport Cooperative Research Program (ACRP)

	Dollars ($000)	FTE
Airport Cooperative Research Program (Net change from FY 2012)	**0**	**0**
Overview: For FY 2014, we maintain the Airport Cooperative Research Program at the FY 2012 Enacted level of $15 million. There is a discretionary reduction in contracts to offset the pay and non-pay inflation.		
Unavoidable Adjustments		
Pay Inflation: This 1.0 percent increase is required to provide for costs associated with base salary increases. (January to September)	1	
Non-Pay Inflation: This 0.5 percent increase is required to provide for inflationary cost increases.	75	
Discretionary increases/decreases		
ACRP Discretionary Decrease in contracts: There is a discretionary reduction in contracts to offset inflationary costs.	(76)	

AIRPORT IMPROVEMENT PROGRAM
Grants-in-Aid to Airports Planned Distribution
$000

	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request
Formula Grants*			
Primary Airports	806,872	850,254	386,056
Cargo Service Airports	111,956	112,395	96,212
Alaska	21,345	21,345	10,673
States (General Aviation)	639,750	642,257	494,802
Carryover (from Formula Grants)	622,473	702,708	585,445
Subtotal, Formula Grants	2,202,396	2,328,959	1,573,187
Discretionary Grants			
Discretionary Set-Aside: Noise Compatibility	177,513	138,572	280,080
Discretionary Set-Aside: Reliever	3,347	2,613	0
Discretionary Set-Aside: Military Airport Program	20,287	15,837	32,009
C/S/S/N (Capacity/Safety/Security/Noise)	229,524	179,174	366,104
Discretionary -- AATF	76,512	59,725	122,035
Subtotal, Discretionary Grants	507,183	395,921	800,227
Small Airport Fund**	489,171	486,404	375,485
Total Grants	**3,198,750**	**3,211,284**	**2,748,900**

* The 2013 formulas were run under the assumption of the full year CR estimated as of 3/1/2013. The final breakout of formula vs. discretionary is contingent upon final Obligation Limitation, as subject to the terms of the Authorization

** The proposed FY-2014 budget does not propose any changes that would eliminate the Small Airport Fund, as was proposed for FY-2013. Instead, the proposed FY-2014 budget reflects the existing structural provisions of the authorizing legislation, consistent with the FAA Modernization and Reform Act of 2012.

Passenger Facility Charge (PFC) Approved Locations
As of January 1, 2013
(Whole Dollars)
PFC APPROVED LOCATIONS

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
Birmingham	AL	Birmingham - Shuttlesworth International	BHM	S	$3.00	$24,548,436	6y3m	8/1/1997	11/1/2003
Birmingham	AL	Birmingham - Shuttlesworth International	BHM	S	$3.00	$15,646,592	4y10m	12/1/2003	10/1/2008
Birmingham	AL	Birmingham - Shuttlesworth International	BHM	S	$4.50	$168,449,328	22Y4M	10/1/2008	2/1/2031
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	$15,237,907	12y3m	6/1/1992	9/1/2004
Huntsville	AL	Huntsville International - Carl T. Jones Field	HSV	S	$4.50	$43,885,368	17y8m	9/1/2004	5/1/2022
Mobile	AL	Mobile Regional	MOB	N	$3.00	$4,715,747	6y7m	12/1/1997	7/1/2004
Mobile	AL	Mobile Regional	MOB	N	$3.00	$7,705,042	10y3m	3/1/2005	6/1/2015
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	$54,730	4y5m	12/1/2004	4/1/2009
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$4.50	$261,425	6y	4/1/2009	4/1/2015
Anchorage	AK	Ted Stevens Anchorage International	ANC	M	$3.00	$91,243,173	26y2m	10/1/2000	12/1/2026
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	N	$3.00	$1,552,249	2y4m	10/1/1998	2/1/2001
Juneau	AK	Juneau International	JNU	N	$4.50	$15,211,781	15y9m	8/1/2001	5/1/2017
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	$1,375,000	7y	7/1/2007	7/1/2014
Pago Pago	AS	Pago Pago International	PPG	N	$3.00	$950,000	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
Bullhead City	AZ	Laughlin/Bullhead International	IFP	N	$2.00	$904,132	4y5m	5/1/2008	10/1/2012
Flagstaff	AZ	Flagstaff Pulliam	FLG	N	$3.00	$2,932,317	16y11m	12/1/1992	2/1/2015
Mesa	AZ	Phoenix-Mesa Gateway	IWA/AZA	S	$4.50	$38,141,055	8Y8M	11/1/2008	7/1/2017
Peach Springs	AZ	Grand Canyon West	1G4/PGS	N	$3.00	$308,210	2y	9/1/2004	9/1/2006
Peach Springs	AZ	Grand Canyon West	1G4/PGS	N	$3.00	$9,614,736	15y7m	6/1/2008	1/1/2024
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$3.00	$241,106,516	6y	4/1/1996	4/1/2002
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$4.50	$2,491,171,800	26y4m	7/1/2002	11/1/2028

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
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	NYL/YUM	N	$3.00	$2,390,423	12y10m	12/1/1993	10/1/2005
Yuma	AZ	Yuma MCAS/Yuma International	NYL/YUM	N	$4.50	**	1y6m	10/1/2005	4/1/2007
Yuma	AZ	Yuma MCAS/Yuma International	NYL/YUM	N	$4.50	$2,707,035	10y8m	11/1/2007	7/1/2018
Bentonville	AR	Northwest Arkansas Regional	XNA	S	$3.00	$125,025,221	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	$4,011,641	13y6m	8/1/1994	2/1/2008
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	**	1y1m	2/1/2008	3/1/2009
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	$1,250,500	4y1m	3/1/2009	4/1/2013
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	$63,339,747	11y11m	9/1/2001	8/1/2013
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
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$4.50	$1,414,137	10y2m	7/1/2008	9/1/2018
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$169,564	1y1m	2/1/1993	3/1/1994
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$767,300	3y	11/1/1994	11/1/1997
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$1,084,184	5y2m	4/1/1998	6/1/2003
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$673,862	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	$2,437,950	5y4m	4/1/2006	8/1/2011
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$1,568,328	4y10m	10/1/2011	8/1/2016
Bakersfield	CA	Meadows Field	BFL	N	$3.00	$1,562,876	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	$97,588,421	8y3m	1/1/2008	4/1/2016
Burbank	CA	Bob Hope	BUR	M	$3.00	$19,931,292	2y7m	4/1/2016	11/1/2018
Burbank	CA	Bob Hope	BUR	M	$4.50	$3,917,000	5m	11/1/2018	4/1/2019
Carlsbad	CA	McCellan-Palomar	CRQ/CLD	N	$4.50	$4,947,065	34y1m	1/1/2009	2/1/2043
Chico	CA	Chico Municipal	CIC	N	$3.00	$211,117	4y9m	12/1/1993	9/1/1998
Chico	CA	Chico Municipal	CIC	N	$3.00	$19,822	1y8m	6/1/1999	2/1/2001
Chico	CA	Chico Municipal	CIC	N	$3.00	$468,782	8y1m	11/1/2001	12/1/2009
Chico	CA	Chico Municipal	CIC	N	$4.50	$590,000	5y	12/1/2010	12/1/2015
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	$393,228	11y3m	4/1/2007	7/1/2018
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

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
Imperial	CA	Imperial County	IPL	CS	$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
Inyokern	CA	Inyokern	IYK	N	$4.50	$502,105	10y	3/1/2009	3/1/2019
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$3.00	$69,493,089	4y9m	8/1/2003	5/1/2008
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$4.50	**	7y6m	5/1/2008	11/1/2015
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$4.50	$97,377,700	14y8m	11/1/2015	7/1/2030
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$166,593,784	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	$1,637,779,968	13y3m	12/1/2005	3/1/2019
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$29,107,609	3m	3/1/2019	6/1/2019
Mammoth Lakes	CA	Mammoth Yosemite	MMH	N	$3.00	$0	10y	9/1/1995	9/1/2005
Mammoth Lakes	CA	Mammoth Yosemite	MMH	N	$4.50	$399,917	16y2m	11/1/2009	11/1/2025
Modesto	CA	Modesto City County-Harry Sham Field	MOD	N	$3.00	$400,757	10y7m	8/1/1994	3/1/2005
Modesto	CA	Modesto City County-Harry Sham Field	MOD	N	$4.50	$395,134	7y4m	8/1/2008	12/1/2015
Monterey	CA	Monterey Peninsula	MRY	N	$3.00	$5,607,775	9y6m	1/1/1994	7/1/2003
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$2,155,077	2y9m	7/1/2003	4/1/2006
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$5,119,248	6y7m	5/1/2006	12/1/2012
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$52,621,337	6y9m	9/1/1992	6/1/1999
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$49,772,681	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	$496,506,257	17y7m	9/1/2003	4/1/2021
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$70,259,000	2y1m	4/1/2021	5/1/2023
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	5y5m	11/1/2007	4/1/2013
Oxnard	CA	Oxnard	OXR	CS	$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	$1,124,987	4y4m	12/1/2002	4/1/2007
Redding	CA	Redding Municipal	RDD	N	$4.50	$1,362,398	7y1m	8/1/2007	9/1/2014
Sacramento	CA	Sacramento International	SMF	M	$3.00	$112,695,020	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	$175,064,757	6m	2/1/2003	9/1/2003
Sacramento	CA	Sacramento International	SMF	M	$4.50	**	7y10m	9/1/2003	7/1/2011
Sacramento	CA	Sacramento International	SMF	M	$4.50	$676,588,317	23y4m	7/1/2011	11/1/2034

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San Diego	CA	San Diego International	SAN	L	$3.00	$149,301,528	7y10m	10/1/1995	8/1/2003
San Diego	CA	San Diego International	SAN	L	$4.50	$1,332,661,422	33y2m	8/1/2003	10/1/2036
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	$157,837,626	8y7m	9/1/1992	4/1/2001
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	**	10m	4/1/2001	2/1/2002
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	$880,690,247	27y3m	2/1/2002	5/1/2029
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	**	8y9m	9/1/2002	6/1/2011
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$1,057,676	3y	6/1/2011	6/1/2014
San Luis Obispo	CA	San Luis County Regional	SBP	N	$4.50	$3,758,461	3y7m	6/1/2014	1/1/2018
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	$8,746,624	4y10m	1/1/1998	11/1/2003
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	**	1y6m	11/1/2003	5/1/2005
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	$27,641,741	34y2m	5/1/2005	7/1/2039
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	Charles M. Schultz - Sonoma County	STS	N	$3.00	$711,232	7y11m	5/1/1993	4/1/2001
Santa Rosa	CA	Charles M. Schultz - Sonoma County	STS	N	$4.50	**	4y	4/1/2001	4/1/2005
Santa Rosa	CA	Charles M. Schultz - Sonoma County	STS	N	$4.50	$1,594,049	4y11m	5/1/2008	4/1/2013
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
Stockton	CA	Stockton Metropolitan	SCK	N	$4.50	$790,760	3y	9/1/2009	9/1/2012
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	$6,005,116	7y7m	1/1/2005	8/1/2012
Colorado Springs	CO	City of Colorado Springs Municipal	COS	S	$3.00	$71,093,257	22y1m	3/1/1993	4/1/2015
Cortez	CO	Cortez Municipal	CEZ	CS	$3.00	$200,078	8y4m	11/1/1999	3/1/2008
Cortez	CO	Cortez Municipal	CEZ	CS	$4.50	$339,072	8y	3/1/2008	3/1/2016
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	$3,130,691	5y10m	6/1/2005	4/1/2011
Durango	CO	Durango-La Plata County	DRO	N	$4.50	$953,500	9m	11/1/2011	8/1/2012
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

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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	$1,175,884	7y4m	8/1/2004	12/1/2011
Fort Collins-Loveland	CO	Fort Collins-Loveland Municipal	FNL	N	$4.50	$804,048	3y1m	2/1/2012	3/1/2015
Grand Junction	CO	Grand Junction Regional	GJT	N	$3.00	$4,879,574	13y5m	4/1/1993	9/1/2006
Grand Junction	CO	Grand Junction Regional	GJT	N	$4.50	$15,857,760	17y4m	9/1/2006	1/1/2024
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	$2,568,969	18y	4/1/2001	4/1/2019
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	$6,115,140	13y7m	2/1/2002	9/1/2015
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
Montrose	CO	Montrose Regional	MTJ	N	$4.50	$2,046,975	5y1m	11/1/2010	12/1/2015
Pueblo	CO	Pueblo Memorial	PUB	N	$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	CS	$3.00	$778,287	9y2m	2/1/1993	4/1/2002
Telluride	CO	Telluride Regional	TEX	CS	$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	$567,286	3y9m	10/1/2001	7/1/2005
New Haven	CT	Tweed-New Haven	HVN	N	$4.50	$1,462,380	7y7m	5/1/2006	12/1/2013
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$8,607,831	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	$27,749,445	2y11m	9/1/1997	8/1/2000
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$257,534,407	18y10m	5/1/2001	3/1/2020
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$4,152,000	4m	3/1/2020	7/1/2020
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$19,403,032	1y5m	7/1/2020	12/1/2021
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	$1,646,236,643	24y11m	10/1/2005	9/1/2030
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	$187,201,829	11y8m	9/1/2006	5/1/2018
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	$5,668,584	10y6m	1/1/2003	7/1/2013
Jacksonville	FL	Jacksonville International	JAX	M	$3.00	$39,343,583	9y1m	4/1/1994	5/1/2003

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Jacksonville	FL	Jacksonville International	JAX	M	$4.50	$310,577,713	21y6m	5/1/2003	11/1/2024
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	$3,634,125	5y7m	12/1/1997	6/1/2003
Key West	FL	Key West International	EYW	N	$4.50	$745,867	2y1m	6/1/2003	7/1/2005
Key West	FL	Key West International	EYW	N	$4.50	$13,523,000	11y3m	10/1/2005	1/1/2017
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	12y7m	5/1/1997	12/1/2009
Melbourne	FL	Melbourne International	MLB	N	$4.50	**	9y3m	12/1/2009	3/1/2019
Miami	FL	Miami International	MIA	L	$3.00	$176,730,162	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		$3.00	$899,685	6y	2/1/1995	2/1/2001
Naples	FL	Naples Municipal	APF		$3.00	$91,651	2y3m	2/1/2002	5/1/2004
Orlando	FL	Orlando International	MCO	L	$3.00	$538,040,022	14y2m	2/1/1993	4/1/2007
Orlando	FL	Orlando International	MCO	L	$4.50	$1,168,294,479	12y8m	4/1/2007	12/1/2019
Orlando	FL	Orlando International	MCO	L	$3.00	$304,070,400	6y6m	12/1/2019	6/1/2026
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	7y9m	12/1/2003	9/1/2011
Orlando	FL	Orlando Sandford International	SFB	S	$4.00	**	1y3m	9/1/2011	12/1/2012
Panama City	FL	Panama City - Bay County International	PFN	N	$3.00	$6,732,080	10y3m	2/1/1994	5/1/2004
Panama City	FL	Panama City - Bay County International	PFN	N	$4.50	**	4y8m	5/1/2004	1/1/2009
Panama City	FL	Panama City - Bay County International	PFN	N	$4.50	$39,251,783	1y4m	1/1/2009	5/1/2010
Panama City	FL	Northwest Florida Beaches International	ECP	N	$4.50	**	28y11m	5/1/2010	4/1/2039
Pensacola	FL	Penscola Gulf Coast Regional	PNS	S	$3.00	$24,954,478	9y10m	2/1/1993	12/1/2002
Pensacola	FL	Penscola Gulf Coast Regional	PNS	S	$4.50	**	4y9m	12/1/2002	9/1/2007
Pensacola	FL	Penscola Gulf Coast Regional	PNS	S	$4.50	$119,534,914	23y1m	9/1/2007	10/1/2031
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$3.00	$75,384,399	9y8m	9/1/1992	5/1/2002
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$4.50	**	19y9m	5/1/2002	2/1/2022
St Petersburg	FL	St Petersburg-Clearwater International	PIE	S	$3.00	$3,811,738	1y6m	5/1/2005	11/1/2006
St Petersburg	FL	St Petersburg-Clearwater International	PIE	S	$4.50	**	2y3m	11/1/2006	2/1/2009
St Petersburg	FL	St Petersburg-Clearwater International	PIE	S	$4.50	$6,628,510	3Y9M	2/1/2009	11/1/2012
Tallahassee	FL	Tallahassee Regional	TLH	N	$3.00	$11,219,936	9y8m	2/1/1993	10/1/2002
Tallahassee	FL	Tallahassee Regional	TLH	N	$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	$625,065,074	14y11m	6/1/2002	5/1/2017
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	$13,330,797	6y9m	8/1/2018	5/1/2025
West Palm Beach	FL	Palm Beach International	PBI	M	$3.00	$122,322,594	14y3m	4/1/1994	7/1/2008
West Palm Beach	FL	Palm Beach International	PBI	M	$4.50	$22,283,317	1y9m	7/1/2008	4/1/2010
West Palm Beach	FL	Palm Beach International	PBI	M	$4.50	$44,778,178	3y1m	4/1/2010	5/1/2013

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Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$348,383	2y9m	9/1/1995	6/1/1998
Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$539,645	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	$457,111	4y6m	8/1/2003	2/1/2008
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	$665,281	4y7m	7/1/2008	2/1/2013
Athens	GA	Athens/Ben Epps	AHN	CS	$3.00	$165,615	4y5m	8/1/1997	1/1/2002
Atlanta	GA	Hartsfield-Jackson Atlanta International	ATL	L	$3.00	$1,463,359,982	3y11m	5/1/1997	4/1/2001
Atlanta	GA	Hartsfield-Jackson Atlanta International	ATL	L	$4.50	**	7y6m	4/1/2001	10/1/2008
Atlanta	GA	Hartsfield-Jackson Atlanta International	ATL	L	$4.50	$2,533,657,127	15y6m	10/1/2008	4/1/2024
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$3.00	$27,636,360	1y10m	9/1/1999	7/1/2001
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	**	23y1m	7/1/2001	8/1/2024
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	$4,098,034	3y3m	8/1/2024	11/1/2027
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	**	5y6m	11/1/2003	5/1/2009
Brunswick	GA	Brunswick Golden Isles	BQK	N	$4.50	$860,268	7y11m	5/1/2009	4/1/2017
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	$876,138	2y10m	8/1/2000	6/1/2003
Columbus	GA	Columbus Metropolitan	CSG	N	$4.50	**	3y5m	6/1/2003	11/1/2006
Columbus	GA	Columbus Metropolitan	CSG	N	$4.50	$1,032,681	2y2m	2/1/2010	4/1/2012
Macon	GA	Middle Georgia Regional	MCN		$4.50	$1,052,392	9y2m	3/1/2002	5/1/2011
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$48,179,908	8y9m	7/1/1992	4/1/2001
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	**	8y10m	4/1/2001	2/1/2010
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$977,956	3m	2/1/2010	5/1/2010
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	$17,933,743	5y11m	5/1/2010	4/1/2016
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	$438,675	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
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$94,727	11m	8/1/2009	7/1/2010
Valdosta	GA	Valdosta Regional	VLD	N	$4.50	$472,800	1y4m	6/1/2011	10/1/2012
Agana	GU	Guam International	GUM	S	$3.00	$258,370,758	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	$548,196	1y7m	2/1/2007	11/1/2008
Hilo	HI	Hilo International	ITO	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Honolulu	HI	Honolulu International	HNL	L	$3.00	$87,641,419	4y1m	10/1/2004	11/1/2008
Honolulu	HI	Honolulu International	HNL	L	$4.50	**	1y2m	11/1/2008	1/1/2010
Honolulu	HI	Honolulu International	HNL	L	$4.50	$105,909,130	4y1m	1/1/2010	2/1/2014
Kahului	HI	Kahului	OGG	M	$3.00	$19,664,231	4y1m	10/1/2004	11/1/2008
Kahului	HI	Kahului	OGG	M	$4.50	**	1y2m	11/1/2008	1/1/2010

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
Kahului	HI	Kahului	OGG	M	$4.50	$24,663,770	4y1m	1/1/2010	2/1/2014
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$3.00	$6,929,851	4y1m	10/1/2004	11/1/2008
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$4.50	$7,254,050	4y1m	1/1/2010	2/1/2014
Lihue	HI	Lihue	LIH	S	$3.00	$3,987,100	4y1m	10/1/2004	11/1/2008
Lihue	HI	Lihue	LIH	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Lihue	HI	Lihue	LIH	S	$4.50	$7,254,050	4y1m	1/1/2010	2/1/2014
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	$1,959,103	8y7m	6/1/2005	1/1/2014
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
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$4.50	$1,658,299	3y3m	7/1/2020	10/1/2023
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$3.00	$2,478,343	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	$1,678,251	6y2m	10/1/2006	12/1/2012
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	$1,723,443	15y2m	10/1/2001	12/1/2016
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	5y3m	7/1/2007	10/1/2012
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	$2,464,310	8y2m	12/1/1995	2/1/2004
Champaign/Urbana	IL	University of Illinois-Willard	CMI	N	$4.50	$3,494,265	8y10m	10/1/2005	8/1/2014
Chicago	IL	Chicago Midway International	MDW	L	$3.00	$690,891,936	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	$1,720,370,920	41y	11/1/2012	11/1/2053
Chicago	IL	Chicago O'Hare International	ORD	L	$3.00	$1,158,485,219	7y7m	9/1/1993	4/1/2001
Chicago	IL	Chicago O'Hare International	ORD	L	$4.50	**	4y10m	4/1/2001	2/1/2006
Chicago	IL	Chicago O'Hare International	ORD	L	$4.50	$5,374,634,766	32y9m	2/1/2006	11/1/2038
Decatur	IL	Decatur	DEC		$4.50	$732,628	12y9m	6/1/2006	3/1/2019
Marion	IL	Williamson County Regional	MWA	CS	$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

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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	$26,132,335	21y	7/1/2016	7/1/2037
Peoria	IL	General Downing - Peoria International	PIA	N	$3.00	$8,145,036	6y7m	12/1/1994	7/1/2001
Peoria	IL	General Downing - Peoria International	PIA	N	$4.50	**	5y7m	7/1/2001	2/1/2007
Peoria	IL	General Downing - Peoria International	PIA	N	$4.50	$1,476,770	1y6m	2/1/2007	8/1/2008
Peoria	IL	General Downing - Peoria International	PIA	N	$4.50	$7,550,000	6y3m	11/1/2008	2/1/2015
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	$4,922,593	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	$2,295,457	10y9m	10/1/2005	7/1/2016
Evansville	IN	Evansville Regional	EVV	N	$4.50	$1,270,789	1y3m	8/1/2007	11/1/2008
Evansville	IN	Evansville Regional	EVV	N	$4.50	$3,983,706	4y2m	12/1/2008	2/1/2013
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	$80,825,898	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	N	$3.00	$34,172,802	16y8m	11/1/1994	7/1/2011
South Bend	IN	South Bend Regional	SBN	N	$4.50	**	9y6m	7/1/2011	1/1/2021
South Bend	IN	South Bend Regional	SBN	N	$4.50	$6,000,000	8y6m	1/1/2021	7/1/2029
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	**	19y5m	9/1/2001	2/1/2021
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	$23,341,050	12y7m	5/1/2004	12/1/2016
Des Moines	IA	Des Moines International	DSM	S	$3.00	$17,953,852	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	$56,253,562	17y5m	5/1/2002	10/1/2019
Dubuque	IA	Dubuque Regional	DBQ	N	$3.00	$1,106,761	8y4m	1/1/1993	5/1/2001
Dubuque	IA	Dubuque Regional	DBQ	N	$4.50	$6,461,405	31y9m	5/1/2001	2/1/2033
Fort Dodge	IA	Fort Dodge Regional	FOD	CS	$3.00	$169,331	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

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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	$1,076,723	14y4m	8/1/2003	12/1/2017
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	8y6m	11/1/2004	5/1/2013
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	$1,256,332	9y7m	5/1/2003	12/1/2012
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	**	6y4m	3/1/2002	7/1/2008
Manhattan	KS	Manhattan Regional	MHK	N	$4.50	$601,007	9y11m	7/1/2008	6/1/2018
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	$25,595,809	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	$7,548,050	2y2m	7/1/2007	9/1/2009
Wichita	KS	Wichita Mid-Continent	ICT	S	$4.50	$166,384,422	35y5m	11/1/2010	4/1/2046
Covington	KY	Cincinnati/Northern Kentucky International	CVG	M	$3.00	$155,087,555	6y2m	6/1/1994	8/1/2000
Covington	KY	Cincinnati/Northern Kentucky International	CVG	M	$3.00	$74,129,829	2y1m	7/1/2001	8/1/2003
Covington	KY	Cincinnati/Northern Kentucky International	CVG	M	$4.50	$212,737,000	5y9m	8/1/2003	5/1/2009
Covington	KY	Cincinnati/Northern Kentucky International	CVG	M	$3.00	$98,253,000	6y7m	5/1/2009	12/1/2015
Covington	KY	Cincinnati/Northern Kentucky International	CVG	M	$4.50	$32,958,000	2y2m	12/1/2015	2/1/2018
Lexington	KY	Blue Grass	LEX	S	$3.00	$11,900,969	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	$87,804,742	34y2m	12/1/2003	2/1/2038
Louisville	KY	Louisville International - Standiford Field	SDF	S	$3.00	$90,600,000	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	**	1y11m	10/1/2006	9/1/2008
Louisville	KY	Louisville International - Standiford Field	SDF	S	$4.50	**	1m	9/1/2008	10/1/2008
Louisville	KY	Louisville International - Standiford Field	SDF	S	$3.00	**	2y2m	10/1/2008	12/1/2010
Louisville	KY	Louisville International - Standiford Field	SDF	S	$4.50	**	3y	12/1/2010	12/1/2013
Louisville	KY	Louisville International - Standiford Field	SDF	S	$4.50	$19,970,137	2y11m	12/1/2013	11/1/2016
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	BTR	S	$3.00	$37,469,799	12y10m	12/1/1992	10/1/2005

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
		Field							
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	**	9y10m	10/1/2005	8/1/2015
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	$43,889,437	15y11m	8/1/2015	7/1/2031
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	$3,433,629	2y11m	5/1/2005	4/1/2008
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	$5,736,733	6y9m	8/1/2008	5/1/2015
Lake Charles	LA	Lake Charles Regional	LCH	N	$3.00	$1,877,234	4y2m	3/1/2001	5/1/2005
Lake Charles	LA	Lake Charles Regional	LCH	N	$4.50	**	6y4m	5/1/2005	9/1/2011
Lake Charles	LA	Lake Charles Regional	LCH	N	$4.50	$1,070,000	4y	9/1/2011	9/1/2015
Monroe	LA	Monroe Regional	MLU	N	$4.50	$1,359,504	4y5m	4/1/2003	9/1/2007
Monroe	LA	Monroe Regional	MLU	N	$4.50	$16,400,000	25y7m	11/1/2008	6/1/2036
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	$431,317,387	23y4m	8/1/2003	12/1/2026
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	N	$3.00	$8,961,006	15y3m	6/1/1995	9/1/2010
Bangor	ME	Bangor International	BGR	N	$4.50	$1,998,100	1y5m	12/1/2010	5/1/2012
Portland	ME	Portland International Jetport	PWM	S	$3.00	$33,601,082	15y	2/1/1994	2/1/2009
Portland	ME	Portland International Jetport	PWM	S	$4.50	**	1y9m	2/1/2009	11/1/2010
Portland	ME	Portland International Jetport	PWM	S	$4.50	$132,206,104	29y5m	11/1/2010	4/1/2040
Presque Isle	ME	Northern Maine Regional Airport at Presque Isle	PQI	N	$4.50	$245,853	4y9m	9/1/2004	6/1/2009
Presque Isle	ME	Northern Maine Regional Airport at Presque Isle	PQI	N	$4.50	$353,298	7y5m	8/1/2010	1/1/2018
Rockland	ME	Knox County Regional	RKD	CS	$4.50	$167,250	4y6m	1/1/2012	7/1/2016
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$3.00	$189,381,695	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	$721,395,097	16y11m	11/1/2002	10/1/2019
Cumberland	MD	Greater Cumberland Reg	CBE		$3.00	$144,345	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	N	$3.00	$308,817	2y7m	8/1/1999	3/1/2002
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	N	$4.50	**	1y10m	3/1/2002	1/1/2004
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	N	$4.50	$108,124	3y7m	1/1/2004	8/1/2007
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$3.00	$1,446,184	6y1m	2/1/2002	3/1/2008
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$4.50	**	4y3m	3/1/2008	6/1/2012
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$4.50	$783,269	3y	6/1/2012	6/1/2015
Boston	MA	General Edward Lawrence Logan International	BOS	L	$3.00	$702,015,217	11y11m	11/1/1993	10/1/2005

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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	$682,025,941	12y4m	2/1/2011	6/1/2023
Hyannis	MA	Barnstable Municipal-Boardman/Polando Field	HYA	N	$2.00	$2,573,600	13y7m	3/1/2011	10/1/2024
Worcester	MA	Worcester Regional	ORH		$3.00	$614,336	5y	10/1/1992	10/1/1997
Worcester	MA	Worcester Regional	ORH		$3.00	$1,021,417	13y3m	9/1/1999	12/1/2011
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	$240,053	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	$966,117,476	8y3m	5/1/2026	8/1/2034
Escanaba	MI	Delta County	ESC	CS	$3.00	$164,496	5y2m	2/1/1993	11/1/1997
Escanaba	MI	Delta County	ESC	CS	$3.00	$182,700	1y11m	8/1/1998	7/1/2000
Escanaba	MI	Delta County	ESC	CS	$3.00	$114,900	2y5m	10/1/2001	3/1/2004
Escanaba	MI	Delta County	ESC	CS	$4.50	$40,000	1y10m	3/1/2004	1/1/2006
Escanaba	MI	Delta County	ESC	CS	$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	3y4m	10/1/2016	2/1/2020
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	$387,250	5y9m	10/1/1999	7/1/2005
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	**	3m	7/1/2005	10/1/2005
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	$711,793	7y4m	10/1/2005	2/1/2013
Iron Mountain Kingsford	MI	Ford	IMT	CS	$3.00	$176,029	8y9m	9/1/1995	6/1/2004
Ironwood	MI	Gogebic-Iron County	IWD		$3.00	$90,531	13y2m	8/1/1993	10/1/2006
Ironwood	MI	Gogebic-Iron County	IWD		$4.50	$128,549	18y8m	6/1/2007	2/1/2026
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$3.00	$1,089,716	3y2m	4/1/1997	6/1/2000
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$3.00	$5,312,429	4y	1/1/2001	1/1/2005
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	**	1y7m	1/1/2005	8/1/2006
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	$1,279,785	1y6m	10/1/2006	4/1/2008
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	$14,821,076	16y	9/1/2008	9/1/2024
Lansing	MI	Capital Region International	LAN	N	$3.00	$9,380,340	8y9m	10/1/1993	7/1/2002
Lansing	MI	Capital Region International	LAN	N	$4.50	**	1y4m	7/1/2002	11/1/2003
Lansing	MI	Capital Region International	LAN	N	$4.50	$21,115,759	10y	11/1/2003	11/1/2013
Manistee	MI	Manistee County-Blacker	MBL	C	$4.50	$388,986	32y5m	6/1/2008	11/1/2040

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
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Marquette	MI	Marquette County	MQT	N	$3.00	$62,225	4y	12/1/1992	12/1/1996
Marquette	MI	Sawyer International	SAW/ MQT	N	$3.00	$1,077,540	4y3m	4/1/1998	7/1/2002
Marquette	MI	Sawyer International	SAW/ MQT	N	$4.50	**	6m	7/1/2002	1/1/2003
Marquette	MI	Sawyer International	SAW/ MQT	N	$4.50	$773,078	3y8m	1/1/2003	9/1/2006
Marquette	MI	Sawyer International	SAW/ MQT	N	$4.50	$150,711	1y7m	10/1/2006	5/1/2008
Marquette	MI	Sawyer International	SAW/ MQT	N	$4.50	$852,250	3y	8/1/2008	8/1/2011
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	$159,752	4y6m	3/1/1993	9/1/1997
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$3.00	$916,433	13y7m	12/1/1997	7/1/2011
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$4.50	$415,974	3y3m	7/1/2011	10/1/2014
Saginaw	MI	MBS International	MBS	N	$3.00	$6,119,950	10y5m	2/1/1997	7/1/2007
Saginaw	MI	MBS International	MBS	N	$4.50	**	9m	7/1/2007	4/1/2008
Saginaw	MI	MBS International	MBS	N	$4.50	$13,233,477	21y5m	4/1/2008	9/1/2029
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	$3,637,041	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	$6,441,642	7y2m	10/1/2003	12/1/2010
Traverse City	MI	Cherry Capital	TVC	N	$4.50	$2,452,975	3y	2/1/2011	2/1/2014
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	$401,336	3y6m	2/1/2002	8/1/2005
Bemidji	MN	Bemidji Regional	BJI	N	$4.50	$790,324	7y7m	6/1/2006	1/1/2014
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	$1,833,556	32y1m	7/1/2001	8/1/2033
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	$5,204,309	9y7m	4/1/2005	11/1/2014
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	Range Regional	HIB	N	$3.00	$338,299	7y1m	6/1/1996	7/1/2003
Hibbing	MN	Range Regional	HIB	N	$4.50	**	3y10m	7/1/2003	5/1/2007
Hibbing	MN	Range Regional	HIB	N	$4.50	$461,737	10y6m	5/1/2007	11/1/2017
International Falls	MN	Falls International	INL	N	$3.00	$597,058	7y6m	12/1/1994	6/1/2002
International Falls	MN	Falls International	INL	N	$4.50	**	3y	6/1/2002	6/1/2005
International Falls	MN	Falls International	INL	N	$4.50	$477,226	9y7m	11/1/2005	6/1/2015
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$3.00	$430,142,570	8y10m	6/1/1992	4/1/2001
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	**	1y10m	4/1/2001	2/1/2003
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	$1,121,742,107	16y5m	2/1/2003	7/1/2019

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Rochester	MN	Rochester International	RST	N	$3.00	$5,507,696	5y10m	5/1/1996	3/1/2002
Rochester	MN	Rochester International	RST	N	$4.50	**	6y5m	3/1/2002	8/1/2008
Rochester	MN	Rochester International	RST	N	$4.50	$3,868,625	7y2m	8/1/2008	10/1/2015
St. Cloud	MN	St. Cloud Regional	STC		$3.00	$1,147,578	2y5m	2/1/2000	7/1/2002
St. Cloud	MN	St. Cloud Regional	STC		$4.50	**	11y6m	7/1/2002	1/1/2014
Thief River Falls	MN	Thief River Falls Regional	TVF		$4.50	$636,828	20y	6/1/2003	6/1/2023
Rota Island	MP	Rota International	GRO/ ROP	N	$4.50	$1,777,742	11y8m	1/1/2005	8/1/2016
Saipan Island	MP	Francisco C. Ada/Saipan International	GSN/S PN	S	$4.50	$29,573,280	11y8m	1/1/2005	8/1/2016
Tinian Island	MP	Tinian International	TNI/TI Q	N	$4.50	$1,705,526	11y8m	1/1/2005	8/1/2016
Columbus	MS	Golden Triangle Regional	GTR	N	$3.00	$1,526,314	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	$2,149,304	14y9m	1/1/2004	10/1/2018
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	$21,327	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	$162,432	5y4m	12/1/2005	8/1/2011
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	$697,709	11y11m	6/1/2001	5/1/2013
Jackson	MS	Jackson-Evers International	JAN	S	$3.00	$22,059,819	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	$29,282,321	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	$436,597	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	$1,640,134	15y	10/1/2005	10/1/2020
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	$1,285,973	14y11m	1/1/2004	12/1/2018
Columbia	MO	Columbia Regional	COU	N	$4.50	$809,302	10y3m	11/1/2002	2/1/2013
Joplin	MO	Joplin Regional	JLN	CS	$4.50	$889,664	9y2m	4/1/2003	6/1/2012
Kansas City	MO	Kansas City International	MCI	M	$3.00	$339,142,503	9y5m	3/1/1996	8/1/2005
Kansas City	MO	Kansas City International	MCI	M	$4.50	**	7y11m	8/1/2005	7/1/2013
Kansas City	MO	Kansas City International	MCI	M	$4.50	$30,646,859	1y	7/1/2013	7/1/2014
Kansas City	MO	Kansas City International	MCI	M	$3.00	$22,679,060	11m	7/1/2014	6/1/2015
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

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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	$324,539,342	9y	12/1/1992	12/1/2001
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	**	12y1m	12/1/2001	5/1/2002
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	$783,625,492	19y9m	5/1/2002	2/1/2022
Billings	MT	Billings Logan International	BIL	S	$3.00	$18,555,709	19y6m	4/1/1994	10/1/2013
Bozeman	MT	Gallatin Field	BZN	S	$3.00	$9,144,326	15y7m	8/1/1993	3/1/2009
Bozeman	MT	Gallatin Field	BZN	S	$4.50	$31,200,000	19y4m	3/1/2009	7/1/2028
Butte	MT	Bert Mooney	BTM	N	$3.00	$1,289,307	11y11m	7/1/1994	6/1/2006
Butte	MT	Bert Mooney	BTM	N	$3.00	$112,047	1y1m	7/1/2006	8/1/2007
Butte	MT	Bert Mooney	BTM	N	$3.00	$146,916	2y4m	11/1/2007	3/1/2010
Butte	MT	Bert Mooney	BTM	N	$4.50	$271,635	2y11m	3/1/2010	2/1/2013
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	$8,826,161	20y3m	7/1/2002	8/1/2018
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	$3,831,691	11y4m	10/1/2003	2/1/2015
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	$5,110,384	8y7m	9/1/1992	4/1/2001
Missoula	MT	Missoula International	MSO	N	$4.50	**	1y2m	4/1/2001	6/1/2002
Missoula	MT	Missoula International	MSO	N	$4.50	$14,996,624	15y5m	6/1/2002	11/1/2017
West Yellowstone	MT	Yellowstone	WYS	CS	$4.50	$277,202	14y	6/1/2011	6/1/2025
Grand Island	NE	Central Nebraska Regional	GRI	N	$3.00	$50,370	2y2m	2/1/1999	4/1/2001
Grand Island	NE	Central Nebraska Regional	GRI	N	$4.50	$1,460,580	15y	5/1/2001	5/1/2016
Kearney	NE	Kearney Regional	EAR	CS	$4.00	$0	1y10m	11/1/2005	9/1/2007
Kearney	NE	Kearney Regional	EAR	CS	$4.50	$231,600	3y10m	9/1/2007	7/1/2011
Kearney	NE	Kearney Regional	EAR	CS	$4.50	$191,378	4y6m	10/1/2011	4/1/2016
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	CS	$3.00	$0	3y	3/1/2000	3/1/2003
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	CS	$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	**	1y9m	1/1/2007	10/1/2008
Las Vegas	NV	McCarran International	LAS	L	$4.50	$3,713,433,002	45y1m	10/1/2008	11/1/2053

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Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$61,222,704	7y1m	1/1/1994	2/1/2001
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$7,258,689	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	$11,922,040	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	$53,000,000	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	$3,066,408	5m	7/1/2007	12/1/2007
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$58,369,376	9y4m	12/1/2007	4/1/2017
Lebanon	NH	Lebanon Municipal	LEB	C S	$3.00	$530,630	7y	8/1/1995	8/1/2002
Lebanon	NH	Lebanon Municipal	LEB	C S	$4.50	$63,774	2y6m	11/1/2003	5/1/2006
Lebanon	NH	Lebanon Municipal	LEB	C S	$4.50	$203,144	6y1m	10/1/2007	11/1/2013
Manchester	NH	Manchester	MHT	S	$3.00	$123,305,983	15y	1/1/1993	1/1/2008
Manchester	NH	Manchester	MHT	S	$4.50	**	7y7m	1/1/2008	8/1/2015
Manchester	NH	Manchester	MHT	S	$4.50	$75,185,261	7y4m	8/1/2015	12/1/2022
Atlantic City	NJ	Atlantic City International	ACY	S	$3.00	$15,912,616	6y2m	10/1/1999	12/1/2005
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	**	3y5m	12/1/2005	4/1/2009
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	$14,594,296	5y1m	4/1/2009	5/1/2014
Newark	NJ	Newark Liberty International	EWR	L	$3.00	$935,667,735	13y6m	10/1/1992	4/1/2006
Newark	NJ	Newark Liberty International	EWR	L	$4.50	**	5y3m	4/1/2006	7/1/2011
Newark	NJ	Newark Liberty International	EWR	L	$4.50	$191,631,217	2y11m	7/1/2011	6/1/2014
Trenton	NJ	Trenton Mercer	TTN		$3.00	$0	3y4m	1/1/2001	5/1/2004
Trenton	NJ	Trenton Mercer	TTN		$4.50	$1,061,436	8y10m	5/1/2004	3/1/2013
Albuquerque	NM	Albuquerque International Sunport	ABQ	M	$3.00	$169,822,308	15y	7/1/1996	7/1/2011
Albuquerque	NM	Albuquerque International Sunport	ABQ	M	$4.50	**	6y3m	7/1/2011	10/1/2017
Farmington	NM	Four Corners Regional	FMN	N	$3.00	$661,102	13y11m	6/1/2003	5/1/2017
Roswell	NM	Roswell International Air Center	ROW	N	$3.00	$334,477	4y10m	4/1/1999	2/1/2004
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	**	4m	2/1/2004	6/1/2004
Roswell	NM	Roswell International Air Center	ROW	N	$3.00	**	1y	6/1/2004	6/1/2005
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	**	2y8m	6/1/2005	2/1/2008
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	$776,507	5y8m	3/1/2008	11/1/2013
Albany	NY	Albany International	ALB	S	$3.00	$116,740,338	15y6m	3/1/1994	9/1/2009
Albany	NY	Albany International	ALB	S	$4.50	**	10y5m	9/1/2009	2/1/2020
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$3.00	$4,684,325	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	$4,909,532	8y4m	5/1/2008	9/1/2016
Buffalo	NY	Buffalo Niagara International	BUF	M	$3.00	$149,995,516	14y11m	8/1/1992	8/1/2007
Buffalo	NY	Buffalo Niagara International	BUF	M	$4.50	**	5y3m	8/1/2007	11/1/2012
Buffalo	NY	Buffalo Niagara International	BUF	M	$4.50	$17,214,369	1y7m	11/1/2012	6/1/2014
Elmira	NY	Elmira/Corning Regional	ELM	N	$3.00	$733,042	3y1m	12/1/2004	1/1/2008

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Elmira	NY	Elmira/Corning Regional	ELM	N	$4.50	$5,857,162	12y7m	5/1/2008	12/1/2020
Islip	NY	Long Island MacArthur	ISP	S	$3.00	$27,723,078	10y9m	12/1/1994	9/1/2005
Islip	NY	Long Island MacArthur	ISP	S	$4.50	$37,133,218	9y7m	9/1/2005	4/1/2015
Ithaca	NY	Ithica Tompkins Regional	ITH	N	$3.00	$6,872,612	16y2m	1/1/1993	3/1/2009
Ithaca	NY	Ithica Tompkins Regional	ITH	N	$4.50	**	7y2m	3/1/2009	5/1/2016
Jamestown	NY	Chautauqua County/Jamestown	JHW	C S	$3.00	$593,058	9y2m	6/1/1993	8/1/2002
Jamestown	NY	Chautauqua County/Jamestown	JHW	C S	$4.50	$200,112	11y2m	9/1/2004	11/1/2015
Massena	NY	Massena International - Richards Field	MSS	C S	$3.00	$163,429	19y7m	4/1/1996	11/1/2015
New York	NY	John F. Kennedy International	JFK	L	$3.00	$992,679,240	13y6m	10/1/1992	4/1/2006
New York	NY	John F. Kennedy International	JFK	L	$4.50	**	5y3m	4/1/2006	7/1/2011
New York	NY	John F. Kennedy International	JFK	L	$4.50	$255,794,990	2y11m	7/1/2011	6/1/2014
New York	NY	LaGuardia	LGA	L	$3.00	$702,439,084	13y6m	10/1/1992	4/1/2006
New York	NY	LaGuardia	LGA	L	$4.50	**	5y3m	4/1/2006	7/1/2011
New York	NY	LaGuardia	LGA	L	$4.50	$121,561,393	2y11m	7/1/2011	6/1/2014
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
Newburgh	NY	Stewart International	SWF	N	$4.50	$4,415,202	3y7m	7/1/2010	2/1/2014
Ogdensburg	NY	Ogdensburg Intl	OGS		$3.00	$125,050	23y8m	4/1/1996	12/1/2019
Plattsburgh	NY	Clinton County	PLB	N	$3.00	$184,658	7y8m	7/1/1993	3/1/2001
Plattsburgh	NY	Clinton County	PLB	N	$3.00	$46,317	3y10m	6/1/2001	4/1/2003
Plattsburgh	NY	Plattsburgh International	PBG	N	$4.50	$56,902,809	34y1m	1/1/2009	2/1/2043
Rochester	NY	Greater Rochester International	ROC	S	$3.00	$20,664,219	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	C S	$3.00	$120,749	13y1m	8/1/1994	9/1/2007
Saranac Lake	NY	Adirondack Regional	SLK	C S	$4.50	$470,825	22y4m	2/1/2011	6/1/2033
Syracuse	NY	Syracuse Hancock International	SYR	S	$3.00	$15,445,446	6y3m	10/1/1995	1/1/2002
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$10,495,193	2y10m	10/1/2002	8/1/2005
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$4,248,943	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	$34,300,000	9y3m	5/1/2004	8/1/2013
Asheville	NC	Asheville Regional	AVL	S	$3.00	$5,622,844	7y10m	12/1/1994	10/1/2002
Asheville	NC	Asheville Regional	AVL	S	$4.50	$4,916,517	4y1m	10/1/2002	11/1/2006
Asheville	NC	Asheville Regional	AVL	S	$4.50	$478,051	5m	4/1/2007	9/1/2007
Asheville	NC	Asheville Regional	AVL	S	$4.50	$11,754,891	10y4m	10/1/2007	2/1/2018
Charlotte	NC	Charlotte/Douglas International	CLT	L	$3.00	$1,039,775,65 6	18y9m	11/1/2004	8/1/2023
Fayetteville	NC	Fayetteville Regional/Grannis Field	FAY	N	$3.00	$1,676,077	5y3m	11/1/2000	2/1/2006
Fayetteville	NC	Fayetteville Regional/Grannis Field	FAY	N	$4.00	$3,796,330	4y11m	7/1/2009	6/1/2014

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Greensboro	NC	Piedmont Triad International	GSO	S	$4.50	$43,872,158	10y8m	9/1/2011	5/1/2022
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	$11,487,343	37y3m	7/1/2001	10/1/2038
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	$988,225	3y10m	3/1/2005	1/1/2009
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$115,842	2y9m	2/1/2009	11/1/2011
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$11,845,235	3m	11/1/2011	2/1/2012
Jacksonville	NC	Albert J. Ellis	OAJ	N	$4.50	**	17y2m	2/1/2012	4/1/2029
New Bern	NC	Coastal Carolina Regional	EWN	N	$3.00	$10,681,398	6y9m	2/1/1997	11/1/2003
New Bern	NC	Coastal Carolina Regional	EWN	N	$4.50	**	21y	11/1/2003	11/1/2024
New Bern	NC	Coastal Carolina Regional	EWN	N	$4.50	$518,877	11m	11/1/2024	10/1/2025
Raleigh	NC	Raleigh-Durham International	RDU	M	$3.00	$7,439,029	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	S	$3.00	$1,526,487	2y7m	2/1/1994	9/1/1996
Wilmington	NC	Wilmington International	ILM	S	$3.00	$7,984,994	4y11m	6/1/1998	5/1/2003
Wilmington	NC	Wilmington International	ILM	S	$4.50	**	3y11m	5/1/2003	4/1/2007
Wilmington	NC	Wilmington International	ILM	S	$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	$12,915,129	19y10m	4/1/2002	2/1/2022
Fargo	ND	Hector International	FAR	S	$3.00	$4,633,814	5y7m	1/1/1997	8/1/2002
Fargo	ND	Hector International	FAR	S	$4.50	**	1y11m	8/1/2002	7/1/2004
Fargo	ND	Hector International	FAR	S	$4.50	$21,050,526	19y1m	7/1/2004	8/1/2023
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$680,106	3y6m	2/1/1993	8/1/1996
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$1,649,102	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
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	$3,211,072	9y	1/1/2009	1/1/2018
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	9y4m	4/1/2003	8/1/2012
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	$44,624,553	16y4m	9/1/2002	1/1/2019
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	$360,575,600	16y6m	8/1/2004	2/1/2021
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	$334,181,216	19y4m	10/1/2004	2/1/2024
Dayton	OH	James M Cox Dayton International	DAY	S	$3.00	$28,098,728	6y11m	10/1/1994	9/1/2001

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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	$95,294,745	14y4m	7/1/2003	11/1/2017
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	$7,789,544	14y5m	1/1/2004	6/1/2018
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	$2,493,885	22y10m	4/1/2007	2/1/2030
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	$249,492	1y1m	9/1/2004	10/1/2005
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$1,274,888	6y	11/1/2007	11/1/2013
Oklahoma City	OK	Will Rogers World	OKC	S	$3.00	$131,057,571	12y9m	7/1/1997	4/1/2010
Oklahoma City	OK	Will Rogers World	OKC	S	$4.50	**	10y1m	4/1/2010	5/1/2020
Oklahoma City	OK	Will Rogers World	OKC	S	$4.50	$5,226,000	7m	5/1/2020	12/1/2020
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	$118,426,569	12y11m	1/1/1997	8/1/2010
Tulsa	OK	Tulsa International	TUL	S	$4.50	**	8y4m	8/1/2010	4/1/2019
Tulsa	OK	Tulsa International	TUL	S	$4.50	$7,875,712	1y2m	4/1/2019	6/1/2020
Eugene	OR	Mahlon Sweet Field	EUG	S	$3.00	$6,537,176	7y7m	11/1/1993	6/1/2001
Eugene	OR	Mahlon Sweet Field	EUG	S	$4.50	$21,812,157	15y1m	6/1/2001	7/1/2016
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	$4,881,207	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	$28,869,233	22y5m	4/1/2003	9/1/2025
North Bend	OR	Southwest Oregon Regional	OTH	N	$3.00	$520,605	7y6m	2/1/1994	8/1/2001
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	**	1y9m	8/1/2001	5/1/2003
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	$2,557,363	17y9m	5/1/2003	2/1/2021
Pendleton	OR	Eastern Oregon Regional at Pendleton	PDT	CS	$3.00	$486,540	13y10m	12/1/1995	10/1/2009
Pendleton	OR	Eastern Oregon Regional at Pendleton	PDT	CS	$4.50	**	5y5m	10/1/2009	3/1/2015
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	$451,611,641	14y10m	5/1/2016	3/1/2031
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

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Redmond	OR	Roberts Field	RDM	N	$4.50	$27,930,168	33y4m	3/1/2007	7/1/2040
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	$298,660	8y5m	7/1/2000	12/1/2008
Altoona	PA	Altoona-Blair County	AOO	CS	$4.50	**	3y	12/1/2008	12/1/2011
Altoona	PA	Altoona-Blair County	AOO	CS	$4.50	$139,918	3y	12/1/2011	12/1/2014
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	$437,822	14y6m	5/1/2003	11/1/2017
Du Bois	PA	Dubois Regional	DUJ	CS	$3.00	$386,636	5y10m	6/1/1995	4/1/2001
Du Bois	PA	Dubois Regional	DUJ	CS	$4.50	**	2y7m	4/1/2001	11/1/2003
Du Bois	PA	Dubois Regional	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	$12,070,540	19y7m	7/1/2005	2/1/2025
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	CS	$3.00	$148,269	3y1m	11/1/1993	12/1/1996
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$3.00	$510,227	5y4m	12/1/1997	5/1/2001
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$4.50	**	5y8m	5/1/2001	1/1/2007
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$4.50	$285,335	6y10m	7/1/2007	5/1/2014
Lancaster	PA	Lancaster	LNS	CS	$3.00	$384,858	14y	2/1/1995	2/1/2009
Latrobe	PA	Arnold Palmer Regional	LBE		$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	$249,450,000	4y11m	7/1/2013	6/1/2018
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	$426,674,028	18y3m	9/1/2006	12/1/2024
Reading	PA	Reading Regional/Carl A Spaatz Field	RDG		$3.00	$1,006,653	13y7m	12/1/1994	7/1/2008
State College	PA	University Park	UNV/SCE	N	$3.00	$3,742,876	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	$5,621,690	8y5m	7/1/2006	12/1/2014

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Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$3.00	$4,453,122	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	$17,206,290	24y1m	5/1/2001	6/1/2025
Williamsport	PA	Williamsport Regional	IPT	N	$3.00	$132,488	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	$186,378,136	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	$479,036,578	22y	6/1/2008	6/1/2030
San Juan	PR	Luis Munoz Marin International	SJU	M	$3.00	$19,713,152	1y7m	6/1/2030	1/1/2032
Providence	RI	Theodore Francis Green State	PVD	M	$3.00	$100,136,720	12y7m	2/1/1994	9/1/2006
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	**	1y6m	9/1/2006	3/1/2008
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	$83,421,991	8y8m	3/1/2008	11/1/2016
Charleston	SC	Charleston AFB/International	CHS	S	$4.50	$14,833,920	3y3m	3/1/2010	6/1/2013
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	**	26y10m	12/1/2001	10/1/2028
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	$1,375,156	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
Myrtle Beach	SC	Myrtle Beach International	MYR	S	$4.50	$104,020,700	21y7m	6/1/2010	1/1/2032
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	6y5m	6/1/2007	11/1/2013
Pierre	SD	Pierre Regional	PIR	N	$4.50	$366,239	6y5m	2/1/2003	7/1/2009
Pierre	SD	Pierre Regional	PIR	N	$4.50	$422,107	7y	9/1/2009	9/1/2016
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$700,358	2y5m	8/1/1997	1/1/2000
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$4,109,960	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	$30,800,773	27y5m	5/1/2007	10/1/2034
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	$668,500	1y4m	3/1/2012	7/1/2013
Chattanooga	TN	Lovell Field	CHA	N	$3.00	$15,091,446	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	**	5y6m	2/1/2005	8/1/2010
Chattanooga	TN	Lovell Field	CHA	N	$4.50	$2,413,001	2y2m	8/1/2010	10/1/2012

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Jackson	TN	McKellar-Sipes Regional	MKL	C S	$4.50	$332,248	22y8m	10/1/2002	6/1/2025
Knoxville	TN	McGhee Tyson	TYS	S	$3.00	$99,080,294	9y9m	1/1/1994	10/1/2003
Knoxville	TN	McGhee Tyson	TYS	S	$4.50	**	18y9m	10/1/2003	7/1/2022
Knoxville	TN	McGhee 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	$223,093,064	22y8m	1/1/1993	12/1/2009
Nashville	TN	Nashville International	BNA	M	$4.50	**	9m	12/1/2009	9/1/2010
Nashville	TN	Nashville International	BNA	M	$3.00	$81,618,442	5y9m	9/1/2010	6/1/2016
Nashville	TN	Nashville International	BNA	M	$4.50	$11,698,934	7m	6/1/2016	1/1/2017
Nashville	TN	Nashville International	BNA	M	$3.00	$2,512,500	2m	1/1/2017	3/1/2017
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
Amarillo	TX	Rick Husband Amarillo International	AMA	S	$4.50	$19,200,000	9y7m	12/1/2008	7/1/2018
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	Jack Brooks Regional	BPT	N	$3.00	$2,784,768	7y6m	9/1/1994	3/1/2002
Beaumont/Port Arthur	TX	Jack Brooks Regional	BPT	N	$4.50	**	3y1m	3/1/2002	4/1/2005
Beaumont/Port Arthur	TX	Jack Brooks Regional	BPT	N	$4.50	$1,758,573	16y6m	4/1/2005	10/1/2021
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	$5,925,705	17y11m	5/1/2003	4/1/2021
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	$3,479,637	9y	1/1/2004	1/1/2013
Corpus Christi	TX	Corpus Christi International	CRP	N	$3.00	$49,700,114	9y1m	3/1/1994	3/1/2003
Corpus Christi	TX	Corpus Christi International	CRP	N	$4.50	**	23y10m	3/1/2003	1/1/2027
Dallas	TX	Dallas Love Field	DAL	M	$3.00	$383,636,108	2y	2/1/2008	2/1/2010
Dallas	TX	Dallas Love Field	DAL	M	$4.50	**	16y2m	2/1/2010	4/1/2026
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$182,438,761	2y1m	5/1/1994	6/1/1996
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$2,306,174,080	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	$2,988,412,952	17y4m	5/1/2017	9/1/2034
Del Rio	TX	Del Rio International	DRT	N	$4.50	$403,739	5y10m	2/1/2010	12/1/2015
El Paso	TX	El Paso International	ELP	S	$3.00	$76,826,242	13y7m	1/1/1997	8/1/2010
El Paso	TX	El Paso International	ELP	S	$4.50	**	2y7m	8/1/2010	3/1/2013
Harlingen	TX	Valley International	HRL	S	$3.00	$9,716,744	9y1m	11/1/1998	12/1/2007

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Harlingen	TX	Valley International	HRL	S	$4.50	$3,876,104	1y7m	12/1/2007	7/1/2009
Harlingen	TX	Valley International	HRL	S	$4.50	$13,044,000	6y9m	8/1/2009	5/1/2016
Houston	TX	William P. Hobby	HOU	M	$3.00	$163,517,150	12y	11/1/2006	11/1/2017
Houston	TX	George Bush Intercontinental/ Houston	IAH	L	$3.00	$1,372,445,14 3	18y11m	12/1/2008	11/1/2027
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	$3,579,834	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/G RK	N	$4.50	*	2y1m	12/1/2003	1/1/2006
Killeen	TX	Robert Gray AAF	GRK	N	$4.50	$4,794,772	6y6m	6/1/2006	12/1/2012
Laredo	TX	Laredo International	LRD	N	$3.00	$6,303,839	15y8m	10/1/1993	6/1/2009
Laredo	TX	Laredo International	LRD	N	$4.50	**	9y2m	6/1/2009	8/1/2016
Laredo	TX	Laredo International	LRD	N	$4.50	$7,852,765	9y5m	8/1/2016	1/1/2026
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	10y3m	9/1/2002	12/1/2012
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	$4,168,971	2y	2/1/2005	2/1/2007
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$3.00	$14,974,138	1y4m	2/1/2007	6/1/2008
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$4.50	**	5y6m	6/1/2008	12/1/2013
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$4.50	$13,101,351	6y4m	12/1/2013	4/1/2020
McAllen	TX	McAllen Miller International	MFE	N	$3.00	$15,479,029	13y2m	4/1/1998	6/1/2011
McAllen	TX	McAllen Miller International	MFE	N	$4.50	**	2y	6/1/2011	6/1/2013
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	$1,395,921	10m	1/1/2014	11/1/2014
Midland	TX	Midland International	MAF	S	$4.50	$1,544,032	9m	11/1/2014	8/1/2015
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$3.00	$1,266,877	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	$2,942,045	10y	8/1/2004	8/1/2014
San Antonio	TX	San Antonio International	SAT	M	$3.00	$364,227,049	5y11m	11/1/2001	10/1/2007
San Antonio	TX	San Antonio International	SAT	M	$4.50	**	11y7m	10/1/2007	5/1/2019
San Antonio	TX	San Antonio International	SAT	M	$4.50	$142,929,158	6y2m	5/1/2019	7/1/2025
Tyler	TX	Tyler Pounds Regional	TYR	N	$3.00	$2,901,212	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	$3,220,587	9y1m	8/1/2008	9/1/2017
Victoria	TX	Victoria Regional	VCT	C S	$3.00	$195,960	3y	12/1/1994	8/1/1998
Victoria	TX	Victoria Regional	VCT	C S	$3.00	$188,872	3y	1/1/1999	1/1/2002
Victoria	TX	Victoria Regional	VCT	C S	$4.50	$444,905	11y9m	1/1/2002	10/1/2013
Waco	TX	Waco Regional	ACT	N	$3.00	$2,438,451	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	$1,458,418	4y3m	1/1/2008	4/1/2012

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Wichita Falls	TX	Sheppard AFB/Wichita Falls Municipal	SPS	N	$4.50	$1,646,268	9y2m	10/1/2008	12/1/2017
Cedar City	UT	Cedar City Regional	CDC	CS	$4.50	$229,900	4y8m	2/1/2007	10/1/2011
Cedar City	UT	Cedar City Regional	CDC	CS	$4.50	$170,000	4y1m	2/1/2012	3/1/2016
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	$435,127,130	12y8m	7/1/2001	3/1/2013
St George	UT	St George Municipal	DXZ/SGU	N	$3.00	$23,568	4y4m	5/1/1998	9/1/2002
St George	UT	St George Municipal	DXZ/SGU	N	$4.50	$3,515,402	12y7m	6/1/2003	1/1/2016
Wendover	UT	Wendover	ENV		$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
Burlington	VT	Burlington International	BTV	S	$4.50	$17,467,574	4y4m	12/1/2009	4/1/2014
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
Charlotte Amalie	VI	Cyril E. King	STT	S	$4.50	$13,353,396	9y6m	4/1/2012	10/1/2021
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$2,158,095	3y1m	3/1/1993	4/1/1996
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$4,914,898	6y7m	12/1/1996	7/1/2003
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$1,869,822	9y4m	10/1/2011	2/1/2021
Arlington	VA	Ronald Reagan Washington National	DCA	L	$3.00	$249,603,543	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	$350,449,489	9y9m	6/1/2005	3/1/2015
Chantilly	VA	Washington Dulles International	IAD	L	$3.00	$269,427,498	7y6m	1/1/1994	5/1/2001
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	**	4y	5/1/2001	5/1/2005
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	$2,173,226,652	33y7m	5/1/2005	12/1/2038
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	$3,847,780	9y9m	4/1/1995	1/1/2005
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	**	1m	1/1/2005	2/1/2005
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	$1,448,699	4y11m	2/1/2005	1/1/2010
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	$3,454,340	6y	8/1/2010	8/1/2016
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$3.00	$184,209	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	$5,731,108	20y3m	6/1/2002	9/1/2022
Newport News	VA	Newport News/Williamsburg International	PHF	S	$3.00	$552,500	9m	10/1/2006	7/1/2007
Newport News	VA	Newport News/Williamsburg International	PHF	S	$4.50	$15,866,709	9y8m	7/1/2010	3/1/2020
Norfolk	VA	Norfolk International	ORF	S	$3.00	$64,951,249	12y7m	5/1/1997	1/1/2010
Norfolk	VA	Norfolk International	ORF	S	$4.50	$47,090,687	6y1m	9/1/2010	10/1/2016
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

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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	$8,158,043	9m	2/1/2005	11/1/2005
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	**	6y	11/1/2005	11/1/2011
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	$6,471,251	4y4m	11/1/2011	3/1/2016
Staunton	VA	Shenandoah Valley Regional	SHD	N	$3.00	$87,482	5y	12/1/2001	12/1/2006
Staunton	VA	Shenandoah Valley Regional	SHD	N	$4.50	$244,810	10y9m	6/1/2007	3/1/2018
Bellingham	WA	Bellingham International	BLI	S	$3.00	$1,594,527	5y1m	7/1/1993	8/1/1998
Bellingham	WA	Bellingham International	BLI	S	$3.00	*	10m	3/1/1999	1/1/2000
Bellingham	WA	Bellingham International	BLI	S	$3.00	$1,400,000	2y6m	1/1/2000	7/1/2002
Bellingham	WA	Bellingham International	BLI	S	$4.50	**	2y11m	7/1/2002	6/1/2005
Bellingham	WA	Bellingham International	BLI	S	$4.50	$5,241,939	5y1m	6/1/2005	7/1/2010
Bellingham	WA	Bellingham International	BLI	S	$4.50	$30,250,000	17y3m	10/1/2010	10/1/2027
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		$3.00	$470,000	6y8m	3/1/1999	11/1/2005
Moses Lake	WA	Grant County International	MWH		$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	$13,289,313	18y6m	4/1/2003	10/1/2021
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	$877,100	15y1m	9/1/1996	10/1/2011
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	$1,059,235	8y4m	10/1/2005	2/1/2014
Seattle	WA	Seattle-Tacoma International	SEA	L	$3.00	$369,583,600	8y11m	11/1/1992	10/1/2001
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	**	1y7m	10/1/2001	3/1/2003
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	$1,797,794,860	25y8m	3/1/2003	11/1/2028
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	$62,533,633	9y4m	5/1/2005	9/1/2014
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	$1,197,819	6y11m	5/1/2003	4/1/2010
Wenatchee	WA	Pangborn Memorial	EAT	N	$4.50	$881,750	4y9m	5/1/2010	2/1/2015
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$1,565,797	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

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$1,976,471	10y10m	6/1/2000	4/1/2011
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$4.50	$178,995	1y4m	4/1/2011	8/1/2012
Charleston	WV	Yeager	CRW	N	$3.00	$6,921,430	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	$18,720,086	15y2m	4/1/2003	6/1/2018
Clarksburg	WV	North Central West Virginia	CKB	N	$3.00	$79,103	2y1m	3/1/1994	10/1/1995
Clarksburg	WV	North Central West Virginia	CKB	N	$4.50	$101,489	1y10m	4/1/2001	8/1/2002
Clarksburg	WV	North Central West Virginia	CKB	N	$4.50	$2,920,641	50y	5/1/2004	5/1/2054
Huntington	WV	Tri-State/Milton J. Ferguson Field	HTS	N	$3.00	$1,853,497	13y	12/1/1995	12/1/2008
Huntington	WV	Tri-State/Milton J. Ferguson Field	HTS	N	$3.00	$1,195,890	3y1m	5/1/2009	6/1/2012
Lewisburg	WV	Greenbrier Valley	LWB	N	$4.50	$1,105,408	13y9m	4/1/2011	1/1/2025
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	N	$2.00	$54,012	1y1m	12/1/1992	1/1/1994
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	N	$2.00	$211,390	7y1m	12/1/1994	1/1/2002
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	N	$4.50	**	2y5m	1/1/2002	6/1/2004
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	N	$4.50	$227,618	3y9m	6/1/2004	3/1/2008
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	N	$4.50	$663,774	16y7m	6/1/2009	1/1/2026
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	13y5m	8/1/2003	1/1/2016
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	$318,410	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	N	$3.00	$7,530,958	9y	3/1/1993	3/1/2002
Green Bay	WI	Austin Straubel International	GRB	N	$4.50	$38,768,829	18y7m	3/1/2002	10/1/2020
La Crosse	WI	La Crosse Municipal	LSE	N	$3.00	$1,964,469	6y9m	7/1/1994	4/1/2001
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	**	6m	4/1/2001	10/1/2001
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	$6,981,624	14y2m	10/1/2001	1/1/2016
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	$361,324,193	28y11m	5/1/1995	4/1/2024
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	**	3y2m	9/1/2007	12/1/2010
Mosinee	WI	Central Wisconsin	CWA	N	$4.50	$3,529,500	5y9m	12/1/2010	9/1/2016
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	$457,484	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	$1,432,752	8y5m	1/1/2004	6/1/2012
Casper	WY	Casper/ Natrona County International	CPR	N	$3.00	$1,629,582	7y7m	9/1/1993	4/1/2001

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Estimated Exp Date
Casper	WY	Casper/ Natrona County International	CPR	N	$4.50	**	2y2m	4/1/2001	6/1/2003
Casper	WY	Casper/ Natrona County International	CPR	N	$4.50	$2,890,545	11y2m	6/1/2003	8/1/2014
Casper	WY	Casper/ Natrona County International	CPR	N	$3.00	$443,082	1y10m	8/1/2014	6/1/2016
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	$413,037	3y11m	8/1/1997	7/1/2001
Cody	WY	Yellowstone Regional	COD	N	$4.50	**	2y	7/1/2001	7/1/2003
Cody	WY	Yellowstone Regional	COD	N	$4.50	$76,373	1y9m	7/1/2003	4/1/2005
Cody	WY	Yellowstone Regional	COD	N	$4.50	$982,034	10y9m	9/1/2005	6/1/2016
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	$972,544	9y1m	7/1/2005	8/1/2014
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	$21,146,288	23y10m	8/1/2002	6/1/2026
Laramie	WY	Laramie Regional	LAR	CS	$3.00	$126,457	4y2m	8/1/1996	10/1/2000
Laramie	WY	Laramie Regional	LAR	CS	$3.00	*	9m	12/1/2000	8/1/2001
Laramie	WY	Laramie Regional	LAR	CS	$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	$476,907	6y5m	4/1/2006	9/1/2012
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	$433,610	6y9m	12/1/2001	9/1/2008
Sheridan	WY	Sheridan County	SHR	N	$4.50	$736,114	6y8m	10/1/2008	6/1/2015
Worland	WY	Worland Municipal	WRL	CS	$4.50	$72,022	5y2m	1/1/2003	3/1/2008
Worland	WY	Worland Municipal	WRL	CS	$4.50	$193,038	13y11m	8/1/2008	7/1/2022
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

State	City	Airport Name	Discretionary 2013	Entitlement 2013	Discretionary 2014	Entitlement 2014
AK	Anchorage	Ted Stevens Anchorage International	4,000,000	4,250,837	4,000,000	1,911,930
CA	Los Angeles	Los Angeles International	10,000,000	3,195,863	10,000,000	0
CA	Sacramento	Sacramento International	6,000,000	2,220,000	6,000,000	2,271,000
CO	Denver	Denver International	2,000,000	0	0	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	20,000,000	4,000,000	20,000,000	4,000,000
IL	Chicago	Chicago O'Hare International - Phase 1	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Completion Phase	65,000,000	0	45,000,000	0
IN	Gary	Gary/Chicago International	5,000,000	1,000,000	5,000,000	1,000,000
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000	150,000	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000	0	6,000,000	0
NC	Greensboro	Piedmont Triad International	0	6,115,513	0	0
NY	New York	John F Kennedy International	0	0	1,000,000	0
OH	Cleveland	Cleveland-Hopkins International	0	3,304,000	0	3,378,000
OH	Columbus	Port Columbus International	10,000,000	2,026,000	10,000,000	2,064,000
PA	Philadelphia	Philadelphia International	15,000,000	6,800,000	23,000,000	6,800,000
TX	Dallas	Dallas Love Field	7,000,000	900,000	8,000,000	900,000
UT	St. George	St George Municipal	10,000,000	1,000,000	10,000,000	1,000,000
VA	Washington	Washington Dulles International	13,000,000	0	13,000,000	0
WA	Seattle	Seattle-Tacoma International	0	5,600,000	0	5,700,000
		Total	199,850,000	40,562,213	181,000,000	29,024,930

Letter of Intent (LOI) Commitments by Fiscal Year

State	City	Airport Name	Discretionary 2015	Entitlement 2015	Discretionary 2016	Entitlement 2016
AK	Anchorage	Ted Stevens Anchorage International	4,000,000	0	1,000,000	0
CA	Los Angeles	Los Angeles International	11,000,000	0	11,000,000	0
CA	Sacramento	Sacramento International	6,000,000	1,450,061	0	0
CO	Denver	Denver International	0	0	0	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	20,000,000	4,000,000	20,000,000	0
IL	Chicago	Chicago O'Hare International - Phase 1	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Completion Phase	30,000,000	0	25,000,000	0
IN	Gary	Gary/Chicago International	2,844,597	1,000,000	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0	0	0
NC	Charlotte	Charlotte/Douglas International	0	0	0	0
NC	Greensboro	Piedmont Triad International	0	0	0	0
NY	New York	John F Kennedy International	7,000,000	0	7,000,000	0
OH	Cleveland	Cleveland-Hopkins International	0	3,455,000	0	3,535,000
OH	Columbus	Port Columbus International	10,000,000	2,104,000	10,000,000	2,144,000
PA	Philadelphia	Philadelphia International	23,000,000	6,900,000	28,000,000	7,000,000
TX	Dallas	Dallas Love Field	7,000,000	900,000	7,000,000	900,000
UT	St. George	St George Municipal	9,000,000	1,000,000	0	0
VA	Washington	Washington Dulles International	14,000,000	0	9,000,000	0
WA	Seattle	Seattle-Tacoma International	0	6,231,753	0	0
		Total	163,844,597	27,040,814	138,000,000	13,579,000

Letter of Intent (LOI) Commitments by Fiscal Year

State	City	Airport Name	Discretionary 2017	Entitlement 2017	Discretionary 2018	Entitlement 2018
AK	Anchorage	Ted Stevens Anchorage International	0	0	0	0
CA	Los Angeles	Los Angeles International	11,000,000	0	11,000,000	0
CA	Sacramento	Sacramento International	0	0	0	0
CO	Denver	Denver International	0	0	0	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Phase 1	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Completion Phase	25,000,000	0	35,000,000	0
IN	Gary	Gary/Chicago International	0	0	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0	0	0
NC	Charlotte	Charlotte/Douglas International	0	0	0	0
NC	Greensboro	Piedmont Triad International	0	0	0	0
NY	New York	John F Kennedy International	0	0	0	0
OH	Cleveland	Cleveland-Hopkins International	0	658,991	0	0
OH	Columbus	Port Columbus International	1,928,463	1,703,869	0	0
PA	Philadelphia	Philadelphia International	28,000,000	0	28,000,000	0
TX	Dallas	Dallas Love Field	7,000,000	900,000	0	0
UT	St. George	St George Municipal	0	0	0	0
VA	Washington	Washington Dulles International	0	0	0	0
WA	Seattle	Seattle-Tacoma International	0	0	0	0
		Total	112,928,463	3,262,860	114,000,000	0

Letter of Intent (LOI) Commitments by Fiscal Year

State	City	Airport Name	Discretionary 2019	Entitlement 2019	Discretionary 2020	Entitlement 2020
AK	Anchorage	Ted Stevens Anchorage International	0	0	0	0
CA	Los Angeles	Los Angeles International	0	0	0	0
CA	Sacramento	Sacramento International	0	0	0	0
CO	Denver	Denver International	0	0	0	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Phase 1	20,000,000	0	20,000,000	0
IL	Chicago	Chicago O'Hare International - Completion Phase	45,000,000	0	45,000,000	0
IN	Gary	Gary/Chicago International	0	0	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0	0	0
NC	Charlotte	Charlotte/Douglas International	0	0	0	0
NC	Greensboro	Piedmont Triad International	0	0	0	0
NY	New York	John F Kennedy International	0	0	0	0
OH	Cleveland	Cleveland-Hopkins International	0	0	0	0
OH	Columbus	Port Columbus International	0	0	0	0
PA	Philadelphia	Philadelphia International	28,000,000	0	28,000,000	0
TX	Dallas	Dallas Love Field	0	0	0	0
UT	St. George	St George Municipal	0	0	0	0
VA	Washington	Washington Dulles International	0	0	0	0
WA	Seattle	Seattle-Tacoma International	0	0	0	0
		Total	113,000,000	0	113,000,000	0

Letter of Intent (LOI) Commitments by Fiscal Year

State	City	Airport Name	Discretionary 2021	Entitlement 2021	Discretionary Beyond	Entitlement Beyond
AK	Anchorage	Ted Stevens Anchorage International	0	0	0	0
CA	Los Angeles	Los Angeles International	0	0	0	0
CA	Sacramento	Sacramento International	0	0	0	0
CO	Denver	Denver International	0	0	0	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	20,000,000	0	10,000,000	0
IL	Chicago	Chicago O'Hare International - Phase 1	0	0	0	0
IL	Chicago	Chicago O'Hare International - Completion Phase	25,000,000	0	105,000,000	0
IN	Gary	Gary/Chicago International	0	0	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0	0	0
NC	Charlotte	Charlotte/Douglas International	0	0	0	0
NC	Greensboro	Piedmont Triad International	0	0	0	0
NY	New York	John F Kennedy International	0	0	0	0
OH	Cleveland	Cleveland-Hopkins International	0	0	0	0
OH	Columbus	Port Columbus International	0	0	0	0
PA	Philadelphia	Philadelphia International	30,000,000	0	208,000,000	0
TX	Dallas	Dallas Love Field	0	0	0	0
UT	St. George	St George Municipal	0	0	0	0
VA	Washington	Washington Dulles International	0	0	0	0
WA	Seattle	Seattle-Tacoma International	0	0	0	0
		Total	75,000,000	0	323,000,000	0

Letter of Intent (LOI) Commitments Summary

State	City	Airport Name	Discretionary Total	Entitlement Total
AK	Anchorage	Ted Stevens Anchorage International	13,000,000	6,162,767
CA	Los Angeles	Los Angeles International	64,000,000	3,195,863
CA	Sacramento	Sacramento International	18,000,000	5,941,061
CO	Denver	Denver International	2,000,000	0
FL	Fort Lauderdale	Fort Lauderdale/Hollywood International	190,000,000	12,000,000
IL	Chicago	Chicago O'Hare International - Phase 1	160,000,000	0
IL	Chicago	Chicago O'Hare International - Completion Phase	445,000,000	0
IN	Gary	Gary/Chicago International	12,844,597	3,000,000
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000	150,000
NC	Charlotte	Charlotte/Douglas International	18,000,000	0
NC	Greensboro	Piedmont Triad International	0	6,115,513
NY	New York	John F Kennedy International	15,000,000	0
OH	Cleveland	Cleveland-Hopkins International	0	14,330,991
OH	Columbus	Port Columbus International	41,928,463	10,041,869
PA	Philadelphia	Philadelphia International	439,000,000	27,500,000
TX	Dallas	Dallas Love Field	36,000,000	4,500,000
UT	St. George	St George Municipal	29,000,000	3,000,000
VA	Washington	Washington Dulles International	49,000,000	0
WA	Seattle	Seattle-Tacoma International	0	17,531,753
		Total	1,533,623,060	113,469,817

FACILITIES AND EQUIPMENT, RECOVERY ACT

Program and Financing
(in millions of dollars)

Identification code: 69-1304-0		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Change in obligated balances:			
3000	Unpaid Obligations, brought forward, Oct 1:	33	2	.....
3020	Total outlays (gross)	-31	-2	.....
3050	Unpaid Obligations, end of year	2	.....	.....
3100	Obligated balance, start of year	33	2	.....
3200	Obligated balance, end of year	2	.....	.....
	Outlays (gross), detail:			
4011	Outlays from discretionary balances	31	2	.....
4080	Outlay, net (discretionary)	31	2	.....
	Net budget authority and outlays			
4180	Budget authority	.....	.....	.....
4190	Outlays (total)	31	2	.....

The American Recovery and Reinvestment Act of 2009 provided $200 million to Federal Aviation Administration's (FAA) Facilities & Equipment account, which finances major capital investments related to modernizing and improving air traffic control and airway facilities, equipment, and systems. Funds were appropriated from the General Fund of the U.S. Treasury and available for obligation through 2010. The funding is being used to upgrade, modernize, and improve FAA power systems, air route traffic control centers, air traffic control towers, terminal radar approach control facilities, and navigation and landing equipment.

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GRANTS-IN-AID FOR AIRPORTS, RECOVERY ACT

Program and Financing
(in millions of dollars)

Identification code: 69-1306-0		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Change in obligated balances:			
3000	Unpaid obligations, brought forward, Oct 1 (gross)	15	3	0
3020	Outlays (gross)	-5	-3	0
3041	Recoveries of prior year unpaid obligations, expired	-7	0	0
3050	Unpaid Obligations, end of year	3	0	0
3100	Obligated balance, start of year	15	3	0
3200	Obligated balance, end of year	3	0	0
	Budget Authority and outlays, net:			
4011	Outlays from discretionary balances	5	3	0
4080	Outlays, net (discretionary)	5	3	0
4180	Budget authority, net (total)	0	0	0
4190	Outlays, net (total)	5	3	0

The American Recovery and Reinvestment Act of 2009 provided $1.1 billion for Grants-in-Aid for Airports. Funds were appropriated from the General Fund of the U.S. Treasury and were available for obligation through 2010. Discretionary grants were allocated to qualified airports based on a project priority system that addresses airport safety and security, runway safety, increased capacity, and mitigation of environmental impacts.

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AVIATION INSURANCE REVOLVING FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
0801	Program administration	3	7	7
0802	Projected Insurance Claims	.....	24	51
0900	Total new obligations	3	31	58
	Budget resources:			
	Unobligated balance:			
1000	Unobligated balance brought forward, Oct. 1	1,676	1,835	1,972
	Budget authority:			
	Spending authority form offsetting collections, mandatory:			
1800	Collected	162	168	50
1850	Spending auth from offsetting collections, mand (total)	162	168	50
1930	Total budgetary resources available	1,838	2,003	2,022
	Memorandum (non-add) entries:			
1941	Unexpired unobligated balance, end of year	1,835	1,972	1,964
	Change in obligated balance:			
	Unpaid obligations:			
3000	Unpaid obligations, brought forward, Oct. 1 (gross)	2	2	2
3010	Obligations incurred, unexpired accounts	3	31	58
3020	Outlays (gross)	-3	-31	-58
3050	Unpaid obligations, end of year (gross)	2	2	2
3100	Obligated balance, start of year	2	2	2
3200	Obligated balance, end of year	2	2	2
	Budget authority and outlays net:			
	Mandatory:			
4090	Budget authority, gross	162	168	50
	Outlay, gross:			
4100	Outlays from new mandatory authority	3	31	48
4101	Outlays from mandatory balances	......	......	10
4110	Outlays, gross (total)	3	31	58
	Offsets against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4121	Interest on Federal securities	-1	-5	-8
4123	Non-Federal sources	-161	-163	-42
4130	Offsets against gross budget authority and outlays (total)	-162	-168	-50
4160	Budget authority, net (mandatory)	....	....	....
4170	Outlays, net (mandatory)	-159	-137	8
4180	Budget authority, net (total)	....	....	....
4190	Outlays, net (total)	-159	-137	8
	Memorandum (non-add) entries:			
5000	Total investments, SOY: Federal securities: Par value	1,631	1,818	1,784
5001	Total investments, EOY: Federal securities: Par value	1,818	1,784	1,783

Summary of Budget Authority and Outlays
(in millions of dollars)

Identification code: 69-4120-0-3-402	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
Enacted/requested:			
Outlays	-159	-137	8
Legislative proposal, subject to PAYGO:	.....	......	-110
Total:			
Outlays	-159	-137	-102

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 filing fees for non-premium coverage issued. The non-premium program provides aviation insurance coverage for aircraft used in connection with certain Government contract operations by a Department or Agency that agrees to indemnify the Secretary of Transportation for any losses covered by the insurance. The premium program provides war risk insurance coverage at a premium based on activity.

The Homeland Security Act of 2002 (P.L. 107-296) added a provision to require the Secretary to provide additional premium war risk insurance coverage (hull loss or damage and passenger and crew liability) to air carriers insured for third-party war risk liability on November 25, 2002.

The premium war risk 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 the air carrier's commercial coverage as of November 25, 2002; and (iii) third-party liability.

The authority to provide aviation war risk insurance expires on December 31, 2013. With the goal of building private capacity to manage aviation war risk, the Administration proposes to transform the program into a co-insurance arrangement in which DOT and a private insurer would jointly underwrite a common policy. In the case of a claim, DOT would pay an established fraction of the losses, and the private partner would pay the remainder. The Federal share would be slightly reduced each year as private capacity expands. The proposal would extend the existing program through 2014, during which time DOT would propose changes to its underlying statutory authority and work with the private insurance industry to develop co-insurance policies. The Budget proposes that a co-insurance arrangement would begin to reduce the governments share of any losses, starting in 2015.

Object Classification
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Reimbursable obligations:			
2111	Personnel Compensation: Full time permanent	1	1	1
2420	Projected Insurance Claims and indemnities	......	24	51
2440	Refunds	2	6	6
9999	Total new obligations	3	31	58

Employment Summary

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
2001	Reimbursable Civilian full-time equivalent employment	4	5	6

AVIATION INSURANCE REVOLVING FUND
(Legislative proposal, subject to PAYGO)

Program and Financing
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
0801	Program administration	......	......	2
0802	Projected Insurance Claims	......	......	16
0900	Total new obligations	......	......	18
	Budget Resources:			
	Budget authority:			
	Spending authority form offsetting collections, mandatory:			
1800	Collected	......	......	128
1850	Spending auth from offsetting collections, mand (total)	......	......	128
1930	Total budgetary resources available	......	......	128
	Memorandum (non-add) entries:			
1941	Unexpired unobligated balance, end of year	......	......	110
	Change in obligated balance:			
	Unpaid obligations:			
3010	Obligations incurred, unexpired accounts	......	......	18
3020	Outlays (gross)	......	......	-18
	Budget authority and outlays net:			
	Mandatory:			
4090	Budget authority, gross	......	......	128
	Outlay, gross:			
4100	Outlays from new mandatory authority	......	......	18
	Offsets against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4123	Non-Federal sources	......	......	-128
4190	Outlays, net (total)	......	......	-110
	Memorandum (non-add) entries:			
5001	Total investments, EOY: Federal securities: Par value	......	......	110

Object Classification
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Reimbursable obligations:			
2111	Personnel Compensation: Full time permanent	......	......	2
2420	Projected Insurance Claims and indemnities	......	......	16
9999	Total new obligations	......	......	18

Employment Summary

Identification code: 69-4120-0-3-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
2001	Reimbursable Civilian full-time equivalent employment	......	......	6

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ADMINISTRATIVE SERVICES FRANCHISE FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
0801	Accounting Services	54	58	59
0804	Information Services	102	106	107
0805	Duplicating Services	3	4	4
0806	Multi Media	2	2	2
0807	CMEL/Training	11	12	12
0808	International Training	5	4	4
0810	Logistics	249	233	235
0811	Aircraft Maintenance	54	56	57
0812	Acquisition	9	9	10
0900	Total new obligations	489	484	490
	Budgetary Resources:			
1000	Unobligated balance brought forward, Oct 1	128	110	11
1021	Recoveries of prior year unpaid obligations	19	....	....
1050	Unobligated balance (total)	147	110	111
	Budget authority:			
	Spending authority from offsetting collections, discretionary:			
1700	Collected	458	485	500
1701	Change in uncollected payments, federal sources	-6	....	....
1750	Spending auth from offsetting collections, disc (total)	452	485	500
1930	Total budgetary resources available	599	595	611
	Memorandum (non-add) entries:			
1941	Unexpired unobligated balance, end of year	110	111	121
	Change in obligated balances:			
	Unpaid obligations:			
3000	Unpaid obligations, brought forward, Oct 1	143	169	153
3010	Obligations incurred, unexpired accounts	489	484	490
3020	Outlays (gross)	-444	-500	-494
3040	Recoveries of prior year unpaid obligations unexpired	-19	....	....
3050	Unpaid obligations, end of year	169	153	149
	Uncollected payments:			
3060	Uncollected pymts, Fed sources, brought forward, Oct 1	-13	-7	-7
3070	Uncollected pymts, fed sources, unexpired	6	....	....
3090	Uncollected pymts, fed sources, end of year	-7	-7	-7
	Memorandum (non-add) entries:			
3100	Obligated balance, start of year	130	162	146
3200	Obligated balance, end of year	162	146	142
	Budget authority and Outlays, net:			
	Discretionary:			
4000	Budget authority, gross	452	485	500
	Outlays gross:			
4010	Outlays from new discretionary authority	337	330	340
4011	Outlays from discretionary balances	107	170	154
4020	Outlays, gross (total)	444	500	494
	Offsets against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4030	Federal sources	-458	-485	-500
	Additional offsets against gross budget authority only:			
4050	Change in uncollected pmts, Fed sources unexpired	6	....	....
4080	Outlays, net (discretionary)	-14	15	-6
4190	Outlays, net (total)	-14	15	-6

In 1997, the Federal Aviation Administration (FAA) established a franchise fund to finance operations where the costs for goods and services provided are charged to the users on a fee-for-service 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, travel, duplicating services, multi-media services, information technology, materiel management (logistics), and aircraft maintenance.

Object Classification

(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Reimbursable obligations:			
2111	Personnel compensation: Full-time permanent	129	134	137
2121	Civilian personnel benefits	40	42	43
2210	Travel and transportation of persons	5	7	7
2220	Transportation of things	5	5	5
2233	Communications, utilities, and miscellaneous charges	17	15	16
2240	Printing and reproduction	1	1	1
2252	Other services	208	192	193
2260	Supplies and materials	73	74	74
2310	Equipment	11	14	14
9999	Total new obligations	489	484	490

Employment Summary

Identification code: 69-4562-0-4-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
2001	Reimbursable civilian full-time equivalent employment	1,736	1,760	1,791

AVIATION USER FEES

Special and Trust Fund Receipts
(in millions of dollars)

Identification code: 69-5422-0-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
0100	Balance, start of year	51	65	91
	Receipts:			
0200	Aviation User Fee, Overflight Fee[021-00-542240-0]	64	76	88
0220	Property Disposal or Lease Proceeds, Aviation User Fee	1	....	......
0299	Total receipts and collections..	65	76	88
0400	Total: Balances and collections..	116	141	179
	Appropriations:			
0500	Aviation User Fees..	......	76	......
0501	Aviation user Fees..	-51	-126	-116
0599	Total Appropriations..	-51	-50	-116
0799	Balance, end of year..	65	91	63

Program and Financing
(in millions of dollars)

Identification code: 69-5422-0-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Budgetary Resources:			
	Unobligated balance:			
1000	Unobligated balance brought forward, Oct 1	......	17	17
1011	Unobligated balance transferred from other accounts [69-5423]	16	....	....
1050	Unobligated balance (total)	16	17	17
	Budget authority:			
	Appropriations, discretionary:			
1132	Appropriations temporarily reduced	......	-76	......
1160	Appropriations, discretionary (total)	......	-76	......
1201	Appropriations (special or trust fund)	51	126	116
1220	Transferred to other accounts [69-5423]	-50	-50	-116
1260	Appropriations, mandatory (total)	1	76	....
1900	Budget authority (total)	1	.....	......
1930	Total budgetary resources available	17	17	17
	Memorandum (non-add) entries:			
1941	Unexpired unobligated balance, end of year...........................	17	17	17
	Budget authority and outlays net:			
4000	Budget authority, gross	.....	-76	......
	Outlays, gross			
4010	Outlays from new discretionary authority	.....	-76	.....
	Mandatory:			
4090	Budget authority, gross	1	76	.....
	Outlays, gross:			
4100	Outlays from new mandatory authority.................................	.....	76	......
4180	Budget authority, net (total)	1	....	....

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 Federal Aviation Administration to aircraft that neither take off nor land in the United States, commonly known as overflight fees. The Budget estimates that $88 million in overflight fees will be collected in 2014. A full-year 2013 appropriation for this account was not enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 112-175). The continuing resolution extended as a term and condition a proviso of Section 112 of the 2012 FAA Administrative Provisions (P.L. 112-55) that the Department of Transportation interprets as restricting the availability of overflight fees for the Essential Air Service program provided in section 428 of the FAA Modernization and Reform Act of 2012 (P.L. 112-95). This restriction, which limits the availability of overflight fees to $50 million, is reflected as a -$76 million discretionary change in a mandatory program in FY 2013. It is expected that a full year appropriation will amend this proviso of Section 112 so that the additional overflight fees will be available.

AIRPORT AND AIRWAY TRUST FUND

Program and Financing (in millions of dollars)

Identification code: 69-8103-0-7-402		FY 2012 Actual	FY 2013 Estimate	FY 2014 Estimate
	Memorandum (non-add) entries:			
50.00	Total investments, start of year: Federal securities: Par value	8,641	10,425	10,399
50.01	Total investments, end of year: Federal securities: Par value	10,425	10,399	10,676

Section 9502 of Title 26, U.S. Code, provides for amounts equivalent to the funds received in the U.S. 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, Federal Aviation Administration facilities and equipment, research, operations, payment to air carriers, and for the Bureau of Transportation Statistics Office of Airline Information.

To more equitably distribute the cost of air traffic services across the aviation user community, the Administration proposes to establish a new surcharge for air traffic services of $100 per flight. Military aircraft, public aircraft, piston aircraft, air ambulances, aircraft operating outside of controlled airspace, and Canada-to-Canada flights would be exempt. The revenues generated by the surcharge would be deposited into the Airport and Airway Trust Fund. The surcharge would be effective for flights beginning after September 30, 2013.

The status of the fund is as follows:

Status of Funds (in millions of dollars)

Identification code: 69-8103-0-7-402		FY 2012 Actual	FY 2013 Estimate	FY 2014 Estimate
	Unexpended balance, start of year:			
01.00	Balance, start of year...	10,326	11,623	11,580
	Adjustments:			
01.99	Total balance, start of year	10,326	11,623	11,580
	Cash Income during the year:			
	Current law:			
	Receipts			
12.00	Excise Taxes, Airport and Airway Trust Fund [021-00-810310-0]	12,532	11,921	12,199
	Offsetting receipts (intragovernmental):			
12.40	Interest, Airport and Airway Trust Fund [021-00-810320-0] .	221	232	217
12.41	Interest, Airport and Airway Trust Fund [021-00-810320-0] .		....	....
	Offsetting collections:			
12.80	Facilities and Equipment (Airport and Airway and Airport Trust Fund [021-12-8107-0]...	......	1	1
12.81	Research, engineering and development (Airport and Airway Trust Fund) [021-12-8108]	4	13	13
12.82	Grants-in-aid for Airports (Airport and Airway Trust Fund) [021-12-8106-0]	......	40	40
12.83	Facilities and Equipment (Airport and Airway and Airport Trust Fund [021-12-8107-0]	50	49	30
12.99	Income under present law	12,807	12,256	12,500
22.01	Airport and Airway Trust Fund - Air Traffic Service Fee Receipts	......	....	807
22.99	Income under proposed legislation	......	....	807
32.99	Total cash income	12,807	12,256	13,307
	Cash outgo during year:			
	Current law:			
45.00	Payments to Air Carriers [021-12-8304-0]..........................	-149	-143	-146
45.01	Grants-in-aid for Airports (Airport and Airway Trust Fund) [021-12-8106-0]	-3,144	-3,947	-3,671
45.02	Facilities and Equipment (Airport and Airway Trust Fund) [021-12-8107-0]	-2,968	-2,922	-2,911
45.03	Research, Engineering and Development (Airport and Airway Trust Fund) [021-12-8108-0]..	-188	-195	-193
45.04	Trust Fund Share of FAA Activities (Airport and Airway Trust Fund) [021-12-8104-0	-5,061	-5,092	-6,484
45.99	Outgo under current law (-)	-11,510	-12,299	-13,405
65.99	Total Cash outgo (-)	-11,510	-12,299	-13,405
76.45	Facilities and Equipment (Airport and Airway Trust Fund)	1	....	....
76.90	Rounding adjustment	-1	....	....
76.99	Total adjustments	....	....	....
	Unexpended balance, end of year:			
87.00	Uninvested balance (net), end of year...............................	1,198	1,181	806
87.01	Airport and Airway Trust Fund..	10,425	10,399	10,676
87.99	Total balance, end of year..	11,623	11,580	11,482

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 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
	Obligations by program activity:			
00.01	Payment to operations	5,061	5,092	6,484
09.00	Total new obligations	5,061	5,092	6,484
	Budgetary resources:			
	Appropriations, discretionary:			
11.01	Appropriations (special or trust fund).	5,061	5,092	6,484
11.60	Appropriations, discretionary: (total)	5,061	5,092	6,484
19.30	Total budgetary resources available	5,061	5,092	6,484
	Change in obligated balance:			
	Unpaid obligations:			
30.00	Unpaid obligations, brought forward, Oct. 1	....	....	....
30.10	Obligations incurred, unexpired accounts	5,061	5,092	6,484
30.20	Outlays (gross):	-5,061	-5,092	-6,484
	Budget authority and outlays, net:			
	Discretionary:			
40.00	Budget authority, gross	5,061	5,092	6,484
	Outlays, gross:			
40.10	Outlays from new discretionary authority	5,061	5,092	6,484
40.70	Budget authority, net (discretionary)	5,061	5,092	6,484
40.80	Outlays, net (discretionary)	5,061	5,092	6,484
41.80	Budget authority, net (total)	5,061	5,092	6,484
41.90	Outlays, net (total)	5,061	5,092	6,484

For 2014, the Budget proposes $9,707 million for FAA Operations, of which $6,484 million would be provided from the Airport and Airway Trust Fund.

Object Classification
(in millions of dollars)

Identification code: 69-8104-0-7-402		FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Estimate
19.40	Direct obligations: Financial Transfers	5,061	5,092	6,484

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FAA Administrative Provisions in FY 2014 President's Budget

Sec. 110. The Administrator of the Federal Aviation Administration may reimburse amounts made available to satisfy 49 U.S.C. 41742(a)(1) from fees credited under 49 U.S.C. 45303 and any amount remaining in such account at the close of that fiscal year may be made available to satisfy section 41742(a)(1) for the subsequent fiscal year.

- ❖ In order to satisfy 49 U.S.C. 41742(a)(1), at the beginning of each fiscal year FAA makes available to the Essential Air Services (EAS) program $50 million from the Facilities & Equipment (F&E) account. This provision allows FAA to reimburse F&E from the over-flight fees collected and is needed in order to continue the practice in FY 2014.

Sec. 111. Amounts collected under section 40113(e) of title 49, United States Code, shall be credited to the appropriation current at the time of collection, to be merged with and available for the same purposes of such appropriation.

- ❖ As authorized under 49 USC 40113(e), the FAA may provide safety-related training and operational services to foreign aviation authorities with or without reimbursement. While FAA generally enforces a prepayment policy for reimbursable goods and services provided to foreign countries or international organizations, many have laws or regulations similar to the U.S. that prohibit advance payments. In those instances, FAA often receives payments for services provided during a fiscal year after that year has ended. This provision allows FAA to use the funds for additional technical assistance work that cannot be prepaid, instead of returning the funds to a lapsed appropriation.

Sec. 112. None of the funds limited by this Act for grants under the Airport Improvement Program shall be made available to the sponsor of a commercial service airport if such sponsor fails to agree to a request from the Secretary of Transportation for cost-free space in a non-revenue producing, public use area of the airport terminal or other airport facilities for the purpose of carrying out a public service air passenger rights and consumer outreach campaign.

- ❖ This provision requires airports to make space available, at the request of the Secretary, in the public use areas of a terminal (both non-revenue and revenue-producing areas) for an air passenger rights and consumer outreach campaign. The space includes areas that are currently leased to airline tenants.

Sec. 113. None of the funds in this Act shall be available for paying premium pay under subsection 5546(a) of title 5, United States Code, to any Federal Aviation Administration employee unless such employee actually performed work during the time corresponding to such premium pay.

- ❖ The provision stems from past legal action taken by air traffic controllers to receive premium pay for a full shift, even if only part of the shift was eligible for premium pay. The FAA recommends retaining this provision as a GP that would apply to all FAA accounts. FAA also recommends keeping this provision for FY 2013 in order to minimize potential payroll liability.

Sec. 114. None of the funds in this Act may be obligated or expended for an employee of the Federal Aviation Administration to purchase a store gift card or gift certificate through use of a Government-issued credit card.

- ❖ This provision prohibits FAA employees from using a government-issued credit card to purchase a store gift card or gift certificate. FAA recommends retaining this provision as a GP that would apply to all FAA accounts.

Sec. 115. None of the funds in this Act may be obligated or expended for retention bonuses for an employee of the Federal Aviation Administration without the prior written approval of the Deputy Assistant Secretary for Administration of the Department of Transportation.

- The FY 2013 budget proposes to retain the provision that all FAA retention bonuses continue to be approved by the Deputy Assistant Secretary for Administration.

Sec. 116. Subparagraph (D) of section 47124(b)(3) of title 49, United States Code, is amended by striking "20 percent." and inserting "50 percent.''.

The FY 2012 appropriations act covering the FAA (P.L. 112-55) amended Title 49 to establish a 20 percent cap on the maximum allowable local cost share in FAA's Contract Tower Cost Share program. This program covers airports with Benefit/Cost ratios less than the 1.0 needed to qualify for the full Contract Tower Program. The FY 2014 budget proposes to increase the maximum allowable local cost for these airports from 20 to 50 percent.

FEDERAL AVIATION ADMINISTRATION

OPERATIONS

ESTIMATES		APPROPRIATIONS	
2003	[1, 2] 7,481,970,000	2003	[3, 4, 5] 7,019,170,377
2004	[6] 7,590,648,000	2004	[7, 8] 7,479,206,153
2005	[9] 7,849,000,000	2005	[10, 11] 7,706,537,000
2006	[12, 13] 8,201,000,000	2006	[14, 15] 8,104,140,000
2007	[16] 8,366,000,000	2007	[17] 8,374,374,217
2008	[18] 8,725,783,000	2008	[19] 8,740,000,000
2009	[20] 8,998,461,700	2009	[21] 9,046,167,000
2010	[22] 9,335,798,000	2010	[23, 24] 9,351,400,000
2011	[25] 9,793,000,000	2011	[26] 9,516,172,000
2012	[27] 9,823,000,000	2012	[28] 9,653,395,000
2013	[29] 9,718,000,000	2013	[30] 9,712,473,777
		2013 Sequester (P.L.112-240)	[31] -486,123,689
2014	9,707,000,000		

[1] FY 2003 includes $404,768,000 for CSRS/Health benefit accruals proposed by the Administration.
[2] Includes 3,799,278,000 from Airport and Airway Trust Fund.
[3] Includes $3,774,582,693 from Airport and Airway Trust Fund and $3,248,064,934 from General Fund.
[4] Reflects 0.65 percent across-the-board rescission per P.L. 108-7 and Working Capital Fund cut of $3.9M.
[5] Excludes Midway Island Airfield earmark for $3,500,000—reduced to $3,477,250 by 0.65 rescission.
[6] Administration proposes $6,000,000,000 from Airport and Airway Trust Fund.
[7] Reflects 0.59 percent across-the-board rescission per P.L. 108-199; Working Capital Fund cut by $7.3M.
[8] Includes $4,469,000,000 from Airport Airway Trust Fund.
[9] Includes $6,002,000,000 from Airport and Airway Trust Fund with $2M for Bureau of Transportation Statistics.
[10] Reflects 0.80 percent across-the-board rescission per P.L. 108-447 and Working Capital Fund cut of $6.3M.
[11] Includes $$4,878,728,416 from Airport and Airway Trust Fund.
[12] Includes $6,500,000,000 from the Airport and Airway Trust Fund.
[13] Includes $150,000,000 for Flight Service Station A-76 Competition.
[14] Reflects 1.0 percent across-the-board rescission per P.L. 109-148.
[15] Includes $5,541,000,000 from Airport and Airway Trust Fund.
[16] Includes $5,445,000,000 from Airport and Airway Trust Fund.
[17] Includes $5,627,900,000 from Airport and Airway Trust Fund
[18] Includes $6,243,027,000 from Airport and Airway Trust Fund. FAA did not request funding for this account in FY 2008. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Operations amount is shown here for comparative purposes.
[19] Includes $6,397,061,000 from Airport and Airway Trust Fund.
[20] Includes $6,280,973,000 from Airport and Airway Trust Fund. FAA did not request funding for this account in FY 2009. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Operations amount is shown here for comparative purposes.
[21] Includes $5,238,005,000 from Airport and Airway Trust Fund. Also includes $3.7 million transfer from the U.S. Department of State.
[22] Includes $6,207,798,000 from Airport and Airway Trust Fund.
[23] Includes $4,000,000,000 from Airport and Airway Trust Fund.
[24] Includes $1,300,000 transfer from the U.S. Department of State
[25] Includes $6,064,000,000 from Airport and Airway Trust Fund
[26] Reflects as rescission of $19,066,000 per P.L. 112-55. Includes $4,549,882,000 from Airport and Airway Trust Fund. Also includes $2.3 million transfer from the U.S. Department of State
[27] Includes $4,958,000,000 from Airport and Airway Trust Fund
[28] Includes $5,060,694,000 from Airport and Airway Trust Fund
[29] Includes $6,721,000,000 from Airport and Airway Trust Fund
[30] Reflects funding at the annualized FY 2012 funding level plus an increase of 0.612% pursuant to P.L. 112-175, Continuing Appropriations Resolution, 2013.
[31] FY 2013 funds sequestered pursuant to the Budget Control Act of 2011 as Amended by The American Taxpayer Relief Act of 2012 (P.L. 112-240). Includes $254,583,272 from the Operations share of the Airport and Airway Trust Fund and $500,000 in offsetting collections.

FEDERAL AVIATION ADMINISTRATION

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES

2003	[1]2,981,022,000
2004	2,916,000,000
2005	2,500,000,000
2006	2,448,000,000
2007	2,503,000,000
2008	[10]2,461,566,000
2009	[11]2,723,510,000
2010	2,925,202,000
2011	2,970,000,000
2012	[15]3,120,000,000
2013	2,850,000,000
2014	2,777,798,000

APPROPRIATIONS

2003	[2]2,961,645,357
2003 Rescission	[3]-20,000,000
2004	[4]2,892,831,000
2004 Rescission	[5]-30,000,000
2005	[6]2,519,680,000
2005 Supplemental (P.L.108-324)	[7]5,100,000
2006	[8]2,514,600,000
2006	[9]40,600,000
2007	2,517,520,000
2008	2,513,611,000
2009	2,742,095,000
2009 Supplemental (P.L.111-5)	[12]200,000,000
2010	[13]2,928,315,000
2011	[14]2,730,731,000
2012	2,730,731,000
2013	[16]2,747,443,074
2013 Supplemental (P.L. 113-2)	[17]30,000,000
2013 Sequester (P.L.112-240)	[18]-141,972,154

[1] FY 2003 request excludes $18,551,000 for CSRS/Health benefit accruals proposed by the Administration.
[2] Reflects 0.65 percent across-the-board rescission of per P.L. 108-7.
[3] Rescission of unobligated balances.
[4] Reflects 0.59 percent across-the–board rescission per P.L. 108-199.
[5] Rescission of unobligated balances.
[6] Reflects 0.80 percent across-the-board rescission per P.L. 108-447.
[7] American Recovery and Reinvestment Act Supplemental per P.L. 111-5, from the General Fund.
[8] Reflects 1.0 percent across-the-board rescission, per P. L. 109-148.
[9] Hurricane Supplemental fund per P.L. 109-148
[10] FAA did not request funding for this account in FY 2008. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Facilities and Equipment amount is shown here for comparative purposes.
[11] FAA did not request funding for this account in FY 2009. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Facilities amount is shown here for comparative purposes.
[12] American Recovery and Reinvestment Act Supplemental per P.L. 111-5, from the General Fund.
[13] Reflects $7,888,000 rescission of prior year authority per P.L. 111-117.
[14] Reflects a rescission of $5,472,000 per P.L. 112-55.
[15] Includes $250,000,000 of mandatory General Fund from the Administration's Infrastructure proposal.
[16] Reflects funding at the annualized FY 2012 funding level plus an increase of 0.612% pursuant to P.L. 112-175, Continuing Appropriations Resolution, 2013.
[17] Hurricane Sandy Emergency Supplemental, P.L. 113-2
[18] FY 2013 funds sequestered pursuant to the Budget Control Act of 2011 as Amended by The American Taxpayer Relief Act of 2012 (P.L. 112-240). Includes $3,100,000 in offsetting collections.

FEDERAL AVIATION ADMINISTRATION

RESEARCH, ENGINEERING, AND DEVELOPMENT

ESTIMATES	
2003	126,744,000
2004	100,000,000
2005	117,000,000
2006	130,000,000
2007	130,000,000
2008	[5]140,000,000
2009	[6]171,028,000
2010	180,000,000
2011	190,000,000
2012	190,000,000
2013	180,000,000
2014	166,000,000

APPROPRIATIONS	
2003	[1]147,485,075
2004	[2]118,734,310
2005	[3]129,879,584
2006	[4]136,620,000
2007	130,234,000
2008	146,828,000
2009	171,000,000
2010	190,500,000
2011	[7]169,660,000
2012	167,556,000
2013	[8]168,581,443
2013 Sequester (P.L.112-240)	[9]-8,429,072

[1] Reflects a 0.65 percent across-the-board rescission per P.L. 108-7.
[2] Reflects a 0.59 percent across-the-board rescission per P.L. 108-199.
[3] Reflects a 0.80 percent across-the-board rescission per P.L. 108-447.
[4] Reflects a 1.0 percent across-the-board rescission of 1.0 percent per P.L. 109-148.
[5] Includes $122,867,000 from the Airport and Airway Trust Fund.
[6] Includes $156,003,000 from the Airport and Airway Trust Fund.
[7] Reflects a $340,000 rescission per P.L. 112-55.
[8] Reflects funding at the annualized FY 2012 funding level plus an increase of 0.612% pursuant to P.L. 112-175, Continuing Appropriations Resolution, 2013.
[9] FY 2013 funds sequestered pursuant to the Budget Control Act of 2011 as Amended by The American Taxpayer Relief Act of 2012 (P.L. 112-240).

FEDERAL AVIATION ADMINISTRATION

GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
2002	1,800,000,000	2002	1,800,000,000
2002 Rescission	-331,000,000	2002 Rescission	[1] -301,720,000
		2002	[2] 175,000,000
2003	3,100,000,000	2003	3,100,000,000
2004	3,400,000,000	2004	3,400,000,000
2005	2,800,000,000	2005	2,800,000,000
2006	3,300,000,000	2006	3,399,000,000
2007	4,000,000,000	2007	4,399,000,000
2008	4,300,000,000	2008	4,399,000,000
2009	3,600,000,000	2009	3,600,000,000
		2009 Supplemental (P.L. 111-5)	[3] 1,100,000,000
2010	3,000,000,000	2010	3,000,000,000
2011	3,550,000,000	2011	3,550,000,000
2012	3,600,000,000	2012	3,435,000,000
2013	3,400,000,000	2013	[4] 3,456,022,200
2014	3,200,000,000		

[1] Rescission of Contract Authority per P.L. 107-87.
[2] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[3] American Recovery and Reinvestment Act Supplemental, per P.L. 111-5, from the General Fund.
[4] Reflects funding at the annualized FY 2012 funding level plus an increase of 0.612% pursuant to P.L. 112-175, Continuing Appropriations Resolution, 2013.

FEDERAL AVIATION ADMINISTRATION

GRANTS-IN-AID FOR AIRPORTS
LIMITATION ON OBLIGATIONS
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
2002	(3,300,000,000)	2002	[1](3,474,944,000)
2003	(3,400,000,000)	2003	[2](3,377,900,000)
2004	(3,400,000,000)	2004	[3] (3,379,940,000)
		2004	[4](1,988,200)
2005	(3,500,000,000)	2005	[5](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	(3,514,500,000)
2009	(2,750,000,000)	2009	(3,514,500,000)
2010	(3,515,000,000)	2010	(3,515,000,000)
2011	(3,515,000,000)	2011	(3,515,000,000)
2012	(2,424,000,000)	2012	(3,350,000,000)
2013	(2,424,000,000)	2013	[6](3,370,502,000)
2014	(2,900,000,000)		

[1] 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.
[2] Reflects 0.65 percent across-the-board rescission per P.L. 108-7.
[3] Reflects 0.59 percent across-the-board rescission per P.L. 108-199.
[4] Direct appropriation from General Fund for Ft. Worth Alliance Airport, pursuant to Division H, Section 167, P.L. 108-199.
[5] 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.
[6] Reflects funding at the annualized FY 2012 funding level plus an increase of 0.612% pursuant to P.L. 112-175, Continuing Appropriations Resolution, 2013.

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FEDERAL AVIATION ADMINISTRATION
RESEARCH, DEVELOPMENT, AND TECHNOLOGY

The FAA's Research, Engineering, and Development (R,E&D) program, in partnership with the aviation community, provides world leadership by conducting high-priority research and developing innovative technologies to support a safe, efficient, and environmentally acceptable global aviation system. The program undertakes research and coordinates its research with both domestic and international partners. It is responsible for establishing and overseeing FAA's Research and Development (R&D) policy and plans, developing its R&D investment portfolio, and serving as the agency's R&D spokesperson. Its diverse scientific, engineering and technical workforce supports all aspects of aviation from research on materials to development of new products and procedures.

Under the management of the William J. Hughes Technical Center, the R&D program develops and tests specific technologies, tools, and procedures critical to enhancing FAA's unique mission to regulate and certify airmen and aircraft and to enhance the safety and efficiency of the National Aviation System. The program also enables FAA to keep pace with new technologies that affect FAA's ability to regulate and manage the National Airspace System. The FAA publishes the annual National Aviation Research Plan which documents each R&D program area, provides intended outcomes, outputs, programmatic structure, partnerships, and a long-range outlook for the program.

One way FAA ensures its research meets the President's criteria for research and development is through the Research, Engineering, and Development Advisory Committee (REDAC), established by Congress in 1989. This group reports to the FAA Administrator on R&D issues and provides feedback on the FAA's portfolio and similar efforts in industry, academia, and government. The REDAC specifically looks at the FAA research programs in terms of the relevance and appropriateness of programs to the National Airspace System and works to ensure that FAA's program goals and priorities properly link to national needs. The Committee also examines the quality and performance of the R&D program and provides FAA with advice on how best to allocate funds to ensure a high quality R&D program. The REDAC considers aviation research needs in five key areas: air traffic services, airport technology, aircraft safety, human factors, and the environment. Representing corporations, universities, associations, consumers, and other agencies, there are up to 30 REDAC and subcommittee members who hold two-year terms. The REDAC meets with FAA senior managers two times a year and annually reviews the Agency's proposed R&D budget submission.

RESEARCH, DEVELOPMENT & TECHNOLOGY
DEPARTEMENT OF TRANSPORTATION
BUDGET AUTHORITY
($ in Thousands)
EXHIBIT IV-1

		FY 2012 Enacted	FY 2013 CR Annualized	FY 2014 Pres. Bud.	FY 2014 Applied	FY 2014 Development
	FEDERAL AVIATION ADMINISTRATION					
A. Research, Engineering and Development		**167,556**	**168,581**	**166,000**	**166,000**	
A11	**Improve Aviation Safety**	**89,314**	**89,860**	**90,921**	**90,921**	
a.	Fire Research and Safety	7,158	7,202	8,313	8,313	
b.	Propulsion and Fuel System	2,300	2,314	1,974	1,974	
c.	Advanced Structural/Structural Safety	2,534	2,550	2,607	2,607	
d.	Aircraft Icing - Atmospheric Hazards/Digital System Safety	5,404	5,437	7,582	7,582	
e.	Continued Airworthiness	11,600	11,671	8,167	8,167	
f.	Aircraft Catastrophic Failure Prevention Research	1,147	1,154	1,652	1,652	
g.	Flightdeck/Maintenance/System Integration Human Factors	6,162	6,200	5,000	5,000	
h.	System Safety Management	10,027	10,088	11,583	11,583	
I.	Air Traffic Control/Technical Operations Human Factors	10,364	10,427	6,000	6,000	
j.	Aeromedical Research	11,000	11,067	8,672	8,672	
k.	Weather Program	16,043	16,141	15,279	15,279	
l.	Unmanned Aircraft System	3,504	3,525	7,500	7,500	
m.	NextGen - Alternative Fuels for General Aviation	2,071	2,084	5,571	5,571	
n.	Aircraft Catastrophic Failure Prevention Research	-		1,021	1,021	
A12	**Improve Efficiency**	**34,174**	**34,383**	**35,822**	**35,822**	
a.	JPDO	5,000	5,031	12,057	12,057	
b.	NextGen - Wake Turbulence	10,674	10,739	9,267	9,267	
c.	NextGen - Air Ground Integration	7,000	7,043	10,329	10,329	
d.	NextGen - Self-Separation	3,500	3,521	-	-	
e.	NextGen- Weather Technology in the Cockpit	8,000	8,049	4,169	4,169	
A13	**Reduce Environmental Impact**	**38,574**	**38,810**	**33,521**	**33,521**	
a.	Environment and Energy	15,074	15,166	14,542	14,542	
b.	NextGen - Environmental Research, Aircraft Technologies Fuels and Metrics	23,500	23,644	18,979	18,979	
A14	**Mission Support**	**5,494**	**5,528**	**5,736**	**5,736**	
a.	System Planning and Resource Management	1,717	1,728	2,289	2,289	
b.	William J. Hughes Technical Center Laboratory Facility	3,777	3,800	3,447	3,447	
B. Facilities and Equipment		**144,645**	**101,789**	**116,550**		**97,550**
a.	Advanced Technology Development and Prototype	17,100	15,746	19,600		19,600
b.	Plant	22,500	17,079	19,000		-
c.	CAASD	20,045	18,141	16,450		16,450
d.	NextGen System Development	85,000	50,823	61,500		61,500
C. Airport Improvement Program, Airport Technology		**44,250**	**44,521**	**44,500**	**44,500**	
a.	Airport Technology Research	29,250	29,429	29,500	29,500	
b.	Airport Cooperative Research	15,000	15,092	15,000	15,000	
D. Operations		**9,286**	**9,343**	**12,665**		**12,665**
E. Commercial Space Transportation		**1,000**	**1,000**	**1,000**		**1,000**
	Subtotal, Research and Development	**344,237**	**308,155**	**321,715**	**210,500**	**111,215**
	Subtotal , Facilities (F)	**22,500**	**17,079**	**19,000**		
	TOTAL FAA	**366,737**	**325,234**	**340,715**	**210,500**	**111,215**

NextGen Generation Air Transportation System (NextGen)

Executive Summary

The FAA continues to make critical progress implementing Next Generation Air Transportation System (NextGen) capabilities, which encompass the deployment of new systems, technologies, and procedures that will help reduce delays, expand air traffic system capacity, and mitigate aviation's impact on the environment, while ensuring the highest levels of safety.

Since NextGen's inception, FAA has focused primarily on conducing applied and basic research about adapting current information technology (IT) to a wide spectrum of aviation programs to enhance the efficiency and effectiveness of the NAS. NextGen is now moving programs out of the development and into baselined and operational programs, and FAA and other stakeholders are beginning to experience the benefits of NextGen investments. This Budget Request includes six baselined programs, which have entered the implementation stages for Initial Operating Capability (IOC) and Operational Readiness Decision (ORD). NextGen achievements have already provided the following capabilities to the aviation community:

- Expanded satellite-based surveillance and navigation. Automatic Dependent Surveillance-Broadcast (ADS-B) has been implemented in about two-thirds of the country. Air traffic controllers are using ADS-B to separate traffic in South Florida, Louisville, Philadelphia, Juneau, and the Gulf of Mexico. Implementation of ADS-B to control air traffic in the Gulf of Mexico is a significant safety and efficiency improvement by providing radar-like services to a region which was without surveillance. Airlines are also increasingly investing in the ADS-B and in required navigation performance equipage to fully realize these surveillance and navigational benefits.
- Advanced navigational procedures. The introduction of area navigation operations and the more advanced GPS-based performance-based navigation procedures are reducing flight distances, flight times, noise pollution, fuel consumption, and harmful engine emissions.
- Improved airport runway access at general aviation airports through GPS landing procedures.
- Reduced aircraft wait times, in active demonstration locations, on the tarmac by beginning to share surface movement data between FAA, airport authorities and airlines for better decision making as well as increasing throughput at airports with closely spaced and converging or intersecting runways.

Introduction

For FY 2014, $1.002 billion is requested for NextGen programs, projects, and activities. With the requested funding FAA will continue the on-going development and implementation of operational improvements in how safely and efficiently we operate the NAS, and in how well we fulfill our responsibilities as stewards of the environment.

As the number of international passengers and aviation activities across the globe increase every year, it becomes even more important the United States remain the gold standard for aviation safety. To make this happen, FAA actively builds partnerships and shares knowledge to create a safe, seamless and efficient global aviation system. Our premise is simple: national boundary lines should not be impediments to safety. The global aviation system moves more than 6.2 million people and tons of cargo to their destinations every day. Through the Office of Policy, International Affairs and Environment (APL), FAA collaborates with domestic and international partners to improve aviation safety, efficiency and the environment. People across the globe benefit from the work we do.

The public at large benefits from reduced aviation noise and emission impacts. The aviation industry also benefits because lower impacts reduce environmental constraints on aviation operation growth. Improvements in fuel burn and energy efficiency improve emission, reduce the economic burden imposed by high fuel costs and contribute to U.S. energy conservation.

By the end of the NextGen mid-term, the air transportation system will be fundamentally different from the one we know today. The way we track aircraft will be transforming from ground-based radar to satellite-based position-fixing. For commercial aviation, satellite-based surveillance is a technological leap that will greatly increase accuracy and improve situational awareness at air traffic control facilities and on properly equipped aircraft.

Aircraft navigation capabilities are transitioning from today's cumbersome, step-by-step clearances to PBN-based procedures, allowing for more precise, more direct trajectories in all phases of flight – takeoff, ascent, cruise, descent, and landing. Additionally, PBN procedures are reducing flight distances, flight times, fuel consumption, and harmful engine emissions – all of which further the FAA's commitment to reducing the environmental footprint of greenhouse-gas emissions and noise created by the aviation industry, while ensuring the continuation of a safe and secure NAS.

FAA is also increasing its focus on the way information is transferred between the cockpit and the air traffic control facilities. Currently, all communications are voice, but switching to a more data-focused transfer of information will both modernize the information transfers and increase efficiency by minimizing garbled or misunderstood messages. As with other improvements, this will be phased in to minimize disruption and ensure that messages are delivered without the errors in hearing and transcribing the information causing repeats or worse – operational errors. Applied initially to messages between airport towers and aircraft on the surface, data communications will improve safety and reduce the time it takes from gate to air, and will eventually become the principal method of routine communications through all phases of flight.

Organizing information for pilots, controllers, airports, airlines and other NAS stakeholders will undergo perhaps the greatest change of all, moving from disjointed data presentations in ad-hoc formats, to improved, fully-merged data presented in the same format to all players.

NextGen Benefits

We've estimated that NextGen will reduce total flight delays about 41 percent by 2020, compared with the level that delays would reach absent NextGen, while providing $38 billion in cumulative benefits to the traveling public, aircraft operators, and the FAA. Aircraft owners will save about 1.6 billion gallons of fuel during this period, reducing carbon dioxide emissions by 16 million tons.

Flight planners, in the mid-term, will have increased access to information on the status of the NAS through a shared, network-enabled information source. Operators will be able to see current and planned strategies to deal with congestion and other airspace constraints. New information will indicate whether airspace is blocked for military, security or space operations. It will describe other airspace limitations, such as those due to current or forecasted weather events and congestion.

As the time for the flight approaches, the flight crew will receive the final flight path agreement as a data message. Data communications will provide pre-departure clearances that allow for amendments to flight plans. When the aircraft taxis out, the flight crew's situational awareness will be improved by flight deck displays of a moving map indicating the aircraft's position on the airport surface and, at busy airports, the position of other aircraft and surface vehicles. In the tower, improved ground systems, such as surface-movement displays, will enable controllers to manage taxiways and runways more efficiently. Surface-movement displays will help controllers choose the best runway and taxi paths for a departing aircraft's intended flight path, and provide the status and positions of all other aircraft on the airport surface and in the terminal area.

These flight deck and tower displays are important safety tools that will improve the prevention of runway incursions and other surface conflicts, especially when visibility is low. More efficient management will mean fewer radio transmissions, shorter wait times, fewer departure delays and reduced fuel consumption and emissions. Weather information will be integrated into decision-making for surface management.

Departure performance will be improved by using multiple precise departure paths from each runway end through Area Navigation (RNAV) and Required Navigation Performance (RNP) procedures. Multiple departure paths will enable controllers to place each aircraft on its own separate track, avoiding known constraints, thunderstorms and other severe weather near the airport. The ability to operate simultaneously on closely spaced parallel runways – through increased accuracy in surveillance and navigation, and through improved understanding of wake vortices – means airports will gain capacity for their existing runways.

Together, these capabilities will enhance safety, improve environmental performance, and reduce operators' delay and fuel costs.

As an aircraft climbs into the en route airspace, enhanced processing of surveillance data will improve position information and enable the flight crew and controllers to take advantage of reduced separation standards. Because the flight crew will be able to monitor the position of other aircraft from their own aircraft's flight deck, air traffic personnel will be able to assign spacing responsibility to the flight crew as the aircraft climbs to its cruising altitude. The aircraft will be able to merge into the overhead stream with minimal additional maneuvers.

Data communications will provide routine and strategic information to the flight crew and automate some routine tasks for both pilots and controllers. Also fewer voice communications will reduce radio-frequency congestion and oral miscommunication.

In oceanic operations, air traffic management (ATM) personnel will provide aircraft entering oceanic airspace with an optimized trajectory. Airspace entry will be specified by track entry time and the intended trajectory. As weather and wind conditions change, both individual reroutes and changes to the entire route structure will be managed via data communications.

NextGen capabilities will provide a number of improvements to terminal area operations that save fuel, increase predictability and minimize holding patterns, delaying vectors and other such maneuvers. Enhanced traffic management tools will analyze flights approaching an airport from hundreds of miles away, across air traffic control facility boundaries, and will calculate scheduled arrival times to maximize arrival performance. These advances will improve the flow of arrival traffic to maximize use of existing capacity. Precision arrivals will save fuel and reduce emissions.

NextGen Today

NextGen programs made great strides in 2012, which continues in 2013, particularly in the areas of ADS-B ground-based infrastructure deployment, PBN procedure-related activities, renewable fuels, and responding to the Radio Technical Commission for Aeronautics (RTCA) recommendations.

The end of 2012 saw more than 450 operational ADS-B ground stations, providing satellite-based surveillance coverage of the East, West and Gulf coasts and most of the area near the U.S.-Canadian border. Total complements of about 700 radio stations are expected in place and operational by early 2014.

In 2012, FAA published a significant volume of PBN arrival and departure procedures, in addition to high- and low- altitude routes. The agency attributes the increased publication levels to a new agency process developed to reduce the time it takes to introduce new PBN procedures. These new PBN procedures are designed to provide greater flexibility in the NAS and to facilitate more dynamic management of air traffic.

The FAA continues to provide significantly improved access to general aviation airports through the publication of PBN approach procedures known as Area Navigation (RNAV) Wide Area Augmentation System (WAAS) Localizer Performance with Vertical Guidance (LPV). WAAS, a satellite based navigation technology, allows qualifying airports in the NAS to have vertical and horizontal guidance during all phases of a flight, regardless of weather conditions, without installing expensive legacy navigation hardware at each runway. As of July 2012, more than 3,000 WAAS LPV procedures were in place at more than 1,500 airports throughout the United States.

Additionally, the design phase of our metroplex initiative has been completed in six locations, with some new approach procedures already implemented in the Washington, D.C. metroplex. The FAA's metroplex initiative is providing new flight path procedures which eliminate interactions between aircraft operating at adjacent runways and airport, and reduce fuel, noise and emissions. Under the metroplex initiative, study groups identify near-term PBN improvements and minor airspace adjustments that can be completed in major metropolitan areas within three years. Metroplex study teams began work at Washington, D.C., and north Texas in 2010 and in Houston in 2011 and design activities have been completed at all three sites.

We also completed studies in 2011 for northern California, Atlanta and Charlotte, where design and implementation teams completed their work at the end of FY 2012. Design work is scheduled for FY2013 in southern California, Phoenix, Chicago and three combined Florida metroplexes in FY 2013.

Our ongoing advocacy of sustainable jet fuels through the Commercial Aviation Alternative Fuels Initiative reached a significant milestone on July 1, 2011. Standards-setting organization ASTM International approved the use of a renewable, bio-derived jet fuel. In 2012, endurance tests of a turbofan engine using this Hydroprocessed Renewable Jet fuel showed that this blend does not affect long-term engine wear or operational performance.

At FAA's request, RTCA formed the NextGen Mid-Term Implementation Task Force in 2009. One of our most effective collaborative efforts, this consortium of 300-plus representatives from the aviation community provides recommendations for moving forward together on NextGen implementation. The FAA responded to those recommendations with plans for achieving Task Force objectives. More than a third of our Task Force response actions are complete, with progress in areas identified by the Task Force as high priority, such as metroplex operations. The following tables depict a partial illustration of the progress made in response to the Task Force recommendations.

Program	RTCA Task Force	FY 2011 FY2012	FY 2013	FY 2014 - Mid-Term
Automatic Dependent Surveillance - Broadcast (ADS-B) BLI 2A13 G02S.01-0	NAS Access #28	▪ Continued to deploy ADS-B ground infrastructure ▪ Completed final assessment of 3-nautical mile (nm) separation in 3-nautical mile (nm) separation in en route operations (beyond those achievable in the near-term prior to achievable in the near-term prior to (FIS-B)	▪ Complete the ADS-B to ADS-B target level of safety study ▪ Achieve Initial Operating Capability (IOC) for Air Traffic Control (ATC) Surface Advisory Services at 12 sites ▪ Achieve IOC for En Route ATC Separation Services at 15 sites. ▪ Achieve IOC for Terminal ATC Separation Services at 45 sites.	▪ Complete NAS-wide deployment of ADS-B, Traffic Information Services–Broadcast (TIS-B) and Flight Information Services–Broadcast (FIS-B) ▪ Achieve IOC of Automation Upgrades for ATOP automation platform o Achieve IOC for ASSC at 1 Site ▪ Achieve IOC for Ground-Based Interval Management – Spacing (GIM-S) ▪ Achieve IOC for Terminal ATC Separation Services at 15 Sites
		▪ Pursued ADS-B program expansion to provide surveillance services in non-radar airspace	▪ Provide initial operating capability for surface alerting	▪ Establish FAA infrastructure that supports of ground vehicle surveillance at: Denver and O'Hare Airports
Data Communications (DataComm) 1A05 G01C.01-01	DataComm #16, 17, 39, 44, 42	▪ Released solicitation for DataComm network service provider ▪ Achieved final investment decision for procurement of en route DataComm automation infrastructure and controller-pilot data link communications applications	▪ Achieve final investment decision on acquisition of the digital very high frequency (VHF) aeronautical mobile communications infrastructure	▪
		▪ Initiated development of revised departure	▪ Complete Revised Departure Clearance	▪ Initiate development of en route

Program	RTCA Task Force	FY 2011 FY2012	FY 2013	FY 2014 - Mid-Term
		clearance capability in tower	trials procedures and training development	automation enhancements
			▪	▪ Enroute Automation ERAM 4.2 Initial Test Release (ITR) ▪ Tower Data Link Services (TDLS) V12 Initial Test Release (ITR) ▪ Complete Data Comm Integration Testing on FANS 1/A+
System Wide Information Management (SWIM) 2A12 G05C.01	Surface #40, 35	▪ Provided Corridor Integrated Weather System publication ▪ Achieved final investment decision for SWIM Segment 2	▪ Complete Flight Data Publication – Initial Flight Data Services operational ▪ Complete documentation in support of Initial Investment Decision (IID) for Common Support Services – Weather (CSS-WX) Segment	▪ Publish data for: o pilot weather report o Traffic Flow Management o flight data o Runway Visual Range
		▪ Provided Integrated Terminal Weather system publication	▪ Provide terminal data distribution capability ▪ Provide flight data services with publish/subscribe	▪ Provide flight data publication host air traffic management data distribution system/flight data input/output and AIM Special Use Airspace client ▪ Provided reroute data exchange capability ▪ Provided flight data publication for initial flight data services
Collaborative Air Traffic Management Technologies (CATMT 2A16 G05A.05-01	Integrated ATM #47	▪ Continued CATMT Work Package 3 concept engineering and planning to support: (1) modernization of the decision support tool suite, and (2) collaborative information exchange ▪ Upgraded the Traffic Flow Management System to include an initial electronic negotiation capability for more efficient flight planning	▪ Design and develop Route Availability Planning Tool (RAPT) ▪ Design and develop the next increment of the Collaborative Airspace Constraint Resolution (CACR) capability.	CATMT WP3: o Complete test and deployment of Collaborative Information Exchange (CIX) ▪
		▪ Continued the analysis to develop the requirements to implement proven decision-support tools and data sharing capabilities	▪	▪ Achieve final investment decision on acquisition of CAMT Work Package 4 to support improvements to arrival and departure route planning, air

Program	RTCA Task Force	FY 2011 FY2012	FY 2013	FY 2014 - Mid-Term
				traffic flow demand predictions, and traffic management initiative decision support tools

In 2010, the RTCA launched the NextGen Advisory Committee (NAC) to solicit recommendations on issues critical to successful NextGen implementation at the request of FAA. Early in 2011, top-level aviation executives began analyzing equipage and related incentives, trajectory operations, airspace and procedures, metrics, and integrated capabilities. On September 29, 2011, the NAC approved the work group's recommendations and submitted the suggestions to the FAA. Cross-agency teams formulated responses and action plans, which FAA executive management approved.

We summarize the NAC recommendations and the FAA responses in the NextGen Implementation Plan, March 2012 (www.faa.gov/nextgen). The FAA is adjusting its planning as necessary to address these recommendations. Our responses and actions take into consideration funding allocations, scheduling constraints, investment decisions, standards, training and other critical work that will be required by FAA and industry as well as the interdependencies that exist between systems.

Best Equipped – Best Served Concept

NextGen is being implemented airport-by-airport, region-by-region, aircraft-by-aircraft, over a period of years. The FAA proposes moving from the concept of first come, first served to best equipped, best served. While early adopters will reap the greatest benefits, lesser equipped aircraft will receive safe and efficient service at the same high standards as today. The FAA is working with the aviation community on an operational transition plan that adequately accommodates all types of operators with varying levels of equipage, while maximizing overall system performance and enhancing safety.

Among factors that determine how much and how quickly NextGen will increase efficiency, safety, and environmental performance in the NAS, equipage decisions by aircraft operators will have a significant effect. For this reason, FAA is developing options for different ways to encourage rapid deployment of NextGen avionics throughout the industry.

NextGen Performance Measures

In 2012, by direction of the FAA's NextGen Management Board, FAA developed a comprehensive set of performance metrics to gauge its overall operational performance. The metrics are aligned with the International Civil Aviation Organization (ICAO) Key Performance Areas (KPA), and while not exhaustive, cover a wide range of important aspects of the Agency's operations. Although most of these metrics have been publically available for some time, a new public Web site (www.faa.gov/nextgen) has been created in order to provide increased transparency.

NextGen targets have thus far been defined for six of the Key Performance Areas, which align with other FAA performance metrics and FAA's strategic plan (*Destination 2025)*:

1. Cost Effectiveness. The FAA's harmonized cost-effectiveness metric is the Unit Cost per Operation, defined as the total air traffic organization costs divided by the number of IFR and VFR operations handled. Tower, en route Center, and TRACON operations are separately counted and then summed. Both Federal and contract towers are included. Since NextGen is not expected to decrease the cost of providing air traffic control services, the goal is to maintain the unit cost at the

FY 2011 level in real terms (i.e., after accounting for inflation). The target is thus to maintain the unit cost per operation at $87.85 through FY 2018.

2. Access. NextGen will help General Aviation (GA) maintain access to small airports during bad weather through the use of Precision-Based Navigation, and in particular through the use of the GPS Wide-Are Augmentation System (WAAS). NextGen will be measuring the number of runways with Published LP/LPV Procedures. Localizer Performance (LP) and Localizer Performance with Vertical Guidance (LPV) procedures allow WAAS-equipped aircraft to perform precision and improved non-precision approaches when ceilings and visibilities are low, improving access during inclement weather as well as safety. The target is 5,218 runways in FY 2018. FAA is currently evaluating a more applicable metric that could measure scheduled carriers' access.

3. Capacity. Airport capacity is essential to reduce delays, decrease fuel burn, and reduce the environmental impact of aviation. The NextGen metric is Average Daily Capacity for Reportable Hours, which is also one of the FAA's harmonized metrics. This metric is the sum of published arrival and departure rates for the Core 30 airports during specified busy hours. The NextGen target is to increase this metric by eight to ten percent by FY 2018.

4. Efficiency. Efficiency refers to the operational and economic cost-effectiveness of gate-to-gate operations, from a single flight perspective. Measures of efficiency typically compare some aspect of the flight trajectory or flight time to some optimal value. NextGen is expected to improve the descent profile of flights by removing level-offs, thereby saving fuel and reducing the environmental impact. The NextGen efficiency metric is therefore Distance in Level Flight from Top of Descent to Runway Threshold. This metric is defined as the total distance in level flight, once descent has begun, divided by the total number of arrivals, for all arrivals at Core 30 airports. To maximize efficiency this metric should approach zero. The target is to reduce this metric by 10 percent by FY 2018.

5. Environment. Two environment metrics (and associated targets) have so far been selected. Several NextGen research efforts, including the Continuous Lower Energy, Emissions, and Noise (CLEEN) initiative, will yield a cleaner and quieter aircraft fleet.
    a. The Number of People Exposed to Significant Noise Around U.S. Airports quantifies the population residing within the 65 decibels (dB) Day/Night Sound Level (DNL) contour for noise inventory airports (defined as those airports having at least 365 annual jet departures). DNL is the 24 hour average sound level obtained from the accumulation of all events, with the addition of 10 dB to sound levels from 10 PM to 7 AM local time. Noise exposure is computed using the MAGENTA model. FAA's target is 300,000 people in FY 2018.
    b. NAS-Wide Energy Efficiency is defined as fuel burn for all U.S. commercial operations normalized by distance flown. FAA's target is 3.56 kg/km in FY 2018, which represents a two percent annual decrease from 2010.

6. Global Interoperability. According to ICAO, the ATM system should be based on global standards and uniform principles to ensure the technical and operational interoperability of ATM systems and facilitate homogeneous and non-discriminatory global and regional traffic flows. The NextGen metric is Percentage of Commercial Aircraft from the Top 25 Aviation States Using Fully Interoperable NextGen Technologies and Procedures. The technologies and procedures referred to here are either PBN, DataComm, or ADS-B Out. The target for this metric is 40 percent in FY 2018.

FY 2014 Funding Profile

This budget supports continued progress on our NextGen effort. The entire FY 2014 NextGen portfolio totals $1.002 billion distributed among F&E programs ($928.1 million), Research, Engineering & Development programs ($61.4 million) and Operations activities ($12.6 million). This investment portfolio reflects an increase of $67.2 million, or approximately 7 percent, above the FY 2012 enacted level. This level of program funding enables the FAA to continue support of near-term NextGen commitments in a budget-constrained environment. Line item detail for each account is shown in the table below.

NextGen Investment Portfolio
($ in Thousands)

NextGen Programs ($ 000)	FY 2012 Actual	FY 2013 CR Annualized	FY 2014 Request
Facilities and Equipment	**862,800**	**870,031**	**928,136**
NextGen - Communications in Support of NextGen	143,000	142,630	115,450
NextGen - Demonstration and Infrastructure Development	15,000	22,300	24,675
NextGen - System Development	85,000	51,980	61,500
NextGen - Trajectory Based Operations	7,000	13,745	18,000
NextGen - Reduce Weather Impact	15,600	13,980	6,000
NextGen - High Desity Arrivals/Departures	12,000	9,498	7,000
NextGen - Collaborative ATM	24,000	20,631	41,000
NextGen - Flexible Terminals and Airports	33,300	25,411	15,000
NextGen - Safety, Security and Environment	0	0	0
NextGen - System Network Facilities	5,000	9,165	9,000
NextGen - Future Facilities	15,000	35,136	10,000
Performance Based Navigation - Optimization of Airspace and Procedures for Metroplex (OAPM)	29,200	41,200	32,200
En Route Automation Modernization (ERAM) - D Position Upgrade and System Enhancements	0	10,000	64,974
System - Wide Information Management (SWIM)	66,350	57,200	70,500
ADS - B NAS Wide Implementation	285,100	271,600	282,100
Collaborative Air Traffic Management Technology (CATMT)	41,500	34,420	29,391
Colorado ADS - B WAM Cost Share	3,800	1,400	3,400
Tactical Flow Time Based Flow Management (TBFM)	38,700	12,900	10,500
Next Generation Weather Processor* (NWP)	0	0	23,510
NAS Voice System (NVS)	9,000	10,250	16,000
Terminal Flight Data Manger (TFDM)	0	30,600	23,500
Aviation Safety Information Analysis and Sharing (ASIAS)	0	15,000	15,000
Aeronautical Information Management Program (AIM Segment 2)	8,000	7,871	9,050
Activity 5 F&E PCBT - NextGen Staffing (ANG 85 EOY/85 FTE)	12,750	12,798	12,961
Activity 5 F&E PCBT - NextGen Staffing (ATO 132 EOY/132 FTE)	13,500	17,016	20,741
Activity 5 F&E PCBT - NextGen Staffing (AVS 40 EOY/40 FTE)	0	3,300	6,684
Research Engineering and Development (RE&D)	**59,745**	**61,960**	**61,393**
NextGen - Alternative Fuels for General Aviation	2,071	1,833	5,571
NextGen - Advanced Systems and Software Validation	0	0	1,021
Joint Planning and Development Office	5,000	11,218	12,057
NextGen - Wake Turbulence	10,674	9,537	9,267
NextGen - Air Ground Integration	7,000	9,358	10,329
NextGen - Self Separation**	3,500	7,181	0
NextGen - Weather in the Cockpit	8,000	4,506	4,169
NextGen - Environmental Research, Aircraft Technologies, Fuels and Metrics	23,500	18,327	18,979
Operations	**12,400**	**12,444**	**12,595**
Integrate Environmental Performance into NextGen (APL 5 EOY/5 FTE)	725	728	737
NextGen Environmental/Noise Studies (APL 5 EOY/5 FTE)	1,675	1,678	1,692
NextGen Staffing (ANG 24 EOY/24 FTE)	3,200	3,212	3,253
NextGen Staffing (ATO 51 EOY/51 FTE)	6,800	6,826	6,913
Total NextGen Programs	**934,945**	**944,435**	**1,002,124**
Note:			
* New BLI in FY 2014 migration of pre-implementation to implementation			
** BLI merged into NextGen Air/Ground Integration in FY 2014			

Note:
* This new budget line item reflects the migration of pre-implementation activities from the NextGen – Reduced Weather Impact solution set into an implementation program beginning in FY 2014.
** The NextGen, R,E&D Self-Separation Human Factors budget line item is being combined into the NextGen – Air/Ground Integration Human Factors budget line item beginning in FY 2014.

NextGen Staffing

The FAA anticipates a number of staffing and workforce challenges as it moves forward with NextGen implementation. In preparation, the FAA commissioned the National Academy of Public Administration (NAPA) to conduct a workforce needs analysis to: (1) identify the skill sets required by the non-operational (acquisition) workforce, including, but not limited to, the technical and contract management skills needed to successfully design, develop, test/evaluate, integrate, and implement NextGen; and (2) define strategies to obtain the expertise needed to design, develop, test/evaluate, integrate, and implement the complex activities inherent in the transition to NextGen. The FAA also commissioned the Stevens Institute of Technology to develop recommendations for systems engineering, systems integration, and software engineering competency requirements for NextGen.

FAA considered NAPA's competency recommendations, Department of Defense, and Federal Acquisition Institute competency models, Stevens Institute of Technology recommendations, and industry competency models for like professions. After doing so, FAA developed detailed competency models for its acquisition professions/disciplines, such as Leadership, Program/Project Management, Research and Engineering/Systems Engineering, Test and Evaluation, Business/Financial Management, Contracting, Contracting Officer Technical Representative, Acquisition Law, and Integrated Logistics Support Specialists. FAA's competency models are used to inform recruitment, selection, training, and development/certification, and performance management.

The integration and implementation of NextGen will require the FAA to hire new employees over the next several years, primarily due to attrition. These new, highly skilled employees will support NextGen activity across all lines-of-business, including the NextGen organization, the Air Traffic Organization (particularly the Program Management Office), Aviation Safety, and Policy, International Affairs, and Environment. Information on staffing levels provided through the budgetary process is provided below.

NextGen Investment Portfolio – Authorized Staffing

	FY 2012 Enacted			FY 2013 Request			FY 2014 Request			FY 2014 Change		
	FTP Positions	FTP EOY	Total FTE	FTP Positions	FTP EOY	Total FTE	FTP Positions	FTP EOY	Total FTE	FTP Positions	FTP EOY	Total FTE
Facilities and Equipment (F&E)												
ANG:												
F&E Activity 5, Personnel & Related Expenses - NextGen Staffing (Various Programs/Projects)	85	85	85.0	85	85	85.0	85	85	85.0	-	-	-
ATO:												
F&E Activity 5, Personnel & Related Expenses - NextGen Staffing (Various Programs/Projects)	90	90	90.0	132	132	111.0	132	132	132.0	-	-	21.0
AVS:												
F&E Activity 5, Personnel & Related Expenses - NextGen Staffing (Performance Based Navigation)	-	-	-	40	40	20.0	40	40	40.0	-	-	20.0
Subtotal, NextGen F&E	**175**	**175**	**175.0**	**257**	**257**	**216.0**	**257**	**257**	**257.0**	**-**	**-**	**41.0**
Research, Engineering & Development (R,E&D)												
JPDO:												
NextGen – JPDO	11	11	11.0	11	11	11.0	11	11	11.0	-	-	-
ANG:												
NextGen – Wake Turbulence	1	1	1.0	1	1	1.0	1	1	1.0	-	-	-
NextGen – Air Ground Integration	1	1	1.0	1	1	1.0	1	1	1.0	-	-	-
NextGen – Self Separation	1	1	1.0	1	1	1.0	1	1	1.0	-	-	-
NextGen – Weather in the Cockpit	4	4	4.0	4	4	4.0	4	4	4.0	-	-	-
APL:												
NextGen – Environmental Research, AircraftTechnologies, Fuels and Metrics	3	3	3.0	3	3	3.0	3	3	3.0	-	-	-
Subtotal, NextGen R,E&D	**21**	**21**	**21.0**	**21**	**21**	**21.0**	**21**	**21**	**21.0**	**-**	**-**	**-**
Operations												
ANG:												
NextGen Staffing	24	24	24.0	24	24	24.0	24	24	24.0	-	-	-
ATO:												
NextGen Staffing	51	51	51.0	51	51	51.0	51	51	51.0	-	-	-
APL:												
Integrate Environmental Performance into NextGen	5	5	5.0	5	5	5.0	5	5	5.0	-	-	-
NextGen Environmental/Noise Studies	5	5	5.0	5	5	5.0	5	5	5.0	-	-	-
Subtotal, NextGen Operations	**85**	**85**	**85.0**	**85**	**85**	**85.0**	**85**	**85**	**85.0**	**-**	**-**	**-**
Total NextGen Staffing	**281**	**281**	**281.0**	**363**	**363**	**322.0**	**363**	**363**	**363.0**	**-**	**-**	**41.0**
JPDO	11	11	11	11	11	11	11	11	11	-	-	-
ANG	116	116	116	116	116	116	116	116	116	-	-	-
ATO	141	141	141	183	183	162	183	183	183	-	-	21
AVS	-	-	-	40	40	20	40	40	40	-	-	20
APL	13	13	13	13	13	13	13	13	13	-	-	-

The FY 2014 budget requests funding to support a total of 363 positions fully dedicated to NextGen. The increase of 41 FTEs is required to annualize financing within the overall F&E, Activity 5, account, for: (1) the 42 new hires requested in FY 2013 to support Performance Based Navigation activities within the Air Traffic Organization (Optimization of Airspace and Procedures for Metroplexes); and (2) the 40 new hires requested in FY 2013 to support Aviation Safety NextGen activities requested in FY 2013. These NextGen positions will replace existing legacy positions in F&E, Activity 5, but will not increase overall total positions in F&E, Activity 5.

We are also working to identify, quantify, and track in the agency's administrative systems existing staff which have been reassigned to the NextGen effort in order to determine total NextGen staffing strength. Once approved, we will expand the reporting of our NextGen staffing strength.

NextGen Challenges

NextGen's multiple capabilities are interdependent, and we will incorporate them into our airspace over varying time frames. This calls for a deliberate and incremental approach, not only in technology and infrastructure development but also the policies, standards, and operational practices that ensure our careful approach. The logical progression of our deployments – near-term, mid-term, long-term –each laying a solid foundation for the next, belies its overall complexity.

Enhancing safety, security, and environmental performance must remain the center of our planning as we improve the current NAS and accommodate new elements with the proliferation of very light jets, unmanned aircraft systems, and commercial space flight. Furthermore, the needs and capabilities of the diverse segments of the aviation community vary across and within sectors and by locality. The FAA is aware that these are complex and sometimes competing factors.

Variable maturity times for interdependent projects create a communications challenge, arising from perceptions about complexity and uncertainty. The FAA must continually ensure that our intent, commitment and timing remain clear to all stakeholders as we move forward together with NextGen.

Proper recognition and management of uncertainty must be a central feature of our overall approach to NextGen development and deployment. Failure to do so would place NextGen capabilities, benefits and costs in jeopardy. For example, premature specification of detailed requirements for distinct NextGen systems could artificially constrain both industry and FAA by locking in specific technical solutions when more cost-effective alternatives could emerge through development activities. Rarely is there only one option, because capabilities often can be realized through combinations of operational practices, policies, systems, and technologies. The FAA must fully explore these possibilities with our stakeholders, global partners, and in our internal business practices to ensure the most effective solutions.

As we make our respective investment decisions, FAA and the private sector must consider the full context of capabilities and benefits, rather than focusing only on specific systems or deployments in isolation. In FAA's case, that requires changes in our acquisition management system so we can deploy NextGen in an integrated way. Likewise, private-sector stakeholders must use their own internal processes to commit to investing in NextGen capabilities. A thorough understanding of expected benefits and costs will help solidify the business cases both FAA and individual stakeholders need to justify investment decisions. The FAA and stakeholders must work closely together and remain flexible to adjust to factors, whether environmental, economic or global conditions, that drive those decisions.

As stakeholders equip their aircraft in varying ways to achieve specific NextGen benefits, air traffic controllers will face the challenge of managing a diverse fleet with very different capabilities. While operators who upgrade avionics for NextGen will receive the earliest benefits, we will continue to accommodate lesser-equipped operators. We are examining best-equipped/best-served concepts, whereby aircraft equipped for NextGen capabilities would be served in ways that deliver the NextGen benefits. Ensuring international harmonization of aircraft equipage standards, so that aircraft equipped for NextGen will be able to operate using equivalent capabilities in other regions of the world, is another complex endeavor. Both of these requirements make partnership an integral component of FAA's strategy for NextGen.

Stakeholder engagement is a way to manage priorities and risks collaboratively by reaching a common understanding of what to implement, and where, when and how benefits will result. By leveraging opportunities for demonstrations and other critical work with willing partners, we gain extremely valuable insight into NextGen benefits, which can reduce uncertainty. Benefits can be clearly measured in a real-world, operational environment. Solutions to integration issues can be accelerated, and specific programmatic requirements and operational and certification standards can crystallize outcomes that can help solidify the case for follow-on investments.

Operational demonstrations and prototypes also present solutions to uncertainties that arise due to local factors, such as unique airport or airspace considerations. These and other local, technical or political factors may require implementation teams tasked with working out a specific local implementation plan guided by an overarching national framework. A properly managed and effective mix of FAA and stakeholder participants is needed to ensure bilateral implementation of respective NextGen capabilities. These types of teams may also be instrumental in developing local applications of emerging best-equipped/best-served principles to stimulate higher levels of aircraft equipage.

NextGen is a wide ranging transformation of the entire national air transportation system. It has aligned research and prototyping activities, developed the components of a mid-term architecture, integrated implementation plans, moved forward with execution, and enhanced industry engagement. NextGen will meet future demands while improving safety and protecting the environment.

Next Generation Air Transportation System (NextGen)
Budget Narrative Reference Guide

Specific funding and program requirements can be found in the below location

		Amount	Page
	Facilities and Equipment (F&E)		**Section 3B**
1A05	Data Communications in Support of NextGen (DataComm)	$115,450,000	35
1A06	Next Generation Transportation System – Demonstration and Infrastructure Development	$24,674,500	39
1A07	Next Generation Transportation System – System Development	$61,500,000	42
1A08	Next Generation Transportation System – Trajectory Based Operations	$18,000,000	51
1A09	Next Generation Transportation System – Reduced Weather Impact	$6,000,000	56
1A10	Next Generation Transportation System – High Density Arrivals / Departures	$7,000,000	60
1A11	Next Generation Transportation System – Collaborative Air Traffic Management	$41,000,000	64
1A12	Next Generation Transportation System – Flexible Terminals and Airports	$15,000,000	72
1A13	Next Generation Transportation System – System Networked Facilities	$9,000,000	79
1A14	Next Generation Transportation System – Future Facilities	$10,000,000	83
1A15	Performance Based Navigation (PBN) – Metroplex Area Navigation (RNAV) / Required Navigation Performance (RNP)	$32,200,000	86
2A02	En Route Automation Modernization (ERAM) – D-Position Upgrade and System Enhancements	$64,974,000	96
2A12	System-Wide Information Management (SWIM)	$70,500,000	120
2A13	ADS-B NAS Wide Implementation (ADS-B)	$282,100,400	125
2A16	Collaborative Air Traffic Management Technologies (CATMT)	$29,390,800	134
2A17	Colorado ADS-B WAM Cost Share	$3,400,000	136
2A18	Tactical Flow Time Based Flow Management (TBFM)	$10,500,000	138
2A20	NextGen Weather Processor (NWP)	$23,510,000	143
2B13	National Airspace System Voice System (NVS)	$16,000,000	177
2B18	Tower Flight Data Manager (TFDM)	$23,500,000	188
3A11	Aviation Safety Information Analysis and Sharing (ASIAS)	$15,000,000	289
4A09	Aeronautical Information Management Program (AIM), Segment 2	$9,050,000	328
5A01	Personnel and Related Expenses – NextGen (ANG 85 EOY/85 FTE)	$12,961,000	
5A01	Personnel and Related Expenses – NextGen (ATO 132 EOY/132 FTE)	$20,741,000	
5A01	Personnel and Related Expenses – NextGen (AVS 40 EOY/40 FTE)	$6,684,000	
	Total, Facilities and Equipment	**$928,135,700**	
	Research, Engineering, and Development		**Section 3C**
A11M	NextGen – Alternative Fuels for General Aviation	$5,571,000	58
A11N	NextGen - Advanced Systems and Software Validation	$1,021,000	63
A12A	NextGen – Joint Planning and Development Office (JPDO)	$12,057,000	65
A12B	NextGen – Wake Turbulence	$9,267,000	70
A12C	NextGen – Air/Ground Integration Human Factors *	$10,329,000	74
A12D	NextGen – Weather Technology in the Cockpit	$4,169,000	78
A13B	NextGen – Environmental Research , Aircraft Technologies, Fuels and Metrics	$18,979,000	87
	Total, Research, Engineering, and Development	**$61,393,000**	
	Operations	**$12,595,000**	**Section 3A**
	Integrate Environmental Performance into NextGen (APL 5 EOY/5 FTE)	$737,000	
	NextGen Environmental/Noise Studies (APL 5 EOY/5 FTE)	$1,692,000	
	NextGen – Staffing (ANG 24 EOY/24 FTE)	$3,253,000	ANG
	NextGen – Staffing (ATO 51 EOY/51 FTE)	$6,913,000	ATO
	Total, NextGen Programs	**$1,002,123,700**	

Note:
* NextGen, R,E&D Self-Separation Human Factors budget line item is being combined into the NextGen – Air/Ground Integration Human Factors budget line item beginning in FY 2014.

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JOINT PLANNING AND DEVELOPMENT OFFICE (JPDO)

The establishing legislation for the JPDO calls for an integrated plan for NextGen that allows a wide range of aircraft operations including Unmanned Aircraft Systems (UAS). The JPDO initiated interagency efforts for UAS operations in 2011 by creating roadmaps for UAS avionics, research and development. During 2012 and 2013, the JPDO led the definition of a comprehensive strategic plan for UAS integration and evolution in the National Airspace System (NAS) including agency requirements, coordinated activities and milestones. The JPDO, with partner agencies, will begin executing the plan in FY 2014.

While many procedures and principles used for manned aircraft apply to UAS, there are significant differences in technological maturity, perception and acceptance, and operational experience that remain. NextGen must deal with these differences now because the demand for UAS operations, particularly by military and public agencies, has increased dramatically over the past few years, and is expected to continue to increase due to the unique capabilities, mission effectiveness, reduced risk and lower operating costs of UAS.

The $12 million total request for FY 2014 allows JPDO to continue to coordinate goals, priorities and research activities within the Federal Government for NextGen. JPDO will facilitate transfer of technology and review research activities such as those related to safety, weather, environment, and secure data exchange. In carrying out its plans, JPDO will ensure participation by the public and consult with stakeholders from the private sector.

JPDO's collaborative methodology begins by engaging stakeholders to articulate a common outcome. To support this outcome, the JPDO seeks agreement on roles and responsibilities to execute the joint strategy, including how resources will be leveraged. In many cases, compatible standards, policies, procedures and data systems must be established to operate across boundaries. Finally, the JPDO, with guidance by the SPC, develops means to monitor and report on the multi-agency effort.

For example, following a series of interagency summits, the JPDO brought together technical experts from five agencies to prepare a concept that describes how all agencies can have a common picture to see all aircraft at all times using a series of sensors and data. This is often called "Integrated Surveillance." With SPC endorsement, technical experts with executive oversight continued to refine the concept, creating a multi-level architecture, and to outline development responsibilities for each agency that will be finalized in a formal agreement in 2012. The JPDO, with agency participation, also used a combination of operational and prototype systems to show how data for a lost cargo jet scenario could be automatically exchanged between FAA and DOD. The JPDO models, documentation and software were transferred to the FAA and National Weather Service for implementation. This is just one of many examples where JPDO-led engagements are producing results.

The JPDO Today

Today, the JPDO continues to lead NextGen by overseeing research and development. The JPDO ensures applicable research by coordinating aviation and aeronautics research programs making them more effective and directed. The JPDO is future focused and provides coordination among all the Federal partners affected by NextGen decisions. The JPDO's FY 2013 work plan focused on supporting a broad Federal view of NextGen and several priority areas such as information sharing and dissemination of weather and flight data, ensuring harmonization exists among the global aviation systems and continuing to promote and develop integrated surveillance capabilities. The JPDO's efforts have resulted in a National approach to complex NextGen related issues and reduced duplicative efforts which ultimately leads to cost savings.

During FY 2013, the JPDO led the development of a comprehensive plan to integrate UAS into the NAS. The JPDO organized the plan around a set of national goals and brought together senior executives and technical experts from all five NextGen partner agencies to create the plan. The JPDO's independent role creates trust, enabling the JPDO to work with researchers, operators and regulators to identify critical issues for UAS operations. In the prior year, FY 2012, the JPDO and our partners identified relevant ongoing and planned NextGen UAS research activities to highlight specific technical challenges. The JPDO's Avionics Roadmap, defined with industry stakeholders in FY 2011, and our investigations of trajectory-based operations (conducted during FY 2010) which are reflected within the national integrated plan, supported the UAS work. By creating a comprehensive strategic plan for UAS integration, in lock step with the national NextGen plan, there are opportunities to cost-share demonstrations, eliminate potentially duplicate investments and accelerate the FAA's utilization of data and development of performance requirements.

Going forward, use of airspace will be more integrated, considering civil aviation, defense and homeland security. This need for integration will make airspace more complex while all missions must operate together. Further, the pace of technology is unfolding rapidly requiring all departments to have full situational awareness of new developments. The JPDO provides the common view.

FY 2014 Funding Profile

This budget supports execution of the JPDO's collaborative processes to ensure the efficient coordination between all Federal partners whose decisions impact NextGen, including UAS integration into the NAS. A total funding request of $12 million enables the JPDO to conduct policy analyses, cost, benefit and risk assessments, and joint studies with stakeholders that will help prioritize multi-agency concerns and drive consensus in the development of investment choices. The JPDO also performs program management and integration, ensuring studies are executed in a cohesive framework with the resulting content updated in the strategic plan. The funding enables the JPDO to identify research priorities to make our system safer, smarter and ready for innovative technologies by convening the SPC; guiding the national comprehensive plan for UAS integration; establishing interagency data exchange policies; and examining Federal requirements for surveillance data and sensors. A detailed description of the requested 2014 JPDO funding profile is available in Section 3C - Research, Engineering and Development (RE&D) Appropriation account (Budget Line Item A12a., page 65).

During FY 2012, the JPDO executed its Congressionally-mandated mission with full support from the Secretary of Transportation and the FAA Administrator. The JPDO's FY 2013 work plan builds upon a reduced FY 2012 program in which severe budget reductions deferred progress on policies on access and authoritative data, identification of NextGen research gaps and cost/benefit analyses. By carefully managing multi-year research funds to retain all Federal employees and focusing mostly on setting National UAS integration goals, the reduced FY 2012 program represented a one-time and non-repeatable budget strategy that nevertheless kept a solid foundation for the years to come. We believe the level of program funding for FY 2014 enables the JPDO to continue to resolve NextGen interagency issues while being mindful of the constrained budget environment.

Organization and Staffing

NextGen requires the active engagement of many different agencies (the Departments of Transportation, Commerce, Defense and Homeland Security; NASA; Office of the Director for National Intelligence; and the White House Office of Science and Technology Policy). Additionally, NextGen requires the work of all of the FAA's internal offices to be successful. The JPDO reports directly to the Deputy Administrator because of these management and oversight responsibilities, the level of interaction and collaboration required with other Federal agencies and stakeholders, and the need to smoothly and effectively move forward with the national UAS initiative.

In this organizational structure, the JPDO can quickly raise and resolve concerns of all the partners who are affected by FAA's NextGen decisions. The JPDO Director, re-designated as the Associate Administrator for JPDO by the FAA Modernization and Reform Act of 2012, also continues to serve as a Senior Advisor to the Secretary of Transportation on NextGen. This relationship enhances the visibility of NextGen interagency issues within FAA and among partner agencies, expands opportunities for collaboration among departments and allows the FAA to better leverage work being conducted outside the FAA to help us meet our NextGen goals.

The SPC relies on the JPDO to maintain a strategic "future" focus and national view for NextGen whereas the FAA's internal focus needs to be on NextGen implementation and its normal operational issues. The JPDO's broad perspective and insights have been helpful for Departmental decision-makers in reviewing

FAA's NextGen-related resource requests and in considering the impact of NextGen decisions on other Administration entities. Elevation of the organization will enable better strategic direction across all partners.

The FY 2014 budget requests funding to support a total of 11 FAA positions at the JPDO, all fully dedicated to NextGen. These people are skilled in disciplines such as engineering, computer science, program and business management, and policy. Mostly due to attrition and partly due to skill mix, the JPDO will be required to hire new employees over the next several years. No new positions are being requested at this time.

The 11 FAA employees represent about 60 percent of the Federal workforce located at the JPDO. Employees from the Departments of Commerce, Defense and Homeland Security and from NASA bring additional skills in research, information technologies, systems engineering, aviation operations and weather information. The JPDO's Federal workforce is blended, meaning that all employees focus on interagency goals while providing the insights, cultural perspectives and linkages to their own agency. The end result of this blended workforce model is that all points of view are considered from the inception of concept definition in order to mitigate risk and streamline knowledge transfer.

JPDO Challenges

The JPDO faces many of the same challenges as the NextGen initiative itself: often competing goals, a dynamically-changing environment, multiple and interdependent capabilities, and alignment of capabilities on the ground and in the aircraft. NextGen is not a single piece of equipment or a program or a system that will instantaneously transform aviation. NextGen must build on legacy air traffic control systems and avionics, taking advantage of technologies that have already been transforming our personal lives and the way we do business, such as GPS, analog-to-digital and network-to-network data sharing. The JPDO seeks to forge collaborations that consider all stakeholder views to minimize these broad NextGen challenges.

NextGen issues cut across many agencies and must be delivered in a way that is consistent with multiple missions and limited resources. There are also long lead times from research to implementation. As budgets tighten, it is sometimes easier for agencies to revert to stove-piped or tactical solutions rather than considering cost-effective National approaches. As the first line of defense, the JPDO must diligently promote and maintain the forward-thinking stakeholder focus.

Now that the JPDO has transitioned from its earlier visionary planner role, the JPDO must carefully balance our skill mix and investments between major projects, such as Federal requirements for surveillance data and sensors, and keeping an eye on new technologies. Research priorities for trajectory-based operations, including human systems integration, air/ground automation, complex system verification and cyber-security will drive US leadership in aviation beyond the mid-term implementation.

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Federal Aviation Administration
FY 2014 President's Budget Submission

Executive Summary – Immediate Transportation Initiative: Next Generation Air Transportation System (NextGen)

What Is The Request And What Will We Get For The Funds?

The President's Immediate Transportation Investment initiative puts America back to work while rebuilding and modernizing America's roads, rails, and airports. For Fiscal Year 2014, $1 billion of the Immediate Transportation Investment will support NextGen air traffic modernization efforts. This funding will be used to accelerate delivery of NextGen services and capabilities which will ensure aircraft operators accrue the economic, environmental, and efficiency gains of NextGen as soon as possible.

While many aircraft flying today are equipped to fly in fast lanes, the current airspace design and infrastructure essentially keeps all the traffic in the local lanes. In order to provide better "highways in the sky," FAA needs to design the interconnecting system, develop efficient on and off ramps, establish the supporting infrastructure, and publish the maps that will allow aircraft to take advantage of 21st century technologies already available in their cockpits.

What Is This Program?

This project consists of multiple supporting projects, some of which are already underway. Accelerated delivery of this infrastructure is supported with investments in the following areas:

- Future air traffic control facilities
- Improved air traffic surveillance capabilities to ensure safety and continuity of operations
- Improved management of operations on the surface integrated with traffic flow
- Enhanced traffic flow management and data handling capabilities
- Facilities Infrastructure to support the availability of new systems technologies for NextGen

Why Is This Particular Program Necessary?

Aviation is a major driver of our nation's economy, impacting all sectors of business and directly contributing $1.3 trillion and 11 million jobs to the U.S. economy. A vibrant aviation system, supported by a high-performance aviation infrastructure, increases capacity at our large metropolitan airports, improves access to small and remote communities, meets passenger demand for travel, supports a thriving tourist industry, and enables strong American business development.

How Do You Know The Program Works?

The FAA continues to expand its work on demonstrations, trials and initial deployment of NextGen systems and procedures. National Airspace System (NAS) operators and users – particularly participants in the demonstrations and trials – are benefiting from them.

Our latest estimates show that by 2020 NextGen will reduce total flight delays about 41 percent compared with the level that delays would reach absent NextGen, while providing $38 billion in cumulative benefits to the traveling public, aircraft operators, and the FAA. Aircraft owners will save about 1.6 billion gallons of fuel during this period, reducing carbon dioxide emissions by 16 million tons.

Why Do We Want/Need To Fund The Program At The Requested Level?

Improvements to the air transportation infrastructure stimulate the economy in a myriad of ways not directly related to aviation. Airlines alone have forfeited 300,000 jobs over the last 10 years. Improvements to the air transportation infrastructure will lower operating costs and provide a better passenger experience, which support airline growth with the accompanying increase in airline jobs. Just a 10 percent growth would represent 3,000 jobs.

FAA estimates the projects included in this $1 billion NextGen portfolio will generate an additional 7,991 jobs in FY 2014 and FY 2015. This does not include what would be a significant downstream jobs impact with manufacturing firms producing radios, management and administrative staff necessary to oversee construction crews and software engineers, as well as additional jobs elsewhere in the economy due to increased economic activity.

Detailed Justification for – Immediate Transportation Initiative: Next Generation Air Transportation System (NextGen)

What Is The Request And What Will We Get For The Funds?

For Fiscal Year 2014, FAA assumes $1 billion to support NextGen air traffic modernization efforts, as part of the Immediate Transportation Investment initiative to put Americans back to work while rebuilding and modernizing America's roads, rails and airports.

While many aircraft flying today are equipped to fly in fast lanes, the current airspace design and infrastructure essentially keeps all the traffic in the local lanes. In order to provide better "highways in the sky," FAA needs to design the interconnecting system, develop efficient on and off ramps, establish the supporting infrastructure, and publish the maps that will allow aircraft to take advantage of 21st century technologies already available in their cockpits.

What Is This Program?

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- Improved management of operations on the surface integrated with traffic flow
- Enhanced traffic flow management and data handling capabilities
- Facilities Infrastructure to support the availability of new systems technologies for NextGen

The specific projects include:

<u>NextGen Future Facilities Program - $235 Million</u>

FAA's current inventory of Air Traffic Control (ATC) Facilities is no longer capable of meeting traffic demand in the future, and is no longer affordable in the long term. FAA's large enroute centers are over 40 years old and have reached the end of their useable life. They were designed and located to accommodate technology available in the 1960's and are not as well suited for the new technologies and procedures coming on line in the National Airspace System (NAS).

The NextGen Future Facilities concept will create a new FAA ATC Facility for the future which will fully leverage new NextGen capabilities to improve traffic flow, ensure cost savings to the user community, reduce the environmental impact of aviation, and reduce operating costs. This facility will replace buildings currently being used and close legacy facilities.

The FY 2014 Facilities and Equipment President's budget submission requests $10 million to support continued planning for the program, which includes airspace redesign within the current ARTCC at New York. The funding will be used to focus on completing the business case for the Final Investment Decision (FID), and setting up the planning, engineering, and procurement for the facility equipment and systems. In addition, site selection, site preparation, environmental assessments, and utility work to prepare for construction of the Project could be initiated in FY 2014.

This additional $235 million will support construction of the new NextGen facility. Construction award of the Integrated Control Facility could be made by September 2016.

With construction award assumed to occur in late 2016, construction, equipment procurement and installation during 2017-2020, Initial Operating Capability would be in 2021. Employees and airspace transition will be achieved in 2021-2023.

Expansion of ADS-B Services - $350 Million

FAA has identified key areas where supplementing Automatic Dependent Surveillance – Broadcast (ADS-B) coverage with additional ground infrastructure can provide economic and safety benefits to air transport and general aviation users through increased airport access, route development, and expanded surface coverage. Potential areas for expansion include:

ADS-B Radio Station Expansion ($258 million):

- Adding up to 200 new radio stations can provide complete coverage down to 1,500 feet above terrain; augment non-radar airport surveillance at roughly 40 – 50 locations in states and territories such as Arizona, Utah, Nevada, Washington, California, Louisiana, Arkansas, Kansas, Mississippi, Idaho, Montana, New Hampshire, Wisconsin, Minnesota, Oregon, Iowa, Idaho, Massachusetts, South Dakota, and Guam; support international deployment in areas such as Mexico, Caribbean, and Bermuda; and support Routes along the East Coast, North Atlantic Tracks (NATS), Southern Pacific (SOPAC), the West Atlantic Route System (WATRS), and Pacific Route System (PACOT).

- Five remaining Service Volumes in Alaska.

Airport Surface Surveillance Capability (ASSC) ($92 million):

Airport Surface Surveillance Capability (ASSC) is a runway safety system that provides coverage on runways and taxiways by collecting data from: multilateration sensors, ADS-B sensors, the terminal automation system, and terminal secondary surveillance radar (optional). When ASSC fuses data from these sources, it determines the position and identification of aircraft and transponder-equipped vehicles on the airport movement area in addition to aircraft located inside the airport approach corridors out to five miles. ASSC, coupled with ADS-B, will provide enhanced situational awareness for both pilots and air traffic controllers. Potential areas for expansion include:

- Surface coverage at non-ASDE locations at up to 19 airports selected based on the potential benefits using ASSC

FAA estimates that this infrastructure can be established within three to four years.

Improving Access to Non-Towered Airports - $3 Million

As an adjunct to the expansion of ADS-B service, the FAA will develop the necessary changes to the controller equipment to support the benefits of improving access to smaller airports. Improving access in nearly all weather conditions by adding a surveillance capability to these small airports will not only eliminate delays due to one-in and one-out at those airports but also provide economic opportunity for these communities. This effort expands the existing Colorado demonstration for improved low altitude surveillance by adding surveillance down to airport surface and adds capability to the controller workstation to support these non-towered airports.

Integration of Flight Deck with Traffic Flow - $92 Million

The integration of Flight Deck with Traffic Flow will enhance the potential of an uninterrupted fuel efficient optimized profile descents (For RNAV/RNP Procedures and Tailored Arrivals) and provide the following benefits:

- Benefits to the airlines in fuel savings
- First Arrival 4D Trajectory Operation
- Benefits to the environment in reduction of emissions and noise
- Benefits to air traffic controllers and pilots in reducing workload

The proposal is to implement a comprehensive approach to providing efficient, 4D trajectory-based operations at medium to high density airports for NextGen. The concept was developed as a collaborative effort between FAA, NASA, Sensis, Inc., The Boeing Company, United, Continental, and SkyWest Airlines, and other industry participants.

The concept is focused on commercial air carrier operations in the arrival-transition airspace. This proposal uses a combination of currently present airborne automation and a new ground automation tool under development by NASA, to compute and execute advisories for conflict-free optimized profile descents from cruise altitude to the Center/TRACON metering fix. The arrival is maximized in that fuel is saved, emissions are reduced and the aircraft spends less time in the air.

Secondary benefits include potentially enhancing throughput at airports. The concept including the ground automation tool has proven to help controllers perform time-based metering which are practiced today at most busy airports. The concept and tool can be used for other applications (i.e. high altitude airspace) where metering is being performed. The tool provides a single trajectory clearance for the controllers to issue, significantly reducing the workload for both controllers and pilots. $92 million is requested to develop source code, computer human interface, and extend capabilities to Datalink.

En Route Data Distribution Acceleration - $120 Million

The funding will complete the operational and engineering analysis to develop a Flight Information Service (FIS) that extends the en route flight data processing into terminal and towers. The FIS would be the core services and flight data processing to converge functions currently in the Flight Data Input Output system, Electronic Flight Strip Transfer System, and would provide a full flight data capability for TRACON and Airport Traffic Control Tower (ATCT) personnel. The benefit of convergence is to reduce the life cycle cost of maintaining the existing NAS capabilities and minimize the cost to implement the planned NextGen capabilities for TRACON, ATCT, and surface operations. This effort will require $120 million to complete operational requirements, system requirements, computer human interface design, design trade studies, and risk reduction studies to reach a final investment decision.

ATC Facilities Infrastructure Sustainment - $200 Million

FAA is responsible for the life cycle maintenance and sustainment of over 26,000 air traffic control facilities nationwide. There is currently a backlog in infrastructure past service life of $4.7 billion, without a significant increase in funding. This is projected to increase to almost $7.5 billion by 2025. This backlog represents a risk to our employees and could impact our ability to provide air traffic control services and support the availability of new systems technology. For example, the FAA currently has over 80 air traffic control towers that do not meet OSHA standards. We also have over 18,000 miles of buried cable nationwide, 96 percent of which is past its lifecycle. Failures of these cables routinely disrupt ATC equipment availabilities.

We project that the conditions within our facilities will continue to deteriorate. The annual additional funding over our current base to maintain the current condition in our facilities is approximately $250 million.

FAA requests $200 million from the Immediate Transportation Investment account to address systemic facility issues across the National Airspace System. We propose that this funding be utilized to address employee safety and mission critical infrastructure needs across the NAS, and to introduce a new cabling replacement program that would complement projects in the Airport Improvement Program (AIP) ITI investment.

Summary:

The following table summarizes the costs associated with the FAA's proposal for Air Transportation Infrastructure project:

NextGen Immediate Transportation Investments	($ in millions)
NextGen Future Facility Construction Award	$235
ADS-B Radio Station Expansion	258
ADS-B ASSC Sites	92
Improving Access to Non-Towered Airports	3
Integration of Flight Deck with Traffic Flow	92
Enroute Data Distribution Acceleration	120
ATC Facilities Infrastructure Sustainment	200
Total	$1,000

Why Is This Particular Program Necessary?

Aviation is a major driver of our nation's economy, impacting all sectors of business and directly contributing $1.3 trillion and 11 million jobs to the U.S. economy. A vibrant aviation system, supported by a high-performance aviation infrastructure, increases capacity at our large metropolitan airports, improves access to small and remote communities, meets passenger demand for travel, supports a thriving tourist industry, and enables strong American business development.

By investing in the infrastructure of aviation – the air routes and procedures that aircraft follow - we open the skies to new opportunities. Rather than flying indirect routes based on the historical locations of ground-based navigational beacons, satellite-based navigation will allow aircraft to fly shorter, more direct routes. We can create more efficient, environmentally friendly, safe routes in the air – from departures to arrivals at a destination airport. Precision, satellite provided location information can be the standard, allowing aircraft increased safety while saving fuel and reducing delays with lower emissions and noise. Smoothing out the aircraft's descent profile can also increase efficiency and reduce environmental impacts. Current operations often require aircraft to burn large amounts of fuel in level flight during its descent to an airport. "Optimized Profile Descents" allow an aircraft to fly most of its descent with the engines at their lowest power setting, saving significant amounts of fuel.

The benefits accrue each flight these techniques are used. Airlines report that saving only one mile of flight distance saves $25. New more efficient routes can save many miles per flight. Smoothing the descent profile is shown to save hundreds of gallons of fuel per flight. The compounding effects of flight after flight, new location after location will lead to tremendous benefits. For example, a 25 percent reduction in amount of time in level flight during descents into Los Angeles is now saving the operators and the environment two to three million gallons of fuel per year, without even reducing the distance flown. FAA studies and early deployments have shown that introduction of these more efficient processes into the airspace around and connecting major metropolitan areas can save operators up to $40 million per year in fuel savings in that metro-area alone. Improved passenger experience resulting from fewer delays and overall improvements to communities from reduced noise and emissions would add to these direct operator benefits.

Accelerating improved NextGen air routes and operating procedures is good for communities, the environment, the economy and jobs. Industry has already invested in the equipment and training to make their adoption a reality and the efforts fall within FAA's existing authority.

How Do You Know The Program Works?

The FAA continues to expand its work on demonstrations, trials and initial deployment of NextGen systems and procedures. National Airspace System (NAS) operators and users – particularly participants in the demonstrations and trials – are benefiting from them.

We've estimated that NextGen will reduce total flight delays about 41 percent by 2020, compared with the level that delays would reach absent NextGen, while providing $38 billion in cumulative benefits to the traveling public, aircraft operators, and the FAA. Aircraft owners will save about 1.6 billion gallons of fuel during this period, reducing carbon dioxide emissions by 16 million tons.

Why Do We Want/Need To Fund The Program At The Requested Level?

Improvements to the air transportation infrastructure stimulate the economy in a myriad of ways not directly related to aviation. Airlines alone have forfeited 300,000 jobs over the last 10 years. Improvements to the air transportation infrastructure will lower operating costs and provide a better passenger experience, which support airline growth with the accompanying increase in airline jobs. The $1 billion would be attributable to other F&E programs.

Executive Summary - Immediate Transportation Investment: Grants-in-Aid for Airports

1. What Is The Request And What Will We Get For The Funds?

The President's Immediate Transportation Investment initiative puts Americans back to work while rebuilding and modernizing America's roads, rails and airports.

For Fiscal Year (FY) 2014, $2.0 billion of the Immediate Transportation Investment will fund additional projects in the Grants-in-Aid for Airports program, also known as the Airport Improvement Program (AIP). Most of this funding would support preservation of existing airport infrastructure, enhancing safety, and preserving existing system capacity. Eligible airports in all size categories are able to compete for the $2.0 billion in one-time funding, which is in addition to the $2.9 billion of FY 2014 funding provided in the AIP program.

2. What Is The Program?

The AIP provides grants to local and state airport authorities to help ensure the safety, capacity, and efficiency of U.S. airports. Through the AIP, the agency funds a range of activities to assist in airport development, preservation of critical facilities, economic competitiveness, and environmental sustainability.

3. Why Is This Particular Program Necessary?

Through the AIP, the agency funds a range of activities to ensure the safety, security, capacity, and environmental mitigation of U.S. airports. The FAA identifies public-use airportsfor the national transportation system in the statutorily required plan, National Plan of Integrated Airport Systems (NPIAS). These public airports support scheduled air carrier service at more than 500 commercial service airports. In addition to scheduled passenger and cargo service, the airport system serves a diverse range of functions at approximately 2,800 non-primary public-use airports that provide emergency medical, flight training, agricultural, and business/corporate activities. The proposed AIP funding level will provide sufficient funding for all high priority safety, security, preservation, capacity, and environmental projects.

4. How Do You Know The Program Works?

The FAA has a very high level of confidence in the effectiveness of the program. The investment of AIP funds in the National Airport System (NAS) improves the safety and enhances the capacity of the system. We work closely with airports and the state aeronautical agencies to monitor the condition of critical airfield infrastructure, and can draw direct connections between our efforts and improvements in safety and capacity.

5. Why Do We Want/Need To Fund The Program At The Requested Level?

The principal tool FAA uses to establish the Airports Capital Improvement Program is the 5-year development needs identified in the NPIAS. The latest NPIAS, which was published in September 2012, identified over $42.5 billion in capital needs over the 5-year period from 2013-2017. The FAA funds capital projects that support system safety, capacity, and environmental projects and the highest priority needs in the NPIAS.

Detailed Justification for Immediate Transportation Investment: Grants-in-Aid for Airports

1. What Is The Request And What Will We Get For The Funds?

The President's Immediate Transportation Investment initiative puts Americans back to work while rebuilding and modernizing America's roads, rails and airports.

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The one-time mandatory funding will be used, in part, to fund commitments made under Letters of Intent (LOI) issued prior to FY 2014, Runway Safety Area (RSA) improvements, noise mitigation for impacted communities, and other high priority projects designated by the Secretary.

The request allows the agency to continue supporting the following key initiatives:

- Improve RSAs that do not conform to FAA standards;
- Reduce the risk of runway incursions by reconfiguring taxiways, perimeter service roads and other facilities;
- Preserve or enhance the safety of critical airfield and other airport infrastructure at airports nationwide;
- Preserve or enhance airfield capacity and efficiency at airports nationwide;
- Mitigate the environmental impacts of aviation including noise mitigation, land use compatibility planning and air quality improvements; and
- Continue to support airport security improvements where applicable.

Funding will support the following key outputs and outcomes:

- Improved RSAs increase safety on runways;
- Reconfigured taxiways, perimeter service roads and other facilities reduce the risk of runway incursions;
- Reconstructed and rehabilitated runways, taxiways and aprons will preserve the nation's critical aviation infrastructure; and
- Air quality improvement and noise mitigation projects reduce air and noise pollution.

2. What Is This Program?

The Grants-in-Aid for Airports program primarily supports Department of Transportation's (DOT) State-of-Good Repair goal, contributing toward the outcome of increased proportion of infrastructure assets in good condition. We also support DOT's Safety goal through our efforts to "reduce transportation-related injuries and fatalities." We additionally support DOT's Economic Competitiveness goal, with resources dedicated to two outcomes: "Maximum economic returns on transportation policies" and "A competitive air transportation system responsive to consumer needs." This program also significantly contributes toward DOT's Environmental Sustainability goal, contributing toward the reduction of transportation-related pollution and impacts on ecosystems.

<u>State of Good Repair</u>
The Airport Improvement Program provides grants to local and state airport authorities to maintain critical facilities, including runways, taxiways, aircraft parking areas (aprons) as well as many other airport facilities, systems and equipment. For example, AIP provides funds to ensure that no less than 93 percent of runways at 3,300 airports included in the NPIAS are maintained in excellent, good or fair condition.

<u>Safety</u>

The AIP provides grants to local and state airport authorities to help ensure the safety, capacity and efficiency of U.S. airports. Through the AIP, the agency funds a range of activities to assist in airport development, preservation of critical facilities, economic competitiveness, and environmental sustainability.

We also support the DOT Safety goal by providing funding for safety-related development at airports that benefit both commercial service and general aviation operations. For example, AIP provides funds to airports to reduce runway incursions caused by vehicle/pedestrian deviations, to accelerate improvements to runway safety areas that do not meet current standards, supports research in airport technology to develop improvements in airport marking and lighting, airport rescue and fire fighting, and mitigation of wildlife hazards near airports.

Economic Competitiveness

The AIP supports the DOT Economic Competitiveness through the following outcomes:

- Maximum economic returns on transportation policies and investments;
- A competitive air transportation system responsive to consumer needs.

By funding airport infrastructure projects that provide access to the National Aviation System in order to maintain a competitive air transportation system responsive to consumer needs, AIP contributes to economic competitiveness. For example, the AIP directs funding investments toward capacity development projects at airports ranging from the largest and most congested airline hubs serving some of the largest metropolitan areas to smaller urban areas and down to airports that enable critical access for emergency medical services to isolated communities.

Environmental Sustainability

The AIP supports the DOT Environmental Sustainability goal, "Reduced transportation-related pollution and impacts on ecosystems" outcome by funding projects and programs that help reduce transportation-related impacts on air quality, water quality, noise, and other impacts on ecosystems. For example, the AIP supports projects to reduce ozone emissions in EPA-designated nonattainment areas; supports airport greening initiatives and developing sustainability best practices; implements Environmental Management Systems to ensure that FAA operations protect the environment and meet statutory and regulatory environmental requirements; and reduces the number of people exposed to significant noise.

Anticipated accomplishments for the Immediate Transportation Investment in AIP grants include:

- Improve nonstandard RSAs;
- Fund infrastructure development projects to meet airport safety and design standards;
- Ensure that 93 percent of runways at more than 3,300 airports in the NPIAS (excluding Large and Medium hubs) are maintained in excellent, good or fair condition (the Large and Medium hub airports would be expected to use PFCs and other resources to maintain their state of good repair);
- Continue progress on reducing runway incursions by 10 percent from the FY 2008 baseline within 5 years;
- Fund all approved Runway Safety Action Team (RSAT) recommendations identified in the Airports Capital Improvement Program (ACIP);
- Fund capacity projects identified in the ACIP;
- Fund noise mitigation to benefit 10,000 residents and students within Day-Night average sound level (DNL) 65dB (decibels) or higher-impacted contours

3. Why Is This Particular Program Necessary?

The aviation system plays a critical role in the success, strength, and growth of the U.S. economy. Approximately 590,000 active pilots, 232,000 general aviation aircraft, and 4,520 air carrier jets rely upon the U.S. airport system. The economic impacts of the air traffic control system are well-documented in FAA's report on "The Economic Impact of Civil Aviation on the US Economy," published in August 2011. It states that, in 2009, aviation accounted for 10 million jobs, $1.3 trillion toward the gross domestic product output, and 5.2 percent of gross domestic product.

Airport infrastructure, particularly airfield facilities, are exposed to constant heavy use and harsh environmental conditions. Runways, taxiways, and aprons are designed to withstand the heavy equipment that operates on them, but even so these facilities require frequent maintenance and rehabilitation in order to remain in good working condition. Runways and taxiways have to be kept clear of snow, ice, and ponding water that can jeopardize aircraft directional control or braking action. Chemicals and plowing, as well as freeze-thaw cycles, all take a toll on runways, taxiways, and other paved areas. The smallest bit of broken asphalt or concrete can represent a major safety hazard to aircraft accelerating on takeoff or maintaining directional control after landing.

The vast majority of public-use airports in the United States are owned and operated by municipal, county or state government agencies, or by independent public authorities. They are required to follow strict rules in establishing rates and charges for the airlines and other users in order to recover their operating and maintenance costs.

Through AIP, the agency funds a range of activities to ensure the safety and capacity of U.S. airports. The FAA identifies public-use airports that are important to the national transportation system, including those airports in the federal plan known as the NPIAS. These public use airports support scheduled air carrier service at approximately 500 airports (known as commercial service airports). In addition to scheduled passenger and cargo service, the airport system serves a diverse range of functions at approximately 2,800 general aviation airports. These uses include emergency medical, flight training, agricultural, and business/corporate activity. The proposed AIP funding level will provide sufficient funding for all high priority safety and capacity projects.

The 64 Large and Medium hub airports account for about 88 percent of all passenger enplanements. Much of the delay to air traffic can be traced to inadequate capacity or efficiency at some of these airports. With the critical support of AIP, constructing new or extended runways, taxiways, and airfield reconfiguration continues to be an important part of FAA's NextGen Implementation Plan. 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. Since FY 2000, 16 new runways, 3 runway extension, and 1 airfield reconfiguration have opened with another airfield reconfiguration two-thirds completed, allowing about 2 million more annual operations.

AIP supports 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. The AIP funding plan will reflect a special emphasis to increase capacity and improve the airport arrival efficiency rate. AIP funding of the following airport projects contributes to these projects:

- 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; and
- Construct new airports/heliport.

4. How Do You Know The Program Works?

The FAA works closely with commercial service airports and with state aeronautical agencies to monitor the physical condition of airport infrastructure, particularly the critical airfield facilities. This gives FAA real-time information about capital funding needs and priorities, the effectiveness of funded projects, and the utilization of the airports. One of the core performance objectives of AIP is to maintain at least 93 percent of the runways at NPIAS airports in good, fair or excellent condition. The FAA's funding decisions consider a number of factors including the physical condition of airport facilities as well as historical, current and projected activity levels. The FAA also reports annually to Congress on how the funds have been used and the benefits of those investments in terms of increased safety, capacity, efficiency, and environmental compatibility.

The investment of AIP funds in the National Airport System has direct benefits, improving the safety and capacity of the system, and providing American jobs. The AIP program also assists airports to become more environmentally friendly and reduces the impact of airport activities on its communities.

<u>Safety</u>
We have several metrics that show the AIP investment is improving or maintaining safety. In FY 2011, the number of total runway incursions decreased slightly from 966 in FY 2010 to 954 in FY 2011. Serious runway incursions (category A and B) remained low. There were 6 Category A or B incursions in FY 2010, and 7 in FY 2011.

The reduction in serious runway incursions is partially attributed to improvement of airport markings, such as the enhanced taxiway centerline marking, end-around taxiways, and improvements in surface geometry.

The investment in improving RSAs and installing Engineered Materials Arresting Systems (EMAS) arresting systems has also shown to be effective. EMAS has already recorded seven successful overrun arrestments with minimal or no damage to the aircraft. The latest arrestment came at Key West International, Florida in November 2011 when an overrunning Cessna Citation was safely arrested.

Since FY 2000, FAA has improved 512 RSAs, and by 2012, 88 percent of practicable improvements will be completed. The installation of EMAS is an example of the effectiveness of this investment. Since installing EMAS on 63 runway ends where it was not practical to achieve standard physical runway safety areas, seven aircraft have departed the runway surface and were stopped by the EMAS, avoiding significant damage and loss of life.

<u>Economic Competitiveness</u>
Since FY 2000, 24 airfield projects have opened at 20 Large and Medium hub airports. These include 16 new runways, 3 taxiways, 3 runway extensions, 1 airfield reconfiguration, and 1 airfield reconfiguration two-thirds completed. The projects have provided these airports with the potential to accommodate about 2 million more annual operations and decrease average delay per operation at these airports by about 5 minutes.

<u>Environmental Sustainability</u>
Funds have assisted airports to become more environmentally friendly. AIP funds assist airports owners to improve land use compatibility near airports through the acquisition of non-compatible residences and sound insulation of residences, schools, and hospitals. From 2005 through 2011, over115,000 people have benefited by their relocation from a noise impacted area or through sound attenuation programs designed to reduce the noise exposure on residences, schools, or hospitals.

The VALE Program addresses air quality by helping airports reduce emissions from all mobile and stationary ground sources. The FAA has funded 57 VALE projects through the AIP program from 2005 through 2012. A total of $116 million has been invested in VALE clean airport technology. Over the long-run, VALE initiatives will reduce ozone forming pollutants (Nitrous Oxides and Volatile Organic Compounds) at airports by 8,010 tons. The smog-reducing benefits of VALE projects are equivalent to removing over 20,600 cars and trucks from the road each year for the next decade.

5. Why Do We Want/Need To Fund The Program At The Requested Level?

Every other year, FAA is required to develop a five-year prospective analysis of capital needs and submit it to Congress as part of the NPIAS. The capital projects included in the NPIAS consistently exceed the annual available funding for the AIP. Projects are routinely broken into smaller phases or deferred to a future year until funding can be identified. The latest NPIAS, published in September 2012, identified over $42.5 billion in capital needs over the 5-year period from 2013-2017. The additional Immediate Transportation Investment in FY 2014 for $2.0 billion would fulfill less than 5 percent of these identified capital needs.