# Federal Aviation Administration

# National Airspace System Capital Investment Plan 2006 - 2010

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# Federal Aviation Administration National Airspace System Capital Investment Plan for Fiscal Years 2006–2010

## 1 Introduction

### 1.1 What Is the Capital Investment Plan?

The Federal Aviation Administration (FAA) Capital Investment Plan (CIP) is a 5-year plan that describes the National Airspace System (NAS) projects that can be funded within the Office of Management and Budget future-year targets over the 5-year period, 2006 to 2010. The CIP fulfills FAA's obligations under P.L. 108-447 to "… 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 2006 through 2010, 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."

The CIP is based on the NAS Architecture and priorities set by the FAA capital investment team. The NAS Architecture defines the services provided by the FAA and the systems necessary to provide those services, such as radars, navigation systems, and air traffic control automation. The capital investment team ranks the CIP programs that fund these systems using FAA Flight Plan goals and estimates of the programs' economic value to establish program funding. The capital investment team also puts a high priority on fully funding projects with funding baselines approved by the FAA Joint Resources Council

The CIP includes planned expenditures for the current fiscal year budget and for each of the next 4 years for each line item in the Facilities and Equipment budget. The project descriptions and funding levels in the CIP are a comprehensive summary of how much system modernization we will do in the next 5 years.

The Flight Plan 2005–2009 is the FAA's new strategic plan. It contains the broad strategic goals that define the fundamental purposes of the agency. Under each goal are several objectives, strategies, and initiatives that articulate the actions the FAA believes are necessary to accomplish those goals. Each objective also has one or more measurable performance targets. These targets set a specific level of achievement in a specific time frame to meet the objectives.

Consistent with the President's Management Agenda, the projects in the CIP have been linked to a goal and objective. The list of goals, objectives, and the related projects appear in Appendix A. Normally, several projects are grouped under a single objective and its related performance targets. This is because in a complex system such as the air traffic control system, many projects are needed to meet the objectives and their related performance targets. In addition, many projects are interdependent, and one project could not affect the performance target without other supporting projects.

## 1.2 The Capital Investment Plan Is Necessary To Manage Long-Range Projects

Because it takes several years to implement many projects, we must plan for future-year resources to ensure that we complete projects and deliver the expected benefits. In addition, we must continue to balance future-year spending between initiatives and sustaining the existing infrastructure because efficient operations depend on sustaining the high performance of existing equipment until we can install more modern systems.

Because of the legislative caps on future-year CIP estimates, Appendix C includes only projects that are likely to receive funding. The CIP does not include other initiatives that were considered but rejected because they would require funding above those caps. As a result, the CIP gives a clear picture of the pace of modernization and how well improvements to the air traffic control system are keeping up with industry growth.

## 1.3 The CIP Supports the Air Traffic Organization

The FAA established the Air Traffic Organization (ATO) February 8, 2004, and air traffic services and supporting functions are now operating within the ATO. A single ATO Business Plan has been developed to guide the operation of the ATO. The Business Plan serves two purposes: (1) to align the goals of the ATO with the strategic goals of the FAA Administrator, the Secretary of Transportation, and the President and (2) to provide a blueprint for ATO strategies and initiatives over the next 5 years. Operating and Financial Plans have been developed to support the goals in the Business Plan. The ATO executives will commit to carrying out these plans, so the objectives of the Business Plan can be met.

Most of the capital investment projects support ATO functions, and the CIP is an integral part of ATO financial planning. With reduced funding available from the aviation trust fund, the ATO will have to allocate a larger portion of capital investment toward more efficient operations and reduce the portion directed toward increasing capacity to meet growing demand. Investment to accommodate growth will have to be carefully focused on locations, which will benefit the most from expanded capacity. The CIP also contains projects that support FAA organizations outside the ATO. Most of these capital investments are directed at improving safety programs by modernizing the databases used to track safety performance.

The challenge for the future will be how to achieve a balance among the competing needs for improving efficiency, expanding capacity, and sustaining the reliability of existing systems. Improving efficiency will require improvements to existing equipment as well as using new technology. It holds the promise of improving capacity at a lesser cost, but it will not solve all capacity problems. The FAA must invest in some new facilities, and it also must ensure that operations with existing equipment remain reliable. Sustaining existing equipment will consume a significant portion of capital investment. The installed base of FAA facilities and equipment has an estimated value of about $35 billion. We estimate that approximately $2 billion per year is necessary to maintain existing system reliability and availability.

Successful management of the ATO depends on setting priorities for spending that recognize today's operating environment. We have developed a strategic management process to provide

guiding principles for achieving the needed efficiencies and providing the high quality services that our customers expect. Key strategic principles for managing the ATO are:

- Achieve operational excellence
- Enhance financial discipline
- Increase capacity
- Ensure Viable Future

# 2 Other Planning Efforts Complement the CIP

## 2.1 The FAA Aerospace Forecast Projects Future Workload

Each year, the FAA Aerospace Forecast projects aviation activity and demand for FAA services for the next 12 years. This forecast is a key planning consideration for FAA system engineering efforts in determining the investment necessary to sustain the air traffic control system. The forecast information enables the FAA to determine system improvements needed to address expected overall growth and changes in the tempo of operations at key airports. As air traffic at busy airports increases, the FAA will also have to deal with the added complexity caused by the increased operations.

Commercial air travel in the past 20 years has more than doubled. We expect this long-term growth trend to resume as the overall economy improves this year and next. Total U.S. commercial air carrier capacity and air traffic exceeded pre-September 11 levels in 2004, and the FAA expects domestic air travel to reach fiscal year 2000 levels during 2005, and then resume more normal growth rates. Instrument Flight Rule (IFR) activity at FAA en route centers exceeded 2000 levels in 2004, and IFR operations at towers are expected to reach pre-September 11 levels in 2007. During 2004, delay has been creeping back into the air traffic system, and, more significantly, delay at a few large hubs is often reflected into the system and affects other airports. In 2004, commercial activity at 17 of the 35 busiest airports identified in the Operational Evolution Plan (OEP) exceeded the 2000 activity.

Projections of continued growth in air travel and FAA workload are based on several factors, including economic growth, low cost fares and increased pleasure travel. Despite unprecedented high fuel prices, the U.S. economy has exceeded 3 percent real growth for the last four quarters. Since air travel correlates highly with economic growth, the number of airline trips is likely to increase proportionately with general economic growth. Expansion in the number of markets served by low-cost carriers has also increased the demand for air travel by reducing the cost of air travel for both leisure and business travelers. The aging of the U.S. population supports an increase in demand for pleasure travel.

More importantly, the impact on FAA workload will be greater because the relationship between the number of passengers handled and the number of aircraft operations, which determines the FAA workload, has changed significantly since September 11. The rapid growth of low-cost carriers, the expanded use of regional jets in markets previously served by larger jets, and increased point-to-point service have resulted in both a change in the mix of aircraft operating in the air traffic environment and more growth in aircraft operations than historical trends would

have predicted. Significantly larger numbers of smaller aircraft have increased the complexity of the workload by creating a greater strain on existing capacity and presenting new operational challenges.

## 2.2 The Concept of Operations Recommends Future Air Traffic Control Capabilities

The FAA and the aviation industry jointly developed the RTCA NAS Concept of Operations and Vision for the Future of Aviation (Conops). The Conops details the consensus view of what air traffic control capabilities should be available in the future. This vision recommends a future air traffic control system that will allow all customers to operate without undue constraint in a system that enhances today's high level of safety while providing equitable access. The operating capabilities outlined in the Conops build the conceptual framework for designing the systems and operating procedures that will be used in future years. These capabilities drive the specific planning in the NAS Architecture, and they translate projected new capabilities into engineering designs necessary to achieve them. The strength of the Conops is that it represents a joint effort to identify the steps necessary to ensure industry needs will be met.

## 2.3 The NAS Architecture Details NAS Systems and Services

The NAS Architecture is closely tied to the Conops. The Conops drives operational improvement evolution, and that drives the design of future infrastructure. The Conops describes how air traffic services can be improved to operate more efficiently. The NAS Architecture then translates those improvements into tangible equipment decisions that are consistent with engineering decisions on overall system configuration.

The NAS Architecture is a Web-based information system that describes the systems and services provided for the NAS. The highest level of the architecture lists services provided to aviation customers. These services are used to define the subcategories of mechanisms and components necessary to provide them. Details are included in the NAS Architecture to show current capabilities for these systems, and the plans for how they will change over the next 15 years. The NAS Architecture also identifies the interfaces between systems, which can be used to determine what systems will be affected when a change is made to a mechanism or component.

## 2.4 The FAA Operational Evolution Plan and Airport Capacity Enhancement Plan Recommend Capacity Improvements

The FAA Operational Evolution Plan (OEP) is the primary internal plan for improving capacity over a10-year rolling timeframe at the 35 most congested airports. The OEP analyzes the causes of delay and develops potential solutions that can be completed within the 10-year timeframe. The OEP is coordinated with aviation customers and reflects their views on the most promising ways to increase capacity and decrease delays. In support of recommendations in the OEP, the FAA regions develop Runway Template Action Plans, which are detailed project plans for supporting construction of new runways.

The Airport Capacity Enhancement Plan is a complementary FAA plan that collects data on 100 airports and shows planned and recommended airport projects that would improve capacity and reduce delays. Airport improvements, recommended in the Capacity Plan, normally receive financial support from the airport grant program, but the NAS equipment that enables full use of airport improvements is provided by CIP projects. The OEP projects can be either operational improvements or equipment installations supported by projects in the CIP.

### 2.5 Joint Planning and Development Office Plans Long-Range Aviation Needs

The FAA reauthorization legislation, titled Vision 100 — Century of Aviation Reauthorization, required the Secretary of Transportation to establish an FAA Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System. This office coordinates with a coalition of government agencies to study the needs of the aviation system of the future. The government agencies include the Departments of Transportation, Defense, Homeland Security, and Commerce, National Aeronautics and Space Administration and the White House Office of Science and Technology Policy. The JPDO is evaluating future air traffic demand and the systems needed to accommodate that demand with minimal delay. It has been developing the broad principles that should be followed in designing the system for the future, and it will continue work on a more detailed long-term plan for system modernization. This long-range view of aviation services will serve as a road map to the future and will be integrated into the NAS Architecture within the financial caps specified for future- year funding.

## 3. FAA Faces Significant Challenges in Planning

The changing fleet mix for commercial carriers is significantly impacting the amount of revenues flowing into the Airport and Airway Trust Fund. With an increasing number of low-cost operators and use of regional jets to serve smaller markets, the average number of passengers per aircraft and the amount of revenue per passenger are declining. At the same time, aircraft operations and the resulting demand for air traffic services are increasing. The result is that fewer resources are available for capital improvements, but the FAA must accommodate a growing demand for services. Because of these conditions, the FAA must structure its choices to focus on the most productive ways to increase capacity while also improving efficiency of operations.

The following principles guide our allocation of capital investment dollars:

- Preserving the FAA's enviable safety record
- Building a sound infrastructure and adding new capabilities to better serve our customers
- Carrying out our mission more efficiently
- Managing our costs and increasing productivity

Every investment must first meet the test of either preserving safety or improving it. Priorities for other investments are changing in the current economic climate. We must ensure that we can sustain present performance before we invest in expansion. As systems age, performance declines and maintenance costs increase. This increases operating costs, and the resulting system outages can cause delays at major airports. We will direct most new investment at sustaining the

current infrastructure to ensure that air traffic services remain reliable and delays are minimized. A smaller portion of the funds available will be spent on providing new capabilities.
The following sections outline how capital investment supports these strategic principles and give examples of the initiatives to achieve them.

## 3.1 Preserving FAA's Enviable Safety Record

Air travel on U.S. commercial airlines has an impressive safety record, and we must both maintain that record and improve it. Several projects will address known safety problems to prevent accidents from happening. The following projects are the key initiatives to improve safety and preserve the confidence travelers have that their journeys will be safe.

### 3.1.1 Surface Surveillance Systems

Surface surveillance systems support the safety initiatives described in the FAA Flight Plan to reduce runway incursions. To prevent accidents on airports runways and taxiways, air traffic controllers need to have precise information on the location of aircraft and other vehicles in the airport operating areas. These systems are especially valuable in decreased visibility conditions and in locations where tower controllers cannot see some parts of the runways and taxiways. The major effort in this program is to increase the number of airports with surface surveillance, but funding is also provided for upgrading existing systems. A longer-term goal is to give pilots displays of ground traffic information and a moving map of the airport surface. This will improve pilot awareness of their location on the airport surface and help them follow controller instructions.

To protect against runway incursions at busy airports that do not already have airport surface surveillance systems, the FAA is installing the Airport Surface Detection Equipment – Model X (ASDE-X). This system uses advanced technology to detect aircraft and ground vehicles in the airport operating area. The ASDE-X uses a triangulation technology based on aircraft transponder responses to pinpoint the exact position of aircraft and vehicles. We will deploy ASDE-X at 25 operational sites.

### 3.1.2 Safety Databases

The Aviation Safety Analysis System (ASAS) and its two follow-on projects—the System Approach for Safety Oversight (SASO) and the Aviation System Knowledge Management Environment (ASKME)—are safety databases that provide detailed information to aviation safety inspectors. These databases contain records of safety infractions for pilots and air carriers; the text of safety regulations governing operation, manufacture, and repair of aircraft; and the text of directives and the compliance records for commercial operators. Having this information readily available ensures the inspectors are aware of the past safety compliance of the persons and organizations being reviewed. It also increases the effectiveness of the inspectors and ensures that they have the latest information about FAA regulations and Advisory Circulars when they conduct inspections.

### 3.1.3 Integrated Flight Quality Assurance

The Integrated Flight Quality Assurance (IFQA) program provides a way for air carriers to transfer information gathered from flight data systems in an aircraft to a centralized database so that it can be examined for safety issues. Many airlines have used this data to identify nonstandard practices in approaches and landing so that they can develop practices that improve safety and reduce the fuel consumed on approach and landing. The FAA will use this data and incorporate additional data from the Aviation Safety Action Program to discover operational safety issues and promote safety improvements through FAA policy and decision-making.

### 3.1.4 Safety Management System

The Safety Management System (SMS) is a disciplined approach to analyzing safety issues that may arise in the design and use of FAA equipment and procedures consistent with international standards. The program requires a rigorous review of new equipment designs early in the acquisition process to identify safety issues. The safety analysis results in recommendations to integrated product teams that manage development of new equipment, to help them redesign the equipment to remove or lessen any safety problems that have been uncovered. The same process is used for new procedures or operational changes to ensure the proposed changes will improve safety.

## 3.2 Building a Sound Infrastructure to Better Serve Our Customers

Operation of the air traffic control system requires both modern facilities and sophisticated supporting equipment such as radars, navigation aids, and communication equipment. Outages of a single component at or near a large airport can cause delays costing millions of dollars. There are 21 en route centers and just under 500 towers and TRACON facilities (both FAA-operated and contract) in the National Airspace System. Surveillance information from more than 300 radars provides controllers accurate displays of aircraft location at those facilities. More than 2,000 navigation and precision landing systems enable pilots to follow the routes they have told FAA that they will fly and land safely in reduced visibility conditions. About 3,000 remote communications sites enable pilots to stay in voice contact with air traffic control facilities. In addition, there are automation systems, weather sensing systems, and other supporting systems that make air traffic control possible. The FAA estimates that more than 40,000 individual pieces of equipment are necessary to operate the U.S. air traffic control system. Examples of some of the most important replacement programs follow.

### 3.2.1 Tower and Terminal Radar Control Facilities Replacement and Modernization

**Figure 1. Airport Traffic Control Tower**

Every year, the FAA for various reasons replaces or modernizes a portion of the air traffic control towers at airports. Some currently operating towers were built more than 40 years ago and fall far short of modern standards for an efficient workplace. Some towers requiring replacement are at airports that have built new facilities to accommodate growth in passenger travel and air cargo shipments, and sight lines to the runways have become obscured. To improve safety, the tower must be built taller to ensure full visibility of the runways and taxiways.

When obsolete equipment is replaced in a tower or terminal control facility, the existing tower cab and terminal radar control (TRACON) facility may need to be upgraded. Finally, increases in air service may require expansion of control facilities to accommodate more controllers and their workstations. This is especially true when new runways are opened at an airport and the resulting increase in traffic requires more traffic control positions to be opened. In a typical year, the FAA will have up to 20 projects ongoing to replace existing air traffic control towers and TRACON facilities.

### 3.2.2 Voice Switches

The FAA installs voice switches in air traffic control facilities to enable controllers to send and receive messages from (1) remote radio sites that transfer messages to and from pilots; (2) other controllers within their facility; and (3) controllers in adjacent facilities. The voice switches route all these communications from incoming and outgoing lines to a panel at the controllers' positions; so a controller can select the voice channel he or she needs to speak with pilots or other controllers. Controllers and facility staff also need to be able to use normal telephone lines to communicate with parties in the local area such as emergency services personnel and aviation customers.

The FAA is developing a business case to replace the 16 existing types of voice switches with a standard switch scaled to the size of the facility where it will be used. Operations and maintenance costs for the existing switches are increasing due to the age of the switches, the cost of obtaining spare parts, and the difficulty in finding experienced personnel to maintain these older technology switches. In addition, these switches will not support future NAS capabilities such as airspace redesign, dynamic resectorization, digital communications, heightened security, and remote maintenance monitoring.

### 3.2.3 Terminal Radars

The FAA is completing the process of replacing older terminal radars (mainly Airport Surveillance Radars – Models 7 and 8) that are 20–30 years old with the newer Airport Surveillance Radar – Model 11 (ASR-11). This new radar provides data to terminal air traffic control facilities in a digital format as required by the Standard Terminal Automation Replacement System (STARS), which is replacing existing obsolete automation systems. The initial replacement program, which is the ASR-9, began transition to a digital format, and the ASR-11 will complete replacement of the older terminal radars now in service.

**Figure 2. ASR-11 Radar System**

The ASR-9 is compatible with STARS, and it is in operation at about 120 airports. Installations began in the late 1980s, and this system requires a service life extension program (SLEP). The SLEP replaces transmitter and receiver components that have high failure rates and improves the antenna drive system. By replacing these key components, the FAA will extend its operational life and reduce existing maintenance costs. This program is especially important because the ASR-9 provides surveillance data for the larger airports where outages are costly.

### 3.2.4 Terminal Automation Systems

The FAA operates 170 terminal radar control (TRACON) facilities. These facilities control air traffic as it transitions from en route control to the approach zones for airports and from departure paths around airports to en route control. The automation systems installed in the TRACON facilities show aircraft position on controllers' displays. The FAA has approved a program to replace 51 of these systems and is studying alternatives for replacing the remaining systems.

**Figure 3. Standard Terminal Automation Replacement System**

The FAA has installed STARS at 29 of the 51 approved locations. The new system can accept additional automation aids, and it improves controller displays by adding six-color weather depiction. It also has an improved backup system that is independent of the STARS software.

### 3.2.5 En Route Facilities Modernization

**Figure 4. En Route Center**

Most of the 21 Air Route Traffic Control Centers (ARTCC) and the Combined Center Radar Approach Control (CERAP) facility at San Juan, Puerto Rico, were built in the early 1960s and over the years have been expanded and modernized in phases. However, much of the

mechanical and electrical equipment in these facilities is old and requires replacement to reduce the risk of an air traffic control service interruption. In addition, many areas in these facilities do not meet current standards for handicapped accessibility, and there is a continuing need to remove asbestos fireproofing materials installed when the facilities were built. Condition assessment surveys show that there is a backlog of facility improvements that should be funded. The risk of not keeping up with facility maintenance projects is that repairs will be made on an emergency basis and thus cost substantially more. There is also a risk of loss of service. For example, a fire in 2001 at the Cleveland ARTCC resulted in an evacuation of the control room, diversion of all en route air traffic around the center airspace, and loss of air traffic control services for 16 minutes in the sectors controlled by the Cleveland ARTCC.

Examples of the projects performed with this funding are: (1) replacement of obsolete electric power distribution systems; (2) replacement of heating, ventilation, and air-conditioning systems; (3) fire-detection and prevention upgrades; (4) asbestos abatement; and (5) interior construction to provide space for new equipment.

### 3.2.6 En Route Automation Systems

The Host Computer System, which is the central component of the en route automation system, will be difficult to maintain after 2010. Operational availability and maintainability will be at risk, if it is not replaced. En route automation system outages at individual centers during peak travel times can create a ripple effect that results in long delays or cancellations. Also, automation improvement provides an opportunity to achieve productivity and efficiency gains without significant increases in controller staffing that are necessary to deal with forecasted growth in operations. Current system hardware and software limitations are progressively impeding the ATO's ability to accommodate the increasing demand for air traffic services.

The En Route Automation Modernization (ERAM) Program replaces the Host Computer, its backup systems, and portions of the display system infrastructure, which includes the technical refresh of the radar position processor. The ERAM backup system simplifies system maintenance and eliminates the need for air traffic restrictions if there is a primary system failure. The current Host has technological and structural restrictions, which include limits on the number of flight plans that can be stored, the number of radars that can be used, and flexibility in airspace configuration. ERAM will have capabilities that minimize these restrictions.

**Figure 5. En Route Control Display**

The ERAM architecture and deployment plans assume successful implementation of other projects included in the ERAM Program. The new En Route Communications Gateway (ECG) replaced the Peripheral Adaptor Module system, and it provides a modular and expandable communications network to support ERAM. The En Route Modification program replaces obsolete display processors and upgrades air traffic control consoles to address maintenance issues with existing systems.

In coordination with other en route programs, ERAM will enable a smooth transition from the current system to a modernized en route system architecture without affecting critical services. The upgraded system architecture will provide improved capabilities and facilitate implementation of future improvements. These improvements will provide more efficient routing for aircraft in the en route domain. ERAM will reduce maintenance costs for both en route hardware and software. The newer hardware will have fewer failures. The modern programming language used for the software will make it easier to maintain the software.

### 3.2.7 Navigation Systems

The FAA faces difficult decisions regarding the future mix of ground- and space-based navigation systems. It would be desirable to replace existing ground-based systems with a system less costly to maintain, but we must continue to provide existing navigation services until a satisfactory solution is accepted. The longer it takes to agree on acceptable alternatives to ground-based systems, the greater the cost will be for maintaining dual capabilities. The current systems define the most commonly used routes in the air traffic control system. They also provide other services such as a communications link to broadcast weather conditions to pilots in flight. They provide precision guidance to airports in low-visibility conditions, which improves schedule reliability for commercial carriers. Efforts are underway to take advantage of new satellite navigation technology, but users must equip and procedures must be developed before the number of existing systems can be reduced.

The Very High Frequency Omnidirectional Radio (VOR) navigation system provides position information for aircraft in flight. The Distance Measuring Equipment (DME) system can also be used for in-flight position and guidance for nonprecision approaches to airports. Both systems require consistent annual levels of reinvestment to sustain current levels of service.

In 2003, two new runways became operational. The FAA Flight Plan sets a target of opening seven more new runways by 2009. New runways require precision landing guidance to maximize the potential increase in capacity at busy airports. Instrument landing systems, runway lighting, and visibility sensors make runways usable in low-visibility conditions when the added capacity is most needed.

A candidate for providing future navigation services is the Global Positioning System (GPS), a satellite navigation system that can be used to determine precise position information. The 24-satellite system provides worldwide coverage with high accuracy. There are concerns, however, that must be resolved before this system can be used for aviation. Pilots must have assurance that there are not any significant errors in the information that they are receiving from the

satellites. Augmentation is needed to provide information on reliability of the signal and to provide precise corrections to the satellite signals.

The Wide Area Augmentation System (WAAS) uses more than 20 ground stations to determine precise corrections to the satellite signals, detect unusable satellites, and send that information via communications satellites to aircraft receivers.

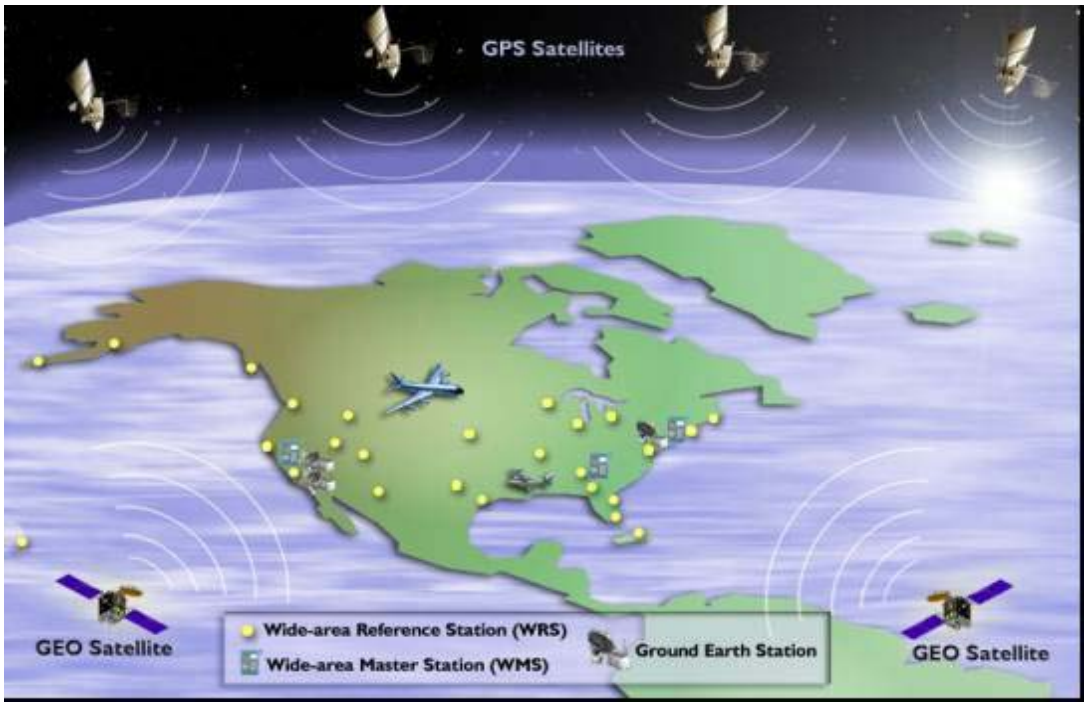


**Figure 6. Wide Area Augmentation System**

The corrected GPS information can then be used for landing guidance during adverse weather, when proper procedures are developed and the aircraft is equipped with the necessary instrumentation. The WAAS is operational, and we continue to develop procedures to allow landings at airports that do not have instrument landing systems. The GPS signal can also increase navigation coverage at low altitudes because it provides accurate position information for pilots flying in areas where the VOR signal is blocked by terrain.

3.2.8 Security of the National Airspace System Infrastructure

As threats to security have increased, the FAA has had to devote substantial additional resources to programs that improve both facility and information system security for the air traffic control system and related infrastructure. FAA employees and the facilities they work in are essential in supporting the smooth flow of air travel. Even small disruptions can cause major economic loss to both commercial air carriers and air travelers.

The Facilities Security Risk Management (FSRM) program assesses the physical security risks for staffed facilities and funds improvements to correct security issues. Efforts are directed at

identifying any inadequacies in protective systems for staffed facilities and ensuring that all steps are taken to prevent facility intrusions and facility damage. The recommended actions are consistent with guidelines established by the Department of Justice for the physical security of government buildings.

The air traffic control system depends on computer automation and relies on elaborate communication systems to keep the system running. All systems must be analyzed for vulnerabilities and have protections installed to prevent system intrusion and disruption. We use the FAA's Android Cyber Defense Model to accomplish this. The model strives to emulate the defenses and resiliency of the human body against attack by infection and disease. It includes hardening systems, boundary protection, informed recovery, systematic monitoring, and orderly quarantine.

The FAA's achievements to date include certification and authorization of air traffic control systems, intrusion detection monitoring, and simplification of the architecture to address system protection. Future activities include remediation of system vulnerabilities discovered during the certification and authorization process and vulnerability reviews, implementation of the NAS Information Systems Security Architecture, and implementation of adaptive quarantine to isolate infected systems from non-infected systems.

## 3.3 Carrying Out Our Missions More Efficiently

To handle future growth within expected future resources, we must find ways to more efficiently use existing systems and airport capacity. The following sections highlight some of the programs that increase efficiency of operations.

### 3.3.1 Free Flight Programs

The Traffic Management Advisor (TMA) program is an automation aid that enables en route and terminal facilities to coordinate traffic flows before they reach terminal airspace. This maximizes use of landing slots at an airport because en route facility personnel can properly space aircraft before they enter terminal airspace, and the terminal controllers can optimize the flow of aircraft landing on available runways.

The User Request Evaluation Tool (URET) is another automation aid, and it enables controllers to check a requested change in the intended path of flight for an aircraft to determine if any conflicts would occur. When pilots request direct routings to save time and fuel, the controllers can use URET to determine whether and when they can approve the requested change. Controllers can also use URET to determine the feasibility of alternate routes when adverse weather requires pilots to alter their planned routes of flight to avoid thunderstorms or turbulence. Reducing flight route length saves direct operating costs and fuel.

### 3.3.2 Traffic Flow Management (TFM) Modernization

The Traffic Flow Management (TFM) system is used for strategic and tactical planning to accommodate heavy traffic flows. Traffic Management Units at terminal facilities coordinate

with flow management units at en route centers to determine when demand may exceed capacity. The terminal and en route units, in consultation with the Air Traffic Control System Command Center, jointly decide on strategies to prevent excessive system delays. The TFM system has sophisticated software applications that compare capacity and demand using real-time information on aircraft in flight. It provides a clear picture of potential congestion and helps in assessing alternatives to handle high demand. The hardware used for TFM is becoming obsolete and lacks the necessary capacity for further improvements in management of air traffic. Funding has been approved to replace the hardware, and a decision is pending on how much funding to allocate for software upgrades.

### 3.3.3 Communication Facilities

An essential function for air traffic control is to enable air traffic controllers to talk to pilots. Since many air traffic facilities cover areas that are larger than the range of the radios used to communicate with pilots, remote radio sites are installed to send and receive those communications. There are about 3,000 of these remote sites used nationwide. As air traffic patterns change and airlines change route structures to provide new services, either a new remote site must be added or existing sites must be relocated.

In heavy air traffic areas, many radio frequencies reserved for FAA use are fully allocated. The FAA expects that further growth in aircraft operations will require more communication channels to ensure that critical messages can be exchanged between controllers and pilots. It is unlikely that radio frequencies outside the bands allocated to the FAA will be available for aviation use. The FAA is exploring new technologies to accommodate the increasing need for more channels to meet air traffic service requirements. The transition to a new technology or technologies will take several years because of the installed base of existing equipment, but solutions must be pursued now to prevent limits on future growth.

In fiscal year 2004, in recognition of the need for international harmonization on the best technical solution to the spectrum congestion problem, the FAA decided to defer developing and implementing the ground component of the Next Generation Very High Frequency Air/Ground Communication (NEXCOM) system. However, there is agreement that if the problem is not addressed, we could experience limits on air traffic services by 2015.

The FAA is continuing to field its new multimode digital radios, and it is continuing development of compatible avionics to help airline and business jet operators prepare for implementation of new technology. The lead times for equipage for these operators are longer than that required for FAA ground infrastructure modernization.

The FAA and Eurocontrol are partnering in a 3-year joint Future Communications Study to define a global air/ground communications system that will accommodate the increasing growth in air traffic and provide worldwide interoperability among all air traffic service users. We expect that this study will result in a globally harmonized communications system that will begin service in the high-altitude en route airspace by 2015 and provide benefits to all airspace users through 2030 and beyond.

### 3.3.4 Oceanic Air Traffic Control

Transoceanic travel is growing faster than domestic travel, and the increasing tempo of operations is resulting in operational inefficiencies.

**Figure 7. Oceanic Automation System**

Many aircraft are unable to immediately climb to their most efficient operating altitudes, so they consume extra fuel. In addition, current limitations affecting the precision of information on aircraft location requires controllers to provide as much as 100 miles separation between aircraft. This results in longer routes and increases the flight times for oceanic flights, which increases fuel consumption. The new oceanic automation system, coupled with better communications and better aircraft position information, will increase the precision in oceanic air traffic control. This will allow reduced miles of separation and quicker approval of preferred altitudes.

### 3.3.5 Terminal Weather Information

The FAA will install the Integrated Terminal Weather System (ITWS) at 22 TRACON facilities and provide weather information to 28 airports. The system integrates the information from several weather sensors and provides a composite picture of the weather around busy airports. The system is also able to project movement of weather systems 20 minutes into the future. Tower managers have stated that this system results in a reduction in delays and diversions due to severe weather near an airport. By having accurate weather information, air traffic managers are able to keep airports open longer and reopen them sooner after thunderstorms and other severe weather have passed the operating area. The system is also used to decide when to shift traffic flows to different runways for takeoffs and landings when there is a change in the wind direction over the airport. Advance notification of these changes allow controllers to direct aircraft to the most efficient approach routes rather than having to redirect them from their an approach path to a runway that will no longer be used.

## 3.4 Managing Our Costs and Improving Productivity

In addition to improving the efficiency of air traffic operations to better serve our customers, the FAA must carefully manage its own internal costs. The FAA must allocate a portion of its capital investments to projects that lower its operating costs. This section highlights some of the projects that we have justified based on their potential to reduce the cost of operations for the FAA.

### 3.4.1 Federal Telecommunications Infrastructure (FTI)

The Federal Telecommunications Infrastructure contract provides commercial telecommunications services to support both voice and data communications among FAA facilities and to and from FAA headquarters. This contract uses an integrated approach to improve delivery of services. Costly legacy networks will be replaced by modern, reliable, and consolidated network infrastructure incorporating multi-service and multi-media capabilities at low cost. This contract is projected to save the FAA about $500 million over a 10-year period.

### 3.4.2 National Airspace System Infrastructure Management

The National Airspace System Infrastructure Management System (NIMS) program is designed to increase the efficiency of maintaining FAA systems. It relies on remote maintenance monitoring to minimize travel of maintenance technicians, and it uses software to facilitate new business practices by improving information collection and sharing. Workload information is analyzed to determine the total amount of staffing for maintenance functions and to decide on allocation of staffing to FAA facilities. Historical maintenance data provides the maintenance technician information on previous equipment failures and successful solutions, so repairs can be accomplished in a shorter period.

### 3.4.3 Supply System Management

The Asset and Supply Chain Management (ASCM) system improves management of FAA assets and inventory. It replaces 12 existing legacy information systems. Using bar coding and automated inventory control equipment, the system will increase accountability and control of repairable parts and expendable inventory. By exerting tighter control, it will decrease the amount of inventory purchased and increase visibility and subsequent use of existing inventory

### 3.4.4 Distance Learning

The Distance Learning Program enables the FAA to provide instruction to FAA employees at their workplace rather than bringing them to the FAA Academy in Oklahoma City. We mostly use computer-based instruction to provide distance learning. Employees can take courses at their worksite and use interactive media to learn about new equipment and procedures being introduced into the NAS. One significant benefit is lowering the cost of student travel and per diem compared to the costs for resident training. In addition, distance learning increases training opportunities for FAA employees and minimizes time away from their worksites.

### 3.4.5 Competitive Sourcing

As part of the President's Management Agenda, the FAA has been examining opportunities for competitive sourcing. The flight service station program met the criteria and competitive bids were solicited to determine the most cost effective mechanism for providing these services. One of the criteria was that proposals would have to show cost savings of at least $1.0 billion over ten years. The FAA evaluated five competing service providers, including the existing FAA organization to determine which offered the best value to the government. A contact has been awarded to provide these services and the new provider will assume operations in October 2005.

# 4 Conclusion

The FAA faces major challenges in dealing with growth in operations while sustaining the large capital base already in place. Growth is returning, and pressure on large airports will require more sophisticated management of air traffic activity. Yet, revenues into the trust fund will not reach the levels predicted a few years ago. More rigorous management will be required for capital investment funds, and decisions on project funding will have to carefully balance initiatives against sustaining the present system. The comprehensive ATO Business Plan addresses these issues. However, it must also consider the vision for the future contained in the recommendations of the Joint Planning and Development Office for the future configuration of the air traffic control system.

A significant consideration in planning is recognizing that the high standards of performance for FAA equipment and automation systems require lengthy testing and implementation schedules. Capacity cannot be increased quickly. We must consider modernization needs now to ensure that new equipment can be installed and operational when it is needed. The CIP is part of the planning process and contains active projects for 2006 to 2010 to keep the NAS operating successfully. The NAS Architecture addresses both the time frame of the CIP and longer-term planning for system modernization.

One of the useful outcomes of future planning is development of a benchmark for the structure of the air traffic control system beyond 2010. Understanding future demand and the configuration of the system to meet that demand is a critical step in determining how to proceed with system modernization; and it improves the accuracy of estimating the resources to meet that vision of the future. The CIP information and the NAS Architecture complement each other in that role and set the stage for an informed dialogue on the pace and content of our future modernization efforts.

# 5 Appendices to the Capital Investment Plan

The CIP contains four appendices:

Appendix A

- Lists FAA strategic goals, objectives, and performance targets
- Associates CIP projects with strategic objectives and performance targets

Appendix B

- Provides CIP project descriptions and relationship of project to strategic goals
- Lists FY 2006–2010 — Performance Output goals

Appendix C

- Provides estimated expenditures 2006–2010 by Budget Line Item

Appendix D

- Defines acronyms and abbreviations

# Federal Aviation Administration

# National Airspace System

# Capital Investment Plan

# Appendix A

# Fiscal Years 2006 – 2010

# APPENDIX A

# GOAL MATRIX

This year's, Capital Investment Plan (CIP) projects have been connected to the goals, objectives and performance targets in the Federal Aviation Administration (FAA) Flight Plan 2005-2009. As such, Appendix A has been revised to reflect the alignment of projects with FAA goals and objectives consistent with the new FAA Flight Plan 2005-2009. In general, many FAA capital investments will contribute to more than one, goal, objective and performance target, Appendix A will reflect an alignment of that project to the goal, objective and performance target(s) where its contribution is most significant. CIP projects with Fiscal Year (FY) 2006-2010 funding are included in this Appendix.

For ease of clarification, the following definitions are provided a general description of the structure of the FAA Flight Plan 2005-2009 and a systematic way to relate the objectives and performance targets to projects in the CIP.

## STRATEGIC GOAL

A general statement of the broad agency purpose in carrying out its mission, such as: "Achieve the lowest possible accident rate and constantly improve safety."

## OBJECTIVE

A statement of a specific emphasis area that will contribute to the overall goal, such as: "Reduce the commercial airline fatal accident rate."

## PERFORMANCE TARGET

A quantifiable measure of the improvement in a goal area that sets a target for specific improvements in outcomes that affect FAA customers, such as: "Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007".

# 1. STRATEGIC GOAL: INCREASED SAFETY

**FAA Strategic Goal:** To achieve the lowest possible accident rate and constantly improve safety.

- **FAA Objective 1:** Reduce the commercial airline fatal accident rate.
  - **FAA Performance Target 1:** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
  - **FAA Performance Target 2:** Reduce the three-year rolling average fatal accident rate below .010 by FY 2009.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01F | M42.01-00 | Safer Skies |
| 2B02 | W03.03-01 | Terminal Doppler Weather Radar (TDWR) - SLEP |
| 2B11X | W09.01-00 | ASR Weather Systems Processor (ASR-WSP) – Tech Refresh / Product Improvement |
| 2B12 | C23.00-00 | Voice Recorder Replacement Program (VRRP) |
| 2B12X | C23.01-00 | Next Generation Voice Recorder Replacement Program (VRRP) |
| 2D06 | N04.03-00 | Visual Navaids - ALSIP Continuation |
| 2E05A | M12.00-00 | Aircraft Related Equipment Program |
| 2E05B | M12.01-02 | Aircraft Related Equipment - Airbus Simulator Replacement |
| 3A02 | A17.00-00 | Aviation Safety Analysis System (ASAS) |
| 3A05 | M24.00-00 | National Aviation Safety Data Analysis Center (NASDAC) |
| 3A09 | A20.00-00 | Integrated Flight Quality Assurance (IFQA) |
| 3A10 | A25.01-00 | System Approach for Safety Oversight (SASO) |
| 3A11 | A26.01-00 | Aviation Safety Knowledge Management Environment (ASKME) |

- **FAA Objective 2:** Reduce the number of fatal accidents in general aviation.
  - **FAA Performance Target:** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01E | M35.01-00 | General Aviation/Vertical Flight Technology – ATDP |
| 1A02B | M36.02-00 | Safe Flight 21 - Ohio Valley Prototype Project |
| 1A02C | M36.02-01 | Safe Flight 21 - Ohio Valley Prototype Project - Surface Moving Maps |
| 1A02D | S10.02-00 | Automatic Dependent Surveillance Broadcast (ADS-B) – ATDP |
| 1A03 | C20.03-00 | Aeronautical Data Link - Flight Information Service |
| 2C02A | A07.00-00 | FSAS Operational and Supportability Implementation System (OASIS) |
| 2C03 | F05.03-00 | AFSS Facilities Sustainment |
| 2D03 | N12.01-00 | Wide Area Augmentation System (WAAS) |
| 4A11 | A08.01-01 | NOTAMS Infrastructure / Distribution |

- **FAA Objective 3:** Reduce accidents in Alaska.
  - **FAA Performance Target:** By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01I | W10.01-00 | Juneau-Alaska Weather Research |
| 1A02A | M36.01-00 | Safe Flight 21 - Alaska Capstone Initiative |
| 1A02E | M08.31-00 | Alaska MIH and Video Equipment |
| 2E07 | C17.01-01 | Alaskan NAS Interfacility Communications System (ANICS) Satellite Network - Phase II |

- **FAA Objective 4:** Reduce the risk of runway incursions.
  - **FAA Performance Target:** By FY 2009, reduce the number of Category A and B (most serious) runway incursions to no more than 27, equivalent to a rate of 0.390 per million operations.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01B | S09.02-00 | Runway Incursion Reduction Program (RIRP) - ATDP |
| 2B01A | S09.01-00 | Airport Surface Movement Detection - Model X |
| 2B01B | S09.03-01 | Airport Surface Movement Detection - ASDE-3X – Upgrade ASDE 3 Sites with multilateration for initial 7 site/ADS-B |

- **FAA Objective 5:** Measure the safety of the U.S. civil aviation system with a composite index
  - **FAA Performance Target:** By FY 2006, implement a single, comprehensive index that provides a meaningful measure of the safety performance of the U.S. civil aviation system.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| None | None | Currently no Facilities & Equipment project support this Target |

- **FAA Objective 6:** Ensure the safety of commercial space launches.
  - **FAA Performance Target:** No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed space launch and reentry activities.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| None | None | Currently no Facilities & Equipment project support this Target |

- **FAA Objective 7:** Enhance the safety of FAA's air traffic systems.
  - **FAA Performance Target 1:** By 2009, reduce the number of Categories A and B (most serious) operational errors to no more than 563, equivalent to a rate of 3.15 per million activities.
  - **FAA Performance Target 2:** Apply safety risk management to at least 30 significant changes in the NAS.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01G | M08-32-01 | Safety Analysis and Assessment - ATDP |
| 3B02B | M20.01-00 | NAS Training – Equipment Modernization – Training Simulators |
| 4A02 | M08-32-02 | Safety Management System |

***** END OF INCREASE SAFETY STRATEGIC GOAL*****

## 2. STRATEGIC GOAL: GREATER CAPACITY

**FAA Strategic Goal:** Work with local governments and airspace users to provide capacity in the United States airspace system that meets projected demand in an environmentally sound manner.

- **FAA Objective 1:** Increase airport capacity to meet projected demand.
  - **FAA Performance Target 1:** Achieve an average daily airport capacity of 104,338 arrivals and departures per day by 2009 at the 35 OEP airports.
  - **FAA Performance Target 2:** Open as many as seven new runways, increasing the annual service volume of the 35 OEP airports by at least 1 percent annually, measured as a five-year moving average, through 2009.
  - **FAA Performance Target 3:** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01C | M08.28-00 | System Capacity, Planning, and Improvements - ATDP |
| 1A01D | M08.29-00 | Operations Concept Validation - ATDP |
| 1A01H | M08.27-00 | NAS Requirements Development |
| 1A01J | M08.28-02 | Airspace Management Lab – ATDP |
| 1A01K | M8.36-01 | Wake Turbulence |
| 1A04A | C21.01-01 | Next-Generation VHF A/G Communication System (NEXCOM) - Segment 1A |
| 1A04X1 | C21.01-02 | Next-Generation VHF A/G Communication System (NEXCOM) - Segment 1B |
| 1A04X2 | C21.01-01 | NEXCOM Segments 2 & 3 |
| 1A06 | A24.03-00 | Free Flight Phase Two (FFP2) - Traffic Management Advisor (TMA) - Single Center |
| 2A01A | A01.10-01 | En Route Automation Modernization (eRAM) |
| 2A01B | A01.10-02 | En Route Automation Modernization - ERAM - Radar Position Tech Refresh - R Side Upgrades |
| 2A01X | A01.10-03 | En Route Automation Program - ERAM – Tech Refresh ERAM/ERIDS |
| 2A02 | A01.12-01 | En Route Automation Program - En Route Communications Gateway (ECG) |
| 2A02X | A01.12-02 | En Route Automation Program - En Route Communications Gateway (ECG) – Technology Refresh |
| 2A03 | A01.09-01 | En Route Automation Program - En Route System Modification |
| 2A04A | A01.07-01 | En Route Automation Program - En Route Enhancements |
| 2A04C | A01.13-01 | En Route Automation Program - FAA Aeronautical Training System (IATS) |
| 2A05 | W02.02-00 | Next Generation Weather Radar (NEXRAD) - Open System Upgrades |

***(Continued)***

- **FAA Objective 1:** Increase airport capacity to meet projected demand. (continued)

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 2A06A | W04.02-00 | Weather and Radar Processor (WARP) - Stage 3 - Sustain Weather Ops |
| 2A06B | W04.03-00 | Weather and Radar Processor (WARP) – WARP Replacement |
| 2A07 | F06.01-00 | ARTCC Plant Modernization/Expansion - ARTCC Modernization |
| 2A08 | C01.02-01 | Voice Switching and Control System (VSCS) - Tech Refresh |
| 2A10A | C06.01-00 | Communications Facilities Enhancement - Expansion |
| 2A10B | C06.03-00 | Communications Facilities Enhancement - Air/Ground Communications RFI Elimination |
| 2A10C | C06.04-00 | Communications Facilities Enhancement - UHF Replacement |
| 2A10D | C04.00-00 | Radio Control Equipment (RCE) |
| 2A11A | S02.03.00 | Secondary Surveillance - ATC Beacon Interrogator (ATCBI) Replacement |
| 2A11X | S02.03-02 | Air Traffic Control Beacon Interrogator (ATCBI-6) - Beacon Only Buildings |
| 2A12 | S04.02-03 | Long Range Radar (LRR) Program - LRR Improvements - Infrastructure Upgrades |
| 2A13 | M08.05-00 | Continued General Support – Regional Projects |
| 2A14A | W07.01-00 | Integrated Terminal Weather System (ITWS) - ITWS Development/Production |
| 2A16 | F25.00-00 | Relocate Guam CERAP |
| 2B03A | A04.01-00 | Standard Terminal Automation Replacement System (STARS) Development and Procurement |
| 2B03B | A04.01-02 | STARS Phase 1 - Terminal Enhancement |
| 2B03C | A04.01-01 | STARS Phase 1 - Technical Refresh |
| 2B03X | A04.04-00 | Terminal Automation Modernization - Phase 2 & 3 |
| 2B04A | A03.04-01 | Terminal Sustainment |
| 2B04B | A01.11-01 | Flight Data Input/Output (FDIO) Replacement |
| 2B05 | F01.02-00 | ATCT/TRACON Establish/Sustain/Replace - ATCT/TRACON Replacement |
| 2B06A | F01.01-00 | ATCT/TRACON Establish/Sustain/Replace - ATCT/TRACON Modernization |
| 2B06B | F01.01-01 | ATCT/TRACON Establish/Sustain/Replace - STARS Facility Upgrades |
| 2B06C | F02.10-00 | Large TRACONs - Advanced Facility Planning |
| 2B07 | C05.02-00 | Enhanced Terminal Voice Switch (ETVS) |
| 2B09 | F02.11-01 | Large TRACONs - Houston Area Air Traffic System (HAATS) |
| 2B11A1 | S03.01-04 | Terminal Radar (ASR) Program - ASR-9/Mode S SLEP, Phase 1A |
| 2B11A2 | S03.01-05 | Terminal Radar (ASR) Program - ASR-9/Mode S SLEP, Phase 1B |
| 2B11A3 | S03.01-06 | Terminal Radar (ASR) Program - ASR-9/Mode S SLEP, Phase 2 |
| 2B13A | S03.02-01 | Terminal Digital Radar (ASR-11) - ASR-7/ASR-8 Replacement, DOD Takeover, New establishments |
| 2B13X | S03.02-04 | Terminal Radar (ASR) Program – ASR-11 – Tech Refresh |

***(Continued)***

- **FAA Objective 1:** Increase airport capacity to meet projected demand. (continued)

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 2B14 | F04.01-00 | DOD/FAA ATC Facility Transfer/Modernization - Original Program |
| 2B15 | S08.00-00 | Precision Runway Monitor (PRM) |
| 2B16A | M08.05-00 | Continued General Support – Regional Projects |
| 2C01A | W01.02-02 | Automated Surface Observing System (ASOS) - Product Improvements |
| 2C01B | W01.02-04 | Automated Surface Observing System (ASOS) - ASOS - Data Displays |
| 2D01 | N06.00-00 | VORTAC |
| 2D02A | N03.01-00 | Instrument Landing Systems (ILS) - Instrument Landing Systems (ILS) |
| 2D04 | N08.02-00 | Runway Visual Range (RVR) - Replacement/Establishment |
| 2D07 | N09.00-00 | Distance Measuring Equipment (DME) - Sustain |
| 2D08 | N04.01-00 | Visual Navaids - Visual Navaids for New Qualifiers |
| 2D09 | A14.00-00 | Instrument Approach Procedures Automation (IAPA) |
| 2D10 | N04.04-00 | Visual Navaids - Sustain, Replace, Relocate |
| 2E02A | F12.00-00 | FAA Buildings & Equipment Sustain Support - Modernize/ Improve |
| 2E02B | F12.01-01 | Seismic Safety Risk Mitigation |
| 2E03 | F11.00-00 | Power Systems Sustained Support |
| 2E06 | F10.00-00 | Airport Cable Loop Systems Sustained Support |
| 3A04 | M17.00-00 | Test Equipment Modernization/Replacement |
| 4A03 | M08.06-00 | Continued General Support - Program Support Leases |
| 4A07A | M15.01-00 | NAS Spectrum Engineering Management - NAS Spectrum Engineering Sustained Support |
| 4A07B | M15.02-00 | NAS Spectrum Engineering Management - Frequency Interference Support/Resolution |

- **FAA Objective 2:** Increase or improve aviation capacity in the eight major metropolitan areas and corridors that most affect total system delay. For 2005, those areas are: New York, Philadelphia, Boston, Chicago, Washington/Baltimore, Atlanta, Los Angeles Basin, and San Francisco.
  - **FAA Performance Target 1:** Achieve an average daily airport capacity for the eight major metropolitan areas at 44,428 arrivals and departures per day by 2009.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 4A08 | X02.00-00 | Permanent Change of Station (PCS) |

***(Continued)***

- **FAA Objective 3:** Increase on-time performance of scheduled carriers.
  - **FAA Performance Target 1:** Through FY 2009, achieve an 86.9 percent on-time arrival for all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late due to NAS related delays.
  - **FAA Performance Target 2:** Beginning in FY 2005, increase the number of oceanic en-route altitude change requests that are granted through the end of FY 2009 to 80 percent.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A01A | M08.28-01 | Separation Standards - ATDP |
| 1A05 | A24.02-00 | Free Flight Phase Two (FFP2) - User Request Evaluation Tool (URET) |
| 2A09B | A05.01-10 | Collaborative Air Traffic Management Technologies |
| 2A09A | A05.01-06 | Air Traffic Management (ATM) - TFM Infrastructure - Infrastructure Modernization |
| 2A17 | A10.03-00 | Advanced Technologies and Oceanic Procedures (ATOP) |
| 2E04 | M08.04-00 | Continued General Support - Air Navigation Aids Facilities – Local Projects |
| 4A10 | M03.02-00 | CIP Systems Engineering & Technical Assistance - MITRE |

- **FAA Objective 4:** Address environmental issues associated with capacity enhancements.
  - **FAA Performance Target 1:** Reduce the number of people exposed to significant noise by 1 percent per year through FY 2009, as measured by a three-year moving average, from the three-year average for calendar years 2000-2002
  - **FAA Performance Target 2:** Improve aviation fuel efficiency per revenue plane-mile by 1 percent per year through FY 2009, as measured by a three-year moving average, from the three-year average for calendar years 2000-2002

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| None | None | Currently no Facilities & Equipment project support these Targets |

*****END OF GREATER CAPACITY STRATEGIC GOAL*****

## 3. STRATEGIC GOAL: INTERNATIONAL LEADERSHIP

**FAA Strategic Goal:** Increase the safety and capacity of the global civil aerospace system in an environmentally sound manner.

- **FAA Objective 1:** Promote improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners.
  - **FAA Performance Target 1:** Advance U.S. aviation safety leadership in developing regions by significantly increasing safety infrastructure in 10 priority countries by 2009 through implementation of model law and regulations for safety oversight, extensive technical assistance and training activity, and concluding bilateral agreements.
  - **FAA Performance Target 2:** Conclude four new or expanded bilateral agreements with current partners.
  - **FAA Performance Target 3:** Secure an increase of 20 percent every year in intellectual and financial assistance for international aviation activities from the United States and international government organizations, multilateral banks, and industry.
  - **FAA Performance Target 4:** Promote the creation of four new regional aviation authorities or organizations capable of meeting globally accepted safety and efficiency standards.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| None | None | Currently no Facilities & Equipment project supports this Objective and Performance Targets |

- **FAA Objective 2:** Promote seamless operations around the globe in cooperation with bilateral, regional, and multilateral aviation partners.
  - **FAA Performance Target 1:** Expand the utilization of U.S. NAS technologies and procedures to six priority countries
  - **FAA Performance Target 2:** Ensure that international environmental standards, recommended practices, and guidance material adopted by ICAO are globally and uniformly applied, reflect the best available technology that can be integrated into the fleet, provide real environmental benefit, are economically sound, and take interdependencies between environmental parameters into account.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 2D11A | N04.02-00 | Visual Navaids - Replace VASI with PAPI |

*****END OF INTERNATIONAL LEADERSHIP STRATEGIC GOAL*****

## 4. STRATEGIC GOAL: ENVIRONMENTAL STEWARDSHIP

**DOT Strategic Goal:** Reduce pollution and other adverse effects of transportation and transportation facilities.

- **DOT Objective 1:** Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 2B08A | F13.03-00 | Tower Fire Life Safety |
| 2B08B | F13.03-00 | OSHA/Environmental Standards Compliance |
| 2E01 | F13.01-00 | NAS Facilities OSHA & Environmental Standards Compliance - Fuel Storage Tanks |
| 3A01 | F13.02-00 | NAS Facilities OSHA & Environmental Standards Compliance - Environmental Cleanup / HAZMAT |

*****END OF ENVIRONMENTAL STRATEGIC GOAL*****

## 5. STRATEGIC GOAL: HOMELAND AND NATIONAL SECURITY

**DOT Strategic Goal:** Balance homeland and national security transportation requirements with the mobility needs of the Nation for personal travel and commerce.

- **DOT Objective 1:** Support and implement U.S. security strategies and plans related to transportation.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 3A06 | C18.00-00 | National Airspace System Recovery Communications (RCOM) |
| 3A07 | F24.00-00 | Facility Security Risk Management |
| 3A08 | M31.00-00 | NAS Information Security - Information Systems Security |

*****END OF SECURITY STRATEGIC GOAL*****

## 6. STRATEGIC GOAL: ORGANIZATIONAL EXCELLENCE

**FAA Strategic Goal:** Ensure the success of the FAA's mission through stronger leadership, a better trained workforce, enhanced cost-control measures, and improved decision-making based on reliable data.

- **FAA Objective 1:** Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.
  - **FAA Performance Target 1:** Increase Employee Attitude Survey scores in the areas of management effectiveness and accountability by at least 5 percent.
  - **FAA Performance Target 2:** Directly relate 100 percent of all employee performance plans to FAA strategic goals and their organization's performance plans.
  - **FAA Performance Target 3:** Reduce the time it takes to fill mission-critical positions by 20 percent over the FY 2003 baseline.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 2A18 | M29.00-00 | ATOMS Local Area/Wide Area Network |
| 3B02A | M20.00-00 | National Airspace System (NAS) Training - Modernization |
| 3B03 | M10.00-00 | Distance Learning |

- **FAA Objective 2:** Control costs while delivering quality customer service.
  - **FAA Performance Target 1:** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.
  - **FAA Performance Target 2:** Close out 85 percent of cost reimbursable contracts during each fiscal year.

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 1A07 | F14.00-00 | NAS Improvement of System Support Laboratory |
| 1A08 | F14.00-00 | Technical Center Facilities |
| 1A09 | F16.00-00 | William J. Hughes Technical Center Infrastructure Sustainment |
| 2A15 | C26.01-00 | FAA Telecommunications Infrastructure |
| 2B10 | M07.02-00 | NAS Infrastructure Management System (NIMS) - Phase 2 |
| 3A03 | M21.03-00 | Logistics Support Systems & Facilities (LSSF) - Asset and Supply Chain Management |
| 3B01 | F18.00-00 | Aeronautical Center Infrastructure Modernization |
| 4A01A | M03.01-00 | CIP Systems Engineering & Technical Assistance - SETA and Other Contractors |
| 4A01C | M08.01-00 | Continued General Support - Provide ANF/ATC Support (Quick Response) |
| 4A01B | M03.01-01 | Web/CM |
| 4A01D | M45.01-00 | Market Based Competitive Sourcing |

***(Continued)***

- **FAA Objective 2:** Control costs while delivering quality customer service. (Continued)

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| 4A04 | M05.00-00 | NAS Regional/Center Logistics Support Services |
| 4A05 | F19.00-00 | Mike Monroney Aeronautical Center – Leases |
| 4A06 | M22.00-00 | NAS Implementation Support Contract (NISC) |
| 4A09 | M02.00-00 | Technical Support Services Contract (TSSC) |

- **FAA Objective 3:** Make decisions based on reliable data to improve our overall performance and customer satisfaction.
  - **FAA Performance Target 1:** By FY 2009, 90 percent of major system acquisition investments are within 10 percent of budget.
  - **FAA Performance Target 2:** By FY 2009, 90 percent of major system acquisition investments are on schedule.
  - **FAA Performance Target 3:** Achieve 90 percent of all performance targets in the Flight Plan
  - **FAA Performance Target 4:** Increase agency scores on the American Customer Satisfaction Index.
  - **FAA Performance Target 5:** Achieve zero cyber security events that significantly disable or degrade FAA services

| FY 2006 BLI | CIP # | CIP Name |
|---|---|---|
| None | None | Currently no Facilities & Equipment project supports this Objective and Performance Targets |

*****END OF ORGANIZATIONAL EXCELLENCE STRATEGIC GOAL*****

# Federal Aviation Administration

# National Airspace System

# Capital Investment Plan

# Appendix B

# Fiscal Years 2006 – 2010

# APPENDIX B

# DETAILED PROGRAM PLAN DATA

## LINKING FAA CIP PROJECTS TO GOALS

As stated in Appendix A, this year's Capital Investment Plan (CIP) projects are connected to the goals, objectives, and performance targets in the FAA Flight Plan 2005-2009. Since projects are linked to a single objective, the data provided in Appendix B describes how these projects contribute to the performance targets under those objectives.

## FORMAT

Appendix B is organized by budget line item (BLI) consistent with the President's Budget to Congress for fiscal year (FY) 2006. Several CIP projects may be included in one BLI. In those cases, when all of the CIP projects pertain to one specific purpose, they are grouped. However, when the CIP projects have different purposes, they are described with separate CIP entries.

Programs/projects in Appendix B contain a Program Description and Relationship to Performance Target description. FY 2006 Performance Output Goals and FY 2007-2010 Performance Output Goals for all Facilities and Equipment (F&E) funded CIP projects are reported as outlined below.

***BLI numbers with an X (i.e., 1A09X) are used to designate programs/projects that are not in the FY 2006 President's Budget (Facilities & Equipment). Accordingly, their inputs are reflected as follows:***

- Programs/projects representing new starts or future programs not currently in the President's budget will report future year Performance Output Goals based on projected funding.

***CIP Programs/projects are required to reflect FY 2006-2010 Performance Output Goals, with the exception of the following:***

- Programs/projects that do not exceed $5M annually.
- Programs/projects that fund support contracts (such as CAASD, SETA, NISC) or fund program support leases.

**Where, 'None' is reflected in the 2006-2010 Performance Output Goals sections, it denotes that no funding was allocated for that fiscal year.**

## EXAMPLE

The following example illustrates how the project data provided is used to support the FAA Flight Plan Goal, Objective, and Performance Target, along with a sample format of CIP project inputs:

## PROGRAM DESCRIPTION

Airport Surface Detection Equipment – Model X (ASDE-X) is a modular surface surveillance system capable of processing radar, multilateration, and Automatic Dependent Surveillance-Broadcast (ADS-B) sensor data that provides seamless airport surface surveillance to air traffic controllers. The ASDE-X system was designed….

## RELATIONSHIP OF PROGRAM TO FAA STRATEGIC GOAL, OBJECTIVE, AND PERFORMANCE TARGET

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 4 –** Reduce the risk of runway incursions.
- **FAA Performance Target –** By FY 2009, reduce the number of Category A and B (most serious) runway incursions to no more than 27, equivalent to a rate of 0.390 per million operations.

## RELATIONSHIP TO PERFORMANCE TARGET

The reduction in runway incursions will be accomplished through the use of a modular surface surveillance system capable of processing radar, multilateration, and automatic dependent surveillance broadcast sensor data. The result will be increased airport safety through enhanced situational awareness.

## PROGRAM PLAN FY 2006 – PERFORMANCE OUTPUT GOALS

- Deliver and install 3 out of 28 ASDE-X units and achieve operational readiness on 1 site.

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# ACTIVITY 1: ENGINEERING, DEVELOPMENT, TEST, AND EVALUATION

## 1A01, ADVANCED TECHNOLOGY DEVELOPMENT AND PROTOTYPING

**FY 2006 Request $38.5M**

- A, Separation Standards – ATDP, M08.28-01
- B, Runway Incursion Reduction Program (RIRP) – ATDP, S09.02-00
- C, System Capacity, Planning, and Improvements – ATDP, M08.28-00
- D, Operations Concept Validation – ATDP, M08.29.00
- E, General Aviation / Vertical Flight Technology – ATDP, M35.01-00
- F, Safer Skies – ATDP, M42.01-00
- G, Safety Analysis and Assessment, M08.32-01
- H, National Airspace System Requirements Development – ATDP, M08.27-00
- I, Juneau Airport Wind System (JAWS), Alaska Weather Research, W10.01-00
- J, Airspace Management Lab – ATDP, M08.28-02
- K, Wake Turbulence, M08.36-01

### A, SEPARATION STANDARDS – ATDP, M08.28-01

### Program Description

The Separation Standards program is the FAA's vehicle for exercising leadership in developing and implementing new separation standard values in the high-altitude international airspace within which it provides air traffic services, as delegated by the International Civil Aviation Organization (ICAO). The program implements the FAA's "Strategic Plan for Oceanic Airspace Enhancements and Separation Reductions," drawing on complementary contributions from FAA's Certification and Regulation element and from the Air Traffic Organization (ATO). Program contributions result in the introduction of reduced separation-standard values that permit aircraft operators to use airspace in a more fuel-efficient manner, while reducing operational complexity in providing of Air Traffic Control (ATC) service, as the result of increased airspace capacity. An extensive safety assessment takes place before implementation of each separation change, and ongoing monitoring occurs after the date of the change. Recent accomplishments are: (1) the decision to implement the Reduced Vertical Separation Minimum – or replacement of the existing 2,000-foot vertical separation standard with a 1,000-foot value - in all North American airspace on January 20, 2005; (2) conduct two task force meetings under FAA leadership (March and July 2004) to prepare for introduction of the Reduced Vertical Separation Minimum in all airspace of ICAO's Caribbean and South American Regions; and (3) participation in a South Pacific Task Force aimed at implementing 30-nautical mile (nm) lateral and longitudinal separation standards in preparation for introduction of the this change into a portion of FAA-administered airspace in the Pacific in late 2005. In the longer term, the program will seek to introduce reduced separation-standard values in West Atlantic and Caribbean airspace, and reduced horizontal-plane separation values in wider areas of the Pacific.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3 –** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 2 –** Beginning in FY 2005, increase the number of oceanic en-route altitude change requests that are granted through the end of FY 2009 to 80 percent.

### Relationship to Performance Target

The program, through provision of safety management support, implemented the North American Reduced Vertical Separation Minimum in January 2005. This action will ensure that this major airspace capacity

increase will continue to allow the opportunity for granting altitude-change requests. The program also aims to introduce, incrementally, 30-nm lateral and longitudinal separation standards in Pacific airspace through 2009, thereby increasing airspace capacity and enhancing the prospect for granting altitude-change requests.

## B, RUNWAY INCURSION REDUCTION PROGRAM (RIRP) – ATDP, S09.02-00

### Program Description

The RIRP conducts research, development, and operational evaluation of technologies to improve runway safety. In accordance with standing National Transportation Safety Board (NTSB) recommendations, research emphasis will continue to focus on cost-effective technologies for small airports that do not have a surface radar and alerting system, as well as on pilot, controller, and vehicle operator situational awareness aids. When appropriate, the program will develop a prototype and test effective solutions in an operational setting to validate technical performance and operational effectiveness.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 4 –** Reduce the risk of runway incursions.
- **FAA Performance Target –** By FY 2009, reduce the number of Category A and B (most serious) runway incursions to no more than 27, equivalent to a rate of 0.390 per million operations.

### Relationship to Performance Target

The RIRP contributes to safety objectives that will reduce runway incursions. Actions are underway to support resolution of open NTSB recommendations (A-00-66). These activities include continued research, development, and operational evaluation of technologies that will improve runway safety. In the near term, the RIRP will be conducting evaluations of existing and emerging low-cost technologies that enhance pilot and air traffic controller situational awareness using runway status lights and a ground marker system. A proof of concept will be developed that leads to a prototype ground movement safety infrastructure to provide direct warning capability to pilots, drivers, and controllers. The program will also conduct an integrated assessment of emergent runway safety technologies along with a simulation analyses to assess effectiveness, interoperability, and level of readiness for operational transition to a National Airspace System (NAS) ground movement safety infrastructure. These activities will provide vital information on runway safety technologies and their role in reducing fatal accidents and reducing the risk of runway incursions.

***Key Events FY 2006 – Performance Output Goals***

- Continue researching potential technology solutions for small to medium-sized airports.
- Continue developing performance standards and requirements for selected runway incursion reduction technologies.
- Conduct an operational evaluation of the Runway Status Lights prototype system
- Conduct an operational assessment of the enhanced lighting configuration.
- Develop system specifications for approved project(s).

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue researching potential technology solutions for small to medium-sized airports.
- Continue developing performance standards and requirements for selected runway incursion reduction technologies.
- Execute limited deployment of Runway Status Lights at two large airports.
- Transition approved projects to operational status.
- Develop system specifications for approved project(s).

# C, SYSTEM CAPACITY, PLANNING, AND IMPROVEMENTS – ATDP, M08.28-00

## Program Description

This program identifies, analyzes, and evaluates system capacity enhancements for the NAS and fosters an optimal operational environment for NAS users. Outputs include Airport Design Team Studies for the top 100 airports, performance measurement tools to assess NAS operations, and the Capacity Benchmark Report to measure capacity at 35 major airports. Such projects, in conjunction with other capacity-enhancing program activities, support improvement of the ATC system and advancement of the FAA's overall performance. Following are the six major program activities.

1. The Capacity Benchmark Report analyzes system capacity at the 35 Operational Evolution Plan (OEP) airports. The report documents the number of flights that these airports can handle under optimum and less than optimum weather conditions. The report also projects future capacity based on plans for new runways, revised air traffic procedures, and technology improvements.
2. The Performance Data Analysis and Reporting System (PDARS) is a fully integrated performance measurement tool. This system extracts radar data from the Host Computer System (HCS) or Automated Radar Terminal System (ARTS) computers and processes and distributes the data to FAA facilities via a secure Intranet. PDARS gives analysts a set of interactive tools that can access the distributed database of operational data to measure, analyze, and report system performance.
3. Airport Capacity Enhancement/Design Studies investigate capacity and delay issues at major airports within the NAS. Through computer simulation and modeling, the FAA works with airports and other aviation industry stakeholders to conduct studies to seek alternatives for increasing capacity at airports that encounter flight delays and heavy traffic congestion. Currently, studies are being conducted to determine the impact on capacity by adding a sixth runway at the Hartsfield Atlanta and George Bush International Airports.
4. The International Terminal Benchmarking Study links a series of bilateral comparisons of U. S. terminal facilities with similar facilities worldwide. The process pairs a particular U.S. airport with a participating foreign airport. Through a comparable analysis of staffing, operational, and facility cost data, the FAA can compile a set of measurable performance metrics and gain a firm understanding of the relative performance of the agency's terminal service.
5. The Air Traffic Organization (ATO) Strategic Management Process provides the framework for developing, communicating, implementing, and managing ATO strategy by developing and linking strategic objectives, performance targets/metrics, initiatives, and resources from the executive to the field levels of the organization. This business tool will be designed, developed, and implemented at the ATO corporate level and each service unit for the service unit to efficiently and effectively formulate and execute ATO Strategy.
6. New Large Aircraft participation includes modeling, analysis, and procedural development services to assess the potential impact of the Airbus 380 aircraft.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

This program will facilitate the design and improvements of new runways, air traffic procedures, and other technological solutions to increase airport capacity. Additionally, the program examines arrival rates, departure rates, and demand to determine how efficiently airports respond to current traffic conditions. It will also modernize the NAS with facilities management tools to create new efficiencies in the operating system to increase system capacity.

***Key Events FY 2006 – Performance Output Goals***

- Complete the Airfield Delay Simulation model outputs.
- Conduct operational simulation at the Airways Facilities Tower Integration Lab for John F. Kennedy International Airport.
- Draft the operational procedures for the Airbus 380 aircraft.
- Identify data sources, collect baseline data, conduct gap analysis and establish performance targets for each ATO Terminal service unit and ATO Terminal facility-level performance measures.
- Develop a Web-based software application infrastructure to provide the ATO Terminal Service Unit Leadership teams centralized access to Terminal cost and performance information.

***Key Events FY 2007-2010 – Performance Output Goals***

- Conduct the Airfield Delay Simulation National Goal Forecasting.
- Complete the Simulation Model performance model outputs.
- Develop a Web-based software application infrastructure to provide the ATO Flight Service Unit Leadership teams centralized access to Terminal cost and performance information.
- Integrate PDARS outputs with other measurement systems to provide automated performance information to FAA executives.

## D, OPERATIONS CONCEPT VALIDATION – ATDP, M08.29.00

### Program Description

Operational Concepts are the first step in the Enterprise Architecture process as recommended by the Office of Management and Budget (OMB). This program develops and does initial validation of operational concepts that are key to ATO's modernization programs. The program office works with stakeholders to develop and maintain the RTCA "NAS Concept of Operations and Future Vision" and the International Civil Aviation Organization (ICAO) "ATM Global Concept", which are common reference points for modernization. It also provides the detailed second level concepts required for validation and requirements development. Examples of second level concepts include those for En Route, Traffic Flow Management (TFM), Surface, Communications, and Flight Data Management. 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. This information helps the aviation community to develop new procedures and anticipate the changes in aircraft equipment to use with new technology being implemented in the NAS. Information developed includes system specification, roles and responsibilities, procedures, training, and certification requirements. The operational concept development and validation outputs provide for continued development and support of NAS modernization through: (1) concept/scenario development; (2) concept validation; (3) simulation and analysis; (4) system design; (5) metric development; and (6) modeling.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship to Performance Target

Developing the operational procedures early in the design phase of new equipment reduces the number of adaptations and allows users to prepare in advance for implementing technology that will increase capacity and reduce delays.

***Key Events FY 2006 – Performance Output Goals***

- Expand the concept of splitting en route operations into high airspace/low airspace to improve productivity and training efficiency through the analysis of cognitive and situational awareness issues, such as the local knowledge requirements and decision support.
- Conduct an analysis and develop the concept to support de-emphasizing geographic dependency in facilities that include splitting front and back rooms of ATC facilities and the related impact on cross facility coordination (terminal and en route).
- Deliver a Concept of Use for future flight data management in a System Wide Information Environment including the Flight Object.
- Apply the performance framework for concepts including Required ATM System Performance and Real-Time Streaming Protocol.
- Validate the Flight Object Concept of Use and its relation to Common Trajectory Management to ensure completeness and harmonization of the definition for integration into ground and airborne decision support systems in the US and Europe.
- Expand the performance framework for Required ATM System Performance and Real-Time Streaming Protocol by incorporating and expanding next level metrics such as Required Navigation Performance, Required Surveillance Performance and Required Communications performance to support the move from technology based procedures to a Performance based NAS.
- Continue RTCA support.

***Key Events FY 2007-2010 – Performance Output Goals***

- Expand the concept development and validation to include increased opportunities to right size the ATC infrastructure for cost-efficiency and productivity.
- Expand the gate-to-gate concept for increased coordination and integration of operations across time horizons in a net-centric System Wide Information Management environment.
- Develop criteria for evaluation of the standard controller platform to support reduced maintenance, training, and increased flexibility in establishing and implementing changes to controller roles and responsibilities.
- Continue RTCA support.

## E, GENERAL AVIATION / VERTICAL FLIGHT TECHNOLOGY – ATDP, M35.01-00

## Program Description

The General Aviation/Vertical Flight Technology (GAVF) program conducts research to adapt satellite navigation and automatic dependent surveillance technology for use of light general aviation aircraft and helicopters in low altitude airspace; develops instrument approach and departure procedures for heliports; and evaluates cockpit technology to enhance pilot situation awareness. Procedures and regulations are developed to separate slower, highly maneuverable aircraft from transport aircraft, thereby improving safety while increasing overall system capacity and reducing delays. This program also evaluates techniques that enable aircraft operating under visual flight rules to navigate at a higher level of precision and awareness of the proximity of other aircraft and obstacles.

In FY 2006, the GAVF program will complete standards development testing for rotorcraft steep approaches and departures. Testing will be initiated to develop complex approaches to safely avoid obstacles and reduce noise in populated areas. Work will be continued on developing and implementing simultaneous and non-interfering helicopter operations in a congested major terminal area. Tests will be conducted to determine the feasibility of safely reducing simultaneous and non-interfering route widths based on Global Positioning System Wide Area Augmentation System capabilities. Research will continue into improving lighting standards for heliports. Both the heliport approach and lighting work also support U.S. positions in ICAO standards negotiations. Research to provide information for guidance materiel for approval and use of enhanced vision equipment will be conducted.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The GAVF program contributes to the FAA's general aviation safety goal by expediting implementation of satellite navigation and automatic dependent surveillance technology for use of light general aviation aircraft and helicopters to reduce controlled flight into terrain accidents and midair collisions. Satellite navigation technology also permits development of instrument approaches to heliports, which will reduce landing accidents. The program also addresses the safety issue related to helicopters using the same routes, approaches, and airport runways as transport aircraft.

# F, SAFER SKIES – ATDP, M42.01-00

## Program Description

Safer Skies stems from a joint effort between the FAA and users to reduce aviation accident rates by analyzing causes of accidents, evaluating pilot actions, and evaluating equipment failures and then developing and implementing intervention strategies to prevent or reduce factors that cause most aviation accidents. The FAA and its partners (industry representatives, other Government agencies, and employee groups) have identified 12 Safer Skies focus areas, many interventions, and numerous safety activities. Commercial accident-reduction efforts involve six focus areas: Approach/Landing Accident Reduction (ALAR), Controlled Flight Into Terrain (CFIT), Uncontained Engine Failure, Runway Incursion, Loss of Control, and Commercial Weather Needs. General aviation focus areas include CFIT, Weather, Runway Incursion, Aeronautical Decision Making, Loss of Control, and Survivability as they pertain to general aviation aircraft. Each focus area contains many interventions; each intervention in turn may contain many additional specific activities and product deliverables.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The Safer Skies program contributes to the FAA's safety goal by analyzing causes of accidents and developing and implementing intervention strategies to prevent or reduce factors that are the leading causes of aviation accidents. The recommendations support capital investments in the focus areas identified by Safer Skies, and these investments are approved based on an economic analysis that shows benefits will exceed costs.

***Key Events FY 2006 – Performance Output Goals***

- Develop for Mountain Pass Program 25 additional approach charts and text information to allow safe navigation of mountain passes by general aviation.
- Assess existing and emerging weather-related technologies that affect commercial and general aviation operations.

- Continue developing and implementing Safer Skies interventions for commercial and general aviation in areas of CFIT, Runway Incursion, ALAR, Loss of Control, and Weather focus areas.
- Conduct modeling scenarios and develop guidance/implementation materials relevant to the evolution to a performance-based NAS using Required Navigation Performance (RNP), Required Communication Performance (RCP), Required Surveillance (RSP) and Global Navigation Satellite Systems (GNSS) and operations.
- Continue reviewing and analyzing the Traffic Alert and Collision Avoidance System for logic issues; support development and implementation of revisions.

***Key Events FY 2007-2010 – Performance Output Goals***

- Develop for Mountain Pass Program 25 approach charts and text information to allow safe navigation of mountain passes by general aviation.
- Continue Weather Programs, assessing existing and emerging weather-related technologies that affect commercial and general aviation operations.
- Continue developing and implementing Safer Skies interventions for commercial and general aviation in areas of CFIT, Runway Incursion, ALAR, Loss of Control, and Weather focus areas.
- Conduct modeling scenarios and develop guidance/implementation materials relevant to the evolution to a performance-based NAS using RNP, RCP, RSP and GNSS and operations.

## G, SAFETY ANALYSIS AND ASSESSMENT - ATDP, M08.32-01

## Program Description

The Safety Analysis and Assessment program brings FAA NAS acquisitions into compliance with the Safety Management System (SMS) requirements defined by the ICAO. The program will modify the Acquisition Management System (AMS) to meet or exceed internal FAA and external ICAO requirements for an SMS. Safety assessments required to meet the upgraded AMS guidance will conform to the standards set by this program. This program also supports operation of the NAS Modernization System Safety Working Group, which ensures the high quality of NAS safety products and provides tools and assistance to programs in executing their individual and integrated safety program plans.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 7 –** Enhance the safety of FAA's air traffic systems.
- **FAA Performance Target 2 –** Apply safety risk management to at least 30 significant changes in the NAS.

## Relationship to Performance Target

This program contributes to the FAA's performance target of applying "SMS to all significant changes to the NAS" by ensuring that the FAA has an operational SMS for acquisitions that is integrated with and a part of the FAA's overall SMS program. This program will directly affect the FAA's ability to manage the safety risk inherent in operating and modernizing the NAS as required by FAA orders and ICAO requirements.

***Key Events FY 2006 – Performance Output Goals***

- Design, develop, and deliver tool modules to be used to conduct safety risk management.

***Key Events FY 2007-2010 – Performance Output Goals***

- Develop and disseminate additional SMS/Safety Risk Management guidance materials, tools, and lessons learned across ATO/FAA.

## H, NATIONAL AIRSPACE SYSTEM REQUIREMENTS DEVELOPMENT – ATDP, M08.27-00

### Program Description

The NAS Requirements Development program provides specifications that are used for identifying and evaluating new technologies to meet the needs of aerospace users and improve system efficiency. The program also develops plans and new procedures to transition from the existing technologies and practices to advanced capabilities that satisfy user needs and impact overall NAS system capacity. Extensive study and analysis are completed before an investment decision is made. Activities—such as operational concept development, sustainability analysis, simulation, human factors analysis, procedure development, performance definition, impact analysis, workload analysis, hazard analysis, and NAS architecture development—assist in providing the key discriminating factors for good investment decisions. Specific program examples include requirements development for runway incursion research and development efforts and Capstone initiatives.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship to Performance Target

The requirements development activity is integral to the success of air traffic modernization programs and therefore, supports programs that increase capacity.

## I, JUNEAU AIRPORT WIND SYSTEM (JAWS), ALASKA WEATHER RESEARCH, W10.01-00

### Program Description

This program aims to develop and deliver turbulence alert functionality using wind display systems at Juneau International Airport, Alaska. Plans include algorithm tuning, operation of the prototype, and development of the end-state system. JAWS provides data intended for use by non-meteorologists. Wind data from JAWS will be directly fed to the Juneau Airport Traffic Control Tower (ATCT). It will also feed the Juneau Automated Flight Service Station (AFSS), Juneau National Weather Service (NWS), and the Anchorage Center Weather Service Unit (Anchorage Air Route Traffic Control Center (ARTCC)). Wind data will be available to other Alaska aviation users such as Alaska Airlines and at end-state to the general aviation (GA) community via the Internet.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 3 –** Reduce accidents in Alaska.
- **FAA Performance Target –** By 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.

### Relationship to Performance Target

With improved information to the ATCT, aviation users may be able to avoid the hazards that are the major causes of accidents in Alaska.

## J, AIRSPACE MANAGEMENT LABORATORY – ATDP, M08.28-02

## Program Description

Airspace management and its technology support the FAA's plan to improve NAS efficiency and performance while sustaining the current high levels of safety. The NAS design (e.g., sectors and routes) must be reviewed continuously to identify performance improvement alternatives. It is essential that the agency deploy decision support tools and aeronautical data that will enable NAS performance improvements to be engineered for enhanced air traffic control flight operations. Therefore, the agency needs the capability to operate an analysis, data collection, modeling, measurement, and simulation tools laboratory that includes development and use of geo-spatial analysis tools, statistical methods for operations management and decision sciences, and environmental (noise) impact analysis tools.

This initiative will enhance the agency's ability to manage and use aeronautical information to support airspace management goals. Capabilities will include data collection, performance measures, analysis, and airspace redesign as well as standardization of aeronautical information and processes to support these functions. By focusing on aeronautical information management, data quality and workflow processes, this project will directly affect the success of current operations, area navigation (RNAV) development, and airspace design alternatives nationally and at local high-density traffic areas such as the New York metropolitan area.

Furthermore, the Airspace Management Laboratory is the FAA's primary collection point and repository for traffic information. The centralized collection of post-operational traffic data and metrics is used extensively within airspace management by many FAA organizations and throughout the U.S. Government for decision support. The lab develops environmental design tools that are used as part of an airspace project to mitigate aircraft noise and to reduce aircraft emissions. The lab's analytical and design capabilities facilitate using advanced air traffic control decision support tools to support agency NAS improvement initiatives.

Working with the National Geo-spatial Intelligence Agency and other FAA partners, Aeronautical Information Management (AIM) will converge on a single U.S. data model to produce, track, and distribute aeronautical data for the United States. Eurocontrol's Aeronautical Information Exchange Model (AIXM) will be the protocol to facilitate the convergence. The FAA is working with ICAO and our AIM partners to make version 5 of AIXM the first global aeronautical exchange mechanism.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1** – Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

This program provides process automation to support management and analysis of aeronautical data; develops and supports airspace tools that enable redesign and analysis of airspace and traffic flows; and, collects and manages traffic data used in analysis of airspace designs and for performance metrics.

Optimizing the NAS core capability is one of the FAA's highest priorities. The agency is investing in core capability ATC/ Air Traffic Management (ATM) decision support tools to improve system performance through increased flexibility, predictability and safety. The core tools depend heavily on high-quality data and the structure of the airspace. Supporting this initiative's data quality, modeling, and analysis capability goals will centralize national redesign activities and maximize the effect of implementing capability enhancements. This initiative will benefit the American public by improving system efficiency through the use of airline-desired flight profiles. In turn this will reduce airline operating costs and flight delays. Within the domain of system redesign and maturity, savings due to reduced air traffic control operating

costs will be realized by better balancing workload demand generated by user-desired flight profiles and by reducing facility operating costs.

***Key Events FY 2006 – Performance Output Goals***

- Continue developing the AIM Integration of NAS Resources and Obstruction Evaluation/Airport Airspace Analysis exports to a composite geo-spatial U.S. AIM system.
- Begin integrating AIM areas into a single composite geo-spatial AIM system.
- Enable all FAA-connected facilities to be capable of analyzing local airspace and traffic issues using a single integrated system.
- Standardize security, workflow, and processing for all airspace management AIM processes.
- Evaluate performance (using airspace metrics) with advanced drill-down capabilities for all FAA points of delivery from terminal to center.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue converting AIM deliverables to be based on U.S. AIM systems.
- Continue integrating tools and workflow for all AIM users within FAA headquarters, regions and ATC facilities.
- Enhance workflow processes within local facility airspace offices and integrate them with AIM system, enabling International Organization for Standardization 9000 convergence.
- Distribute AIM aeronautical data to NAS systems via an extended AIXM model.

## K, WAKE TURBULENCE, M08.36-01

## Program Description

This program will develop air traffic control decision support tools and the supporting infrastructure to safely reduce the wake turbulence spacing between aircraft departing on an airport's closely spaced parallel runways. National Aeronautics and Space Administration (NASA) is exploring various concepts for the departure spacing decision support tool and will develop a prototype for evaluation in FY 2006. The prototype will be evaluated in an airport environment but will not be immediately integrated into the NAS. If successful, the Wake Turbulence Program will initiate the development engineering to integrate the prototype's capabilities into the NAS. Implementation of the integrated capability is planned for FY 2010 after an extensive 2-year evaluation.

The Wake Turbulence Program has also developed a pulsed Light Detection And Ranging system that is able to track aircraft-generated wake vortices. This sensor and others collect detailed information on how wake vortices travel and decay in varying weather conditions. NASA will use this information in designing its prototype decision support tool and associated supporting system (including new sensors).

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1** – Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

The Wake Turbulence Program is using results from the research program to develop changes to air traffic control wake turbulence procedures during FY 2006. The changes would allow more arrivals on an airport's closely spaced parallel runways during inclement weather. These near-term changes will not require new NAS infrastructure capabilities.

The FY 2006 requested funding is for development and implementation of a more comprehensive wake prediction and monitoring capability. This capability will require a decision support tool for the air traffic

controller and additional weather sensors for the airport. This technology will provide more benefits than the near-term procedures by allowing more departures at closely spaced runways.

***Key Events FY 2006 – Performance Output Goals***

- Assess the winds in the airport area as a predictor of the transport of a departing aircraft's wake turbulence.
- Evaluate NASA's initial wake separating air traffic control decision support tool prototype (and associated sensor suite) for departing aircraft.
- Develop the computer-human interface for the NASA air traffic control decision support tool prototype.
- Provide development support for pulsed Light Detection And Ranging to detect and track wake turbulence from departing aircraft.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

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## 1A02, SAFE FLIGHT 21 (SF-21)

**FY 2006 Request $33.0M**

- A, Safe Flight 21 – Alaska Capstone Initiative, M36.01-00
- B, Safe Flight 21 – Ohio Valley Prototype Project, M36.02.00
- C, Safe Flight 21 – Ohio Valley Prototype Project - Surface Moving Map, M36.02-01
- D, Automatic Dependent Surveillance Broadcast (ADS-B) – Advanced Technology Development and Prototyping, S10.02-00
- E, Alaska MIH & Video Equipment, M08.31-00

### A, SAFE FLIGHT 21 – ALASKA CAPSTONE INITIATIVE, M36.01-00

### Program Description

The Safe Flight 21 Alaska Capstone Initiative provides an improved ground and air infrastructure that furnishes pilots better information about the location and severity of hazardous weather, proximity to terrain, improved instrument approaches to small airports, and traffic situations to reduce accidents. Additionally, the Capstone program provides improved surveillance information to controllers to assist them in sequencing, separation, flight following, and search and rescue activities. A more useable Instrument Flight Rules infrastructure will be provided to enable lower en route and approach/departure routes. The Capstone program is demonstrating the use of ADS-B communication links for two-way communication to and from an aircraft. ADS-B provides a link to transmit the aircraft position determined from onboard navigation systems to an air traffic control facility, and information on weather and other aircraft in the area is transmitted from a ground-based transceiver to the pilot.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 3 –** Reduce accidents in Alaska.
- **FAA Performance Target –** By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.

### Relationship to Performance Target

The Alaska Capstone program is contributing to the safety objective through a three-phase approach affecting Bethel, Southeast Alaska, and eventually the entire state. The program will optimize access to

minimum en route altitudes along existing routes and add new instrument procedures in Southeast Alaska, initiating enhanced capabilities for pilots to see and avoid other aircraft using ADS-B. With improved information in the cockpit, pilots will be able to avoid the hazards that are the major causes of accidents in Alaska. This information is provided by a terrain database in the aircraft and a moving map to show pilots the proximity of hazardous terrain and broadcast information that fills in the surveillance gaps within a state that has less aviation infrastructures than more populous states.

***Key Events FY 2006 – Performance Output Goals***

- Assist in procuring and installation of ADS-B avionics in participating aircraft throughout the state.
- Install and commission minimum operational performance standards compliant for ADS-B ground-based transceivers at additional locations throughout the state.
- Begin certification of a wide-area multilateration system in Juneau for use for air traffic services.
- Develop additional low-level routes and airport approach/departures supported by spaced based navigation.
- Continue expansion of ADS-B ground stations, Automated Weather Sensors Systems (AWSS), and surveillance coverage for the remainder of the state.

***Key Events FY 2007-2010 – Performance Output Goals***

- Assist in procuring and installation of ADS-B avionics in participating aircraft throughout the state.
- Install and commission minimum operational performance standards compliant for ADS-B ground-based transceivers at additional locations throughout the state.
- Begin certification of a wide-area multilateration system in Juneau for use for air traffic services.
- Develop additional low- level routes and airport approach/departures supported by spaced based navigation.
- Continue expansion of ADS-B ground stations, AWSS, and surveillance coverage for the remainder of the state.

## B, SAFE FLIGHT 21 – OHIO VALLEY PROTOTYPE PROJECT, M36.02-00

## Program Description

The Safe Fight 21 (SF-21) Ohio River Valley Project is a government/industry collaborative effort to explore the use of ADS-B and related enabling technology and to conduct real-world end-to-end evaluation of how it can be used to enhance capacity, efficiency, and safety in the NAS. This effort includes deploying and evaluating the following nine Free Flight operational enhancements:

1. Weather and Other Information in the Cockpit,
2. Cost-Effective Controlled-Flight-Into-Terrain (CFIT) Avoidance,
3. Improved Terminal Operations in Low Visibility,
4. Enhanced See and Avoid,
5. Enhanced En Route Air-to-Air Operations,
6. Improved Surface Surveillance and Navigation for the Pilot,
7. Enhanced Surface Surveillance for the Controller,
8. ADS-B Surveillance in Non-Radar Airspace, and
9. ADS-B Surveillance in Radar Airspace.

The nine operational enhancements are being demonstrated and validated in a real-world operational environment to understand the capabilities of this advanced surveillance and data-link system. With ADS-B as the "cornerstone," enabling technologies such as Traffic Information Service-Broadcast (TIS-B), Flight Information Service-Broadcast (FIS-B), surface moving maps and enhanced air traffic procedures are under evaluation. ADS-B demonstrations and evaluations are providing the FAA and industry with valuable information needed to make decisions about implementing applications that have the potential for significant safety, efficiency, and capacity benefits to the NAS. Developmental, evaluation, and testing activities are being conducted in conjunction with the Cargo Airlines Association (CAA), the Aircraft Owners and Pilots Association (AOPA), the aviation departments of several states and Regional Airport

Authorities, NASA, the Helicopter Association International, Continental Airlines and aircraft avionics manufacturers. ADS-B operational sites for surface and terminal area evaluation are in Memphis, Tennessee and Louisville, Kentucky, and en route/flight safety capabilities have been established in the Gulf of Mexico. Additional deployment of ADS-B Broadcast Services has begun with the establishment of 23 ground stations along the East Coast and in central Arizona with deployment complete in 2005. Additionally, central processing of all the surveillance source information is conducted at the William J Hughes Technical Center and the TIS-B and FIS-B messages are generated for the ADS-B data-links. The ground station broadcast system will expand to a total of approximately 40 ground stations in 2005.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The SF-21 program is evaluating and demonstrating ADS-B and other information service applications that could lead to reducing the number of fatal accidents in the general aviation community.

***Key Events FY 2006 – Performance Output Goals***

- In FY 2006, requested funding will continue the maintenance of the ground infrastructure in the Ohio River Valley and East Coast, and work efforts for definition and development of a small-medium airport architecture to provide ADS-B services such as flight following, and Broadcast services.
- The SF-21 program will be migrating service capabilities such as "radar like services" to the lower 48 states to take advantage of efforts being undertaken in Alaska to improve safety in non-radar areas.
- The effort will continue to integrate ADS-B onto Terminal, En Route, and Oceanic Automation systems.

***Key Events FY 2007-2010 – Performance Output Goals***

- Implement Joint Resources Council 2A decision on ADS-B deployment.
- Assess applications associated with ADS-B and broadcast service technology.
- Conduct Operational concepts evaluation efforts, operational demonstrations and simulations.

# C, SAFE FLIGHT 21 – OHIO VALLEY PROTOTYPE PROJECT - SURFACE MOVING MAP, M36.02-01

## Program Description

The SF-21 Surface Moving Map (SMM) program is a developmental program working in cooperation with the FAA's Runway Safety Program to facilitate the implementation of an Airport Map Database (AMDB) which will enable Airport SMM and other shared surface situational awareness and management technologies. The production of AMDB's digital data must be accurate and timely updated to assure reliable digital images are available. The AMDB's digital maps depict airport features, such as runways, taxiways, hold lines, ramps, hangars, and prominent airport structures. Specifications for digital AMDB were rewritten and finalized in preparation for a formal FAA certification. Upon certification, the data previously produced for the 82 airports with the greatest risk of runway incursions will be reprocessed using the approved process and specifications. Additionally, AMDB will be used in certified aircraft avionics and vehicle applications to enhance pilot and vehicle operator shared situational awareness.

SMM provides the cockpit crew and/or airport vehicle operators a display of their aircraft/vehicle position on a digital airport surface map. Additionally, enhancements such as ADS-B with data-link, and TIS-B will provide the capability to display other aircraft/vehicles operating on the airport surface. When fully

developed, SMM will provide airline ramp controllers, Regional Airport Authorities and potentially emergency services vehicles with a tactical display of aircraft, both on the surface and aircraft in the vicinity of the airport. This will serve as a vital tool to enhance safe operations and provide more efficient ramp and overall airport management.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

Airport SMM supplements traditional means for awareness of own-ship position, airport orientation, and other vehicles/aircraft to provide a safer airport surface environment. With the enhanced airport surface situational awareness provided by SMM, surface operators can better plan when to use their cleared taxi routes, which should result in fewer surface runway errors. Airport SMM can potentially reduce the number of progressive taxi requests, which would reduce communications channel use.

***Key Events FY 2006 – Performance Output Goals***

- Transition initial AMDB capability to operational use.
- Pending Joint Resources Council (JRC) -2B decision - Began the growth and upkeep of the AMDB to all 520 towered airports in the U.S.
- Pending JRC-2B decision - Began development of automated change detection to support an AMDB with a large airport population.

***Key Events FY 2007-2010 – Performance Output Goals***

- Pending JRC-2B decision - Complete the growth and upkeep of the AMDB to all 520 towered airports in the U.S.
- Pending JRC-2B decision - Test and deploy automated change detection to support an AMDB with a large airport population.
- Complete the transition AMDB capability and automated change detection to operational service.

# D, AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) – ATDP, S10.02-00

## Program Description

The ADS-B – ATDP is a non-acquisition program supporting research, testing, and standards development to evaluate the capabilities and develop standards for ADS-B as a surveillance and data-link technology that will enable the concept of free flight (i.e., enhanced capacity, efficiency, and safety). The ADS-B ATDP supports the Safe Fight 21 (SF-21) Ohio Valley Prototype Project, a government/industry collaboration to explore the use and conduct real-world end-to-end evaluation of ADS-B and related enabling technology to enhance safety, capacity, and efficiency in the NAS. This program also supports development of domestic (RTCA, Inc.) as well as ICAO standards to achieve global ADS-B interoperability in air space domains (surface, terminal area, oceanic, and en route); developmental and implementation transition plans; and standards for avionics system engineering development. The above effort contributes to the US leadership in aeronautics, standards development, and international rulemaking.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.

- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The standards developed by the ADS-B ATDP provide the basis for implementing ADS-B technology and related applications and are designed to ensure interoperability throughout the aviation community. The ADS-B ATDP program is contributing to the Safe Flight 21 program, which is evaluating and demonstrating ADS-B and other information broadcast service applications that could lead to reducing the number of fatal accidents in the general aviation community, as well as the commercial airline fatal accident rate.

***Key Events FY 2006 – Performance Output Goals***

- Obtain RTCA approval of Airborne Separation Assistance Systems (ASAS) Minimum Operational Performance Standards (MOPS) (Surveillance Transmit Processing MOPS, Airborne Surveillance and Separation Assurance Processing MOPS, Cockpit Display of Traffic Information MOPS).
- Complete Operational Services and Environmental Description, Safety and Performance Requirements and Interoperability documents for Package I applications in conjunction with EUROCONTROL, RTCA and European Organization for Civil Aviation Equipment (EUROCAE).
- Coordinate with EUROCONTROL, RTCA, and EUROCAE to reach consensus on a list of Package II ADS-B applications.
- Began RTCA Aircraft Surveillance Applications (ASA) Minimum Aviation System Standards (MASPS) Revision A to include Operational Services and Environmental Description, Safety and Performance Requirements, and Interoperability from Package I applications.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete RTCA Aircraft Surveillance Applications MASPS Revision A for Package I applications.
- Work with EUROCONTROL, RTCA and EUROCAE to complete Package II applications.
- Work on RTCA ASAS MOPS Revision A to complete Package I applications.
- As needed, work on the following revisions to RTCA MASPS MOPS:
    - TIS-B MASPS to Revision B
    - ADS-B MASPS Revision B
    - 1090 Megahertz MOPS Revision B
    - Universal Access Transceiver (UAT) MOPS Revision B

# E, ALASKA MIH & VIDEO EQUIPMENT, M08.31-00

## Program Description

Terrain and rapidly changing weather phenomena do not permit effective use of automated weather systems at many locations throughout Alaska. Additionally, automated systems do not provide pilots all the operationally significant weather information for making effective decisions. The Alaska Weather Camera program provides real-time images of remote airports and mountain passes to air carriers, dispatchers, commercial and general aviators and Flight Service Station specialists. The Internet-based system enables users to compare real-time weather at remote sites with stored clear-day images that have terrain features annotated.

A study conducted by an independent contractor from December 2002 to March 2003 shows that of 182 pilots, almost 80 percent use the weather cameras regularly, with almost 66 percent of pilots using them for flight-planning purposes. Most of the airports in Alaska rely on visual flight rule operations. Pilots said that using the weather camera led them to cancel or delay flights when weather conditions were unfavorable.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 3 –** Reduce accidents in Alaska.
- **FAA Performance Target –** By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.

## Relationship to Performance Target

Using weather cameras enables air carriers, air taxis, and general aviation pilots to see the weather and decide, in real-time, whether they can reach a particular destination. These decisions save money and reduce accidents.

***Key Events FY 2006 – Performance Output Goals***

- Install twenty new sites (ten with Internet connectivity).
- Install two mountain pass locations.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

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## 1A03, AERONAUTICAL DATA LINK (ADL) APPLICATIONS

**FY 2006 Request $1.0M**

- Aeronautical Data Link – Flight Information Service (FIS), C20.03-00

## Program Description

The FIS program includes two key elements. The first is a national data link system that broadcasts graphic and text FIS data, including weather products to the cockpit. The second is a national system for collecting and disseminating automated meteorological (AUTOMET) reports from aircraft operations.

The FIS data link (FISDL) system provides pilots timely access to FIS data that is consistent with FIS information available to air traffic controllers and flight service specialists in the NAS. The FISDL service implementation is through a FAA/Industry agreement based on the FAA Airborne FIS Policy Statement (May 1998) and a supporting FIS Data Link Requirements Document (February 1999). The FAA is providing access to the aeronautical spectrum, and program quality assurance and control. An industry service provider is furnishing the data processing and communications infrastructure. The first FISDL ground transmitter site was delivered and commissioned in June 2001. The last site was delivered and commissioned in October 2004. FISDL is a very high frequency broadcast service. As the NAS modernization evolves, the FISDL service will transition to the planned FAA Automatic Dependent Surveillance-Broadcast Universal Access Transceiver (UAT) network, or other suitable FAA data link, such as the Next Generation Air-to-Ground Communications (NEXCOM) data link.

The automated meteorological (AUTOMET) reports will provide coverage over data-void regions and will supplement similar data collected from airline operations through the Meteorological Data Collection and Reporting System. The FIS program is developing implementation strategies for establishing a national system for collecting and disseminating weather reports from low altitude commuter and package carrier operations through on-board automation and data link communications. This task builds on the Tropospheric Airborne Meteorological Data Reporting (TAMDAR) sensor sponsored by NASA. Flight evaluations of the TAMDAR sensor are planned during FY 2005. Contract award for establishing a national AUTOMET collection system is targeted for FY 2008.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998.

## Relationship to Performance Target

Hazardous weather is a major factor in general aviation accidents. Timely access to FIS weather data information through the FISDL system allows pilots to make early decisions to continue or divert a flight; this leads to safer flight operations. The national collection of AUTOMET data will enable increased resolution and accuracy in National Weather Service aviation weather forecasts. These improved forecasts will be used by the Integrated Terminal Weather System (ITWS) and the Weather and Radar Processor (WARP) to support NAS operations, which will result in improved predictions of hazardous weather conditions that impact the NAS.

***Key Events FY 2006 – Performance Output Goals***

- Achieve at least 2,300 active users of FISDL services out of 5,000 planned (46 percent).
- Pending successful transition negotiations in FY 2005 and funding, install 50 (31 percent) UAT ground stations at existing FISDL ground sites; target is 159.
- Publish AUTOMET system requirements documents.
- Publish AUTOMET standards and guidance documents to include RTCA documents and FAA Advisory Circulars and Technical Standards Orders.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete installation of UAT ground stations at all existing FISDL ground sites; target is 159 (100 percent).
- Achieve at least 900 additional active users of FIS data link services each year using either the FISDL service or the UAT network; target at least 5,000 by FY 2009 (100 percent).
- Obtain FAA decision to implement a national AUTOMET reporting system in FY 2007 using the TAMDAR sensor.
- Contract award for AUTOMET system in FY 2008.
- Pending funding starting in FY 2009, equip at least 50 of planned 200 aircraft (25 percent) and collect at least 50 AUTOMET reports per day of planned 1000 per day (5 percent) by FY 2010.

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## 1A04, NEXT GENERATION VHF AIR-TO-GROUND COMMUNICATIONS SYSTEM (NEXCOM)

**FY 2006 Request $33.5M**

- Next-Generation VHF A/G Communications System (NEXCOM) – Segment 1a, C21.01-01
- Next-Generation VHF A/G Communications System (NEXCOM) – Segment 1b, C21.01-02
- Next-Generation VHF A/G Communications System (NEXCOM) – Segment 2/3, C21.02-01

## Program Description

The NEXCOM program replaces and modernizes the aging and obsolete NAS air-to-ground (A/G) analog radio communications infrastructure. Replacement aims to eliminate existing NAS limitations that will impact air traffic system capabilities to effectively meet and manage the projected U.S. air traffic requirements of the future. These limitations include FAA very high frequency (VHF) radio frequency spectrum saturation, inadequate A/G radio equipment maintainability and reliability, and lack of A/G information security and communications control.

The FAA is currently fielding its new multimode, digital radios. However, in recognition of the need for international harmonization on the best technical solution to the global spectrum congestion problem, the FAA decided in FY 2004 to defer the development and implementation of the NEXCOM ground system.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

NEXCOM will reduce the number of unplanned outages by replacing existing communications equipment with modern digital communications A/G equipment. It will also increase capacity by expanding the number of communication channels within the spectrum assigned to the FAA. This capability increases the capacity to meet current and near-term air traffic control radio communication demands.

***Key Events FY 2006 – Performance Output Goals***

- Procure and begin installing 1,320 additional Multimode Digital Radios.

***Key Events FY 2007-2010 – Performance Output Goals***

- Procure and begin installing 5,990 additional Multimode Digital Radios.

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## 1A05, USER REQUEST EVALUATION TOOL (URET)

**FY 2006 Request $73.3M**

- Free Flight Phase 2 (FFP2) – User Request Evaluation Tool (URET), A24.02-00

## Program Description

The Conflict Probe capability provided by the URET Core Capability Limited Deployment under Free Flight Phase 1 was deployed to six contiguous centers in the middle of the United States in FY 2002. URET provides four key capabilities to the ARTCCs:

- Aircraft-to-aircraft conflict detection;
- Aircraft-to-airspace conflict detection;
- Evaluation of user or controller request for flight plan amendments or route changes; and
- Enhanced flight data management.

This tool allows controllers to determine whether requests for direct routes can be approved without conflicting with other flights or airspace restrictions. To enhance the benefit of the tool for flights associated with the first six centers (Atlanta was deferred to FFP2) and to provide benefits for flights beyond these centers, the tool needs to able to reach across the boundaries of all 20-centers for the NAS to use its full potential. By the end of FY 2006, URET will be deployed at 14 additional ARTCCs.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3 –** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 1** – Through FY 2009, achieve an 86.9 percent on-time arrival for all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late due to NAS related delays.

## Relationship to Performance Target

The URET program contributes to the FAA's greater capacity goal by providing an automation tool that air traffic controllers in the ARTCC use to provide more direct routes for aircraft. The controllers use the tool to identify future flight path conflicts and to increase direct aircraft routing by 15 percent. Direct routes save flight time and fuel.

***Key Events FY 2006 – Performance Output Goals***

- Achieve URET Initial Daily Use (IDU) at the remaining two URET sites (100 percent).
- Deliver Build VI (the final FFP2 version of URET).

***Key Events FY 2007-2010 – Performance Output Goals***

- Transition URET support to the Operations budget in FY 2007.

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## 1A06, TRAFFIC MANAGEMENT ADVISOR (TMA)

**FY 2006 Request $24.0M**

- Free Flight Phase 2 (FFP2) – Traffic Management Advisor (TMA)– Single Center, A24.03-00

## Program Description

Traffic Management Advisor – Single Center (TMA-SC) provides an aircraft arrival schedule in the en route and terminal Traffic Management Units and produces meter lists for display on en route controllers' displays that estimate optimal arrival times. TMA-SC provides advisories to en route controllers for metering traffic into terminal airspace. During the Free Flight Phase 1 (FFP1) program, six en route centers received this tool. They were Minneapolis, Oakland, Los Angeles, Denver, Miami and Atlanta. During FFP2, TMA-SC will be sustained at the six sites and deployed at four additional sites. TMA SC has already been deployed at Houston and is scheduled to be deployed in Chicago by September 2005.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009

## Relationship to Performance Target

TMA-SC contributes to the FAA's greater capacity goal by improving capacity utilization at selected airports by an average of 3 to 5 percent. The program includes a software tool that traffic management coordinators use to plan traffic flows to major airports. It also helps controllers adjust aircraft spacing to optimize use of runways at major airports. Through time-based metering, TMA provides optimal arrival flows by dynamically feeding an arrival rate consistent with the airport acceptance rate.

***Key Events FY 2006 – Performance Output Goals***

- Deploy TMA-SC to one additional site.

***Key Events FY 2007-2010 – Performance Output Goals***

- Deploy TMA-SC to one additional site.
- Transition last four TMA-SC sites to the Operations budget.

## 1A07/1A08, NAS IMPROVEMENT OF SYSTEM SUPPORT LABORATORY AND WILLIAM J. HUGHES TECHNICAL CENTER FACILITIES

**FY 2006 Request $13M**

- System Support Laboratory Sustained Support, F14.00-00

## Program Description

The William J. Hughes Technical Center (WJHTC) System Support Laboratory provides the environment to implement, test, and integrate new systems into the NAS. Once accepted, the systems become part of the FAA's test bed and are used to support the operational field sites over the lifecycle of the operational systems. This program provides the F&E funding to sustain the agency's centralized test bed infrastructure. These test beds consist of the En Route System Support Facility; Terminal System Support Facility; Oceanic System Support Facility; Flight Service Station and Weather Systems; Communications Systems; Radar Systems; Navigation and Tracking Systems; Target Generator Facility; Cockpit Simulation Facility; Human Factors Laboratory; and the fleet of specially instrumented aircraft. The test beds are also used for field support to the Operational Sites and for developmental activities associated with Research and Development programs. Maintaining a centralized core of test beds reduces the overall cost to the FAA and increases efficiency of all phases of program activities. Centralized test beds ensure that the highly capable services of the WJHTC are available when individual programs need them.

The Improvement of the System Support Laboratory Program upgrades and enhances the test beds. It also procures unique equipment and systems that can interface and switch the various systems into multiple test and field support configurations. Without this flexibility, numerous separate system configurations would need to be created, which would undermine the cost-efficient concept of centralized test beds.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

This centralized set of systems and equipment forms the FAA's research, development, testing, and field support infrastructure. With this system centralization, each Integrated Product Team/Business Unit need not establish and maintain the infrastructure to support its individual programs and fielded systems. It also enables the FAA to evaluate concepts and programs that span more than one domain of the NAS (e.g., OEP, Free Flight). The overall cost to the FAA is therefore kept to a minimum. A centralized knowledge base can also be integrated across program lines and the data can move easily during concept exploration, development, implementation, and field support activities.

***Key Events FY 2006 – Performance Output Goals***

- Sustain the facilities that comprise the FAA's System Support Laboratories.
- Provide the test beds needed for FAA programs in meeting their goals.

***Key Events FY 2007-2010 – Performance Output Goals***

- Sustain the facilities that comprise the FAA's System Support Laboratories.
- Provide the test beds needed for FAA programs in meeting their goals.

## 1A09, WILLIAM J. HUGHES TECHNICAL CENTER INFRASTRUCTURE SUSTAINMENT
**FY 2006 Request $5.1M**

- William J. Hughes Technical Center Building and Plant Support, F16.00-00

## Program Description

The FAA William J. Hughes Technical Center (WJHTC) owns and operates about 1.58 million square feet of test and evaluation, research and development, and administrative facilities, plus numerous project test sites. The value of the buildings and infrastructure is about $187.1 million. The FAA must have an annual program of capital improvements and modernization for these buildings and supporting infrastructure. 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 life safety codes. The average annual expenditure to sustain the WJHTC is about 2.7 percent of the center's value.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

Infrastructure Sustainment at the WJHTC will control costs while delivering quality customer service by replacing old systems and equipment before serious problems occur. It will also reduce energy consumption on a per-square-foot basis, which contributes to reducing costs. This line item will update facilities and facility support systems to ensure that the laboratories and other facilities operate properly and can handle utility loads of the systems being tested. Since the WJHTC plays a key role in developing and testing new equipment that will be used in the NAS, it is critical that the facilities operate efficiently. WJHTC effectiveness in testing and approving equipment reduces delays in implementing NAS systems and the costs of air traffic delays.

***Key Events FY 2006 – Performance Output Goals***

- Make domestic and fire water system improvements.
- Develop a WJHTC-wide utility master plan development.
- Make Life Safety upgrades to seven buildings.
- Expand Building 277 (design/permits).
- Refurbish aircraft hangar doors.
- Expand parking areas.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete phase 2 of the Building 300 mechanical equipment replacement program.
- Renovate Building 275 and expand Building 277.
- Replace WJHTC motor control centers and electrical transformers.
- Repave Amelia Earhart Boulevard.
- Re-mediate the WJHTC storm-water system.
- Create a water distribution loop.
- Upgrade the electrical duct bank to the research and development Area.
- Renovate Building 316.
- Construct a combined heating and power plant at the WJHTC.

# ACTIVITY 2. AIR TRAFFIC CONTROL FACILITIES AND EQUIPMENT

## A. EN ROUTE PROGRAMS

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## 2A01, EN ROUTE AUTOMATION PROGRAM – EN ROUTE AUTOMATION MODERNIZATION (ERAM)

**FY 2006 Request $341.6M**

- A, En Route Automation Modernization (eRAM), A01.10-01
- B, En Route Automation Modernization (eRAM), Radar Position Tech Refresh – R Side Upgrades, A01.10-02

### A, EN ROUTE AUTOMATION MODERNIZATION (ERAM), A01.10-01

### Program Description

The ERAM system replaces the Host Computer System (HCS) software and hardware, the backup Direct Access Radar Channel (DARC) system software and hardware, associated interfaces, communications, and support infrastructure. ERAM will provide existing functionality and new capabilities to support the NAS architecture evolution, Air Traffic Services operational requirements, and information security requirements. The Enhanced Backup Surveillance (EBUS) system, scheduled to begin deployment in FY 2005, is the first phase of ERAM replacing the existing DARC system. The EBUS system provides safety alerts and Next Generation Weather Radar data not available on the current backup system. The second phase of ERAM is the En Route Information Display System (ERIDS), which has three prototype sites deployed and will begin national deployment in FY 2006. The ERIDS provides electronically accessible aeronautical and controller operational information. ERAM Release 1, which replaces the HCS and provides improved flight data and surveillance data processing, is scheduled to begin deployment in December 2009.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship of Performance Target

The EBUS system will provide safety alerts for the en route backup system. The ERIDS will reduce controller workload in accessing aeronautical and operational information. The ERAM Release 1 will enable flexible routing around congestion, weather, and restrictions; provide real-time status and accurate trajectory data that improves quality of traffic flow management initiatives; and provide departure to arrival route conversion, which will improve predictability. The ERAM system provides full processing backup capabilities to reduce the impact of outages on efficiency.

***Program Plan FY 2006 – Performance Output Goals***

- Complete EBUS Last Site Initial Operational Capability (IOC).
- Complete ERIDS Key Site IOC.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete ERIDS Last Site IOC.
- Complete ERAM Release 1 systems integration.
- Complete ERAM Release 1 William J. Hughes Technical Center government acceptance.
- Obtain ERAM Release 1 In Service Decision.
- Complete ERAM Key Site government acceptance.

## B, EN ROUTE AUTOMATION MODERNIZATION (ERAM), RADAR POSITION TECH REFRESH – R SIDE UPGRADES, A01.10-02

### Program Description

The ERAM Radar Position Technology Refresh will modify and replace components of the radar controller (R-side) display processors and associated software in the en route centers. This technology refresh completely removes the R-side processing infrastructure so that the R-side displays can function with the entirely new ERAM system infrastructure. It will integrate a new application program interface (software), developed under ERAM, into the new display components. It will also incorporate the new ERAM message set, consistent with ICAO standards. These upgrades are necessary to allow the R-side displays to function with the modern components of ERAM and to make future enhancements to the en route air traffic control system more efficient.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship to Performance Target

The ERAM radar position technology refresh increases system efficiency at all the en route centers by using of a modern, open, and supportable en route automation system that more readily accepts enhancements and meets the long-term requirement for availability and capacity.

***Program Plan FY 2006 – Performance Output Goals***

- Continue development and complete testing of R-side display processors coincident with the ERAM Release 1 deployment.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete technology refresh of R-side display processors coincident with the ERAM Release 1 deployment.

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## 2A02, EN ROUTE AUTOMATION PROGRAM – EN ROUTE COMMUNICATIONS GATEWAY (ECG)

**FY 2006 Request $6.0M**

- En Route Communications Gateway (ECG) Program, A01.12-01 and
  En Route Communications Gateway - Technology Refresh, A01.12-02

### Program Description

The ECG program will replace the Peripheral Adapter Module Replacement Item communication gateway to the HCS and the DARC. The program increases the capacity and expandability of the NAS by enabling

integration of new surveillance technology, introduction of new interface standards and data formats—for compatibility with ICAO standards—and connection to additional remote equipment such as radars. The ECG infrastructure will provide the automation system capacity and expandability to support anticipated increases in air traffic and changes in the operational environment. Because the ECG is providing the flexible and expandable architecture to introduce new services, systems, and capabilities, it must be deployed before introducing those new services, systems, and capabilities.

The ECG technology refresh project will provide the opportunity to upgrade software and hardware so as to be able to incorporate new capabilities in support of additional functionality.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

The ECG infrastructure will provide the automation system capacity and extensibility to support anticipated increases in air traffic and changes in the operational environment. The ECG will provide a flexible and expandable architecture that will support introduction of new services, systems, and capabilities within the NAS. For example, the En Route Automation Modernization program, which is identified in the FAA's 2001 Strategic Plan as a Corporate Project in the area of System Efficiency, will use ECG for inter-facility and surveillance interfaces.

***Key Events FY 2006 – Performance Output Goals***

- Achieve Operational Readiness Demonstration at last two of 20 sites (100 percent).
- Begin technology refresh.

***Key Events FY 2007-2010 – Performance Output Goals***

- Execute the ECG technology refresh plan to keep the ECG system viable.

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## 2A03, EN ROUTE AUTOMATION PROGRAM – EN ROUTE SYSTEM MODIFICATIONS
**FY 2006 Request $34.6M**

- En Route System Modification, A01.09-01

## Program Description

The En Route System Modification program will replace and upgrade obsolete en route display system components; replace system processors; upgrade the controller's displays and the infrastructure that supports them; and configure the consoles to accommodate additional processors. Replacing obsolete equipment will ensure reliability and maintainability of the display system.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1–** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

This modification program replaces obsolete components of the en route display system to maintain NAS reliability. It also provides upgraded display system processors that support the URET and ERAM programs. These upgrades support use of direct routes, which will maintain or reduce travel times between major metropolitan areas.

***Program Plan FY 2006 – Performance Output Goals***

- Complete deployment of Data-side processor technology refresh at all 22 sites.
- Continue engineering activities for console modifications to accommodate additional processors to be deployed concurrently with ERAM deployment.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete engineering activities for console modifications to accommodate additional processors to be deployed concurrently with ERAM deployment.

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## 2A04, EN ROUTE AUTOMATION PROGRAMS

**FY 2006 Request $6.9M**

- A, En Route Enhancements, A01.07-01
- B, Initial Academy Training System (IATS), A01.13-01

### A, EN ROUTE ENHANCEMENTS, A01.07-01

## Program Description

The En Route Enhancements program maintains current NAS en route software systems and supports development, integration, and implementation of upgrades to the Host Computer System (HCS) software. Upgrades include safety-critical functions and computer-human interface enhancements to support such new initiatives as area navigation, airspace redesign, and ICAO message formats. These upgrades will enhance capabilities and provide functional improvements for both Air Traffic and Airway Facilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009

## Relationship to Performance Target

The En Route Enhancements program provides software evolution, as prioritized and approved by Air Traffic (AT) and Airway Facilities (AF). The program improves HCS infrastructure through software releases to AT and AF, which support incremental improvements in their automation tools; this enhances functionality, productivity, and system safety. New capabilities will allow more efficient flight routes and thus increase capacity.

***Key Events FY 2006 – Performance Output Goals***

Planned enhancements in HCS release A5f1.6 include:

- More accurate coordination messages between centers and more accurate aircraft tracking;
- Preferential route processing that will allow airline users to file preferential routes per phase of flight;
- Support of an automated ICAO-compatible interface with Canada that will increase controller efficiencies and reduce delays, and
- HCS common message set that will facilitate transition during future automation modernization.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

## B, INITIAL ACADEMY TRAINING SYSTEM (IATS), A01.13-01

### Program Description

The IATS project provides a training platform to prepare a larger number of certified en route air traffic control specialists to meet the anticipated need based on current retirement projections. The IATS will provide a replica of the en route environment to meet the complex NAS air traffic training requirements. The IATS consists of two 10-sector training laboratories and one two-sector development laboratory equipped with a platform running multiple copies of NAS software, Display System Replacement workstations, ghost pilot workstations, master instructor workstations, a local area network, and a Voice Switching and Control System (VSCS) training and backup communication system.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship to Performance Target

The IATS project supports training new controllers to replace expected controller retirement. Without the IATS, the FAA will be unable to develop the levels of knowledge and expertise within the air traffic controller workforce to support the greater capacity goals.

***Program Plan FY 2006 – Performance Output Goals***

- Begin training new students.
- Continue maintenance of system.
- Perform technology refresh of servers, ghost pilot personal computers, and master instructor workstations.

***Key Events FY 2007-2010 – Performance Output Goals***

- Update contractor delivered documentation.
- Perform technology refresh of obsolete components.

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## 2A05, NEXT GENERATION WEATHER RADAR (NEXRAD) – PROVIDE

**FY 2006 Request $5.1M**

- Weather Radar Program – NEXRAD Open Systems Upgrades, W02.02-00

### Program Description

There are 158 NEXRAD systems currently operating. This modern, long-range weather radar detects, analyzes, and displays severe weather information on air traffic controllers' consoles, enabling controllers to better determine location, time of arrival, and severity of weather conditions to enhance both flight safety and airspace capacity. The open system upgrades to the radar's processors and receiver extend NEXRAD's capabilities by improving data quality and detection ability.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 -** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The NEXRAD program contributes to the FAA's aviation goal of sustained operational availability by detecting weather precipitation intensity and providing this data in varied displays to air traffic control facilities. This program incorporates technology upgrades into the existing NEXRAD system to improve its detection capability and update rates. The Open Radar Data Acquisition production upgrade will be completed with deployment of the 12 FAA sites in Alaska, Hawaii, and Puerto Rico. The FAA will procure and deploy dual polarization at all NEXRAD sites.

***Key Events FY 2006 – Performance Output Goals***

- Continue providing funds to the Department of Commerce (DOC)/National Weather Service (NWS) to cover the FY 2005 portion of the Department of Transportation (DOT)/FAA Tri-Agency funding obligation (cost sharing Memorandum of Agreement (MOA)) for NEXRAD Product Improvement/Open Systems Upgrade.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue providing funds to the DOC/NWS to cover the FY 2005 portion of the DOT/FAA Tri-Agency funding obligation (cost sharing MOA) for NEXRAD Product Improvement/Open Systems Upgrade.

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## 2A06, WEATHER AND RADAR PROCESSOR (WARP)

**FY 2006 Request $10.5M**

- Weather and Radar Processor (WARP) – Stage 3 – Sustain Weather Ops, W04.02-00
- Weather and Radar Processor (WARP) – WARP Replacement, W04.03-00

## Program Description

A next-generation WARP is designed to collect, process, and disseminate Next Generation Weather Radar (NEXRAD) data and other weather data to ARTCC controllers, Air Traffic Control System Command Center (ATCSCC) personnel, traffic management specialists, and ARTCC weather service unit meteorologists. The WARP system is a computer-based interactive, meteorological data processing system that simultaneously and continuously receives, processes, stores, distributes, and displays aviation-related weather information and radar products. Each WARP consists of the Weather Server, the Communications Subsystem, the Meteorologist's Workstation, the Briefing Terminals, the ARTCC Monitor and Control Center workstation, and the Weather Information Network Server. The ATCSCC WARP also includes the FAA Bulk Weather Telecommunications Gateway server. The WARP primarily provides timely and accurate weather displays to air traffic controllers through controller display systems; supports the Traffic Management Unit and ATC specialists at the ARTCCs and the ATCSCC; and disseminates weather information to other NAS systems.

The WARP program provides processing tools to consolidate weather data from several sources into a single, integrated workstation to support air traffic operations. The program reduces weather-related delays, provides timely weather products, and improves collaborative decision-making. In providing enhanced, integrated weather information, the WARP furnishes the most timely and accurate weather forecast products to NAS systems.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009

## Relationship to Performance Target

The WARP contributes to maintaining the average daily airport capacity by providing NEXRAD data to controllers' consoles and providing processing tools to consolidate weather data from several sources into a single, integrated workstation to support air traffic operations. As a result of the integrated weather information made available through the WARP, air traffic controllers have an enhanced awareness of the weather and can better direct aircraft. Additionally, the WARP provides weather on the briefing terminals in the Traffic Management Units, whose enhanced weather awareness allows them to redirect flights better.

***Key Events FY 2006 – Performance Output Goals***

- Continue WARP Maintenance and Sustainment Service activities.
- Implement changes to hardware and software to accommodate replacement of FAA Telecommunication Satellite with FAA Telecommunications Infrastructure (FTI) service.
- Complete WARP Replacement JRC 2b.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue WARP Maintenance and Sustainment Services activities.
- Award WARP Replacement contract and continue WARP Replacement activities.

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## 2A07, ARTCC BUILDING IMPROVEMENTS/PLANT IMPROVEMENTS

**FY 2006 Request $42.4M**

- ARTCC Plant Modernization/Expansion – ARTCC modernization, F06.01-00

## Program Description

The Air Route Traffic Control Center (ARTCC) Modernization and Expansion program supports En Route Air Traffic operations and service-level availability through facility lifecycle program management of the 21 ARTCCs, two Center Radar Approach Control (CERAP) facilities, the Honolulu Control Facility, and the Air Traffic Control System Command Center. This program expands and modernizes these facilities to accommodate new air traffic control equipment. It also renovates and upgrades en route centers to prevent outages that would delay air traffic.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The ARTCC Modernization/Expansion program contributes to the FAA's greater capacity goal by ensuring that buildings that house en route control equipment are modified, as necessary, to accept new equipment. The program also maintains these buildings in good condition to avoid air traffic control outages due to failures in such infrastructure systems as electrical distribution systems. The program maintains the integrity of 21 ARTCCs, the Honolulu Control Facility, and two CERAP facilities, as well as upgrades facilities for integration and transition of new NAS systems. Modernizing ARTCC, the Honolulu Control

Facility, and CERAP building infrastructure – with such projects, such as electrical wiring, heating and ventilation systems, and structural components – reduces the chances of outages, which can cause air traffic delays.

***Key Events FY 2006 – Performance Output Goals***

- Fund Combination Administrative Wing Mini-Modification and Control Wing Basement (CWB) Mod 2 project at four sites.
- Fund CWB Mod 2 construction project at four sites.
- Fund the Anchorage ARTCC Chiller Lease Program.
- Design Administrative Wing Mini-Modification project at one site.
- Provide $100,000 per ARTCC for repairs and upgrades.
- Conduct facility condition assessments at seven ARTCCs per year.
- Update the national Facility Condition Assessment database annually.
- Fund equipment relocation as required.

***Key Events FY 2007-2010 – Performance Output Goals***

- Fund Administrative Wing Mini-Modification construction project at five sites.
- Fund CWB Mod 2 construction project at two sites.
- Fund Model-1 (M-1) construction project at four sites.
- Fund Combination M-1/Automation Wing Rehabilitation project at six sites.
- Fund Combination M-1/CWB Mod 2 project at one site.
- Fund Administrative Wing Rehabilitation project at one site.
- Design M-1/Automation Wing Rehabilitation project at one site.
- Design Administrative Wing Mini-Modification project at one site.
- Provide $100,000 per year per ARTCC for repairs and upgrades.
- Conduct facility condition assessments at seven ARTCCs per year.
- Update the national Facility Condition Assessment database annually.
- Fund equipment relocation as required.

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## 2A08, VOICE SWITCHING AND CONTROL SYSTEM (VSCS)

**FY 2006 Request $7.5M**

- Voice Switching and Control System (VSCS) – Tech Refresh, C01.02-01

## Program Description

VSCS Technology Refresh program will replace and upgrade the obsolete, non-supportable VSCS hardware and software in all 21 ARTCCs. In addition, the real time Field Maintenance/Testing System at the FAA William J. Hughes Technical Center (WJHTC) will be upgraded to a mirror image of an operational site. Also, the Training System at the FAA Academy is continuously being upgraded to ensure real-time training for all operational AT/AF personnel. 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. To date, this program has replaced all control systems located at ARTCCs as well as the WJHTC and FAA Academy. Equipment has been procured to replace the Contractor Traffic Simulation Unit test bed at the FAA WJHTC, which is used to perform system-loading requirements for all formal baseline verifications of VSCS functions. Future technology refresh activities will ensure that the VSCS continues to provide reliable voice communications to support both current and future en route operations.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.

- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The VSCS Technology Refresh program supports the greater capacity goal by improving the system reliability of en route voice communications for both current and future operations by replacing and upgrading the obsolete, non-supportable VSCS hardware and software. In addition, there are ongoing site expansions at specific ARTCCs to support greater capacity.

***Key Events FY 2006 – Performance Output Goals***

- Complete development of and start testing the Video Display Monitor Replacement.
- Initiate Workstation Upgrade implementation.
- Complete power supply refurbishment at 10 ARTCCs, WJHTC and the FAA Academy.
- Initiate procurement activities for new en route switch program per JRC recommendation.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete testing of Video Display Monitor Replacement and initiate production and complete implementation.
- Complete Workstation Upgrade implementation.
- Complete power supply refurbishment at remaining 11 ARTCCs.
- Initiate procurement activities for new en route switch program per JRC recommendation.

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## 2A09, AIR TRAFFIC MANAGEMENT (ATM)

**FY 2006 Request $83.3M**

- A, Traffic Flow Management Infrastructure – Infrastructure Modernization, A05.01-06
- B, Collaborative Air Traffic Management Technologies (CATMT), A05.01-10

### A, TRAFFIC FLOW MANAGEMENT INFRASTRUCTURE – INFRASTRUCTURE MODERNIZATION, A05.01-06

## Program Description

The Traffic Flow Management (TFM) system is the automation backbone for the Air Traffic Control System Command Center's (ATCSCC) Traffic Management Coordinators and nationwide Traffic Management Units that assist in the strategic planning and management of air traffic demand. The TFM system is the Nation's single source for capturing and disseminating air traffic information and is the key product for coordinating air traffic across the aviation community. The FAA also collaborates with TFM customers to implement programs that reduce delays to ensure smooth and efficient traffic flow through FAA-controlled airspace, thereby saving the flying public and airlines millions of dollars. TFM's customers include the airlines, general aviation, U.S. Department of Defense (DoD), U.S. Department of Homeland Security, industry, and partner countries.

The TFM Modernization (TFM-M) component of the NAS Architecture modernizes the TFM Infrastructure (TFM-I). TFM-I hosts the software decision support systems and tools that manage and meter air traffic to reduce delays and make maximum use of system capacity to balance growing flight demands with NAS capacity within a dynamic environment. The TFM-I has evolved through several generations of hardware and software, and the system is approaching functional obsolescence. TFM-I software has become increasingly difficult to maintain and to modify, and it will not support the emerging ATM structure and system requirements.

## Relationship of Program to FAA Strategic Goal, Objective and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3 –** Increase the on-time performance of scheduled carriers.
- **FAA Performance Target 1 –** Through FY 2009, achieve a percentage of 86.90 for all flights arriving at the 35 OEP airports equal to or less than 15 minutes late due to NAS related delays.

## Relationship to Performance Target

The TFM-M program will support Greater Capacity goal through the use of automated systems that provide more accurate and timely information for all TFM system users, improve operator and passenger access to flight information, and reduce system delays. TFM-M will help to reduce airway and airport congestion by upgrading the existing TFM-I and will increase integration and interoperability within the overall ATM structure by establishing a robust, commercially available, and standards-compliant TFM-I. This will accelerate development and implementation of technology and tools that will improve traffic management synchronization, traffic management flow, and information management services. This will lead to improved passenger throughput, equitable allocation of resources among users, and significant improvement in air traffic operations system performance metrics. As commercial air travel continues to rise, TFM improvements provided by TFM-M are critical in mitigating delays and in aiding the economic survival of FAA customers.

***Key Events FY 2006 – Performance Output Goals***

- Re-engineer TFM architecture that supports improved access to TFM information, and integration of stand-alone capabilities.

***Key Events FY 2007-2010 – Performance Output Goals***

- Begin Initial Daily Use (IDU) of the modernized TFM system.
- Implement Work Packages that will provide new TFM functionality and NAS-wide benefits.

# B, COLLABORATIVE AIR TRAFFIC MANAGEMENT TECHNOLOGIES (CATMT), A05.01-10

## Program Description

The FAA's TFM system is the nation's single source for capturing and disseminating air traffic information and is the key product for coordinating air traffic across the aviation community. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system provides timely information to all aviation stakeholders in order to minimize NAS system delays. The TFM system provides the automation and communication mechanisms that support the decision-making process that ultimately impacts flight schedules. The TFM system enables FAA Traffic Management Specialists and Coordinators and Airline Operations Centers personnel in industry to use common data and automation tools to collaborate and develop daily air traffic flow strategies that balance FAA responsibilities, while preserving the economic flexibility for the customer.

The Collaborative Air Traffic Management Technologies (CATMT) program will complete the development of the legacy TFM Infrastructure programs including the Enhanced Traffic Management System, the National Traffic Management Log, and the Collaborative Decision Making (CDM) programs, including the Flight Schedule Monitor, Route Management Tool, and Post Operations Evaluation Tool. CATMT will then incrementally develop and integrate decision support capabilities for TFM Modernization, which improves NAS predictability and efficiency. CATMT capabilities will:

- Provide more accurate forecasting of system capacity and user demand.
- Improve modeling, evaluation and optimization of traffic management initiatives.
- Improve information dissemination, coordination and execution of traffic flow strategies.
- Minimize and equitably distribute delays across airports and users.
- Collect and process more performance data to define metrics and identify trends.

## Relationship of Program to FAA Strategic Goal, Objective and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3 –** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 1 –** Through FY 2009, achieve an 86.9 percent on-time arrival for all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late due to NAS related delays.

## Relationship to Performance Target

CATMT capabilities continue to support the implementation of strategies to meet the greater capacity performance target. The strategic initiatives supported through TFM and CDM capabilities include promoting use of automated systems that provide more accurate and timely information by improving operator and passenger access to flight information; and restructuring airspace to ensure efficient traffic flow between oceanic and domestic airspace by improving operator and passenger access to flight information. CATMT will support achieving these initiatives by: providing traffic management tools to increase capacity under Instrument Flight Rules conditions; developing and implementing systems and technologies to improve CDM; improving modeling and forecasting techniques to better anticipate and react to volume constraints and to achieve conformity between expected and actual flight times; and developing technology and tools to improve traffic management synchronization, traffic management flow, and information management services.

***Key Events FY 2006 – Performance Output Goals***

- Continue to evolve baseline functionalities to address user priorities, pending JRC-2b approval of Work Packages.
- Provide Ground Delay Program (GDP) and Flight Schedule Monitor Enhancements, including:
  - Adaptive GDP Compression.
  - Airspace-based GDPs.
  - Distance-based GDPs.
- Reroute modeling.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

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## 2A10, AIR/GROUND COMMUNICATIONS INFRASTRUCTURE

**FY 2006 Request $22.9M**

- Radio Control Equipment, C04.00-00
- Communications Facilities Enhancement – Expansion, C06.01.00
- Communications Facilities Enhancement – Air-to-Ground Communications Radio Frequency Interference Elimination, C06.03.00
- Backup Emergency Communications Replacement, C09.00.00
- Communications Facilities Enhancement – Ultra High Frequency Radio Replacement, C06.04.00

## Program Description

The Air-to-Ground (A/G) Communications Infrastructure Sustainment program enhances operational efficiency and effectiveness by making planned improvements to the A/G communications infrastructure (in all NAS environments, both en route and terminal). The improvements encompass replacing old and increasingly unreliable equipment and associated sites, and facility improvements, including establishing new facilities intended to broaden communications coverage. The Communications Facilities Enhancements (CFE) program provides new radio control facilities and/or modifies existing facilities to enhance the A/G communications between air traffic control and aircraft. The radio frequency interference

elimination program provides modern communication and ancillary equipment to improve operational performance at select remote communication facilities and eliminate interference from commercial or other radio frequency emissions.

The ultra high frequency (UHF) radio replacement project replaces aging equipment used to communicate with Department of Defense aircraft. The FAA maintains the UHF A/G communications service for air traffic control of military operations in the United States. The Backup Emergency Communications replacement program provides a dedicated channel/sector in place of a priority-based, shared outlet system and replaces a 1970s technology system that is logistically unsupportable.

The Radio Control Equipment (RCE) program, beginning in 1995, replaced obsolete radio signaling and tone control equipment, improved operational performance, and reduced maintenance costs. Due to the deferment of the next generation air/ground communications (NEXCOM) system development program, funding is required in FY 2006 to continue to meet RCE requirements. RCE is required at control end sites, such as ARTCCs, TRACON facilities, Airport Traffic Control Towers (ATCT), center radar approach (CERAP), Radar Approach Control, and Automated Flight Service Stations (AFSS). This equipment has also been used for controlling radio assets at radio control facilities such as, Remote Center Air/Ground (RCAG) facilities, Remote Transmitter/Receiver facilities, and Remote Communications Outlet facilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

This A/G Communications program supports the FAA initiative to provide communications infrastructure to make airspace restructuring feasible. It will reduce the number of outages and enhance communications capacity by replacing aging and increasingly unreliable communications equipment with modern equipment. This program improves and upgrades associated sites and facilities. In addition, it enables additional capacity by providing new communications sites to conform to new air traffic patterns.

***Key Events FY 2006 – Performance Output Goals***

- Procure and begin installation of 1,520 UHF Radios.
- Provide support to CFE critical sites.
- Procure 1,200 RCE units.

***Key Events FY 2007-2010 – Performance Output Goals***

- Procure and begin installation of 6,378 UHF Radios.
- Provide support to CFE critical sites.

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## 2A11, AIR TRAFFIC CONTROL BEACON INTERROGATOR - REPLACEMENT

**FY 2006 Request $15.4M**

- Secondary Surveillance – ATC Beacon Interrogator (ATCBI) Replacement, S02.03-00
- Air Traffic Control Beacon Interrogator Model 6 - Beacon Only Buildings, S02.03-02

## Program Description

The Air Traffic Control Beacon Interrogator Replacement (ATCBI-6) is a secondary radar used for En Route and Oceanic air traffic control. The ATCBI-6 ensures that aircraft positional information and identification remain available to support Air Traffic Control services, including separation assurance, traffic management, navigation, and flight information.

The ATCBI-6 sensors replace the 129 ATCBI-4/5 systems. These ATCBI-4/5 systems are 5 to 10 years past their 20-year life span and have many obsolete parts. Furthermore, the existing beacons are analog systems that are incompatible with new automation systems such as Standard Terminal Automation Replacement System (STARS) and HCS Replacement.

The ATCBI-6, in conjunction with co-located primary long-range radar, also provides back-up Center Radar Approach surveillance service to numerous Terminal Radar Approach Control facilities in the case of lost terminal radar services and/or scheduled maintenance downtime. The ATCBI-6 system is a low-cost, highly reliable, extremely accurate, and more capable replacement for old, high-cost obsolete beacon interrogators with higher failure rates.

The actual performance of ATCBI-6 systems show an increased mean time between outages and decreased time to restore service, resulting in increased system availability and reduced maintenance staffing needs. The ATCBI-6 provides digital outputs that support other NAS modernization including STARS and common Automated Radar Tracking System user workstations. There has also been extremely positive user feedback on the initial deployed systems, validating the test results.

The ATCBI-6 program collaborates with the DoD and the Department of Homeland Security (DHS) by providing FAA radar data to these agencies. This information sharing enhances the ability of the DoD and DHS to meet their air sovereignty and homeland defense missions.

The ATCBI-6 Beacon Only Sites - Facility Establishments project establishes buildings that will house the new beacon interrogators and adds new coverage. The new buildings will help protect the beacon interrogators from outage caused by severe weather or other causes.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The ATCBI-6 system significantly improved the reliability and availability of aircraft positional and identification data that will support the DOT and FAA goals for flights arriving on time, increased airport capacity and reduced operational costs.

***Key Events FY 2006 – Performance Output Goals***

- Deliver remaining ATCBI-6 systems to Norfolk, VA.
- Install and site test 10 systems.
- 24 Systems will require storage.
- Complete IOC at 20 sites.
- Continue installing Air Route Surveillance Radar Model 4 (ARSR-4)/Mode 4 Interface.
- Complete construction of the Georgetown, Bahamas facility.
- Begin construction of the Freeport, Bahamas facility.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue and complete installation activities.
- Continue and complete commissioning activities.
- Complete construction of the Freeport, Bahamas facility.
- Complete construction of the Yakutat, AK facility.

## 2A12, AIR TRAFFIC CONTROL EN ROUTE FACILITIES IMPROVEMENTS

**FY 2006 Request $3.0M**

- Long Range Radar (LRR) Program – LRR Improvements – Infrastructure Upgrades/Sustain, S04.02-03

## Program Description

The LRR infrastructure upgrades program sustains and improves the facilities where LRRs are installed to provide aircraft position information to FAA en route control centers. These planned improvements support the secondary beacons, both standalone and those co-located with the long-range primary radars. These secondary beacon radars have been and are being installed in facilities that dates back to the 1950's and 60's. Many of the en route secondary radar service outages can be directly linked to failing infrastructure. If the infrastructure of these en route radars is allowed to continue to degrade, the radar-supported service will suffer increasing outages and related delays. There is not a single contract to do the necessary upgrades. Contracts for improvements are specific to the component being repaired and sometimes also specific to the site where the improvement is needed. This project finances upgrades to the antenna drive systems and improvements to the facility infrastructure systems, such as power systems; engine generators; environmental control systems; electrical systems; and lightning protection, grounding, bonding, and shielding systems.

LRR Infrastructure Upgrades consist of two phases:

Phase I – Short-Term Upgrades to Facility Infrastructure. These are limited to refurbishing Heating, Ventilation, and Air-Conditioning (HVAC), Engine Generators, Uninterruptible Power Supply (UPS), and Lightning Protection, Grounding, Bonding, and Shielding Systems and performing minimum infrastructure upgrades to support ATCBI-6 deployment.

Phase II – Long-Term Upgrades to Facility Infrastructure. These will replace critical infrastructure systems if required for en route secondary beacon operations. Requirements are being defined through Web-based surveys and site surveys.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand
- **FAA Performance Target 1 –** Achieve an average daily capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

The LRR program is required to support the capacity performance goal in the NAS. This infrastructure upgrade project ensures that LRRs maintain high reliability and availability required to support the performance goal.

***Key Events FY 2006 – Performance Output Goals***

- Complete all 126 LRR sites by upgrading en route, beacon-only, ARSR-1, 2, 3, 4, and fixed-position surveillance sites receiving ATCBI-6 systems, including refurbishment of HVAC systems and power panels, grounding systems upgrades, and shelter replacements.
- Complete LRR site surveys, finalize engineering solutions, and acquire necessary equipment and components to replace obsolete or unsustainable infrastructure systems.
- Begin primary radar decommissioning activities at 126 sites.
- Perform en route radar in-service engineering.
- Begin Phase II – Long-term upgrades to facility infrastructure.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue Phase II – Long-Term Upgrades to Facility Infrastructure.
- Perform en route radar in-service engineering.

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## 2A13, EN ROUTE COMMUNICATIONS AND CONTROL FACILITIES IMPROVEMENTS

**FY 2006 Request $1.9M**

- Continued General Support – Regional Projects, M08.05-00

## Program Description

The En Route Communications and Control Facilities Improvements program upgrades and/or refurbishes operating positions in airport control towers; upgrades flight service station consoles; installs additional operating positions; replaces broken cab glass; replaces remote air/ground communications systems; renovates navigational aids, such as runway end identifier lights; and upgrades outer marker facilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The Regional Projects program contributes to the FAA's greater capacity goal by maintaining NAS equipment to minimize outages that would result in delays and, correspondingly, decreased capacity. It also funds projects such as adding new air traffic control positions, which enables increased capacity.

***Key Events FY 2006 – Performance Output Goals***

- Install additional Airport Traffic Control Tower (ATCT) operating positions.
- Replace/improve heating, ventilation, and air-conditioning (HVAC) systems.
- Refurbish/improve 74 ATCT facilities.
- Relocate/upgrade various localizers, Instrument Landing Systems (ILS), Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), Runway End Identifier Lights (REIL), and Glide Slope facilities.
- Establish/improve en route communications operating positions.
- Establish Air Route Traffic Control Center (ARTCC) Sectorization.
- Install Remote Center Air-to-Ground (RCAG) antenna towers.
- Install Occupational Safety and Health Administration (OSHA) approved safety devices on ATCBI-6 antennas.
- Provide Automatic Terminal Information Service to several locations.
- Provide Terminal Radar improvements for two locations.

***Key Events FY 2007-2010 – Performance Output Goals***

- Install additional ATCT operating positions.
- Replace/improve HVAC systems.
- Refurbish/improve multiple ATCT facilities.
- Relocate/upgrade various localizers, ILS, MALSR, REIL, and Glide Slope facilities.
- Establish/improve en route communications operating positions.
- Establish ARTCC Sectorization.
- Install RCAG antenna towers.
- Install OSHA-approved safety devices on ATCBI-6 antennas.
- Provide Automatic Terminal Information Service to several locations.
- Provide Terminal Radar improvements for two locations.

## 2A14, INTEGRATED TERMINAL WEATHER SYSTEM (ITWS)

**FY 2006 Request $18.4M**

- Integrated Terminal Weather System (ITWS) – Development/Procurement, W07.01-00

### Program Description

ITWS provides full-color graphic displays of essential weather information to promote the safety, efficiency, and capacity of air traffic control operations. ITWS products meet the specific needs of pilots, controllers, and air traffic managers and are immediately usable without further meteorological interpretation. ITWS also predicts weather conditions 20 minutes into the future. The system uses inputs from numerous weather radar systems and FAA and National Weather Service (NWS) sensors located at or near the airport. These include Terminal Doppler Weather Radar, Airport Surveillance Radar, Next Generation Weather Radar, Low Level Windshear Alert System, Airport Surface Observing System, and aircraft and other NWS weather information systems. ITWS products include windshear and microburst predictions, storm cell and lightning information, and terminal area winds aloft.

The FAA will deploy the ITWS to 22 TRACONs, and it will provide weather information to 28 high-activity airports that have demonstrated a significant convective weather history. The system displays hail, lightning, and tornadoes. Integrating data and products from various FAA and NWS sensors and specially equipped aircraft (via the meteorological data collection and reporting system) gives ITWS the accuracy and sophisticated predictions that it must have to operate effectively.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1** – Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

### Relationship to Performance Target

Traffic managers can use ITWS to plan traffic flow reconfiguration and to coordinate with personnel in the TRACONs, ATCTs, ARTCCs, and the ATCSCC to minimize cancellations and delays and sustain average daily capacity.

***Key Events FY 2006 – Performance Output Goals***

- Install ITWS at New York.
- Begin deploying such products Dry Microburst prediction and detection and Terminal Convective Weather Forecast.

***Key Events FY 2007-2010 – Performance Output Goals***

- Install ITWS at Dallas/Ft. Worth, Orlando, Memphis, Pittsburgh, Phoenix, Philadelphia, Salt Lake City, and Cleveland.

## 2A15, FAA TELECOMMUNICATIONS INFRASTRUCTURE (FTI)

**FY 2006 Request $57.8M**

- FAA Telecommunications Infrastructure (FTI), C26.01-00

### Program Description

The FTI solution is an integrated approach that will improve telecommunications services within the FAA's NAS and non-NAS infrastructures. FTI will replace costly legacy networks that are a combination of separately managed leased and owned systems and services. The objective of the FTI program is to

provide the FAA commercial telecommunications services capable of meeting present and future needs of programs requiring inter-facility telecommunications. The integrated telecommunications service environment will be able to use modern, highly reliable consolidated network infrastructure incorporating multi-service capabilities at the lowest possible cost. Additional benefits include:

- More efficient bandwidth utilization;
- Improved information security; and
- State-of-the-art business processes and technology.

The FTI transition has two phases that will take about 5 years to complete. Phase I implemented a 27-facility backbone at the 21 ARTCC, the William J. Hughes Technical Center (WJHTC), the Mike Monroney Aeronautical Center (MMAC), the Volpe National Transportation Center, the ATCSCC, and two FTI National Network Operations Control Centers. Phase II extends services to all other NAS facilities, and phase II deployment of FTI service to 14 sites is underway.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

The FTI program supports the Organizational Excellence Performance Target by lowering the cost of providing telecommunications services within the FAA's NAS and non-NAS infrastructures. FTI eliminates the need to manage and operate multiple sub-networks. The cost of provisioning, operating, and maintaining telecommunications services provided by FTI will be lower than the telecommunications cost of operating and maintaining the legacy systems. The prices for access and transport services are competitive and exhibit economies of scale regarding bandwidth. Technological improvements support bandwidth sharing. Combining the bandwidth needs of multiple end-users will increase the efficiency of bandwidth usage and decrease the cost. Additional efficiencies are gained with FTI's Integrated Business Systems interface for ordering, provisioning, and tracking telecommunications services.

***Key Events FY 2006 – Performance Output Goals***

- Complete installation at 75 percent of all major sites (316 of 422).
- Complete development and verification of the Integrated Business Systems Final Operational Capability.
- Complete mission support transition to FTI.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete NAS services transition to FTI (about 5,000 cumulative sites).

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## 2A16, GUAM CERAP – RELOCATE

**FY 2006 Request $3.0M**

- Relocate Guam CERAP, F25.00-00

## Program Description

The existing Guam Center Radar Approach (CERAP) building was built in the early 1960's, and, as a result of Super Typhoon Paka, the building retains moisture and leaks throughout. The infrastructure is deteriorating rapidly due to the moisture problem. The FAA will renovate and expand the existing base

building at the Agana International Airport NAS equipment, the critical power distribution system with it's engine/generator, the uninterruptible power supply system, and mechanical systems. This project will also include procurement and installation of electronic equipment. Once the project is completed, the FAA will relocate its CERAP operations from Andersen Air Force Base to the FAA Base Building at Agana International Airport.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The CERAP relocation will provide the Guam airspace a new building with infrastructure. CERAP operations will be conducted in a modernized control room environment in an FAA-owned facility. The FAA will replace NAS and communications equipment as well as environmental support equipment, which should reduce the chances of equipment and power outages that can cause air traffic delays. Additionally, access to the facility will not be affected by military operations, and future maintenance and modernization activities will be performed quicker and with less coordination. Finally, the relocation will reduce the risk of future typhoon damage, since the facility is on the leeward side of the island.

***Key Events FY 2006 – Performance Output Goals***

- Provide funding for abatement of the old CERAP.
- Provide funding for disposal of excess equipment from the old CERAP.
- Complete installation of the Power System for the Guam facility.

***Key Events FY 2007-2010 – Performance Output Goals***

- Program completed in FY 2006.

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## 2A17, OCEANIC AUTOMATION PROGRAM

**FY 2006 Request $35.7M**

- Advanced Technologies and Oceanic Procedures (ATOP), A10.03-00

## Program Description

The ATOP program will replace oceanic air traffic control systems and procedures and modernize the Oakland, New York and Anchorage ARTCCs. ATOP fully integrates flight and radar data processing, detects conflicts between aircraft, provides data link and surveillance capabilities, and automates the manual processes used today. ATOP will provide a fully modernized oceanic air traffic control automation system, installation, testing, training, common procedures, and lifecycle system maintenance. The program office will conduct modeling and simulations to forecast benefits and, once ATOP is in operational use, will gather and document performance data and metrics to measure services for citizens, productivity, efficiency, and user satisfaction.

ATOP will allow the FAA to discontinue the use of the difficult communications and intensively manual processes that limit controller flexibility in handling airline requests for more efficient tracks over long oceanic routes. The program will provide the FAA the automation, Automatic Dependent Surveillance-Contract (ADS-C), and conflict resolution capability required to reduce aircraft separation from 100 nautical miles (nm) to 30 nm. ATOP also allows the FAA to meet international commitments and helps the Agency avoid losing delegated airspace used by air carriers and military flights.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3 –** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 2 –** Beginning in FY 2005, increase the number of oceanic en-route altitude change requests that are granted through the end of FY 2009 to 80 percent.

## Relationship to Performance Target

ATOP will allow properly equipped aircraft (i.e., ADS-C, Controller-Pilot Data Link Communication, Required Navigation Performance-4 nm) and qualified aircrews to operate using reduced oceanic separation criteria. This will enable more aircraft to fly optimal routes and enhance aircraft flight time (and fuel and payload) efficiency during oceanic legs of their flights. Reduced lateral (side-to-side) separation may provide space for additional routes between current locations or new direct markets. Reduced longitudinal (nose-to-tail) separation may provide more opportunities to add flights without delays (e.g., climbs, descents, reroutes or speed penalties.)

***Key Events FY 2006 – Performance Output Goals***

- Complete Anchorage ARTCC radar/procedural system Initial Operational Capability.

***Key Events FY 2007-2010 – Performance Output Goals***

- Conduct procedural system Independent Operational Test and Evaluation (IOT&E).
- Conduct radar system IOT&E.

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## 2A18, AIR TRAFFIC OPERATIONS MANAGEMENT SYSTEM (ATOMS)

**FY 2006 Request $2.2M**

- ATOMS Local Area/Wide Area Network, M29.00-00

## Program Description

The ATOMS is a personal computer-based system used for transferring information on performance of the air traffic control system from FAA regional facilities to a central system in the agency's Washington, DC, headquarters. The system consists of a multi-tiered enterprise architecture called the Corporate Air Traffic Management Information System. The architecture provides the integrated capability, including infrastructure and common toolset, to support collection, storage, and delivery of business and operational information to the Air Traffic Organization (ATO). The key element of the infrastructure is common data architecture, which supports data gathering and dissemination from legacy systems, interactive Web products, and emerging facility systems such as ***Cru-X***/Labor Distribution Reporting (LDR). ***Cru-X*** is an integrated software suite that automates common administrative tasks and improves service. ***Cru-X*** integrates with both operational and administrative systems to create the first national business system for ATS. Additionally, ***Cru-X*** is the official source within air traffic services to capture LDR information. LDR is an application inside ***Cru-X*** that enables improved control over labor costs, easily the FAA's largest expenditure. By tracking labor hours for projects and activities, LDR gives managers better insight into how resources are used.

Custom-designed facility-level applications employing techniques that require reengineering of administrative and mandated processes are needed to support the FAA's Cost Accounting System and labor distribution reporting initiatives and reduce increasing levels of administrative workload. Enhanced Web-based, data-gathering systems, and improved methods for moving and managing data will complete the distribution system. Accuracy and standardization will improve significantly through one-time-only data entry at the source (field facilities), which will efficiently share the data using information-delivery tools available within the Corporate Air Traffic Toolset Portal. Once data systems are developed and distributed, the FAA will provide appropriate analytical and reporting tools to assist Air Traffic in facilitating business-based decisions for tomorrow's outcomes.

The FAA procured more than 1,000 workstations to support Air Traffic and its sign-in/sign-out activities via Cru-Ops. The information captured will be used to support the LDR and cost accounting requirements.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence**.
- **FAA Objective 1 –** Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.
- **FAA Performance Target 2 –** Directly relate 100 percent of all employee performance plans to FAA Strategic Goals and their organization's performance plans.

## Relationship to Performance Target

Organizations can use data from ATOMS to relate employee performance plans to operational performance. Executive and management performance plans will be based on implementing performance-based data structures and matrices to support the emerging ATO. Executive management and staff personnel will have an integrated toolset that can generate near-real-time reporting and analysis of all major Air Traffic business information related to their performance plans.

# B. TERMINAL PROGRAMS

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## 2B01, AIRPORT SURFACE DETECTION EQUIPMENT – MODEL X (ASDE-X)

**FY 2006 Request $27.2M**

- Airport Surface Detection Equipment – Model X (ASDE-X), S09.01-00
- Airport Surface Detection Equipment – Model 3X (ASDE-3X) – Upgrade ASDE-3 Sites with Multilateration/ADS-B for Initial 7 sites, S09.03-01

## Program Description

The ASDE-X is a modular surface surveillance system that can process radar, multilateration, and Automatic Dependent Surveillance-Broadcast (ADS-B) sensor data, which provides seamless airport surface surveillance to air traffic controllers. The ASDE-X system is for second-tier airports. The ASDE-3X serves as a product improvement for upgrading first-tier airports (ASDE-3/Airport Movement Area Safety System) with ASDE-X functionality. The FAA announced in June 2000 that the ASDE-X program would deploy 25 operational systems and three support systems. Additionally, the ASDE-X Product Improvement/Upgrade (ASDE-3X) for ASDE-3 sites will be deployed at ten operational ASDE-3 sites, for a total of 35 operational systems and three support systems.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 4 –** Reduce the risk of runway incursions.
- **FAA Performance Target –** By FY 2009, reduce the number of Category A and B (most serious) runway incursions to no more than 27, equivalent to a rate of 0.390 per million operations.

## Relationship to Performance Target

The primary benefit of the ASDE-X and ASDE-3X is increased safety through enhanced air traffic control situational awareness on airport surface. The ASDE-X/3X conflict detection and alert equipment (with multilateration) will provide detailed coverage of runways and taxiways, and alert air traffic controllers (visually and aurally) to potential collisions. The ASDE-X/3X depicts aircraft and vehicle position using

identification information overlays on a color map showing the surface movement area and arrival corridors. The ASDE-X/3X assists air traffic controllers by identifying surface traffic during visual meteorological conditions, as well as during instrument meteorological conditions when inclement weather impairs visibility from the tower.

***Key Events FY 2006 – Performance Output Goals***

- Achieve Operational Readiness Date (ORD) at one ASDE-X site.
- Achieve ORD at four ASDE-3X sites.
- Deliver three ASDE-X Systems.
- Deliver three ASDE-3X Systems.

***Key Events FY 2007-2010 – Performance Output Goals***

- Achieve ORD at 18 ASDE-X sites.
- Achieve ORD at five ASDE-3X sites.
- Deliver 15 ASDE-X Systems.
- Deliver two ASDE-3X Systems.

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## 2B02, TERMINAL DOPPLER WEATHER RADAR (TDWR) - PROVIDE

**FY 2006 Request $8.0M**

- Terminal Doppler Weather Radar – Service Life Extension Program, W03.03-01

## Program Description

The primary mission of the TDWR is to enhance the safety of air travel through timely detection, reporting, and display of hazardous weather conditions—wind-shear events, microburst and gust fronts, tornadic winds and thunderstorms—in and near an airport's terminal approach and departure zone. TDWRs are installed at higher-density airports with high occurrences of thunderstorms and provide controllers information on severe weather so that they can issue warnings to pilots. TDWRs are operational at 46 airports.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The TDWR service life extension program contributes to safety goals by improving TDWR software architecture integration and replacing existing components with more reliable components, which will enable the TDWR to operate until 2020.

***Key Events FY 2006 – Performance Output Goals***

- Achieve operational status for backup communication system at two sites.
- Achieve operational status for Direct Digital Controller rehost modification at nine sites.
- Continue to implement major elements of the TDWR service life extension program, including elevation drive enhancement, direct digital controller replacement, antenna motor replacement, and Radar Data Acquisition retrofit.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue to implement major elements of the TDWR service life extension program, including elevation drive enhancement, direct digital controller replacement, antenna motor replacement, and Radar Data Acquisition retrofit.

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## 2B03, TERMINAL AUTOMATION PHASE 1

**FY 2006 Request $83.2M**

- Standard Terminal Automation Replacement System - Phase 1 - Development and Procurement, A04.01-00
- Standard Terminal Automation Replacement System Phase 1 - Technology Refresh, A04.01-01
- Standard Terminal Automation Replacement System Phase 1 - Terminal Enhancements, A04.01-02
- Terminal Automation Modernization Replacement (TAMR) Phases 2 & 3, A04.05-00

## Program Description

On April 20, 2004, the FAA JRC directed a phased approach to terminal automation modernization. The JRC approved STARS as a replacement for 47 critical site systems within three years. (The FAA has already replaced 27 out of a total of 43 Automated Radar Terminal System (ARTS) IIIA and two of four ARTS IIE sites with the STARS). In FY 2005 the terminal automation replacement/modernization beyond the current phase is under review and will be implemented under the Terminal Automation Modernization Replacement (TAMR) program (A04.05-00).

The STARS is a terminal air traffic control system designed to replace the existing ARTS. The STARS assists controllers in separating air traffic during arrivals, departures, and over-flights at airports. The STARS provides a fully digital system that will meet expanding air traffic control needs through 2031. The STARS provides new air traffic control workstations with state-of-the-art computers, high-resolution color displays, and commercially based software that will permit the FAA to move toward a standard configuration at all terminal facilities if economically feasible. The STARS has several significant capabilities, such as improved weather display, increased capacity to accept air traffic control automation improvements, and greater flexibility in allocating air traffic resources.

STARS is a joint program (between the FAA and U.S. DoD that replaces aging, legacy terminal FAA and DoD automation systems with state-of-the-art terminal air traffic control systems. The joint STARS program seeks to avoid duplicating development and logistic costs while facilitating transition of controllers between the civil and military sectors. Civil and military air traffic controllers across the Nation are using STARS to direct aircraft at and near major airports.

The remaining projects under the STARS program are as follows:

- STARS Terminal Enhancements (A04.01-02) will enable addition of software features (e.g., increased security and safety) crucial to maintaining the terminal air traffic control environment.
- The STARS Technology Refresh program (A04.01-01) will keep the STARS hardware and operating systems current as technology evolves through the system lifecycle, thus eliminating another major automation acquisition in the future.
- Upgrade of the Automation Interface Adaptor for the ARTS IIIE/ARTS Color Display interface is essential to deploy to larger consolidated terminal air traffic control facilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.

- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The STARS Phase 1 deployment will reduce the number of outages by replacing older terminal automation equipment with more modern equipment. Also, the STARS has an improved controller data display and data manipulation capabilities, enabling controllers to increase aircraft density without compromising safety.

***Key Events FY 2006 – Performance Output Goals***

- Performance output goals for FY 2006 are to be determined pending results from the FY 2005 JRC.

***Key Events FY 2007-2010 – Performance Output Goals***

- Performance output goals for FY 2007-2010 will be determined pending the future Terminal Automation decision.

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## 2B04, TERMINAL AUTOMATION PROGRAM

**FY 2006 Request $39.3M**

- A, Terminal Sustainment, A03.04-01
- B, Flight Data Input/Output (FDIO) Replacement, A01.11-01

### A, TERMINAL SUSTAINMENT, A03.04-01

## Program Description

The Terminal Sustainment program will continue to maintain existing FAA Terminal automation systems, including the Automated Radar Terminal System (ARTS) Models IIIA, IIE, and IIIE and associated displays.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

Terminal sustainment reduces outages and thus reduces delays.

***Key Events FY 2006 – Performance Output Goals***

- Continue to fix problem reports and perform hardware maintenance on ARTS IE, IIE, and IIIE.
- Reduce the number of Program Trouble Reports (PTRs).
- Continue to support ARTS IIIA until STARS units replace them.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue to fix problem reports and perform hardware maintenance on ARTS IIE and IIIE.
- Reduce the number of PTRs.

## B, FLIGHT DATA INPUT/OUTPUT (FDIO) REPLACEMENT, A01.11-01

### Program Description

The FDIO Replacement program replaces existing system components that produce the flight data information on planned routes of travel for aircraft. It transfers and prints the flight data information to assist controllers in anticipating the arrival of aircraft in the sector under their control. The FDIO systems are used at all but about 70 of 464 control towers and all TRACON facilities in operation. Additionally, the FAA provides FDIO acquisition and engineering support to U.S. DoD facilities in accordance with a memorandum of agreement. Air traffic control facilities not equipped with the FDIO system exchange flight data with ARTCC by phone.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

The FDIO program replaces obsolete equipment, thereby reducing potential outages and delays.

***Program Plan FY 2006 – Performance Output Goals***

- Continue to procure hardware and software to replace equipment in the field.
- Continue to support FDIO sites.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue to procure hardware and software to replace equipment in the field.
- Continue to support FDIO sites.

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## 2B05, TERMINAL AIR TRAFFIC CONTROL FACILITIES – REPLACE

**FY 2006 Request $85.4M**

- Airport Traffic Control Tower (ATCT)/Terminal Radar Approach Control (TRACON) Establish/Sustain/Replace – ATCT/TRACON Replacement, F01.02.00

### Program Description

The FAA provides air traffic control services from more than 500 ATCT and TRACON facilities and must continually replace these buildings to ensure an acceptable level of air traffic control services and to meet current and future operational requirements. The average age of control towers is 27 years, and some are 40 years old. As the volume and complexity of terminal air traffic control increases, so does the need to have additional positions in the ATCT/TRACON facilities (i.e., helicopter positions, Visual Flight Rule traffic advisories, runway monitors, etc.). Control towers built 20 years ago do not meet today's operational requirements. In addition, terminal facilities must conform to current building codes and design standards.

ATCT/TRACON facilities that cannot meet present-day operational requirements are to be replaced. The FAA will also determine the cost and operational benefit of combining TRACON facilities that have common boundaries. New facilities will accommodate future growth, current building codes and design standards. The FAA will fund terminal facility replacement programs in four phases to provide sound financial management of these projects. Phase I includes site selection and advanced engineering; phase II incorporates electronic equipment procurement, environmental studies, and site adaptation; phase III is

facility construction; and phase IV continues funding for equipment installation, demolition, and restoration.

## Relationship of Program to FAA Strategic Goal, Objective and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The Terminal Air Traffic Control Facilities program contributes to the FAA greater capacity goal by replacing ATCTs to meet current and future operational requirements. Some replacements are required to accommodate growth in air traffic; others are needed to provide added space for new equipment; and, in some cases, the tower must be replaced to ensure that controllers have an unobstructed view of the runways and taxiways. The average control tower is 27 years old, and as volume and complexity of terminal air traffic control increases, so does the requirement for additional positions in ATCT/TRACON facilities.

New and replacement facilities support the FAA capacity goal: to provide a system that meets or exceeds air traffic demand. Strategic location, adequate height, and cab size of an airport traffic control tower will provide an efficient working environment, enable controllers to achieve an aerial view of the airport, and enable them to see aircraft at the outer aircraft movement areas.

***Key Events FY 2006 – Performance Output Goals***

- Obtain siting approvals for 10 sites.
- Begin and complete design for five sites.
- Perform site work at one site.
- Began construction start at seven sites.
- Complete electronic design efforts for 10 sites.
- Install electronics at nine sites.
- Continue construction at six sites.
- Provide Other Transaction Agreement support at six sites.
- Decommission/restore four sites.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue siting studies, design, site work, construction, electronic design, electronic installation, decommission and restoration.
- Provide Other Transaction Agreement support.

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## 2B06, ATCT/TERMINAL RADAR APPROACH CONTROL FACILITIES – IMPROVE

**FY 2006 Request $51.5M**

- ATCT/TRACON Establish/Sustain/Replace – ATCT/TRACON Modernization, F01.01-00
- Advanced Facility Planning, F02.10-00

## Program Description

The FAA must continually upgrade and improve various 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 to accommodate facility expansion. Upgrades also include additional operating positions; training space and base-building construction; as well as replacement of undersized generators and environmental equipment.

Since their construction, ATCT/TRACON facilities have had to address additional operational and safety requirements, including upgraded accessibility, hazardous materials, seismic, and security requirements. Facility improvements will incorporate these new requirements and ensure that there is an orderly transition, with minimal impact on existing operations, to the new configuration for relocated or replaced equipment. The power, heating, ventilation, and air-conditioning systems at many of the terminal facilities must be upgraded to handle both the new and old equipment during the in-service change-out. Successful transition of these projects to the new configurations is critical. In many towers, there is no room for additional equipment; therefore, base buildings must be provided or expanded. According to an initial evaluation by the U.S. Army Corps of Engineers, a number of FAA ATCT/TRACON facilities do not meet current seismic code criteria. This program has begun scheduled follow-up evaluations to determine the extent and cost of work to bring the facilities up to a level to withstand a seismic event.

## Relationship of Program to FAA Strategic Goal, Objective and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The ATCT/TRACON Modernization program upgrades and improves facilities to support the NAS modernization strategy for achieving efficient aerospace systems and operations. These projects will enable facilities to meet current operational, environmental, and safety needs economically instead of replacing or relocating the entire facility. This effort will result in a smooth and orderly transition of new equipment into FAA terminal facilities, minimizing disruption of the operating system. This program will also improve the operational efficiency and environmental systems of obsolete and deteriorated ATCT/TRACON facilities. The improvements modernize facility infrastructure such as electrical distribution systems, heating and air-conditioning, and structural problems, to minimize outages that would delay air traffic.

***Key Events FY 2006 – Performance Output Goals***

- Conduct 16 Facility Assessments and planning projects (e.g., Seismic, Government Transition Evaluations, Conditions Assessments, Facility Master Plans, etc.) to determine requirements.
- Initiate 35 new projects to improve, repair, and sustain projects at ATCT/TRACON facilities.
- Initiate 69 Regional Projects.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue facility sustainment, repair, and modernization work within available funding.
- Initiate 45 modernization related projects in FY 2007.
- Initiate 48 modernization related projects in FY 2008.
- Initiate 58 modernization related projects in FY 2009.
- Initiate 41 modernization related projects in FY 2010.

## 2B07, TERMINAL VOICE SWITCH REPLACEMENT (TVSR)/ENHANCED TERMINAL VOICE SWITCH (ETVS)

**FY 2006 Request $8.0M**

- Voice Switches – Enhanced Terminal Voice Switches (ETVS), C05.02-00

### Program Description

The ongoing TVSR program involves replacing the aging, obsolete voice switches in the Air Traffic Control Towers and Terminal Radar Approach Control facilities. 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, and voice switch bypass systems. To date, this program has replaced 325 (189 small and136 large) of 421 terminal switches throughout the NAS. The program also provides the contract vehicles for the FAA to procure voice switch equipment for new and modernized terminal facilities.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

The TVSR program supports the greater capacity goal by improving system reliability of terminal voice communications by replacing aging electronic switches with modern digital equipment.

***Key Events FY 2006 – Performance Output Goals***

- Complete IOT&E on the new terminal voice switch systems.
- Deliver four previously procured terminal voice switch systems.
- Deliver 11 voice switches under the new terminal voice switch contract.

***Key Events FY 2007-2010 – Performance Output Goals***

- Deliver 45 terminal voice switches under a new contract to various FAA locations.

## 2B08, NAS FACILITIES OSHA AND ENVIRONNEMENTAL STANDARDS COMPLIANCE

**FY 2006 Request $20.7M**

- Fire Life Safety for Air Traffic Control Tower, F13.03-00
- Environmental and Occupational Safety and Health Compliance, F13.03-00

### Program Description

Safety and health concerns at FAA facilities have resulted in regulatory actions against the FAA and disruptions to NAS operations. Monthly, there are about ten to twenty disruptions of NAS operations reported to the National Operations Control Center involving environmental and occupational safety and health (EOSH) issues. Since 2000, the Occupational Safety and Health Administration (OSHA) has conducted 70 inspections of FAA facilities and issued 254 citations, including 170 citations listed as "serious." For example, OSHA inspected the Memphis System Management Office in February 2001 and issued 20 citations; 16 were serious. One of the violations involved improper storage of oxygen cylinders, which created an explosion hazard. In 2003, the Environmental Protection Agency (EPA) fined the Mike

Monroney Aeronautical Center $67,210 for Resource Conservation and Recovery Act violations related to hazardous waste handling. In addition, EPA imposed a $99,000 fine on the William J. Hughes Technical Center for Clean Air Act violations. The FAA Administrator signed an agreement with OSHA to upgrade 385 airport traffic control towers by FY 2009 to meet OSHA standards of fire life safety. The estimated cost is $121 million from FY 1997 to FY 2009. This program implements FAA Executive Orders 12088 and 12196, 32 public laws and negotiated labor agreements in occupational safety and health, environmental, fire life safety, and energy conservation in accordance with FAA Executive Order 12902 and the 1992 Energy Policy Act. The Energy Conservation/Efficiency program updates design specifications and implement renewable energy sources. The result will be a safe, healthful, and environmentally sound work place.

The Fire Life Safety program implements fire life safety upgrades at ATCTs. Additionally, it develops fire prevention plans and trains tower occupants, resident engineers, maintenance technicians and employees on maintenance requirements for new systems.

## Relationship of Program to DOT Strategic Goal, Objective, & Performance Target

- **DOT Strategic Goal – Environmental Stewardship.**
- **DOT Objective 1 –** Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

## Relationship to Performance Target

This program supports the Environmental Stewardship goal by implementing Executive Orders, public laws, and negotiated labor agreements that address occupational safety and health, environmental issues, fire life safety and energy conservation requirements.

***Key Events FY 2006 – Performance Output Goals***

- Implement energy-efficient/conservation efforts.
- Continue to perform safety hazard analysis on NAS in-service equipment.
- Continue to revise EOSH training standards and national course titles.
- Implement fire life safety upgrades for 25 ATCTs.
- Perform three on-site EOSH program reviews.
- Support acquisition management organizations by providing Occupational Safety and Health (OSH) and environmental technical assistance throughout the acquisition process.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue implementing fire life safety upgrades at ATCTs.
- Continue implementing energy-efficient/conservation efforts.
- Support acquisition management organizations by providing OSH and environmental technical assistance throughout the acquisition process.
- Complete engineering change proposal follow-up reviews in the Service Areas and centers.
- Continue implementing written safety programs.

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## 2B09, HOUSTON AREA AIR TRAFFIC SYSTEM (HAATS)

**FY 2006 Request $10.2M**

- Large TRACONs – Houston Area Air Traffic System (HAATS), F02.11-01

## Program Description

The HAATS program's objective is to be the focal point and provides resources for all the FAA activities associated with implementing the new airspace in the Houston area. The Operational Evolution Plan (OEP) identifies the redesign of the Houston, TX, terminal airspace as both a mid-and long-term project

under the National Airspace Redesign Program. The HAATS program will implement the new airspace design by providing the infrastructure, national airspace improvements, and by publishing new procedures. The HAATS program, along with the associated expanded TRACON project, will ensure that the FAA is able to meet the capacity increase identified in the OEP. Realization of the capacity increases streaming from expansion projects of George Bush Intercontinental, William P. Hobby, and Ellington Field Airports will provide significant benefits to the entire NAS.

The city of Houston, has initiated a $3-Billion-plus expansion effort for the city-owned airports, which are George Bush Intercontinental, William P. Hobby, and Ellington Field. The increases in airport capacity created by the initial airport expansions of George Bush Intercontinental and William P. Hobby Airports cannot be supported by the existing airspace design or FAA facilities and equipment. In addition, future expansion of these airports will significantly increase the complexity for the air traffic system to accommodate the arrival and departure capacities of the airports. Therefore, the city must upgrade and expand several existing FAA facilities and/or install new systems to support expansion of the airspace.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase Airport Capacity to meet projected demand.
- **FAA Performance Target 2** – Open as many as seven new runways, increasing the annual service volume of the 35 OEP airports by at least 1 percent annually, measured as a five-year moving average, through FY 2009.

## Relationship to Performance Target

The HAATS program, along with the associated expanded TRACON project, will ensure achievement of the capacity increase identified in the OEP and that the FAA will achieve its Strategic Goal for George Bush Intercontinental, William P. Hobby, and Ellington Field on schedule. Realizing new capacity resulting from the George Bush Intercontinental Airport expansion project alone will provide significant benefits to the NAS. Commissioning the extended runway 15R/33L in May 2002 has increased the departure capacity significantly, which in turn, has reduced ground delays. Commissioning the new runway 8L/26R in October 2003 has increased arrival capacity by 50 percent, effectively increasing the arrival flow rate for George Bush Intercontinental Airport from 64 per hour to 96 per hour under Instrument Flight Rules. Implementing HAATS airspace and procedures modifications will ensure that the terminal and en route airspace system provides the capacity to meet or exceed the airport capabilities in the Houston area.

***Key Events FY 2006 – Performance Output Goals***

- Initiate construction of new facilities to support the expanded airspace including; Airport Surveillance Radars (ASRs), Air Route Surveillance Radars (ARSR), Very High Frequency Omnidirectional Range (VOR) systems, RCAG facilities, Terminal Remote Transmitter/Receivers, a communications network, and new sectors at the Houston ARTCC.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue developing charts and procedures to support implementation of the new airspace.
- Begin installing modifications to various computer automation programs to accommodate the new airspace and procedures.
- Complete construction, certification and commissioning of new facilities to support expanded airspace and procedures modifications including; ASRs, ARSRs, VORs, RCAGs, Remote Transmitter/Receivers, a communications network, and new sectors at the Houston ARTCC.
- Complete development, flight inspection, and publication of the charts and procedures to support implementation of the new airspace.
- Complete installation and certification of modifications to various computer automation programs to accommodate the new airspace and procedures.
- Complete airspace modifications identified in the National Airspace Redesign.
- Complete training of ATO personnel on new facilities, equipment, airspace, and procedures.

## 2B10, NAS INFRASTRUCTURE MANAGEMENT SYSTEM (NIMS)

**FY 2006 Request $17.0M**

- NAS Infrastructure Management System (NIMS) - Phase 2, M07.02-00

## Program Description

The NIMS program provides the next generation of tools that support management, operation, and maintenance of the NAS. The NIMS provides a Web-based open architecture system of commercial-off-the-shelf (COTS) hardware and software that replaces the FAA's one-of-a-kind and antiquated Maintenance Processor Subsystem. The NIMS design implements a secure three-tiered architecture, consisting of a National Operations Control Center, three Operations Control Centers, about 30 Service Operations Centers (SOC), and some 380 Systems Support Centers to support more than 6,000 users. The NIMS supports and coordinates maintenance activities; performs Remote Maintenance and Monitoring; and provides service and status information for more than 30,000 Air Traffic Control facilities. The NIMS supports the migration of the FAA's maintenance approach from an equipment outage reactionary-based system to proactive service management and represents the technical cornerstone in the FAA's transition from a decentralized to a centralized maintenance management system. NIMS Event Logging capabilities will ensure a common logging system and provide a centralized logistics and maintenance system across the NAS.

A key cost of maintaining legacy platforms is having to develop obsolete communications protocol packages for new systems to interface with the legacy Equipment Monitor (EM) system. These protocols will ultimately have to be rewritten to interface with new technology. The NIMS will bridge these performance gaps by:

- Deploying a new EM platform using an open system architecture.
- Developing and deploying proxies to convert legacy protocols to an open system architecture to communicate with the new EM platform.
- Implementing an open system architecture to communicate directly with the new EM platform.
- Eliminating proxies as new systems are implemented.

Finally, the NIMS will optimize equipment maintenance to reduce the overall cost per outage by:

- Reducing outage event documentation costs.
- Reducing delays in responding to outage reports while waiting for related reports to arrive.
- Correlating multiple outages so that only one technician is dispatched per outage.
- Reducing the cost per customer contact to coordinate maintenance.
- Reducing the cost to provide and maintain NAS-wide status of outages.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

The NIMS is essential to the success of the FAA's efforts to implement enhanced cost-control measures and is a vital feedback mechanism for tracking performance against any cost metrics related to maintaining the NAS.

***Key Events FY 2006 – Performance Output Goals***

- Complete NAS-wide deployment of EM Tool to the entire the field specialist workforce.
- Commission EM at the Operations Control Centers.
- Complete Remote Maintenance VORTAC Concentrator connection to NIMS NAS-wide (969 very high frequency omni-directional range collocated with tactical air navigation (VORTAC)/Distance Measuring Equipment (DME) subsystems).
- Deploy monitor and control to en route SOCs (23).
- Initiate development of Manager of Managers at Terminal SOCs and large TRACONs (6).
- Connect EM System to other Resource Manager subsystems (Logistics and Information System, Asset Supply Chain Management (ASCM) and National Data Warehouse).

***Key Events FY 2007-2010 – Performance Output Goals***

- Connect to 16 NAS legacy systems totaling 3,047 distinct pieces of equipment and sites.
- Connect to new NAS systems as they are installed.

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## 2B11, AIRPORT SURVEILLANCE RADAR (ASR-9)

**FY 2006 Request $26.2M**

- A1, Terminal Radar (ASR) Program – ASR-9/Mode S SLEP, Phase 1A, S03.01-04
- A2, Terminal Radar (ASR) Program – ASR-9/Mode S SLEP, Phase 1B, S03.01-05
- A3, Terminal Radar (ASR) Program – ASR-9/Mode S SLEP, Phase 2, S03.01-06
- X, ASR Weather Systems Processor (ASR-WSP) – Tech Refresh / Product Improvement, W09.01-00

### A, TERMINAL RADAR (ASR) PROGRAM – ASR-9/MODE S SLEP, PHASE 1A, 1B, AND 2

### Program Description

The ASR-9 program provides aircraft detection and separation services at congested airports, which reduces aircraft delays and improves safety. The ASR-9 Service Life Extension Program (SLEP) will ensure that this critical service remains available by replacing obsolete components to sustain existing system capabilities. Sustaining the ASR-9/Mode Select (Mode-S) systems reduces the risk of outages due to deterioration and parts obsolescence, and ensures continuation of maximum service capabilities.

System failures at ASR-9 sites have indicated how critical it is to extend the service life. As a result of these failures, reliability and performance levels have degraded, which adversely affects capacity. The Mode-S beacon system operates with the ASR-9, and it provides secondary surveillance and communications services by using selective interrogation and the Traffic Information Service. The Mode-S was first deployed in the NAS in 1994. Replacement parts and/or redesign of appropriate assemblies are required to prevent further Mode-S degradation. The SLEP will remedy service degradation by developing and implementing system modifications to replace obsolete components. This will increase reliability, improve performance, and reduce maintenance costs.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The ASR program contributes to the goal of greater capacity by maintaining existing airport capacity and meeting future air traffic demands. The ASR-9 serves the airports with high activity levels and will not be replaced by the ASR-11. The SLEP will determine the parts that are most prone to failure and replace them with more reliable components. This will improve reliability, preventing delays due to radar outages at the high activity airports.

***Key Events FY 2006 – Performance Output Goals***

- Continue installing external antenna modifications.
- Continue designing and developing ASR-9 transmitter modifications.
- Procure and deliver replacement Mode S Local Maintenance Terminals.
- Complete prototype testing of Mode S Radar Intelligence Tool.
- Procure and deliver replacement Mode S Radar Intelligence Tool.
- Continue delivering ASR-9 Remote Maintenance System (RMS) replacement units.
- Award contract for SLEP phase 2 effort.

***Key Events FY 2007-2010 – Performance Output Goals***

- Produce, install, and test first article of ASR-9 transmitter modification.
- Complete operational testing and evaluation of ASR-9 transmitter modification.
- Begin production of ASR-9 transmitter modification.
- Complete installation, testing, and acceptance of ASR-9 transmitter modification at all sites.
- Complete installation, testing, and acceptance of ASR-9 external modification at all sites.
- Complete assembly and delivery of ASR-9 RMS replacement units.

# X, ASR WEATHER SYSTEMS PROCESSOR (ASR-WSP) – TECH REFRESH / PRODUCT IMPROVEMENT, W09.01-00

## Program Description

The WSP is a cost-effective alternative to the Terminal Doppler Weather Radar (TDWR) and provides weather situational awareness for tower and TRACON ATC personnel. The ASR-9 provides the sensor function. The WSP interfaces directly with the ASR-9 using ASR-9 radar data to generate weather products. The WSP provides prediction data for gust fronts and storm-cell motion that will impact flight operations. To improve flight safety, the FAA is installing WSPs at medium- and large-sized airports that do not have TDWR which can detect and warn pilots of hazardous wind shears and micro bursts. All WSPs will be operational by FY 2005, with the technology refresh program starting in FY 2007 to replace obsolete hardware; this will enable the system to operate beyond 2010.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The WSP warns air traffic controllers of wind shear and microburst events that can be communicated to pilots in the air or for those preparing for departure.

***Key Events FY 2006 – Performance Output Goals***

- Develop requirements for WSP technology refresh.

***Key Events FY 2007-2010 – Performance Output Goals***

- Initiate WSP technology refresh.

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## 2B12, VOICE RECORDER REPLACEMENT PROGRAM (VRRP)

**FY 2006 Request $5.5M**

- Voice Recorder Replacement Program (VRRP), C23.00-00
- Next Generation Voice Recorder Replacement Program (VRRP), C23.01-00

## Program Description

The ongoing VRRP is replacing remaining analog voice recorders in the NAS and FAA's first generation of digital recorders (the Digital Voice Recorder System) that were installed in the NAS early in the VRRP. The VRRP is also responding to revalidated operational requirements and to address technical, logistical, and deployment shortfalls of existing voice recorders in the NAS with modern digital recording systems. The FAA uses voice-recording systems to record all voice communications between air traffic controllers and pilots or various ground-based air traffic control facilities. To date, this program has replaced 530 voice recorders at various locations in the NAS. The program also serves as the contract vehicle for the FAA to procure voice recorders for new or modernized facilities and DoD facilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The VRRP supports the goal of increased safety by modernizing the systems that record voice messages between pilots and controllers. These recordings are primarily used for accident investigation to recreate the verbal exchanges between pilots and controllers to assist in determining the cause of an accident. They also can be used to assist in determining the most likely place to search, if an aircraft does not reach its intended destination. Another important use is controller training. By playing back the tapes, controllers can review the exact words used in the messages transmitted to pilots. The controllers can then determine if they used the approved phraseology in communicating with pilots and whether or not these messages were appropriate for effectively handling the traffic in their sector. The recordings are also used to assess safety issues related to voice messages for air traffic control. The safety assessment is the basis for developing safety initiatives and/or new procedures for controllers to reduce the risk of accidents.

***Key Events FY 2006 – Performance Output Goals***

- Award the new procurement contract and initiate delivery or voice recorders to FAA locations throughout the NAS.
- Replace 25 aging recorders under a new contract.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue replacing aging recorders at a rate of about 85 per year.
- Provide voice recorders to new terminal facilities.

## 2B13, TERMINAL DIGITAL RADAR (ASR-11)

**FY 2006 Request $60.6M**

- A, Terminal Radar (ASR) Program – ASR-11 – ASR-7/ASR-8 Replacement, DoD Takeover, New Establishments, S03.02-01
- X, Terminal Radar (ASR) Program – ASR-11 – Tech Refresh, S03.02-04

## A, TERMINAL RADAR (ASR) PROGRAM – ASR-11 – ASR-7/ASR-8 REPLACEMENT, DOD TAKEOVER, NEW ESTABLISHMENTS, S03.02-01

### Program Description

The mission of Airport Surveillance Radar Model-11 (ASR-11) program is to replace the aging ASR-7/8 and ATCBI-4/5 radar systems with a single integrated digital primary and secondary radar system. The ASR-11 provides digital surveillance data for existing terminal automation systems (ARTS IIE & ARTS IIIE) and the new STARS automation system.

The ASR-11 program will also replace the aging infrastructure that supports the current radar systems with new radar facilities, including advanced grounding/bonding and lightning protection systems, digital or fiber optic telecommunications, emergency backup power supplies, and enhanced physical security.

The ASR-11 also provides a six-level, National Weather Service-calibrated weather capability that is not available with the existing ASR-7/8 radar systems. Presented on ATC displays, this six-level weather data will result in a significant improvement in controller and pilot awareness of adverse weather near the airport.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1** – Increase airport capacity to meet projected demand.
- **FAA Performance Target 3** – Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to FAA Performance Target

The ASR-11 benefits the FAA Strategic Capacity Goal by providing improved reliability and maintainability performance over existing systems. The ASR-11 replaces existing ASR-7/8 and ATCBI-4/5 systems that are at the end of their projected life cycle. Additionally, the FAA mission for the ASR-11 program is to provide a single integrated digital primary and secondary radar system, that supports current and future digital automation systems, and provides a resource for new radar establishment sites.

***Key Events FY 2006 – Performance Output Goals***

- Achieve IOC at 10 sites.
- Procure six ASR-11 radar systems.
- Start construction for 10 radar sites.
- Initiate eight site designs.
- Initiate 10 ASR-7/8 site deactivations.

***Key Events FY 2007-2010 – Performance Output Goals***

- Achieve IOC at 35 sites.
- Procure 22 ASR-11 radar systems.
- Start construction for 23 radar sites.
- Initiate 12 site designs.
- Initiate 36 ASR-7/8 site deactivations.

## X, TERMINAL RADAR (ASR) PROGRAM – ASR-11 – TECH REFRESH, S03.02-04

### Program Description

The ASR-11 technology refreshment program provides for replacement and upgrade of obsolete ASR-11 COTS hardware and software to ensure continued operation of the radar system through its designated lifecycle.

One major initiative is replacement of existing Signal Data Processor components with the Advanced Signal Data Processor (ASDP). The ASDP has fewer parts that are less likely to become obsolescent. Additionally, the upgraded processor has a higher speed data bus with faster processing and throughput capabilities along with greater memory capabilities. The ASDP provides the processor power and memory reserves to allow the Government to take advantage of additional processing capability.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1** – Increase airport capacity to meet projected demand.
- **FAA Performance Target 3** – Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to FAA Performance Target

The ASR-11 benefits the FAA Strategic Capacity Goals by providing improved reliability and maintainability performance over existing systems. The ASR-11 replaces existing ASR-7/8 and ATCBI-4/5 systems that are at the end of their projected life cycle. Additionally, the FAA mission for the ASR-11 program is to provide a single integrated digital primary and secondary radar system, which supports current and future digital automation systems, and provides a resource for new radar establishment sites.

***Key Events FY 2006 – Performance Output Goals***

- None

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete Factory Acceptance Testing and First Article Site Acceptance Testing on an ASDP upgrade.
- Initiate contract action for the obsolescence study of COTS system assemblies.

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## 2B14, DOD/FAA FACILITIES TRANSFER

**FY 2006 Request $1.3M**

- DoD/FAA ATC Facility Transfer/Modernization – Original Program, F04.01-00

### Program Description

The Department of Defense (DoD) Facility Transfer program involves transitioning DoD military airspace, land, and facilities into the FAA civilian ATC system. As mandated by DoD, military airspace is transferred to the FAA along with associated DoD real estate and facilities. Before each transfer date, the FAA must engineer, construct, and certify required FAA air traffic facilities to the civilian NAS. Examples of project activities include the following:

- Engineered, constructed, and certified multiple digital, fiber optics, and/or microwave systems in the Vandenberg, California basin, supporting the Los Angeles International airport.
- Engineered, constructed, and certified weather surveillance and air traffic communications system, supporting the Anchorage airport. Systems include: (1) Pt. Lay, AK, Automated Weather Observation System (AWOS), Non-Directional Beacon (NDB), and antenna; and (2) the Adak, AK, localizer, glide slope, Precision Approach Path Indicator, Runway End Indicator Lights, and Medium-intensity Approach Lighting System.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

This program modernizes and increases the reliability of air traffic equipment after DoD base closures and airspace transfers. The program maintenance of airport equipment by the DoD Facility Transfer Program provides improvements and modernization to some NAS facilities, as well as maintenance and upgrades of some NAS infrastructure, which results in increased capacity to the air traveling community.

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## 2B15, PRECISION RUNWAY MONITOR

**FY 2006 Request $8.5M**

- Precision Runway Monitor (PRM), S08.00-00

## Program Description

The PRM system is a highly accurate, electronic scan (e-scan) radar that tracks and processes aircraft targets at a 1-second update rate (as opposed to 4.8 seconds with conventional radars). The PRM system provides the controller automatic alerts and high-resolution displays that, in conjunction with specific procedures, enable pilots to fly simultaneous independent approaches to parallel runways spaced less than 4,300 feet apart. Pilots can use parallel runways for simultaneous independent approaches during Visual Meteorological Conditions, but they cannot use such approaches on closely spaced runways in Instrument Meteorological Conditions without PRM technology. The inability of pilots to conduct simultaneous approaches during adverse weather reduces throughput and increases delays.

Initially, the FAA selected five candidate airports with closely spaced (750 feet to 4,300 feet) parallel runways to receive production PRM systems. The Agency awarded the contract in March 1992 for five production PRM systems, associated site and depot spares, and site installations. To date, all the systems have been manufactured and procured under this contract. The City of San Francisco procured a sixth system for the San Francisco International Airport. Four PRM systems have been installed and commissioned, one at Minneapolis, St. Louis, Philadelphia, and San Francisco. In FY 2003, Congress mandated installation of a PRM system at Cleveland, OH, and procurement of an additional system for Atlanta.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 -** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The PRM system supports the FAA greater capacity goal by allowing more aircraft to land during Instrument Meteorological Conditions at airports with closely spaced parallel runways. Normally, the capacity of an airport to handle arriving aircraft is reduced when visibility is restricted, resulting in delays. The PRM system provides a high update rate radar, that feeds a very accurate display of aircraft position. This allows controllers to ensure that simultaneous independent approaches to parallel runways less than 4300 feet apart are safe during low visibility conditions. Without the PRM system, controllers, during low

visibility conditions, must alternate aircraft along parallel approach paths as they approach the airport; this diminishes the airport's effective capacity and causes delays.

***Key Events FY 2006 – Performance Output Goals***

- Install upgrade kits and upgrade remaining two systems.
- Establish a Program Support Facility at Office of Operational Support (AOS).
- Ship John F. Kennedy International Airport PRM system to Oklahoma.
- Begin site construction at Atlanta PRM site.
- Deliver and install PRM equipment to Atlanta site.
- Perform system integration of Atlanta PRM equipment.
- Begin System Site Testing for Atlanta PRM site.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete in FY 2007 System Site Testing for Atlanta.
- Achieve in FY 2007 Operational Readiness Date (ORD) for Atlanta.

## C. FLIGHT SERVICE PROGRAMS

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## 2C01, AUTOMATED SURFACE OBSERVING SYSTEM (ASOS)

**FY 2006 Request $4.5M**

- Automated Surface Weather Observation Network (ASWON) – ASOS – Pre-Planned Product Improvements, W01.02-02
- Automated Surface Weather Observation Network (ASWON) – ASOS – Data Displays, W01.02-04

### Program Description

The ASWON is an umbrella program that consists of the following systems: the Automated Weather Observing System (AWOS), ASOS, Automated Weather Sensors Systems (AWSS), Standalone Weather Sensors (SAWS), and ASOS Controller Equipment Information Display System (ACE-IDS). The primary purpose of ASWON is to support FAA and the National Weather Service modernization by automating the surface weather observation to meet the needs of pilots, operators and air traffic personnel without incurring the high costs of labor-intensive manual surface weather observations.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

The ASWON program supports the FAA greater capacity goal by supplying automated surface weather observations to meet the needs of pilots, operators, and air traffic personnel. The network includes the AWOS, ASOS, AWSS, SAWS, and ACE-IDS or data displays.

***Program Plan FY 2006 – Performance Output Goals***

- Complete installation of all 571 ASOS Dewpoint Sensor Replacements (100 percent complete).
- Complete installation of all 571 ASOS Ice-Free Wind Sensors (100 percent complete).
- Deliver one ACE-IDS to Integrated Terminal Weather System interface.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete development and implementation of ASOS Enhanced Precipitation Identification sensor and 25,000 foot Ceilometer at all 571 ASOS sites (100 percent complete).

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## 2C02, FSAS OPERATIONAL AND SUPPORTABILITY IMPLEMENTATION SYSTEM (OASIS)

**FY 2006 Request $14.3M**

- Operational and Supportability Implementation System (OASIS) for Flight Service Automation System (FSAS), A07.00-00

### Program Description

The OASIS system replaces the existing FSAS. It enables flight service specialists to provide weather and flight information more efficiently to general aviation pilots. The existing equipment is 1970s technology and is difficult to maintain and support. OASIS will provide software based on modified commercial-off-the shelf (COTS)/non-development item products and COTS hardware leased service that replaces all FSAS hardware and software. This replacement enhances the current FSAS operational capabilities and incorporates the Interim Graphic Weather Display System. Additionally, new ergonomic equipment consoles will be installed.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

### Relationship to Performance Target

The FSAS OASIS program contributes to the FAA safety goal by enabling flight service specialists to provide improved weather and flight planning information to pilots through the use of enhanced functional capabilities, integrated graphic weather displays, and direct user access.

***Key Events FY 2006 – Performance Output Goals***

- To be determined, pending the outcome of the AFSS Office of Management and Budget (OMB) Circular No. A-76 (A-76) competition; sustain OASIS lease service at 16 AFSSs and 3 support sites.

***Key Events FY 2007-2010 – Performance Output Goals***

- To be determined, pending the outcome of the AFSS A-76 competition.

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## 2C03, FLIGHT SERVICE STATION (FSS) MODERNIZATION

**FY 2006 Request $1.8M**

- Flight Service Facilities – AFSS Facilities Sustainment, F05.03-00

### Program Description

The Automated Flight Service Station (AFSS)/FSS Modernization program improves and modernizes flight service facilities to ensure timely and efficient service and provides a safe working environment for flight service specialists, technicians, and other personnel. Projects funded include, but are not limited to:

- Ceilings, floors, and walls
- Doors
- Electrical and power systems
- Fire alarm and detection systems
- Heating, ventilation, and air-conditioning (HVAC) systems
- Lightning protection
- Grounding, bonding, and shielding
- Parking lots
- Fencing
- Plumbing
- Roofs

Future plans for FY 2006 and beyond for this project will be funding renovations of FSSs in Alaska only.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2008, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 325 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The AFSS/FSS Modernization program contributes to the FAA's increased safety goal by upgrading and modernizing AFSS/FSS infrastructure, which includes, but is not limited to, Uninterruptible Power Systems (UPS), HVAC systems, roofs, structural improvements, and fire/life/safety systems. These upgrades ensure continued safety for flight service personnel as well as reliable and efficient service. The FSSs accept flight plans and provide weather briefings for pilots. These two services are key safety efforts that play a significant role in preventing general aviation accidents.

***Key Events FY 2006 – Performance Output Goals***

- Complete infrastructure improvements and power upgrades at Alaska sites.
- Complete facility replacements at the Homer and Dillingham FSSs.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete UPS installations at Alaska sites.
- Complete HVAC upgrades at Alaska sites.
- Complete facility rehabilitation or replacement of the following FSSs: Sitka, Barrow, Deadhorse, Palmer and Ketchikan Alaska.
- Perform minor improvements at Alaska sites, including carpet replacements, lighting upgrades, roof replacements and grounding/lightning protection.
- Implement power-conditioning systems for the AFSS to alleviate power problems, accommodate new load requirements from future systems, and ensure reliable service for Alaska sites.

## D. LANDING AND NAVIGATIONAL AIDS PROGRAMS

## 2D01, VHF OMNI-DIRECTIONAL RANGE (VOR) WITH DISTANCE MEASURING EQUIPMENT (DME)

**FY 2006 Request $3.0M**

- Very High Frequency Omni-directional Range (VOR) Collocated with Tactical Air Navigation (VORTAC), N06.00-00

### Program Description

This is a national program to provide equipment enhancements, relocations, and replacements to ensure that the Very High Frequency Omni-directional Range/Distance Measuring Equipment (VOR/DME) and VOR/Tactical Air Navigation System [TACAN] (VORTAC) facilities can function as intended until the ground-based VOR navigational system can be partially or fully decommissioned and the transition to the Global Positioning System is completed. When VOR signal transmission deterioration occurs due to such site encroachment as tree growth, construction of bridges, buildings, and so forth, the FAA must restore these facilities to their full service volume. Converting these flight restricted VOR sites to a Doppler VOR (DVOR) configuration mitigates operational system changes and corrects signal deficiencies. This program replaces, relocates, converts, and modifies VOR facilities (including VOR/DME and VORTAC) to improve VOR performance and effectiveness.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

Replacing, relocating, or converting VOR and VORTAC facilities increases NAS system efficiency. These facilities are experiencing signal deterioration due to various environmental factors, which negatively impacts system efficiency.

***Key Events FY 2006 – Performance Output Goals***

- Procure about 25 TACAN retrofit kits.
- Procure about four DVORs.
- Convert one VOR system to DVOR.
- Relocate one VOR antenna retrofit kits.
- Relocate one VOR system.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue facility relocations, retrofits, conversions, and upgrades as required.

## 2D02, INSTRUMENT LANDING SYSTEMS (ILS) – ESTABLISH/UPGRADE

**FY 2006 Request $8.2M**

- Instrument Landing Systems (ILS), N03.01-00

## Program Description

The ILS program provides new, partial, and full Category I, II, and III instrument landing systems and associated precision approach equipment to the large and medium hub airports (and their associated reliever airports) that have precision approach needs. An ILS is composed of a grouping of electronic devices (i.e., localizers, glide slopes, distance measuring equipment, etc.) and ancillary aids (i.e., approach lighting systems, runway visual range indicators, etc.) that provide landing aircraft precise electronic guidance and visual aid information. This information enables aircraft to land in weather conditions that would otherwise be prohibited. ILS significantly increases the safety and capacity of landing aircraft in the NAS.

The ILS along with required approach lighting systems, Approach Lighting System with Sequenced Flashing Lights Model 2 and Medium-intensity Approach Lighting System with Runway Alignment Indicator Lights, directly impact both system safety and capacity at equipped runways by providing the only approved, widely used, precision approach method in the U.S. of landing aircraft in adverse weather conditions. The ILS provides both vertical and horizontal guidance information to the pilot to allow safe landings to touchdown and rollout. The approach lighting provides the visual cues for the pilot to safely land an aircraft when conducting an instrument approach. The ability to land aircraft in Instrument Meteorological Conditions allows increased capacity to runways equipped with ILS precision approach.

The ILS and associated equipment enables a pilot approaching a runway to access precision guidance (horizontal, vertical, and distance) information. This information, in conjunction with visual navigational aids, helps guide the pilot to the runway. These systems are critical to an all-weather aviation system because they allow aircraft to approach and land in low-visibility conditions and during adverse weather conditions.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

Establishing ILS precision approach capability allows visual minimums to be lowered for landings and helps to maximize NAS use. Lowering visual minimums helps to increase airport capacity and the number of aircraft enplanements during low-visibility conditions.

***Key Events FY 2006 – Performance Output Goals***

- Procure and install Category I Precision Approach Capability at three locations.
- Install one previously procured Approach Lighting Systems (ALS).

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue to deliver and install ILSs and associated ALS equipment.

## 2D03, WIDE AREA AUGMENTATION SYSTEM (WAAS) FOR GPS

**FY 2006 Request $100.0M**

- Wide Area Augmentation System (WAAS), N12.01-00

## Program Description

The WAAS is an extremely accurate navigation system developed by the FAA for civil aviation. The WAAS system uses a set of government-maintained satellites, known as the Global Positioning System (GPS), to determine a precise navigation solution. The GPS alone is sufficient for aviation en route and non-precision approach uses. However, to use the GPS for vertical guidance and precision approach, civil aviation requires an additional level of safety from that provided by the GPS. WAAS technology allows user equipment to augment the computation of the GPS-derived position estimate, which increases the GPS integrity, position accuracy, and reliability to support safe flight operations. Thus, aviation users can use the WAAS for more efficient arrival, en route, and departure operations.

The WAAS uses a network of precisely located ground reference stations that monitor GPS satellite signals. These sites are distributed across the U.S., with additional potential locations in Canada and Mexico. Information from these reference stations is collected and processed. As a result of this processing, an augmentation message is generated every second. The WAAS broadcasts the augmentation message to users across the U.S. and the Caribbean via leased navigation transponders on geostationary satellites. The WAAS broadcast message improves GPS signal accuracy from about 20 meters to 1.5 to 2 meters in both the horizontal and vertical dimensions. The WAAS also provides an inherent safeguard for timely notification of unreliable GPS or WAAS data. The WAAS-corrected signal provides navigation receivers with three-dimensional guidance that dramatically increases safety. The design of WAAS encompasses the NAS via a single, seamless navigation system.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The WAAS will increase safety by reducing general aviation accident rates. To accomplish this, the WAAS program plans to provide WAAS enabled vertical guidance throughout the U.S. including precision approach capability for the entire continental U.S and most of Alaska. The FAA will install new Wide area Reference Stations in Alaska, Canada and Mexico to increase coverage. The Reference Stations in Alaska will be operational and provide additional coverage in 2006. They will aid the WAAS in accomplishing the performance target to reduce accidents in Alaska for general aviation and all Part 135 operations by 20 percent by FY 2008 (from the 2000-2002 average of 130 accidents per year to no more than 104 accidents per year).

***Key Events FY 2006 – Performance Output Goals***

- Expand the WAAS signal availability in Alaska by December 2005.

***Key Events FY 2007-2010 – Performance Output Goals***

- Expand the WAAS signal availability in Southwest Contiguous United States (CONUS) by December 2006.
- Expand the WAAS signal availability in Northeast CONUS by March 2007.
- Complete WAAS Full Lateral Precision with Vertical Guidance development by December 2010.

## 2D04, RUNWAY VISUAL RANGE

**FY 2006 Request $6.0M**

- Runway Visual Range – Replacement/Establishment – N08.02-00

### Program Description

The Runway Visual Range (RVR) system provides a measure of the distance a pilot can expect to see, in the forward direction, at three points along the runway: touchdown, midpoint, and rollout. The RVR provides critical meteorological visibility data that pilots use to decide if it is safe to take off or land during limited visibility conditions. RVR is critical to in a pilot's decision to take off or land at an alternate location.

About 37 percent of all RVR systems in the NAS are more than 23 years old and exceed their 20 years of Economic Service Life by three or more years. Consequently, there is a high probability of isolated capability gaps due to lifecycle issues associated with the older RVR systems in the NAS. This program establishes or replaces older RVR systems with new equipment that uses forward-scatter meter sensor technology. The new RVR system includes a New Generation RVR and a personal computer (PC)-based RVR (planned for FY 2007).

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

The RVR system increases traffic flow capacity at RVR-equipped runways over non-RVR-equipped runways. The RVR system's precision approach capability allows airports to reduce the non-precision approach Instrument Flight Rules weather minima and remain open to traffic when it would otherwise have closed, avoiding weather-caused flight disruptions.

Furthermore, the older RVR systems are maintenance intensive, resulting in excessive downtime, which negatively impacts airport traffic flow capacity. The replacement or upgraded equipment will require less maintenance and repair time, which reduces system downtime and consequently improves traffic flow capacity.

***Key Events FY 2006 – Performance Output Goals***

- Procure and install about nine RVR systems in the NAS.

***Key Events FY 2007-2010 – Performance Output Goals***

- Procure and install about 30 RVR systems in the NAS.

## 2D06, APPROACH LIGHTING SYSTEM IMPROVEMENT PROGRAM (ALSIP)

**FY 2006 Request $5.0M**

- Visual Navaids – Approach Lighting System Improvement Program Continuation, N04.03-00

### Program Description

The ALSIP retrofits non-frangible approach lighting systems with lightweight and low-impact resistant structures that collapse or break apart at impact. This reduces damage to aircraft that may strike these structures during departure or landing. The two approach lighting systems replaced under this program are

the High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) and the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). ALSIP responds to:

- A National Transportation Safety Board (NTSB) recommendation to improve airport safety. The ALSIP retrofits rigid structure approach lighting systems with lightweight and low-impact resistant structures that collapse or break apart upon impact.
- Congressional mandates to provide approach lighting systems at designated locations.
- Congressional mandates to support the Rural Alaska Lighting Program.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The ALSIP replaces rigid approach lighting structures with lightweight and low-impact resistant structures that collapse or break apart upon impact. This directly impacts the goal of reducing aircraft fatal accidents. The new structures are designed to meet Occupational Safety and Health Administration (OSHA) requirements.

***Key Events FY 2006 – Performance Output Goals***

- Replace one ALSF-2 in the NAS.
- Replace two MALSR in the NAS.

***Key Events FY 2007-2010 – Performance Output Goals***

- Replace four ALSF-2 in the NAS.
- Replace 27 MALSR in the NAS.

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## 2D07, DISTANCE MEASURING EQUIPMENT (DME)

**FY 2006 Request $1.2M**

- Distance Measuring Equipment (DME), N09.00-00

## Program Description

The DME program replaces obsolete, tube-type DME with modern technology electronics that will improve operations and facility performance. DME provides the distance component of navigation information that pilots use to determine aircraft position and that air traffic controllers use to route aircraft. In addition, replacement equipment reduces maintenance and repair downtime required for DME systems. Low Power DME (LPDME) will replace older marker beacons at existing ILS locations and be implemented at new ILS established locations.

To support the Commercial Aviation Safety Team (CAST) requirements the DME program also involves procuring and installing DME systems at recommended sites. These systems will support the reduction of controlled-flight-into-terrain accidents at the most vulnerable locations in the NAS. There are 451 identified CAST DME sites, however, the FAA recommends implementing of only 177. This number would cover 80 percent of all operations. For safety reasons, the industry wants to discontinue using step-down or "dive-and-drive" non-precision approach procedures whenever possible. Using DME supports this operational goal for older, less equipped aircraft until they are outfitted with more advanced equipment.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

Adding DMEs to the NAS increases the number of available navigation aids, which improves the precision of runway approaches. This increased precision can result in an increase in the number of aircraft that can simultaneously approach a runway for landing.

***Key Events FY 2006 – Performance Output Goals***

- Procure and install 29 CAST LPDME systems and 22 sustain LPDME systems.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue to procure and install LPDME systems to replace the legacy, tube-type equipment in the NAS.

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## 2D08, VISUAL NAVAIDS – ESTABLISH/EXPAND

**FY 2006 Request $1.6M**

- Visual Navaids – Visual Navaids for New Qualifiers, N04.01-00

## Program Description

The Visual Navigation Aids program provides the new Precision Approach Path Indicator (PAPI) and Runway End Identifier Lights (REIL) to airports. The PAPI system provides visual approach slope information to pilots and enables them to make a stabilized descent and an approach clearance over obstructions. The PAPI is a visual glide slope indicator system consisting of four lamp housing assemblies arranged perpendicular to the edge of the runway. The PAPI projects a pattern of red and white lights along the desired glide slope.

A REIL is a non-precision visual aid that rapidly and clearly identifies for pilots 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.

Installation of PAPI systems satisfies Commercial Aviation Safety Team (CAST) and Land and Hold Short Operations (LAHSO) requirements.

- There are 781 identified PAPI CAST requirements to implement a precision-like approach capability at runways served by air carriers. The precision-like approach capability will reduce the possibility of a controlled flight into terrain (CFIT) accident during approach and landing. The FAA plans to implement only the highest priority 170. This number would cover 80 percent of Part 121 operations.
- LAHSO is an air traffic control tool used to increase airport capacity by allowing simultaneous approaches on intersecting runways. PAPI lights are required at airports as they are approved for LAHSO.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

Installing PAPI lights at CAST locations will increase system safety by reducing the probability of a CFIT accident during approach and landing. Furthermore, installing PAPI lights at airports approved for LAHSO will increase traffic flow capacity by allowing simultaneous approaches on intersecting runways. Installing the REIL system will reduce accidents because the system clearly identifies the runway's end to the pilot.

***Key Events FY 2006 – Performance Output Goals***

- Procure and install five REIL systems in the NAS.
- Procure and install 11 PAPI systems in the NAS for a total of 65 PAPI CAST requirements.

***Key Events FY 2007-2010 – Performance Output Goals***

- Procure and install 35 REIL systems in the NAS.
- Procure and install 77 PAPI systems in the NAS for a total of 142 PAPI CAST requirements.

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## 2D09, INSTRUMENT APPROACH PROCEDURES AUTOMATION (IAPA)

**FY 2006 Request $5.9M**

- Instrument Approach Procedures Automation (IAPA), A14.00-00

## Program Description

Aviation System Standards maintains more than 14,000 instrument flight procedures in use at over 4,000 paved airport runways, accommodating requirements for both precision and non-precision approaches and departures. Maximizing implementation of ILS, Microwave Landing System, Global Positioning System Area Navigation (GPS/RNAV), and Wide Area Augmentation System (WAAS) will increase the capacity of the NAS and requires development of new and revised instrument flight procedures.

The existing IAPA system, which provides the basis for instrument flight procedure development and maintenance, has been heavily modified since being developed in the early 1970s and does not meet all of today's functional or integration requirements. The current IAPA system, with its functional and architectural limitations, is barely able to support the existing inventory of 14,000 instrument flight procedures. A modern integrated system is needed to accommodate the expected growth of the NAS. Aviation System Standards has identified technological opportunities to replace IAPA and consequently increase functional capabilities, which raises the organization's ability to meet current and expected future demand for instrument flight procedures within the NAS. The new proposed IAPA system, to be called Instrument Flight Procedure Automation will be more efficient and encompassing and will replace and modernize the IAPA system to support instrument flight procedures development. It will include functionality for approaches, missed approaches, circling, Standard Terminal Arrival Routes (STAR), airways, and departures. In addition, the Instrument Flight Procedure Automation will contain an integrated obstacle evaluation application, replacing a mostly manual process. Along with development of the new IAPA tools, integration across three Aviation System Standards organizations will be accomplished— National Flight Procedures Office, Flight Inspections Operations Office, National Aeronautical Charting Office—eliminating manual effort and duplication of data.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports

## Relationship to Performance Target

The IAPA system ensures continued progress toward providing instrument flight procedures for all 35 OEP airports. This means continually adding vertical guidance with lower visual minimums and supporting new initiatives such as Required Navigation Performance (RNP), Area Navigation (RNAV), Lateral Precision with Vertical Guidance, Wide Area Augmentation System (WAAS), Distance Measuring Equipment (DME)/DME, RNAV Standard Instrument Departure, and STAR. Upgrading automation systems allows for efficiency and time savings, which provides opportunities to meet demand for greater capacity.

***Key Events FY 2006 – Performance Output Goals***

- Produce 500 new RNAV instrument approach procedures, 300 with vertical guidance to support WAAS.
- Produce additional RNAV Standard Instrument Departures and STARs to support RNP, and additional RNP Special Aircrew and Aircraft Authorization Required procedures.
- Support the Alaska Capstone program with RNAV routes and procedures.
- Produce new flight procedures to support OEP new runways, runway extensions, and equipment additions.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

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## 2D10, NAVIGATION AND LANDING AIDS – SERVICE LIFE EXTENSION PROGRAM (SLEP)

**FY 2006 Request $2.0M**

- Visual Navaids – Sustain, Replace, Relocate, N04.04-00

## Program Description

The Visual Navaids - Sustain, Replace, Relocate program replaces aging and obsolete ground-based navigation and landing aids that maintain approach and landing capabilities at various U.S. airports. Approximately 50 percent of all visual and navigation aids in the NAS are greater than 23 years old and exceed their 20 years of economic service life by three or more years. Consequently, there is a high probability of isolated capability gaps due to life-cycle issues associated with the older ILS and approach lighting systems currently in the NAS. This program supports the sustainment, replacement, or relocation of the following visual and navigational aids: ILS, High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2), Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), Precision Approach Path Indicator (PAPI) Lights, Runway End Identification Lights (REIL), Very High Frequency Omni-directional Range (VOR), Distance Measuring Equipment (DME), and Non-Directional Beacon (NDB). The FAA will sustain or replace older, unsupportable visual and navigational aids with new equipment and systems that comply with OSHA regulations.

Furthermore, existing MALSR and ALSF-2 in-pavement steady burning approach lights are maintenance intensive. As a result, there is excessive runway down time that negatively impacts airport capacity. Under this program, the FAA will replace these existing approach lights with new in-pavement steady burning approach lights that require less maintenance, thus reducing runway down time.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 1 –** Achieve an average daily airport capacity at the 35 OEP airports at 104,338 arrivals and departures per day by 2009.

## Relationship to Performance Target

Existing navigation and landing equipment is maintenance intensive, resulting in excessive runway downtime, which negatively impacts airport traffic flow capacity. The replacement or upgraded equipment will require less maintenance and repair time, which will reduce runway downtime and consequently improve traffic flow capacity.

***Key Events FY 2006 – Performance Output Goals***

- Replace or sustain one ILS.
- Procure 578 in-pavement lights.

***Key Events FY 2007-2010 – Performance Output Goals***

- Replace or sustain six ILS.
- Replace two MALSR systems.
- Replace three ALSF-2 systems.
- Procure 683 in-pavement lights.

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## 2D11, VISUAL NAVAIDS – REPLACE VISUAL APPROACH SLOPE INDICATOR (VASI) WITH PRECISION APPROACH PATH INDICATOR (PAPI)

**FY 2006 Request $3.0M**

- Visual Navaids – Replace Visual Approach Slope Indicator (VASI) with Precision Approach Path Indicator (PAPI), N04.02-00

## Program Description

The International Civil Aviation Organization (ICAO) has recommended that all international airports standardize the visual vertical guidance information by replacing the VASI lights with PAPI lights. The Replace VASI with PAPI program provides visual navigational aids that are integral to the landing capability at designated airports throughout the United States. This program addresses visual glide slope indicators, which provide approach slope angle information to pilots in final approach, and offers greater system reliability and performance.

At program inception, about 1,387 older (pre-1970's) VASI existed at international and other validated locations requiring replacement. The first phase of the program calls for replacing VASI systems at about 207 ICAO runways. The remaining VASI systems in the NAS will be replaced after the ICAO requirement is fulfilled. To date, the FAA has completed about 87 ICAO VASI replacements and about 443 Non-ICAO VASI replacements with PAPI systems.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – International Leadership.**
- **FAA Objective 2 –** Promote seamless operations around the globe in cooperation with bilateral, regional, and multilateral aviation partners.
- **FAA Performance Target 2 –** Ensure that international environmental standards, recommended practices, and guidance material adopted by ICAO are globally and uniformly applied, reflect the best available technology that can be integrated into the fleet, provide real environmental benefit, are economically sound, and take interdependencies between environmental parameters into account.

## Relationship to Performance Target

Replacement of VASI systems at international runways supports the ICAO recommendation. Additionally, Replacement of VASI system with the PAPI system reduces the number of equipment types that the FAA must maintain while sustaining the functional capability.

***Key Events FY 2006 – Performance Output Goals***

- Install 25 PAPI systems in the NAS.

***Key Events FY 2007-2010 – Performance Output Goals***

- Procure and Install 95 PAPI systems in the NAS.

## E. OTHER ATC FACILITIES PROGRAMS

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### 2E01, FUEL STORAGE TANK REPLACEMENT AND MONITORING

**FY 2006 Request $6.7M**

- NAS Facilities OSHA & Environmental Standards Compliance – Fuel Storage Tanks, F13.01-00

### Program Description

The fuel storage tank (FST) systems replaced and upgraded in the mid-1980s have reached the end of their lifecycle. The 2,741 tank systems under lifecycle maintenance guidelines must be replaced or upgraded with a cost of about $60,000 per tank site. About 90 percent of former FST systems have leaked in the past. If the sites are not cleaned up, fuel will contaminate drinking water, destroy wetlands, and damage the environment. An additional part of the FST program is the ARTCC lifecycle compliance initiative. The pipelines connecting the FST systems to the engine generators are being redesigned to achieve compliance with State and Federal underground regulations. Leaking FST systems will be repaired immediately to minimize any adverse impact to personal and environmental safety, restore availability of the systems for NAS operations, and preclude regulatory fines. Also, at formerly owned FST sites, if tanks are found, they will be removed and the sites tested and remediated to bring the sites into regulatory compliance.

FST systems must comply with State and Federal regulations, which range from tank installation standards to site-closure requirements. The Resource Conservation and Recovery Act, Subtitle 1, and delegated State programs prescribe standards and management practices for underground storage tanks. The Clean Water Act, Section 311, establishes specific planning and prevention requirements for spill prevention, and control and countermeasures plans for underground storage tanks and above-ground storage tanks exceeding certain storage- capacity thresholds. Individual States also regulate FST systems.

### Relationship of Program to DOT Strategic Goal, Objective, and Performance Target

- **DOT Strategic Goal – Environmental Stewardship.**
- **DOT Objective 1** – Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

### Relationship to Performance Target

The FST Replacement and Monitoring project supports the environmental stewardship goal by executing a lifecycle maintenance program that reduces the risk of leaking FST systems, minimizes adverse impacts to personal and environmental safety, and restores availability of the systems for NAS operations.

***Key Events FY 2006 – Performance Output Goals***

- Continue lifecycle replacement/sustainment of FST systems.
- Complete closure of formerly owned FST sites.
- Continue remediation efforts due to FST systems spills and leaks.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue lifecycle replacement/sustainment of FST systems.
- Continue the ARTCC lifecycle compliance initiative.
- Continue remediation efforts due to FST systems spills and leaks.

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## 2E02, FEDERAL AVIATION ADMINISTRATION BUILDINGS AND EQUIPMENT

**FY 2006 Request $11.4M**

- A, Modernize/Improve FAA Buildings and Equipment Sustain Support, F12.00-00
- B, Seismic Safety Risk Mitigation, F12.01-01

### A, MODERNIZE/IMPROVE FAA BUILDINGS AND EQUIPMENT SUSTAIN SUPPORT, F12.00-00

## Program Description

This program extends the service life of FAA buildings and equipment, which reduces maintenance costs and energy consumption. Through timely building and equipment maintenance, the FAA will avoid increased operations funding for future repair or replacement of damaged equipment.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The FAA Buildings and Equipment project contributes to the FAA's greater capacity goal by refurbishing and upgrading existing FAA-owned facilities. The facilities house electronic equipment that must be protected from weather hazards, radio interference, and unauthorized entry. Thus, buildings require routine maintenance and upgrading to prevent equipment failures, which can create air traffic delays.

***Key Events FY 2006 – Performance Output Goals***

- Support the OEP to sustain Navaids and General NAS facilities at the benchmark airports.
- Completely refurbish at least five unstaffed facilities.
- Install at least 10 engine generators.
- Replace at least 10 shelters.
- Refurbish at least 10 antenna steel towers.
- Repair at least 10 facility service roads.
- Reduce the deferred maintenance backlog by 10 percent.

***Key Events FY 2007-2010 – Performance Output Goals***

- Support the OEP to sustain Navaids and General NAS facilities at the benchmark airports.
- Completely refurbish at least five unstaffed facilities.
- Install at least 10 engine generators.
- Replace at least 10 shelters.
- Refurbish at least 10 antenna steel towers.
- Repair at least 10 facility service roads.
- Continue power and heating, ventilation, and air-conditioning upgrades/replacements to facilitate installation of new equipment, as appropriate.
- Reduce the deferred maintenance backlog.

## B, SEISMIC SAFETY RISK MITIGATION, F12.01-01

## Program Description

The Seismic Safety Risk mitigation program identifies unacceptable seismic safety hazards at FAA- owned and -leased buildings and seeks to have the risks mitigated under Executive Order 12941, DOT Seismic Policy SS-98-01, and seismic safety standards published by the Federal Emergency Management Administration and the National Institute of Standards and Technology. The program also seeks to inform FAA Product Teams, facility managers, building engineers, and real-estate contracting officers of required seismic safety standards and provide subject-matter expertise.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

Many FAA buildings face a 10 percent chance of a damaging earthquake and a two percent risk of a devastating earthquake during the next 50 years. The U.S. Geological Survey estimates that there is a 62 percent combined probability of a damaging or devastating earthquake striking somewhere in the San Francisco Bay area alone in the next 30 years. The Seismic Safety Risk Mitigation program safeguards FAA personnel who operate and maintain the Air Traffic Control system and prevents catastrophic failure of the NAS infrastructure.

***Key Events FY 2006 – Performance Output Goals***

- Conduct inspections or evaluations at seven ARTCCs to determine whether unacceptable seismic risks exist at those facilities.
- Brief three product teams regarding required seismic standards for equipment design and installation.
- Provide subject-matter expert support to real-estate contracting officers.
- Conduct detailed technical training at five locations chosen from each Regional Office, the FAA Academy, William J. Hughes Technical Center, and FAA Headquarters.
- Incorporate findings of seismic evaluations into facility maintenance and modernization plans wherever possible.
- Maintain required liaison with DOT Seismic Safety Office.

***Key Events FY 2007-2010 – Performance Output Goals***

- Conduct inspections or evaluations at five ARTCC to determine whether unacceptable seismic risks exist at those facilities.
- Conduct inspections and evaluations at 41 long range radar sites.
- Brief three product teams regarding required seismic standards for equipment design and installation.
- Provide subject-matter expert support to real-estate contracting officers.
- Revised technical training material to reflect changes in regulations.
- Conducted refresher technical training at fourteen locations including each Regional Office, the FAA Academy, William J. Hughes Technical Center, and FAA Headquarters.
- Incorporate findings of seismic evaluations into facility maintenance and modernization plans wherever possible.
- Maintain required liaison with DOT Seismic Safety Office.

## 2E03, ELECTRICAL POWER SYSTEMS – SUSTAIN/SUPPORT

**FY 2006 Request $45.0M**

- Power Systems Sustained Support, F11.00-00

## Program Description

The availability and reliability of the NAS power system infrastructure is critical to ensuring safe, efficient, and reliable operation of the NAS ATC systems. The Power Systems Sustained Support (PS3) program renews and upgrades components of the existing power system infrastructure to maintain and improve the overall electrical power quality and availability. Major PS3 program elements include replacement of the following: expended batteries associated with existing emergency power and power-conditioning systems; aged uninterruptible power systems (UPS); obsolete engine generators; deteriorated underground power cable; and deteriorated lightning protection and grounding systems. Projects are programmed according to their criticality to NAS operations and deferability.

Of the total $2.47billion NAS power system infrastructure, $1.04billion is beyond the equipment's service-life. This backlog of out-of service-life equipment is growing at a rate of $53.7million per year. Of the total $97million NAS battery back-up systems, $19million must be replaced every year to ensure reliable performance of critical ATC systems. A total of 285 of the 587 UPSs exceed their 10 year estimated service life. Of the 3,588 engine generators, more than 80 percent exceed their 20-year estimated service life. The program achieves improvements through integrated efforts involving requirements definition, new technology evaluation, cost-benefit analyses, system design, acquisition, and transition and integration activities focusing on cost-effective lifecycle maintainability.

In additional to the issue of the aging power infrastructure, the new microprocessor equipment of the NAS ATC modernization program is increasingly sensitive to power quality issues, requiring more power conditioning, faster power transfers and more stringent grounding systems than currently available in existing systems. The extended reboot times and sensitive component linkages of many of the modern ATC systems make proper power conditioning and proper grounding more critical than they were with their predecessors.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The $PS^3$ program is critical to maintaining and increasing air traffic capacity. The availability of all ATC OEP airport facilities is directly related to the availability of NAS power systems. ATC equipment must have proper electrical power to operate. Timely electrical power equipment replacement supports the objective to increase airport capacity to meet projected demand by reducing the incidence of NAS equipment outage delays that would have occurred during commercial power outages. The PS3 program focuses on the FAA performance target of sustaining adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports. Of the above mentioned $2.47billion FAA power system infrastructure, the PS3 program replaces a portion of the $1.04bilion power equipment that is beyond its service life as well as the $53.7million annual backlog growth (equipment coming to the end of its service life that year).

***Key Events FY 2006 – Performance Output Goals***

- Sustain existing NAS power systems by completing about 288 projects to replace batteries, replace UPS units, install direct current bus systems, and replace engine generators; replace deteriorated power cables and lightning protection and grounding; and replace ARTCC power distribution equipment.

- Complete the Training/Operational Support Facility at Oklahoma City, OK.

***Key Events FY 2007-2010 – Performance Output Goals***

- Sustain existing NAS power systems by completing about 1400 projects to replace batteries, replace UPS units, install direct current bus systems, and replace engine generators; replace deteriorated power cables and lightning protection and grounding; and replace ARTCC power distribution equipment.

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## 2E04, AIR NAVIGATIONAL AIDS AND ATC FACILITIES (LOCAL PROJECTS)

**FY 2006 Request $2.5M**

- Continued General Support - Air Navigation Aids Facilities – Local Projects, M08.04-00

## Program Description

The Local Projects program funds minor site-specific adjustments and unplanned emergencies that demand immediate action. Local emergency actions are crucial to restore air traffic control equipment, communications, surveillance, and weather operational facilities that have been damaged or destroyed. In addition, the FAA must modify facilities and equipment to accommodate engineering changes to commissioned air navigation and air traffic control facilities. The local modifications include reconfiguring air traffic control positions in control towers and Air Route Traffic Control Centers; raising or relocating air/ground communications antennas to reduce frequency interference; correcting fire hazards; improving security; and restoring lost service caused by major storms that do not qualify as disasters.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 3–** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 1 –** Through FY 2009, achieve an 86.9 percent on-time arrival for all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late due to NAS related delays.

## Relationship to Performance Target

Local projects contribute to the FAA's greater capacity goal by quickly allowing emergency adjustments to the NAS and facilities, which mitigate equipment outages, which cause delays and decreased capacity.

## 2E05, AIRCRAFT RELATED EQUIPMENT PROGRAM
**FY 2006 Request $22.0M**

- A, Aircraft and Related Equipment (ARE) Program, M12.00-00
- B, Aircraft and Related Equipment Program – Airbus Simulator, M12.01-02

## A, AIRCRAFT RELATED EQUIPMENT PROGRAM, M12.00-00

### Program Description

The ARE program upgrades FAA aircraft used for safety-related work. Examples of upgrades are:

- FAA flight inspection aircraft, avionics, and related systems must be updated to ensure capabilities exist to validate and certify the accuracy and integrity of electronic signals emitted by new or modified navigational aids used by commercial and general aviation aircraft in the NAS.
- Flight inspection aircraft must be equipped to validate and certify new instrument flight procedures based on satellite navigation systems developed for commercial and general aviation pilots to guide aircraft on approach and departure flight paths at airports.
- Flight inspection aircraft must be equipped to flight-check "new NAS" Architecture components (i.e., Wide Area Augmentation System (WAAS), Distance Measuring Equipment, Area Navigation (RNAV), and Q-Routes) and efficiently accomplish the increasing "new NAS" inspection workload while simultaneously continuing flight inspection of older technology navigation aids before their removal from service.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

### Relationship to Performance Target

The FAA improves air safety by ensuring that flight inspection aircraft and systems are equipped and modified to validate and certify the accuracy of navigational aid electronic signals as well as validate and certify the safety of approach/departure flight procedures and terminal routes at all airports within the NAS and at military facilities world-wide.

***Key Events FY 2006 – Performance Output Goals***

- Acquire and install an Electronic Flight Bag Display System in FAA Lear 60 and CL 601 aircraft.
- Integrate the Flight Inspection Reporting Procedures System.
- Acquire and install a Multi-Mode Receiver.
- Acquire and replace Flight Inspection Technician Seat on Lear 60 and CL 601 flight inspection aircraft.
- Continue Automated Flight Inspection System Tech Refresh.
- Install an enhanced Operator Display on all flight inspection aircraft.
- Install and support Joint Precision Approach Landing System navigation system capability for CL-601 flight inspection aircraft.
- Continue development, acquisition, and installation of Next Generation Automated Flight Inspection System (NAFIS).
- Acquire and install WAAS receivers for the flight inspection aircraft.
- Complete replacement of Automated Flight Inspection System Printer/Plotter.

- Integrate the Automated Flight Inspection Scheduling/Performance System Technology Refresh.
- Acquire Flight Management System (FMS) for upgrade of Beach 300 flight inspection aircraft
- Develop and acquire Flight Operation Management System.
- Acquire and install High Speed Broad Band Data Link.

***Key Events FY 2007-2010 – Performance Output Goals***

- Acquire and install a Digital Television Positioning System for flight inspection aircraft.
- Upgrade the Facility Database to support changes in Security and interface requirements.
- Continue development, acquisition, and installation of NAFIS.
- Continue installation of WAAS receivers for the flight inspection aircraft.
- Acquire and install FMS for upgrade of Beach 300 flight inspection aircraft
- Integrate the Automated Flight Inspection Scheduling/Performance System Technology Refresh.
- Continue Automated Flight Inspection System Technology Refresh.
- Acquire and install FMS for upgrade of Beach 300 flight inspection aircraft
- Complete installation of Cockpit Voice Recorder/Flight Data Recorder upgrade (fleet).
- Acquire and install an Electronic Flight Bag Display System in FAA Lear 60 and CL 601 aircraft.
- Acquire and install 406 Megahertz Emergency Locator Transmitter in all flight inspection aircraft.
- Acquire and install Emergency Vision Assurance System in Learjet.
- Acquire and install Flight Operation Management System.
- Acquire and install High Speed Broad Band Data Link.
- Acquire and install a Multi-Mode Receiver.
- Develop, acquire, and install Radio Frequency Interference High Speed Antennas for Flight Inspection requirements.
- Develop, acquire, and install upgrade Flight Inspection Aircraft Spectrum Analyzer.
- Acquire and install Digital Ground Proximity System.
- Develop plans and procedures for the NAFIS Tech Refresh.

## B, AIRCRAFT RELATED EQUIPMENT PROGRAM – AIRBUS SIMULATOR, M12.01-02

## Program Description

The primary purpose of the new simulator will be to support flight safety operational evaluation programs. A secondary purpose is to support training of FAA Inspectors. Every new procedure, airport infrastructure improvement, or new equipment implementation requires operational approval before it can be completed. There is a current active proposal for a Terminal Area Safety program that will address all issues related to Land and Hold Short Operations (LAHSO) and Runway Incursion improvements. The simulator will be used to support accident investigations and NTSB requests related to accidents. We offer a unique capability for providing experienced operational evaluation support and data analysis in this area. The simulator will be installed in the Flight Operations Systems Laboratory in Oklahoma City and dynamically linked to the existing advanced Boeing B737-800NG simulator and simulators at remote industry sites.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline accident rate.
- **FAA Performance Target –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007. Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The advanced fly-by-wire full flight simulator improves air safety by providing the FAA with the capability to conduct operational evaluation programs on both the conventional aircraft designs, represented by the

Boeing B737-800NG simulator, and the evolving fly-by-wire technology now contained on the majority of large commercial aircraft. In addition, for evaluation programs the simulators will be dynamically linked to each other and with commercial simulators at remote sites.

***Key Events FY 2006 – Performance Output Goals***

- Issue contract to procure new advanced flight simulator.
- Monitor contract and milestone reviews per contract requirements.

***Key Events FY 2007-2010 – Performance Output Goals***

- 2007: Complete purchase of spare parts, peripheral equipment and spares.
- 2007 – 2008: Install new simulator and initiate program support activities.
- 2009 – 2010: Perform technical refresh and peripheral updates.

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## 2E06, AIRPORT CABLE LOOP SYSTEMS – SUSTAINED SUPPORT

**FY 2006 Request $5.0M**

- Airport Cable Loop Systems – Sustained Support, F10.00-00

## Program Description

This program will replace 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 could cause flight delays related to outages. These lines feed airport surveillance radar, air/ground communications, and landing systems in the tower and operational and maintenance information to FAA-staffed facilities. Where cost-effective, the program will install fiber-optic cable in a ring formation to replace existing copper cable; this will provide redundancy and communications diversity. The airport cable loop program takes advantage of opportunities to save cost by coordinating projects with major construction projects (e.g. tower relocations, and runway projects).

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain adjusted operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The Airport Cable Loop Systems Sustained Support Program will prevent potential failures and outages by replacing obsolete underground cable infrastructure systems. The program improves signaling and communications primarily at large airports with high traffic counts and enplanements, which contributes to airport arrival and departure efficiency.

***Key Events FY 2006 – Performance Output Goals***

- Complete construction and system installation at Phoenix Sky Harbor and Las Vegas McCarran International Airports.
- Begin construction at George Bush Intercontinental Airport.
- Complete fiber-optic system upgrade at Denver International Airport.

***Key Events FY 2007-2010 – Performance Output Goals***

- Begin and complete construction and equipment installation at the following airports; LaGuardia, Washington Dulles International, Ronald Reagan Washington National, Philadelphia, Pittsburgh International, and Baltimore/Washington International.

## 2E07, ALASKAN NAS INTERFACILITY COMMUNICATIONS SYSTEM (ANICS)

**FY 2006 Request $0.6M**

- Establish Alaskan NAS Interfacility Communications System (ANICS) Satellite Network - Phase II, C17.01-01

## Program Description

The ANICS program replaces leased commercial communications circuits in Alaska with FAA owned satellite earth stations and leased satellite transponders to provide reliable telecommunications services. The program acquisition plan was approved in 1991. In 1993, a contract was awarded for up to 160 sites. ANICS facilities are being built in two phases.

ANICS phase I facilities provide communications that are available 99.99 percent of the time (no more than 53 minutes of service outage a year) by using two sets of equipment and two satellites in parallel. This level of service is for communicating with en route aircraft and transporting radar data showing aircraft location and separation. The service is critical for successful control of airspace and aircraft. ANICS phase I has been successfully implemented at 51 operational locations and one test and training facility. Construction of phase I sites started in 1994, and the last of the 52 phase I facilities was completed in 1999. ANICS phase I has successfully improved regional en route remote air-to-ground communications. Communications line outages were reduced from 1,639 hours in 1996 (commercial circuits) to less than 70 hours for all facilities in FY 2002 (ANICS circuits).

ANICS phase II facilities are designed to provide communications that are available 99.9 percent of the time (less than 8 hours of outage per facility per year) by using one set of equipment and one satellite. This improves availability of essential telecommunications by more than twenty times compared to the existing commercial service. This level of service is used for aircraft pilot-to-flight service station communications, transmission of weather information, and remote maintenance monitoring and control of air navigation aids. These services are essential for successful control of airspace and aircraft.

In 2000, The FAA acquisition executive approved acquisition of up to eighteen phase II facilities. Twelve sites are now on order; five are being built, and two are ready for acceptance. Phase II installations will be completed by 2006.

This dramatic increase in telecommunications availability corresponds to a direct increase in the availability of NAS services in Alaska. Air safety is improved by minimizing outages for critical and essential communications between pilots and air traffic controllers. Reliable communications between FAA facilities improves dissemination of air traffic movement and weather information, provides better quality radar data, and allows maintenance personnel to monitor and control FAA air navigation equipment. This equipment is spread out across the 570,370 square miles of the largest state in the union, which is one-fifth the size of the continental 48 states.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 3 –** Reduce accidents in Alaska.
- **FAA Performance Target –** By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year.

## Relationship to Performance Target

ANICS supports FAA's strategic goal of increased safety and the objective of reducing accidents rates in Alaska by improving communications availability. Alaska has the highest number of general aviation (GA) and air taxi (Part 135) aircraft accidents in the U.S. One of the major causes is extreme weather conditions in remote locations. In order to save lives, it's imperative that accurate and timely weather information is

available to pilots. The increase of telecommunications availability provided by implementing ANICS corresponds to a direct increase in the availability of the NAS and improves air safety in Alaska.

***Key Events FY 2006 – Performance Output Goals***

- Complete all phase II sites by the end of FY 2006.
- Complete construction of final two sites: Emmonak and Nuiqsut.
- Accept and bring online all remaining phase II ANICS facilities.
- Correct remaining installation discrepancies.
- Correct joint acceptance inspection discrepancies.
- Cut over existing circuits to new ANICS facilities.

***Key Events FY 2007-2010 – Performance Output Goals***

- Initiate technology refresh activities of phase I sites.

# ACTIVITY 3. NON-AIR TRAFFIC COLTROL FACILITIES AND EQUIPMENT

## A. SUPPORT EQUIPMENT

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### 3A01, HAZARDOUS MATERIALS MANAGEMENT
**FY 2006 Request $17.0M**

- NAS Facilities OSHA & Environmental Standards Compliance – Environmental Cleanup/HAZMAT, F13.02-00

### Program Description

The FAA has identified more than 709 contaminated sites at 244 locations nationwide that require investigation, remediation, and closure activities. Environmental Cleanup site investigations have indicated that toxic contamination resulted from a variety of hazardous substances: cleaning solvents, fuels, pesticides, asbestos, polychlorinated biphenyls (PCB), and heavy metals. FAA organizations, including the Mike Monroney Aeronautical Center and the William J. Hughes Technical Center, have mandatory remediation and monitoring schedules in place as part of negotiated agreements with regulatory agencies. These agreements require the FAA to remediate contaminated soil and groundwater. Extensive contamination at the Technical Center prompted the Environmental Protection Agency (EPA) to place the site on the EPA National Priorities List, indicating its status as one of the Nation's most environmentally dangerous sites (i.e., Superfund site). In addition, contaminated sites and noncompliance with requirements of the Hazardous Materials Management program account for a large portion of the unfunded environmental liabilities documented in the FAA's Financial Statement.

To clean up these contaminated sites and comply with applicable environmental regulations, the FAA developed the Hazardous Materials Management program. The FAA must continue mandated program activities to achieve compliance with all Federal, State, and local environmental cleanup regulations, including the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. FAA program activities include: conducting site investigations; managing hazardous materials, including hazardous waste accumulation, handling, and disposal; installing groundwater monitoring wells; remediating site contamination; and operating air pollution controls. The FAA performs assessment, remediation, and closure activities as aggressively and proactively as funding will allow. Future planned efforts include conducting contaminant investigations, implementing site remediation projects, and completing required regulatory closures; and attaining 95 percent "No Further Remedial Action Planned" closure documentation for FAA sites listed on EPA's Federal Hazardous Waste Compliance Docket.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Environmental Stewardship.**
- **FAA Objective 1 –** Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

### Relationship to Performance Target

The Hazardous Materials Management program supports the environmental stewardship goal by conducting required cleanup activities for contaminated sites within existing NAS land and structures. The program achieves this objective through assessment, remediation, and closure activities for contaminated sites. These activities result in a safe and environmentally sound workplace, and protection of the natural resources of surrounding communities. The program also ensures that the FAA complies with the

Department of Transportation's performance goal of achieving "No Further Remedial Actions Planned" for 95 percent of all FAA sites listed on the EPA's Federal Hazardous Waste Compliance Docket.

***Key Events FY 2006 – Performance Output Goals***

- Treat and dispose of hazardous contamination at Annette Island, AK.
- Treat and dispose of PCB and fuel-contaminated soil at Farewell, AK.
- Perform remediation activities for contaminated areas at William J. Hughes Technical Center, Atlantic City, NJ.
- Perform remediation activities for PCB and fuel-contamination at Mount Santa Rosa, Guam Air Route Surveillance Radar (ARSR).
- Work to ensure successful and timely completion of the Chlorinated Organic Plume Program Plan at the Mike Monroney Aeronautical Center.

***Key Events FY 2007-2010 – Performance Output Goals***

- Treat and dispose of hazardous contamination at Annette Island, AK.
- Treat and dispose of fuel-contaminated soil at Tanana, AK.
- Treat and dispose of PCB and fuel-contaminated soil at McGrath, AK.
- Perform remediation activities for contaminated areas at William J. Hughes Technical Center, Atlantic City, NJ.

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## 3A02, AVIATION SAFETY ANALYSIS SYSTEM (ASAS)

**FY 2006 Request $13.2M**

- Aviation Safety Analysis System (ASAS), A17.00-00

## Program Description

The ASAS program provides the automation hardware, software, and communication infrastructure to support aviation safety information databases and access to them by the increasingly mobile FAA safety work force. The workforce uses these databases to certify and regulate aircrews, airlines, and other licensed companies in aviation. Having information readily available improves the ability of safety personnel to develop safety regulations and oversee the civil aviation industry. The information technology infrastructure and software systems also enhance data and information sharing.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

Inspection and review of airline safety programs and practices are integral to the FAA safety program. The ASAS provides information on the safety record of an airline and the actions required to meet regulations and directives. Having this information allows the safety inspectors to determine if the airline is complying with good safety practices, which is essential to FAA's role in preventing accidents.

***Key Events FY 2006 – Performance Output Goals***

- Begin designing and implementing of new enterprise infrastructure under the Regulation and Certification Infrastructure for System Safety (RCISS) program.
- Complete analysis and design of an improved Aviation Medical Examiner workflow process under Document Imaging Workflow System.
- Expand Covered Position Decision Support System to address processing of medical appeals cases and meet new reporting requirements.
- Expand Administration & Compliance Tracking in an integrated office network subsystem to provide an automated repository of compliance history data.
- Expand functionality of Compliance Enforcement Tracking System (CETS), Certificate Management Information System, and Flight Standards Information Management System systems.
- Complete deployment of FAA Identification Media System.
- Expand Investigations Tracking System to assist in investigation archiving.
- Expand Facility Security Reporting System to improve assessment capabilities and provide remote access.
- Develop and deploy Hazardous Materials Inspection and Enforcement System, allowing airlines to report violations electronically to FAA and Transportation Security Administration in real time.

***Key Events FY 2007-2010 – Performance Output Goals***

- Continue technology refreshment to enable efficient and expanded access to safety data.
- Continue improvement and refreshment to support safety and business functions and activities, thus enabling access to required data and FAA national systems and support capabilities.
- Continue technological modernization and technical refreshment of the automation platform that supports all other Associate Administrator for Regulation and Certification automation projects.
- Continue to develop and make further enhancements to the ID Media System.
- Continue developing enhancements to the National Access Control and Personnel directory.
- Develop and implement a Document Management System to support security agents.
- Develop and implement an Investigations Tracking System to track the contractor work force as well as employees of other government agencies who are working on FAA business.
- Develop additional enhancements for the ad hoc reporting capability, improve ability to upload photos, upgrade data collection hardware and software, and improve remote access.
- Redesign and implement the replacement for the Aircraft Detection and Processing Terminal system.
- Develop and implement an automated system for submitting fingerprints to the Office of Personnel Management for checking criminal records.
- Continue developing the Aviation Medical Examiner Information Subsystem.
- Enhance capabilities of CETS by establishing a clinical care module and developing training materials.
- Design and develop new correspondence tools to create and maintain official communication; expand functionality beyond Part-67 position (i.e., security specialist and non-FAA flight crew positions); integrate Occupational Medical Surveillance Program; move airmen medical certification data to electronic media; and provide instant airman certification under the Covered Position Decision Support System.
- Analyze/revise application/user processes; develop training materials and conduct user training; analyze and develop Web-based interface to replace legacy interface; re-host client server to Web-based platform; enable external interfaces to commercial realm; move airmen medical certification data to electronic media; provide instant airman certification under the Document Imaging Workflow System.
- Integrate CETS data with Decision Support System.

## 3A03, LOGISTICS SUPPORT SYSTEMS AND FACILITIES (LSSF)

**FY 2006 Request $13.2M**

- Logistics Support Systems & Facilities – Asset Supply Chain Management, M21.03-00

## Program Description

The Asset Supply Chain Management (ASCM) program will provide the FAA an asset management and supply chain information system to effectively track and manage over more than $18 billion in Federal Government assets, including personal property and real property assets used to provide citizens a safe and efficient NAS. FAA airways facilities technicians, property managers, property custodians, and other asset management support staff, as well as FAA Logistics Center (FAALC) personnel will use ASCM to cover all phases of an asset's life-cycle, including acquisition, design, development, installation, operation, maintenance, and ultimate disposal. ASCM will enable the Agency to meet FAA, DOT, and Federal Government asset and supply chain management requirements. By simultaneously increasing responsiveness to customer demands and reducing inventory, ASCM will lower FAA operations expenses by effectively managing data and making process improvements. Having an accurate asset inventory will also lower operations expenses by reducing acquisitions of duplicate or unnecessary assets; increasing the number of assets replaced or repaired under warranty; improving optimization and allocating NAS field spares; and reducing costs for maintaining more than a dozen existing asset management information systems. The FAA's ASCM system(s) must work 24 hours a day, 7 days a week to supply parts to support air traffic services to ensure a safe and efficient NAS. The FAALC provides services, logistics support, and parts for the NAS and other national and international customers. Tighter inventory control, improved warehouse management, collaborative planning, forecasting, and replenishment can be leveraged to control factors related to obsolescence and equipment performance in the NAS. ASCM will enable the FAA to maintain standards for asset management, logistics management, financial management, cost accounting, and clean financial statements.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

The ASCM Program will support enhanced cost-control measures and improved decision-making based on reliable data for all agency assets. ASCM will support agency initiatives to reduce operating costs by accurately tracking assets and analyzing trends (e.g., problem components, mean-time-between-failures by system location and individual components, over/under stocking, availability of components, etc.).

***Key Events FY 2006 – Performance Output Goals***

- Complete configuration, development, and testing of a COTS solution for ASCM version 1.
- Initiate design and development for ASCM version 2.
- Initiate development and testing of Logistics Center Support System (LCSS) version 1.
- Continue design and development for LCSS version 2.
- Acquire and implement additional ASCM handheld scanners to support data quality improvements.

***Key Events FY 2007-2010 – Performance Output Goals***

- Implement ASCM version 1 (Initial System Deployment).
- Implement ASCM version 2 (Full System Deployment).
- Implement LCSS version 1 (Initial System Deployment).
- Implement LCSS version 2 (Full System Deployment).

- Retire and eliminate operational costs for remaining asset management systems.
- Retire and eliminate operational costs for Logistics Inventory System and remaining supply chain management systems.
- Acquire and implement additional ASCM handheld scanners to support data quality improvements.
- Continue to identify assets and inventory personal property.

## 3A04, TEST EQUIPMENT – MAINTENANCE SUPPORT FOR REPLACEMENT

**FY 2006 Request $3.0M**

- Test Equipment Modernization / Replacement, M17.00-00

### Program Description

The Test Equipment Modernization/Replacement project procures the test equipment needed to ensure reliable NAS operation. As the FAA modernizes the NAS, the new systems that are installed require specialized test equipment to determine if they are operating properly. In addition, as general use test equipment wears out it must be replaced. With appropriate test equipment, systems can be repaired efficiently, and outage time can be shortened.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

### Relationship to Performance Target

Acquiring new test equipment will reduce restoration time for both scheduled and unscheduled outages. Further, technicians using the new test equipment obtain accurate results when they test, repair, and certify NAS systems, which significantly reduces NAS system callbacks and recertifications stemming from misalignments due to test equipment failures. Inappropriate or inoperable test equipment decreases operational availability and causes aircraft delays.

## 3A05, NATIONAL AVIATION SAFETY DATA ANALYSIS CENTER (NASDAC)

**FY 2006 Request $0.9M**

- National Aviation Safety Data Analysis Center (NASDAC), M24.00-00

### Program Description

The NASDAC is a state-of-the-art automated safety analysis capability that enables users to quickly and accurately query and integrate multiple databases. The NASDAC imports and maintains multiple databases on aviation accidents and other safety factors such as aircraft maintenance and utilization. Powerful analytical tools are used to query databases to determine patterns in accident causal factors and identify precursors of accidents. With rapid change in information technology, it is necessary to update or refresh both the information systems that support the databases and the analytical tools used to search the data. System upgrades include adding technology required to develop quickly customized views or integrations of data for specific user groups, adding additional databases and acquiring leading edge analysis tools.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The NASDAC contributes to a reduction in aviation accidents by enabling users throughout the FAA, industry and academia to identify patterns in accident causal factors, develop remediation programs and actions, and efficiently target safety resources.

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## 3A06, NATIONAL AIRSPACE SYSTEM RECOVERY COMMUNICATIONS (RCOM)

**FY 2006 Request $10.0M**

- Command and Control Communications (C3), C18.00-00

## Program Description

The RCOM program gives the FAA the command and control communications capability to directly manage and operate the NAS during local, regional and national emergencies when normal common-carrier communications are interrupted. The NAS C3 provides and enhances a variety of fixed-position, portable, and transportable C3 systems to support emergency operations. Such C3 systems include the automatic digital network/defense messaging system; secure telephone unit third generation/secure telephone equipment; secure facsimile; very high frequency (VHF)/Frequency Modulated (FM); high-frequency single-side band; satellite telephone network; wireless notification system; secure conferencing system; knowledge services network; and communications in emergency situations. These C3 systems enable the FAA and other Federal agencies to exchange classified and unclassified communication to promote national security. The 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.

## Relationship of Program to DOT Strategic Goal, Objective, & Performance Target

- **DOT Strategic Goal – Homeland and National Security.**
- **DOT Objective 1 –** Support and implement U.S. security strategies and plans related to transportation.

## Relationship to Performance Target

The RCOM program contributes to the FAA's security goal by ensuring that during emergencies the FAA's C3 structure can provide time-critical public and NAS information for the FAA Administrator. The FAA Administrator shares this information with staff members, key regional managers, the Secretary of Transportation, and other national-level executive personnel.

***Key Events FY 2006 – Performance Output Goals***

- Procure and install equipment for VHF/FM Gulf Coast System Maintenance Office (SMO), Atlanta SMO, Miami SMO (non-Caribbean sites), and Southern New England SMO.
- Engineer system requirements for VHF/FM Montgomery SMO, Pacific Northwest Mountain SMO, Chicago SMO, and Columbia SMO.
- Continue modernizing classified facilities.
- Support communication support teams as required.

- Complete procurement of C3 high-frequency systems.
- Deliver additional secure conferencing systems as required.

***Key Events FY 2007-2010 – Performance Output Goals***

- Install VHF/FM equipment in the Montgomery SMO, Pacific Northwest Mountain SMO, Chicago SMO, and Columbia SMO.
- Engineer, procure, and install VHF/FM system equipment for Independence SMO, Tri-State Snow SMO, Gateway SMO, Hawaii-Pacific SMO, Memphis SMO, Pittsburgh SMO, Salt Lake City SMO, Lone Star SMO, Ohio SMO, Rocky Mountain SMO, Red River SMO, Rio Grande SMO, Superior SMO, Crossroads SMO, Dakota-Minnesota SMO, and Great Plains SMO. These installations will complete deployment of the VHF/FM network.
- Continue modernizing classified facilities.
- Support communication support teams as required.
- Deliver additional secure conferencing systems as required.
- Upgrade and enhance satellite telephone network phones.

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## 3A07, FACILITY SECURITY RISK MANAGEMENT

**FY 2006 Request $30.0M**

- Facility Security Risk Management, F24.00-00

## Program Description

The Facility Security Risk Management program seeks to improve and/or enhance physical security at all FAA staffed facilities in accordance with FAA Order 1600.69b. The order specifies requirements for physical security protective measures and establishes standards, objectives, procedures, and techniques to protect FAA employees, agency property, facilities, and contractors, as well as the public. The order clarifies and updates facility security procedures for all FAA facilities and establishes standards for facility security management, control, and safeguarding of assets and facilities.

## Relationship of Program to DOT Strategic Goal, Objective, and Performance Target

- **DOT Strategic Goal – Homeland and National Security.**
- **DOT Objective 1 –** Support and implement U.S. security strategies and plans related to transportation.

## Relationship to Performance Target

The Facility Security Risk Management program provides physical security that conforms to FAA Order 1600.69a for all FAA-staffed facilities. This protects the critical infrastructure of the air traffic control system and prevents disruptions and economic loss that would result from any damage to the system. All work being performed will lead to the accreditation of those facilities that have not been accredited.

***Key Events FY 2006 – Performance Output Goals***

- Upgrade and Accredit 34 Security Level I/II facilities.
- Complete engineering design at nine ATCTs and TRACONs.
- Complete construction at six ATCTs and TRACONs and one ARTCC.
- Complete access control/intrusion detection at 21 ARTCCs.
- Complete surveillance and lighting at 10 ARTCCs.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete upgrades and accreditation of the remaining staffed facilities.

## 3A08, INFORMATION SECURITY
**FY 2006 Request $12.0M**

- NAS Information Security – Information Systems Security, M31.00-00

## Program Description

In accordance with requirements in Homeland Security Presidential Directive-7, formerly PDD-63, and the Federal Information Security Management Act, the FAA established an Information Systems Security Program under the Office of the Chief Information Officer. This office is responsible for gathering corporate cyber security requirements for F&E programs, building the funding justification to meet the requirements, and distributing funds to lines of businesses/staff offices to enable them to conduct their cyber security programs. The FAA has made great strides in detecting and preventing malicious cyber activity. Specifically, the agency has (1) established a 24-hour/365-day Computer Security Incident Response Center (CSIRC); (2) developed an Information System Security architecture that overlays the NAS architecture; (3) demonstrated an intrusion detection system capability for ATC and installed it at four facilities; (4) enhanced cyber boundary protection for ATC facilities and their services; (5) completed certification and authorization on NAS systems; and (6) established a cyber security test facility at WJHTC. Out-year cyber security work plans reflect the agency's Android Cyber Defense Strategy, which is a comprehensive, proactive approach to preventing and removing intrusions in the agency's computer networks. This strategy, which strives to emulate the defenses and resiliency of the human body against attack by infection and disease, involves hardening individual system and network elements, isolating elements to avoid "viral" spread, and backing up the elements to avoid service disruption. There are six reinforcing layers of protection: architecture simplification, element hardening, boundary protection, informed recovery, systemic monitoring, and orderly quarantine.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **DOT Strategic Goal – Homeland and National Security.**
- **DOT Objective 1 –** Support and implement U.S. security strategies and plans related to transportation.

## Relationship to Performance Target

The FAA supports and implements security strategies and plans by: (1) ensuring effective preparedness, detection, response, and recovery regarding cyber attacks; (2) integrating information security efforts into all acquisition and operation phases to protect FAA people, buildings, and information; and (3) supporting the nation's efforts to safeguard homeland security, in particular the aviation infrastructure and industry.

***Key Events FY 2006 – Performance Output Goals***

- Correct NAS vulnerabilities discovered through Plan of Actions and Milestones discovered through the certification and authorization process.
- Certify and authorize spiral releases of complex systems and newly discovered systems.
- Provide CSIRC enhancements to support NAS and the NAS Security Information Group.
- Enhance the NAS architecture regarding cyber security protection by developing cyber security requirements and reviewing certification and authorization work.
- Conduct initiatives to improve the reliability, availability, and integrity of NAS systems during various forms of cyber attack.
- Prototype adaptive quarantine techniques.

***Key Events FY 2007-2010 – Performance Output Goals***

- Implement adaptive quarantine, which involves instituting procedures and processes to ensure that systems affected by a virus are properly identified and isolated from non-affected systems.
- 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.

- Develop architecture and engineering efforts for alternative solutions to secure new NAS systems.
- Monitor and take all actions necessary to ensure that the NAS information technology systems are not interrupted and are available at all times.
- Address vulnerabilities discovered through certifications and authorizations completed in prior years.
- Evaluate and acquire enhanced tools used by the CSIRC to address complex and rapidly changing cyber threats and vulnerabilities.

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## 3A09, INTEGRATED FLIGHT QUALITY ASSURANCE (IFQA)

**FY 2006 Request $2.0M**

- Integrated Flight Quality Assurance (IFQA), A20.00-00

## Program Description

The IFQA program will develop and implement a secure Internet-based electronic system to acquire, manage, analyze, and archive of information from an airline and repair station employee self-reporting program, known as the Aviation Safety Action Program (ASAP). This system will acquire data from pilots, mechanics, flight attendants, dispatchers, ground handlers, and other such employees.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007. Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The IFQA program contributes to FAA safety goals and objectives by providing the electronic capability to collect and analyze airline aviation safety program data to discover operational safety issues and to address risks before they lead to accidents.

***Key Events FY 2006 – Performance Output Goals***

- Deploy IFQA System ASAP at 10 carriers.
- Initiate IFQA System ASAP support at additional 15 carriers.
- Procure hardware, communication, networking, and peripherals for 15 carriers.
- Provide technical and operational support for 40 IFQA System ASAP carriers.
- Develop and implement categorization and analysis tools to support identification of accident contributors and high-risk areas by airlines, industry, and FAA.
- Continue open source release software and documentation.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

## 3A10, SYSTEM APPROACH FOR SAFETY OVERSIGHT (SASO)

**FY 2006 Request $9.2M**

- System Approach for Safety Oversight (SASO), A25.01-00

## Program Description

The SASO is a new initiative to increase the emphasis on a broader interpretation of safety risk management by the Flight Standards Service (AFS) and the aviation industry. The primary focus will be on the safety implications of operating procedures rather than on individual violations of safety regulations. The goal will be to uncover and prevent general safety problems instead of correcting safety problems one at a time. These changes will include:

| Area of Change | Current State | Future State |
|---|---|---|
| AFS Oversight Strategy | Static regulatory compliance | Dynamic safety risk management |
| AFS Management & Organization | Stovepipe programs | Centralized oversight management |
| AFS Workforce Skills | Aviation expertise | Aviation expertise and auditing skills |
| FAA Regulations and Guidance | Silent on system safety | Reinforced system safety |
| AFS Business Processes | End-product observation | Top-down program/system auditing |
| AFS Information Technology | Independent, standalone systems | Integrated Web-based systems |
| AFS/Industry Relationship | Ad hoc, circumstantial | Collaborative and structured |

SASO users will be the 4,800 AFS employees in 9 regions at more than 120 headquarters and field offices throughout the United States, Europe, and Asia and more than 25,000 aviation industry professionals managing safety throughout the United States and around the world.

SASO is a collaborative investment between the FAA and the aviation industry. It supports the President's Management Agenda's Expanded Electronic Government initiative. SASO will transform and consolidate regulatory compliance-based FAA oversight data systems into integrated safety risk management systems consistent with the FAA Enterprise Architecture. The integrated systems will be structured in an intranet/extranet framework that will allow the FAA and the aviation industry to use common system safety applications and distributed databases for managing and overseeing aviation safety, resulting in cost savings for all parties.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The System Approach for Safety Oversight Program will transition the Flight Standards Service and the aviation industry to a national standard of system safety by implementing a comprehensive set of world-class system safety practices. They include:

- Empowering industry with more responsibility for safety management;
- Sharing data, processes, and tools between the FAA and industry;
- Ensuring the most cost-effective use of AFS and industry resources;
- Creating a learning organization of skilled FAA professionals; and
- Facilitating system-safety-based regulatory reform.

Through the SASO program, the FAA projects to accomplish the following activities:

- Identify and mitigate risks;
- Develop certification, surveillance, and investigation processes and procedures to enhance the ability of aviation safety inspectors to identify risks and hazards in the aviation environment;
- Integrate and standardize existing databases, and define additional data needs to develop accident precursors for aviation safety inspectors; and
- Develop decision support capabilities for use by aviation safety inspectors, and FAA management to make timely and correct decisions addressing hazards and risks in the aviation environment.

If accomplished, these activities should ensure that airline systems are properly designed and maintained, resulting in a safe operating environment and contributing to reduction of aviation accidents.

***Key Events FY 2006 – Performance Output Goals***

- Deliver prototype "to-be" business process models for Federal Aviation Regulations (FAR) Parts 121 and 137.
- Deliver prototype "as-is" business process models for FAR Parts 142 and 145.
- Deliver a final safety evaluation methodology to identify and prioritize hazards/risks in commercial aviation systems (in collaboration with the stakeholders).

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete all AFS business process reengineering efforts by 2010.
- Complete Tier One Post-Business Process Reengineering Information Technology requirements for the SASO component programs.

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## 3A11, AVIATION SAFETY KNOWLEDGE MANAGEMENT ENVIRONMENT (ASKME)

**FY 2006 Request $2.2M**

- Aviation Safety Knowledge Management Environment, A26.01-00

## Program Description

The ASKME project is intended to provide the Aircraft Certification Service (AIR) a repository of critical safety technical information and data as well as a set of knowledge management and analysis tools for knowledge collection, dissemination, and analysis. These tools will be integrated into critical AIR business functions to support proactive monitoring and analysis of safety-related data; expedited aircraft design and production approval decisions; improved collaboration between program/project management, inspectors, and engineers; and knowledge transfer capabilities.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 1 –** Reduce the commercial airline fatal accident rate.
- **FAA Performance Target 1 –** Reduce the airline fatal accident rate by 80 percent from the 1994-1996 baseline to a rate of 0.010 per 100,000 departures by FY 2007.
- **FAA Performance Target 2 –** Reduce the three-year rolling average fatal accident rate below 0.010 by FY 2009.

## Relationship to Performance Target

The ASKME project contributes to FAA's air carrier and general aviation safety goals by providing a database of information and an accident precursor awareness tool suite to be used in certifying aircraft.

***Key Events FY 2006 – Performance Output Goals***

- Conduct system functional requirements gathering and analysis for two of AIR operational functions within AIR's certification and regulation responsibilities (Integrated Certificate Management and Assimilate Lessons Learned).
- Develop and implement the Electronic File System and design, develop, and implement Monitor Safety Related Data system.

***Key Events FY 2007-2010 – Performance Output Goals***

- Conduct system functional requirements gathering and analysis for the Airworthiness Certification Process, Compliance and Enforcement Actions Process, and Designee Supervision and Past Performance Process.
- Design, develop, and implement the Airworthiness Certification Process, Compliance and Enforcement Actions Process, and Designee Supervision and Past Performance Process.

## B. TRAINING, EQUIPMENT, AND FACILITIES

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### 3B01, AERONAUTICAL CENTER INFRASTRUCTURE MODERNIZATION
**FY 2006 Request $16.0M**

- Aeronautical Center Infrastructure Modernization, F18.00-00

### Program Description

The Aeronautical Center Infrastructure Modernization program supports FAA Training, Logistics, Engineering, Research, and Regulation and Certification programs and business services. This program upgrades and/or renovates aging facilities and infrastructure at the Mike Monroney Aeronautical Center (MMAC). The addition of new equipment to the FAA's inventory, coupled with existing NAS support requirements, increases the need to maintain suitable space at the MMAC, to house NAS support functions. In addition to facilities, the related infrastructure such as storm sewers, water lines, and telecommunications equipment must be upgraded. The MMAC has 81 buildings (49 owned by the FAA, 32 leased to the FAA by the Oklahoma City Airport Trust), and 31 other structures, totaling 3 million square feet.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings

### Relationship to Performance Target

The Aeronautical Center Infrastructure Modernization program improves efficiency and effectiveness by updating facilities and support infrastructure to meet the need of mission support organizations located at the MMAC. Efficiencies in logistics support translate to the right part in the right place to support the NAS. Efficiencies in aviation training infrastructure translate to more effective student training. Efficiencies in aviation research translate to improved understanding of the impact of human factors on aviation personnel and safer skies.

***Key Events FY 2006 – Performance Output Goals***

- Complete construction of the Logistics Support Facility final phase structural upgrade.
- Complete Phase 2 renovation construction of Building 13.
- Design first floor renovation for Air Navigation, Facility #2.
- Complete upgrades to telecommunications systems and equipment.
- Complete consolidation of the FAA Accounting Service Center
- Design first phase of Multipurpose Building Renovation.
- Design renovation of the Flight Inspection Building.
- Begin storm sewer expansion construction.
- Begin Aviation Records Building construction.

***Key Events FY 2007-2010 – Performance Output Goals***

- Complete first floor renovation of Air Navigation Facility #2.
- Complete telecommunications upgrades.
- Complete final construction of Building 13.
- Complete Aviation Records Building construction.
- Design and complete phased renovation of Multipurpose Building.
- Complete construction of Flight Inspection Building.
- Design renovation of Systems Training Building and begin construction.

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## 3B02, NATIONAL AIRSPACE SYSTEM (NAS) TRAINING FACILITIES

**FY 2006 Request $7.5M**

- A, NAS Training – Equipment Modernization, M20.00-00
- B, NAS Training – Equipment Modernization – Training Simulators, M20.01-00

## A, NAS TRAINING EQUIPMENT MODERNIZATION, M20.00-00

### Program Description

The FAA Academy conducts technical training for air traffic controllers, airway facilities technicians, aviation safety inspectors, and other specialists, and is responsible for internal training infrastructure. Training on the new systems being installed (resulting from NAS modernization) requires updated simulators, training media, and communications equipment. This program provides funding to update the simulators, training media, and communications equipment that significantly cut training costs and creates a well-trained technical workforce.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 1 –** Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.
- **FAA Performance Target 1 –** Increase Employee Attitude Survey scores in the areas of management effectiveness and accountability by at least 5 percent.

### Relationship to Performance Target

A well-trained technical workforce is an effective and accountable workforce. The NAS Training Equipment Modernization program enhances operational/maintenance training for NAS systems. It also increases training efficiency by reducing the time it takes to train this workforce. This equates to less time spent in training and more time on position in the facility. The benefits of reduced training cost and a more effective workforce are reduced time and cost of operating and sustaining the NAS.

Substantial benefits have been provided by reducing training time. These benefits result from upgraded simulators, training media and communication equipment. Operational efficiency is improved because the Academy-trained technical workforce is applying the newly acquired skills to the operational elements of the NAS.

## B, NAS TRAINING – EQUIPMENT MODERNIZATION – TRAINING SIMULATORS, M20.01-00

### Program Description

The NAS Training Simulator project will acquire and deploy training simulators to selected air traffic facilities in the field. Similar technology has been implemented at the Academy that has proven successful. This project focuses on using technology to assist FAA in training newly hired controllers during the next 10 years in response to projected staffing requirements. This program provides funding to acquire simulators for air traffic facilities, training media, and communications equipment.

### Relationship of Program to FAA Strategic Goals, Objective and Performance Target

- **FAA Strategic Goal - Increased Safety.**
- **FAA Objective 7** – Enhance the safety of FAA's air traffic systems.
- **FAA Performance Target 1** – By 2009, reduce the number of category A and B (most serious) operational errors to no more than 563, equivalent to a rate of 3.15 per million activities.

### Relationship to FAA Performance Target

Through the use of simulation in the field, the FAA can further enhance training for air traffic controllers in a high fidelity, realistic environment. Not only will this reduce on-the-job training time, but also significantly reduce operational errors. Students need the simulated environment to learn from mistakes--mistakes that could prove fatal if made with live traffic. This technology has already been proven at the FAA Academy.

***Key events FY 2006 – Performance Output Goals***

- Tabulate post implementation review data.
- Acquire additional simulators using U.S. Air Force contract, based on outcome of post implementation review.
- Prepare Request for Proposal for simulators.

***Key Events FY 2007 – 2010 – Performance Output Goals***

- Let contract for additional simulators based on outcome of post implementation review.
- Acquire additional simulators based on review outcome.

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## 3B03, DISTANCE LEARNING

**FY 2006 Request $1.9M**

- Distance Learning, M10.00-00

### Program Description

The Distance Learning program will replace Computer-Based Instruction (CBI) Delivery Platforms at all CBI Learning Centers, increase connectivity, and upgrade network multimedia support and services. The system consists of about 1,400 Learning Centers located at nearly every FAA facility around the world.

The FAA is replacing the CBI platforms for two reasons: (1) to support high-performance media and simulations required in many lessons; and (2) replacement parts for current platforms are becoming obsolete and hard to obtain.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 1 –** Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce.
- **FAA Performance Target 1 –** Increase Employee Attitude Survey scores in the areas of management effectiveness and accountability by at least 5 percent.

## Relationship to Performance Target

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, increase training opportunities for all FAA employees, provide flexibility in training schedules through local management control, and decrease the time employees spend away from their worksite. The FAA CBI system must deliver initial operator, transition, and maintenance training for many NAS programs. Providing a standard training delivery and equipment simulation platform across all NAS programs reduces the need and space for such equipment. All of these factors contribute to reducing the unit cost of service for en route, terminal, and flight service, consequently saving over $5M each year.

# ACTIVITY 4. FACILITIES AND EQUIPMENT MISSION SUPPORT

## 4A01, SYSTEM ENGINEERING AND DEVELOPMENT SUPPORT

**FY 2006 Request $32.2M**

- A, System Engineering and Development Support - SETA, M03.01-00
- B, Provide ANF/ATC Support (Quick Response), M08.01-00
- C, Web/CM, M03.01-01
- D, Market Based Competitive Sourcing A-76, M45.01-00

### A, SYSTEM ENGINEERING AND DEVELOPMENT SUPPORT - SETA, M03.01-00

### Program Description

The System Engineering and Development Support project enables the FAA to contract for critical expertise to assist in developing and managing the NAS Architecture and key modernization projects. System engineering support is also used for preparing four of the key modernization plans, the Flight Plan, NAS Operational Evolution Plan, Capital Investment Plan, and the NAS Aviation Research Plan. System engineering and integration are key to the NAS Architecture's success and to maintaining interface control between current systems and new systems.

Besides system engineering, the contracts under this program support the Air Traffic Organization (ATO) programs for automation systems, communications, navigation and landing aids, surveillance, and weather. This support includes program management, financial management and investment analysis support 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.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

### Relationship to Performance Target

System Engineering and Development Support contributes to organizational excellence by providing support for designing and managing NAS modernization. With contractor assistance, the FAA is able to plan, analyze, and manage NAS system improvements more effectively. In addition, financial management and investment analysis support helps the FAA track cost, balance competing budgetary resources and make important decisions to ensure that limited program dollars provide the greatest return on investment.

### B, PROVIDE ANF/ATC SUPPORT (QUICK RESPONSE), M08.01-00

### Program Description

This program provides quick response support from ATO-Finance such as funding the initial configuration management tool for the use by ATO Technical Operations, the Oracle enterprise license for the ATO, and the Sourcenet database development. Additionally, it includes ATO development of financial systems and

reports for each service unit, quality control for each financial system, and specialized support for ATO-Finance initiatives, as well as emergency engineering response for unforeseen regional breakdowns.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

This program is a central avenue for obtaining general support and addressing quick response issues, such as popup requirements, and unforeseeable capital needs, and it contributes to cost savings in the long run. Benefits include quick turnaround responses for software needs which enables administrative and mission support systems to be developed and supports the regional requirements for quick fixes including any attributed to weather damage. Program ensures sustainment of operational availability by providing quick turnaround funding for emergency repairs.

# C, WEB/CM, M03.01-01

## Program Description

Configuration Management (CM) is a vital component of NAS life cycle management. CM is a disciplined approach for establishing management processes, identifying and documenting the functional and physical characteristics of a material item, controlling changes to the item characteristics, and reporting and recording of configuration information including maintenance of the configuration record. FAA Order 1800.66, Change 1, NAS Configuration Management prescribes that CM shall apply to all systems, subsystems and components of the NAS, including the documentation describing the NAS. The efficient management of CM information is critical to the operation of CM functions and activities, as well as the management of FAA systems throughout their lifecycle. Web/CM will provide an automated, integrated solution to the Agency's CM community for managing the NAS CM process. Specifically, Web/CM will provide:

- An enterprise solution capability to managers, engineers, field technicians and other personnel for managing, monitoring and reporting on NAS systems;
- Agency-wide access to timely and accurate CM-related information and interfaces to related information systems to support managing installed and currently baseline field systems and facilities;
- State of the art technology that migrated the existing Document Control mainframe system to an Oracle-based, virtual library of NAS documentation; and
- A reduction in change process cycle time during requirements, acquisition, and operational phases; and thereby providing long-term cost savings to the Agency.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control Costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

Web/CM will provide a reduction in change process cycle time during requirements, acquisition, and operational phases; thereby providing long-term cost savings. Specific benefits include:

- Reduced risk associated with the implementation of new systems and technology in the NAS
- Reduced NAS equipment acquisition and maintenance costs through a coordinated systems approach
- Seamless enterprise-wide access to a repository of validated, real-time CM data
- Standardization of CM processes and more effective management of NAS change process; and
- Integration of CM requirements across the Agency.

# D, MARKET-BASED COMPETITIVE SOURCING, M45.01-00

## Program Description

As one of the five government wide reforms under the President's Management Agenda, the competitive sourcing initiative calls on agencies to strive to create a market-based government advocating an environment of competition, innovation and choice. The primary tool for achieving this competition is the OMB Circular A-76, "Performance of Commercial Activities". The FAA has established the Office of Competitive Sourcing Acquisitions to use A-76 as a means of determining whether selected FAA services can be provided more cost effectively to users of the NAS. Circular A-76, establishes the policies and procedures for competing commercial activities and determining the best service providers. The FAA is conducting an A-76 study of the services provided by Automated Flight Service Stations (AFSS). AFSS's are plagued with aging facilities and equipment and an imbalanced workload.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control Costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

Market-Based Competitive Sourcing is the most significant cost-control measure in the FAA. The outcome of the competition is a contract award that caps annual costs for AFSS services and mandates a minimum 22 percent cost savings over a 5-year period. The FAA ensures these cost-control measures by including contractual requirements to cap annual spending at $435 million and a 22 percent cost reduction over a 5-year period. This equates to a minimum, anticipated savings of $479M during the first five years of the contract.

***Key Events FY 2006 – Performance Output Goals***

- Complete transition to new AFSS service contact by September 30, 2006.

***Key Events FY 2007-2010 – Performance Output Goals***

- None

## 4A02, SAFETY MANAGEMENT SYSTEM
**FY 2006 Request $3.0M**

- Safety Management System, M08.32-02

### Program Description

The Safety Management System (SMS) will establish safety management processes and procedures, and apply safety risk management techniques to the operation, development, maintenance, and evolution of the NAS. The SMS will identify, document, mitigate, and monitor hazards to the NAS and prevent accidents and incidents before they occur. The SMS includes processes to collect and analyze safety data, conduct safety reviews and evaluations to ensure safety, and continuously monitor the NAS to assess the safety risk. The SMS program will bring the FAA into compliance with the safety management requirements of ICAO.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 7 –** Enhance the safety of FAA's air traffic systems.
- **FAA Performance Target 2 –** Apply safety risk management to at least 30 significant changes in the NAS.

### Relationship to Performance Target

The SMS program contributes to the FAA's performance target of applying "safety risk management (SRM) to significant changes to the NAS" by using a common SRM framework to analyze all changes to the NAS, both procedural and system changes to determine safety risks.

***Key Events FY 2006 – Performance Output Goals***
- Implement SRM rollout plan to expand the use of SRM beyond initial implementation targets.
- Audit and report on applying SRM by operational service units
- Monitor the effectiveness of SRM strategies employed as a result of SRM.

***Key Events FY 2007-2010 – Performance Output Goals***
- Receive final approval from FAA's Regulation and Certification offices on FAA SMS.
- Provide SRM practitioner training to ATO NAS change agents.
- Support development of 30 safety cases (or Safety Risk Management Documents) by operational service units documenting the conduct of SRM.

## 4A03, PROGRAM SUPPORT LEASES
**FY 2006 Request $45.0M**

- Program Support Leases, M08.06-00

### Program Description

This program provides the payments for approximately 2,380 land leases, 670 space leases, and 75 leases covering both land and space for operational facilities. It also funds the purchase of land when doing so is more economically feasible than continuing to lease.

For FY 2006, the request will fund approximately 3,125 leases, other real estate requirements and will include costs associated with:

- Rental of land and/or space that directly support navigation, communication, weather, and air traffic control facilities,

- Rental and management of land and/or 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,
- Construction-leaseback projects and other related agreements,
- Conversion of existing leases to purchases,
- Condemnation of real property interests,
- Real estate appraisals, market surveys, title reports, and other costs associated with owned and leased real property,
- Management and administration expenses for establishing and maintaining a database of leases and owned facilities, for developing business tools to enhance real estate acquisition and related activities, and for implementing program efficiency practices, and
- Real property disposals with sale proceeds to be used to offset other direct and related program costs.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

The FAA Program Support Leases project contributes to the FAA's greater capacity goal by providing funding for existing leases for land and space that directly support NAS operational facilities for air traffic control, communications, air navigation, weather reporting and landing, and such critical NAS components as towers, approach control and en route systems, radars, landing systems and navigational aids. The leases are contractual commitments and provide the legal right to locate, operate, and maintain critical ATC facilities essential for minimizing outages that result in delays and decreased capacity.

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## 4A04, LOGISTICS SUPPORT SERVICES (LSS)

**FY 2006 Request $9.7M**

- NAS Regional/Center Logistics Support Services, M05.00-00

## Program Description

The Logistics Support Services program provides contractor-supplied services to perform real property acquisition, materiel management, and contracting activities to support FAA Capital Investment Plan projects. Contract services also support accounting activities that require capitalization of facilities and equipment and other property control related activities. These services provide a significant portion of the workforce for acquisition, real estate, and materiel management at the regions and centers. The Logistics Support Services Center (LSSC) program is instrumental in establishing new or upgraded facilities, including air traffic control towers and TRACONS throughout the NAS. LSSC resources will continue to be used for asset tracking and documentation efforts to obtain and maintain a clean audit opinion. The services will also be used to implement the FAA Facility Risk Management Program.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to the Performance Target:

The contractors maintain adequate documentation, suitable for independent audit, to provide a basis for the accounting system entries for capital cost of facilities throughout the FAA. Having accurate accounting records and improving cost controls for real property management allow efficiencies in purchasing, leasing, and managing property.

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## 4A05, MIKE MONRONEY AERONAUTICAL CENTER LEASES

**FY 2006 Request $13.5M**

- Mike Monroney Aeronautical Center – Leases, F19.00-00

## Program Description

The FAA and the Oklahoma City Airport Trust have a fixed-term lease agreement through 2012 for approximately 1,100 acres of land and 32 leased buildings, which comprise the Mike Monroney Aeronautical Center (MMAC). The MMAC requires large parcels of land as NAS test sites for surveillance radar, communications, weather, and navigation/landing systems. The MMAC supports air traffic training, aviation research, engineering support of NAS equipment, logistics supply and repair, aviation medical research, and other important aviation regulation, certification, and business functions.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

MMAC operations result in efficiencies in logistics support, aviation training, second-level engineering support to the NAS, regulation and certification, aviation research, and business services that translate into improved cost control and more effective support services to the FAA.

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## 4A06, TRANSITION ENGINEERING SUPPORT

**FY 2006 Request $24.0M**

- NAS Implementation Support Contract (NISC), M22.00-00

## Program Description

The NISC supports organizations responsible for deploying, implementing, and integrating many different NAS components and equipment. Work products that support transition, implementation, and integration activities include: transition plans and timelines, equipment waterfall schedules, engineering site preparation packages, site implementation plans, analysis of environmental impacts, test procedures, site test monitoring, corporate work planning, and configuration management.

NISC supplements the agency's technical workforce in integrating CIP projects into the NAS. The pace of ATC modernization requires supplemental technical staffing to the existing FAA workforce. Additional, highly skilled, experienced personnel is provided at cost-effective rates that support over 80 CIP projects

within the NAS, including STARS, Capstone, En Route Automation, ATCT/TRACON Replacement, and Occupational Safety, Health, and Environmental projects.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing cost. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

## Relationship to Performance Target

The FAA's transition, implementation and integration engineering contract provides experienced personnel at cost effective rates to support regional and headquarters offices with coordination of NAS programs. This project helps ensure a sound and well-functioning NAS and provides safe, efficient, and cost effective air traffic services.

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## 4A07, FREQUENCY AND SPECTRUM ENGINEERING

**FY 2006 Request $6.1M**

- NAS Spectrum Engineering Management – NAS Spectrum Engineering Sustained Support, M15.01-00
- NAS Spectrum Engineering Management – Frequency Interference Support/Resolution, M15.02-00

## Program Description

These programs provide spectrum engineering and frequency management for all FAA projects and facilities using radio frequencies. Prominent projects include advancing civil aviation interests in developing and coordinating the U.S. position for the 2007 World Radio Communication Conference; ensuring protection of aeronautical safety service radio spectrum; conducting frequency and spectrum studies for the International Civil Aviation Organization (ICAO) to protect frequency bands of the Global Navigation Satellite System (GNSS); and supporting efforts to modernize and develop equipment for more efficient radio frequency engineering capabilities that focus on increasing capacity and reducing air traffic delays. Additionally, this funding maintains the frequency database management program model and provides spectrum management guidance to FAA personnel in national and international forums.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 1 –** Increase airport capacity to meet projected demand.
- **FAA Performance Target 3 –** Sustain operational availability at 99 percent for the reportable facilities that support the 35 OEP airports.

## Relationship to Performance Target

This NAS Spectrum Engineering Management program will improve capacity by providing 100 percent of the radio frequency spectrum engineering to install new or modify existing, communications, navigation and surveillance equipment to support the new runways and airspace.

***Key Events FY 2006 – Performance Output Goals***

- Continue work on the Very High Frequency air-to-ground communications extension.
- Continue engineering frequencies to support the reduced vertical separation minima and the national airspace redesign programs.
- Engineer required Expanded Service Volumes to support Area Navigation (RNAV) approaches.
- Modernize frequency engineering automation tools.
- Complete ICAO studies – GNSS, Universal Access Transceiver (UAT) Standards and Recommended Procedures (SARPS) development, and transition planning.
- Perform International Telecommunications Union studies to develop future aeronautical spectrum requirements.
- Develop U.S. position for World Radiocommunication Conference (WRC) 2007.
- Develop DME spectrum transition plan and support implementation of Global Positioning System (GPS) civil aviation (L5) frequency.
- Assess impacts on aeronautical systems by ultra-wideband devices.
- Perform Automatic Dependent Surveillance – Broadcast technical and capacity analysis.
- Access the spectrum requirement of systems supporting the runway incursion program.

***Key Events FY 2007-2010 – Performance Output Goals***

- Develop a spectrum transition plan for the next generation air-to-ground communication system.
- Support WRC 2007.
- Implement WRC 2007 decisions.
- Support development of WRC 2010 positions.
- Modernize frequency engineering automated tools.
- Engineer of frequencies to support new NAS services.

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## 4A08, PERMANENT CHANGE OF STATION (PCS) MOVES

**FY 2006 Request $0.5M**

- Permanent Change of Station (PCS), X02.00-00

## Program Description

This program provides funding for one-time permanent change of station moves associated with large TRACON consolidation programs or to handle airspace reassignments related to base realignments and/or closures. PCS moves for new TRACONs are critical so that the necessary staff is on-board and trained according to the schedules for equipment installation, checkout, and shakedown tests as well as to ensure that staffing has been relocated to meet airspace redesign efforts associated with the program.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Greater Capacity.**
- **FAA Objective 2 –** Increase or improve aviation capacity in the eight major metropolitan areas and corridors that most affect total system delay. For 2005, those airports are: New York, Philadelphia, Boston, Chicago, Washington/Baltimore, Atlanta, Los Angeles Basin, and San Francisco.
- **FAA Performance Target** – Achieve an average daily airport capacity for the eight major metropolitan areas at 44,428 arrivals and departures per day by 2009.

## Relationship to Performance Target

The PCS Moves program contributes to the FAA goal of greater capacity by supporting the projects that increase capacity or make better use of existing capacity in major metropolitan areas and corridors that affect total system delays.

## 4A09, TECHNICAL SUPPORT SERVICES CONTRACT (TSSC)

**FY 2006 Request $33.0M**

- Technical Support Services Contract, M02.00-00

### Program Description

TSSC helps the FAA ensure timely installation of equipment for NAS modernization. Engineers and technicians, hired under this contract, oversee prime contractors and perform direct Facilities and Equipment project work themselves. They perform site surveys, site preparation, and equipment installation, as well as several other contract functions. As a work force multiplier, the TSSC contract is the agency's primary vehicle to provide a supplemental work force to install capital equipment to ensure that installation schedules will be met. Without this supplemental source of engineers and technical staff, installation and equipment modernization projects would be delayed.

### Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Organizational Excellence.**
- **FAA Objective 2 –** Control Costs while delivering quality customer service.
- **FAA Performance Target 1 –** Develop and implement a centrally managed and highly visible cost control program to lead the agency in reducing costs. Each FAA organization will contribute at least one cost reduction activity each year to its Business Plan with measurable, significant cost savings.

### Relationship to Performance Target

The TSSC contributes to cost control by installing new equipment on a timely basis. This avoids costs of holding and storing equipment and also allows the FAA to receive the benefits of more modern equipment sooner. In a typical year, more than 3,700 separate projects are completed.

## 4A10, CENTER FOR ADVANCED AVIATION SYSTEM DEVELOPMENT (CAASD)

**FY 2006 Request $69.6M**

- Center for Advanced Aviation System Development, M03.02-00

### Program Description

The CAASD is an FAA's Federally Funded Research and Development Center (FFRDC) operated under a long-term Sponsoring Agreement with the MITRE Corporation. A Product Based Work Plan is developed annually within the context of the FAA Flight Plan and other agency long-range plans and is approved by the FAA's FFRDC Executive Board. The Work Plan defines an outcome-based program of technically complex research, development, and system engineering assignments designed to support the goals and requirements of the NAS as well as to ensure the continued growth, efficiency, safety and security of the NAS. Key areas of research, analysis, and systems engineering (along with related objectives and desired outcomes) include but are not limited to:

Communications Modernization: Accomplish the modernization of the FAA's communications infrastructure and facilitate the transition to digital communications. The required outcomes are improved performance of the NAS communications and surveillance systems, and increased NAS throughput by means of new cockpit capabilities enabled by improved air/ground communications.

Navigation Modernization, Broadcast Services and Surveillance Requirements**:** Define the concepts and architecture necessary to transition the NAS to a satellite-based ground-augmented navigation system. The outcomes are improved performance of the U.S. navigation system, better integration of the U.S. navigation

system internationally, and support for new FAA surveillance functions and cockpit tools that increase NAS throughput.

ATM Modernization**:** Define the incremental steps and operational capabilities necessary to achieve the NAS envisioned in the NAS Architecture document. The outcome is improved NAS performance and service delivery. CAASD has played a vital role in shaping the requirements of the En Route Automation Modernization (ERAM).

Airspace Design and Analysis: Improve the performance of the NAS in the near-and mid-term through diagnostic work and change proposals aimed at streamlining the nation's airspace configuration and airspace-related procedures. The outcome is a national airspace policy that encourages airspace design evolution to meet the needs of the airspace user and the service provider. The main focus in the next five years will be in the key metropolitan areas, High Altitude Redesign and with concept exploration and research that will support future airspace planning.

NAS Tactical Operations: Develop an understanding of daily and seasonal NAS operations from a strategic level and provide improved information and decision support capabilities to increase the quality of tactical operations decisions made at operational facilities around the country. The Outcome is to improve the system-wide performance of the NAS via improved information and tools for decision-making.

Operation Capability Evolution Planning**:** Understand the system-wide implications of a portfolio of operational, technology, and policy changes to the NAS both in the near term (Operational Evolution Plan) and for the longer term cross-agency transformation (Next Generation Air Transportation System) and assure that issues are resolved in an integrated manner. The issues include NAS congestion, interoperability, information security, safety, and long-term requirements. The outcome is improved NAS capacity, reduced delays, and better system predictability.

NAS-Wide Information Systems Security: Identify and define Agency-wide ISS policies and guidance, focused on the NAS. The Outcome is to participate in and support FAA activities to develop ISS solutions that apply NAS-wide. CAASD is also helping to define how the security services offered by FTI (FAA Telecommunications Infrastructure) will fit within the FAA's overall strategy and architecture for securing the FAA's information systems.

Aviation Safety**:** Improve the safety of operations in the NAS and the efficiency of safety case validations for new capabilities and procedures. This includes the development of the tools, techniques, and data necessary to identify problems and prevent accidents from occurring. CAASD efforts will help effectively expedite the implementation of the Safety Management System that reduces operational errors and improves the safety of FAA's air traffic systems.

Performance-Based NAS**:** Achieve cost-effective navigation services with the necessary performance and operational capabilities to provide RNAV everywhere, Required Navigation Performance (RNP) where beneficial, and vertically guided approaches everywhere. Eventually these concepts are to be extended to communications and surveillance so that all services are performance based. Areas of emphasis include RNP/RNAV, Procedures Streamlining, and Navigation Modernization.

Mission-Oriented Investigation and Experimentation**:** Investigate new thrust areas for the FAA to conduct independent research to enhance the core capabilities of the FFRDC. Current projects include Airport Demand/Capacity Modeling, 2020 Vision for Future NAS Operations, Logical Expansion of Arrival and Departures to Enhance RNP, and Delay Influence Analysis.

The challenges the FAA faces in meeting established goals and charting an achievable course for the future are extensive and technically complex. High quality research will continue to be required if the FAA is to meet these challenges. The FFRDC continues to play a vital role in defining the next generation air transportation system. 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 information and data, not normally available to support contractors.

Numerous elements of the anticipated CAASD work program are highly specialized research and systems engineering activities that require extensive knowledge of the present and planned NAS systems, as well as use of custom tools developed specifically to address the FAA-unique issues. Although this line is mapped to the "Increase Capacity" performance objective, CAASD provides key support to Flight Plan goals across the board.

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Capacity.**
- **FAA Objective 3 –** Increase on-time performance of scheduled carriers.
- **FAA Performance Target 1 –** Through FY 2009, achieve an 86.9 percent on-time arrival for all flights arriving at the 35 OEP airports, equal to or less than 15 minutes late due to NAS related delays.

## Relationship to Performance Target

The CAASD assists the FAA in analyzing and designing new systems to increase the efficiency and effectiveness of NAS systems. It performs analytical research, develops operational concepts, and tests new procedures. FAA adoption of these new systems and procedures for use in the NAS improves on-time performance, increases capacity, and provides a safer and more efficient air transportation system.

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## 4A11, NOTAMS AND AERONAUTICAL INFORMATION PROGRAMS

**FY 2006 Request $10.0M**

- NOTAMS Infrastructure / Distribution, A08.01-01

## Program Description

The Notices to Airmen (NOTAM) Infrastructure/Distribution project provides an automated NOTAMs distribution system that is standardized within the NAS, improves timeliness of delivery across the NAS, and is a centralized NOTAMs source for state-of-the-art entry and delivery of critical safety information using a dedicated telecommunications network. NOTAMs inform pilots of changes in conditions at airports and changes to airspace. One important example of the important information in NOTAMs is notification that a runway is out of service and cannot be used. This project originated from a June 2001 FAA memorandum identifying weaknesses in the current NOTAMs system. It emphasized the urgent need for a replacement system to help ensure that critical safety information reaches the pilot and other system users.

The NOTAMs Infrastructure/Distribution program will automate, standardize, and provide centralized NOTAMs dissemination to approximately 734 FAA facilities using a dedicated telecommunications network. Data will be provided to Federal Contract Towers (FCTs), FAA ATCT and TRACON facilities, Automated Flight Service Stations (AFSS), and ARTCC using the U. S. NOTAM system database at the Air Traffic Control System Command Center (ATCSCC) in Herndon, VA. This solution will ensure delivery to the facility demarcation point, receipt acknowledgement and an evolutionary path for distribution of all classes of NOTAMs (Domestic, Flight Data Center, ICAO, Military and Local).

## Relationship of Program to FAA Strategic Goal, Objective, and Performance Target

- **FAA Strategic Goal – Increased Safety.**
- **FAA Objective 2 –** Reduce the number of fatal accidents in general aviation.
- **FAA Performance Target –** By FY 2009, reduce the number of general aviation and nonscheduled Part 135 fatal accidents to no more than 319 (from 385, which represents the average number of fatal accidents for the baseline period of 1996-1998).

## Relationship to Performance Target

The NOTAMs automated distribution system modernizes the processing and distribution of critical NOTAMs safety information to FAA ATC facilities and other end users in a timely and standardized format. This should help reduce the number of general aviation and nonscheduled Part 135 fatal accidents.

***Key Events FY 2006 – Performance Output Goals***

- Continue development, testing and deployment of NOTAMs Distribution solution.
- Initiate deployment of the NOTAMs Distribution Program at up to 153 additional FCTs, ATCTs, and TRACONs.
- Upgrade the NOTAMs Distribution Program server at the ATCSCC.
- Initiate planning of further development and deployment activities for new interfaces to Terminal and En Route end state solutions.

***Key Events FY 2007-2010 – Performance Output Goals***

- Provide NOTAMs Distribution solution capability at required AFSSs.
- Provide NOTAMs Distribution solution capability at 394 of 650 FCTs, ATCTs and TRACONs (the remaining facilities to be done after 2010).
- Continue developing updated NOTAMs Distribution interfaces for domain end state systems.
- Provide updated NOTAMs Distribution solution capabilities for end state solutions in the Flight Service, Terminal and En Route domains as required.

# Federal Aviation Administration

# National Airspace System

# Capital Investment Plan

# Appendix C

# Fiscal Years 2006 – 2010

# Appendix C

# Facilities and Equipment Estimated Expenditures

FAA future budget projections are not released to the public due to the requirement for the FAA budget to be approved by the Office of the Secretary of Transportation and Office of Management and Budget and submitted as part of the President's budget to Congress.

# Federal Aviation Administration

# National Airspace System

# Capital Investment Plan

# Appendix D

# Fiscal Years 2006-2010

# LIST OF ACRONYMS AND ABBREVIATIONS

| **A** | |
|---|---|
| A/G | air-to-ground |
| ACE-IDS | automated surface observing system controller equipment information display system |
| ADL | aeronautical data Link |
| ADS-B | automatic dependent surveillance broadcast |
| ADS-C | automatic dependent surveillance-contract |
| AF | airway facilities |
| AFSS | automated flight service station |
| AIM | aeronautical information management |
| AIR | Aircraft Certification Service |
| AIXM | aeronautical information exchange mode |
| ALAR | approach/landing accident reduction |
| ALS | approach lighting systems |
| ALSF-2 | approach lighting system with sequenced flashing light model 2 |
| ALSIP | approach lighting system improvement program |
| AMDB | airport map database |
| AMS | acquisition management system |
| ANICS | Alaskan national airspace system interfacility communications system |
| AOPA | Aircraft Owners and Pilots Association |
| ARE | aircraft and related equipment |
| ARSR | air route surveillance radar |
| ARTCC | air route traffic control center |
| ARTS | automated radar terminal system |
| ASAP | aviation safety action program |
| ASAS | aviation safety analysis system |
| ASCM | asset supply chain management |
| ASDE-3X | airport surface detection equipment – model 3x |
| ASDE-X | airport surface detection equipment – model x |
| ASDP | advanced signal data processor |
| ASKME | aviation system knowledge management environment |
| ASOS | automated surface observing system |
| ASR | airport surveillance radar |
| ASR-9 | airport surveillance radar model 9 |
| ASR-11 | airport surveillance radar model 11 |
| ASWON | automated surface weather observation network |
| AT | air traffic |
| ATC | air traffic control |
| ATCBI | air traffic control beacon interrogator |
| ATCBI-6 | air traffic control beacon interrogator model 6 |
| ATCSCC | air traffic control system command center |
| ATCT | airport traffic control tower |
| ATDP | advanced technology development prototyping |
| ATM | air traffic management |
| ATO | Air Traffic Organization |
| ATOMS | air traffic operations management system |
| ATOP | advanced technologies and oceanic procedures |
| AUTOMET | automated meteorological |
| AWOS | automated weather observing system |

| | |
|---|---|
| AWSS | automated weather sensor systems |
| **B** | |
| BLI | budget line item |
| **C** | |
| C3 | command, control, and communications |
| CAST | commercial aviation safety team |
| CATMT | collaborative air traffic management technologies |
| CBI | computer-based instruction |
| CDM | collaborative decision making |
| CERAP | center radar approach control |
| CETS | compliance and enforcement tracking subsystem |
| CFE | communications facilities enhancement |
| CFIT | controlled flight into terrain |
| CIP | capital investment plan |
| CM | configuration management |
| CONOPS | concept of operations |
| CONUS | contiguous United States |
| COTS | commercial off-the-shelf |
| CSIRC | computer security incident response center |
| CWB | control wing basement |
| **D** | |
| DARC | direct access radar channel |
| DHS | Department of Homeland Security |
| DME | distance measuring equipment |
| DOC | Department of Commerce |
| DoD | Department of Defense |
| DOT | Department of Transportation |
| DVOR | Doppler very high frequency omni-directional range |
| **E** | |
| EBUS | enhanced backup surveillance |
| ECG | en route communication gateway |
| EM | equipment monitor |
| EOSH | environmental & occupational safety and health |
| EPA | Environmental Protection Agency |
| ERAM | en route automation modernization |
| ERIDS | en route information display |
| ETVS | enhanced terminal voice switches |
| **F** | |
| F&E | facilities and equipment |
| FAA | Federal Aviation Administration |
| FAALC | FAA Logistics Center |
| FAATC | Federal Aviation Administration Technical Center |
| FAR | federal aviation regulations |
| ECG | en route communications gateway |
| FDIO | flight data input/output |
| FFP1 | free flight phase 1 |
| FFP2 | free flight phase 2 |
| FFRDC | federally funded research and development center |
| FIS | flight information service |
| FIS-B | flight information service – broadcast |
| FISDL | flight information services data link |
| FM | frequency modulated |

| | |
|---|---|
| FMS | flight management system |
| FSAS | flight services automation system |
| FSS | flight service station |
| FST | fuel storage tank |
| FTI | FAA telecommunications infrastructure |
| FY | fiscal year |
| **G** | |
| GA | general aviation |
| GAVF | general aviation/ vertical flight technology |
| GDP | ground delay program |
| GNSS | global navigation satellite systems |
| GPS | global positioning system |
| **H** | |
| HAATS | Houston area air traffic system |
| HCS | host computer system |
| HVAC | heating, ventilating, and air-conditioning |
| **I** | |
| IAPA | instrument approach procedures automation |
| IATS | initial academy training system |
| ICAO | International Civil Aviation Organization |
| IDU | initial daily use |
| IFQA | integrated flight quality assurance |
| IFR | instrument flight rule |
| ILS | instrument landing system |
| IOC | initial operating capability |
| IOT&E | independent operational test and evaluation |
| ISS | information systems security |
| ITWS | integrated terminal weather system |
| **J** | |
| JAWS | Juneau airport wind system |
| JPDO | joint planning and development |
| JRC | joint resources council |
| JRC-2A | joint resources council - phase 2A |
| JRC-2B | joint resources council - phase 2B |
| **L** | |
| LAHSO | land and hold short operations |
| LCSS | logistical center support system |
| LDR | labor distribution reporting |
| LPDME | low power distance measuring equipment |
| LRR | long-range radar |
| LSS | logistics support services |
| LSSC | logistics support services center |
| LSSF | logistics support systems and facilities |
| **M** | |
| MALSR | medium-intensity approach light system with runway alignment indicator lights |
| MASPS | minimum aviation system performance standard |
| MIAWS | medium intensity airport weather system |
| MMAC | Mike Monroney Aeronautical Center |
| MOA | memorandum of agreement |
| MOPS | minimum operational performance standard |

| | |
|---|---|
| **N** | |
| NAFIS | next generation flight inspection system |
| NAIMES | national airspace system aeronautical information management enterprise system |
| NAS | national airspace system |
| NASA | national aeronautics and space administration |
| NASDAC | national aviation safety data analysis center |
| NDB | non-directional beacon |
| NEXCOM | next generation air/ground communications |
| NEXRAD | next generation weather radar |
| NIMS | national airspace system infrastructure management system |
| NISC | national airspace system implementation support contract |
| nm | nautical mile |
| NOTAM | notice to airmen |
| NTSB | National Transportation Safety Board |
| NWS | National Weather Service |
| **O** | |
| OASIS | operational and supportability implementation |
| OEP | operational evolution plan |
| OMB | Office of Management and Budget |
| ORD | operational readiness demonstration |
| OSH | occupational safety and health |
| OSHA | Occupational Safety and Health Administration |
| OT&E | operational test and evaluation |
| **P** | |
| PAPI | precision approach path indicator |
| PCB | polychlorinated biphenyl |
| PCS | permanent change of station |
| PDARS | performance data analysis and reporting system |
| PRM | precision runway |
| PS3 | power systems sustained support |
| PTR | program trouble report |
| **R** | |
| RCAG | remote center air/ground |
| RCE | radio control equipment |
| RCISS | regulation and certification infrastructure for system safety |
| RCOM | recovery communications |
| RCP | required communication performance |
| REIL | runway end identifier lights |
| RIRP | runway incursion reduction program |
| RMS | remote monitoring system |
| RNAV | area navigation |
| RNP | required navigation performance |
| R-side | radar controller position |
| RSP | required surveillance performance |
| RVR | runway visual range |
| **S** | |
| SASO | system approach for safety oversight |
| SAWS | standalone weather sensors |
| SETA | system engineering and technical assistance. |
| SF-21 | safe flight 21 |
| SLEP | service life extension program |
| SMM | surface moving map |

| | |
|---|---|
| SMO | system maintenance office |
| SMS | surface management system |
| SOC | service operations centers |
| SRM | safety risk management |
| STAR | standard terminal arrival routes |
| STARS | standard terminal automation replacement system |
| **T** | |
| TACAN | tactical air navigation antenna |
| TAMR | terminal automation modernization replacement |
| TDWR | terminal Doppler weather radar |
| TFM | traffic flow management |
| TFM-I | traffic flow management - infrastructure |
| TFM-M | traffic flow management modernization |
| TIS-B | traffic information service - broadcast |
| TMA-SC | traffic management advisor - single center |
| TRACON | terminal radar approach control |
| TSSC | technical support services contract |
| TVSR | terminal voice switch replacement |
| **U** | |
| UAT | universal access transceiver |
| UHF | ultra high frequency |
| UPS | uninterruptible power supply |
| URET | user request evaluation tool |
| **V** | |
| VASI | visual approach slope indicator |
| VHF | very high frequency |
| VOR | very high frequency omni-directional range |
| VORTAC | very high frequency omni-directional range collocated with tactical air navigation |
| VRRP | voice recorder replacement program |
| VSCS | voice switching and control system |
| **W** | |
| WAAS | wide area augmentation system |
| WARP | weather and radar processor |
| WJHTC | William J. Hughes Technical Center |
| WRC | world radiocommunication conference |
| WSP | weather systems processor |