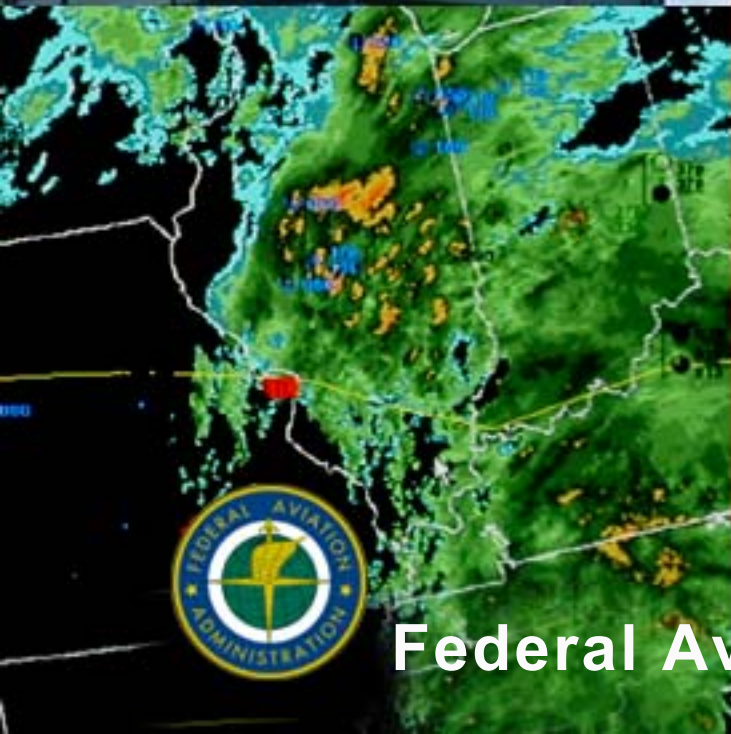




**NATIONAL AIRSPACE SYSTEM
CAPITAL INVESTMENT PLAN
2004-2008**



Federal Aviation Administration

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Federal Aviation Administration National Airspace System Capital Investment Plan for Fiscal Years 2004-2008

1 Introduction

The Federal Aviation Administration (FAA) Capital Investment Plan (CIP) is a 5-year financial plan that allocates funding to National Airspace System (NAS) projects based on a detailed analysis of project funding by FAA functional working groups. It is supported by the detailed technical planning in the NAS Architecture. The CIP includes estimates for the current fiscal year budget and for 4 future years' expenditures for each line item in the Facilities and Equipment budget. It provides a clear understanding of how much modernization we can do in that time. Consistent with appropriations legislation, the total funding estimates in the CIP equal the Office of Management and Budget's (OMB) future year estimates for the FAA Facilities and Equipment budget requests.

In developing the CIP, we analyzed our needs for modernization and considered how the CIP projects support the FAA strategic and performance goals. The 5-year plan gives us a long term view of NAS modernization and it helps to:

- Manage projects with a high degree of complexity successfully.
- Address capacity constraints at the largest airports and changes in user technology.
- Integrate the implementation of all the new systems to ensure financial support for interdependent systems.

2 Need for the Capital Investment Plan

2.1 NAS Modernization is a Long-Term Process

The CIP's detailed financial plan is important to ensuring that present and future resources are available to complete our capital investment projects. The CIP is a critical tool for an organization as large and complex as the FAA. The FAA does a needs-based analysis of about 190 individual capital investment projects required to sustain and improve operations. We then consolidate these capital projects into about 90 budget line items captured in the CIP. The timing of the planned project expenditures is especially important, given FAA's current philosophy of build "a little" and then test the incremental changes made before proceeding with more changes. The CIP must balance the cost of development with funds needed to implement changes in future years. It lets us integrate this complex incremental program into a multifaceted air traffic control system.

Achieving our modernization goals depends on a stable and predictable flow of funding. Since most FAA programs rely on multiyear development schedules to build and install

software and hardware, fluctuations in funding have a significant effect on schedules and overall program cost. Related programs that depend on the delayed projects can also be affected adversely. Delays in implementing projects defer the benefits of modernization and impact our goals for improving the safety and efficiency of the National Airspace System.

Funding for projects in the CIP is appropriated from the Airport and Airway Trust Fund. Appropriations are authorized by the legislation that established the trust fund and identified allowable FAA trust fund expenditures. Because the authorizations for the Facilities and Equipment appropriation are expiring, the FAA must propose future authorizations. The CIP shows how we would spend future authorizations and links them to our performance goals.

The FAA developed the CIP based on a coordinated process that considers many more projects than we include in the plan. We explored alternative solutions and selected those projects that best serve to improve the NAS and have the highest return on investment. Matching future project expenditures with estimated future availability of funding is an important discipline. It results in a capital plan that reflects only those projects that have a high probability of being completed.

2.2 FAA Must Plan for the Future

Commercial air travel has more than doubled over the past 20 years and is likely to double again over the next 20 years. Because of the events of September 11, 2001, and a slowdown in the general economy, there has been a decline in the demand for air travel during late 2001 and all of 2002 from the levels of 2000. The high level of activity during 2000 often exceeded the capacity of the airport and airway system resulting in congestion and delay. Although there is a current temporary decrease in aviation growth, the FAA believes that air travel demand will resume more normal growth rates by 2005. During the late 1990s and in 2000, we were falling behind in our attempts to modernize the NAS while simultaneously providing the needed services and capabilities to the growing aviation industry. If we implement this plan and continue the capital investment it presents during the slowdown in the industry, we will be able to reach and maintain the levels needed to serve the growing aviation industry.

Several circumstances support the projections of continued growth in aviation. The general economy is expected to return to higher growth rates. The proportion of the population with sufficient time and disposable income to use air travel is increasing. The globalization of industry will continue and result in greater demand for air travel. Use of regional jets for service to smaller markets has made air travel more available and appealing for people living in those communities. The continuing success of low-cost service will also generate increased demand. By 2005 both the total number of instrument flight rule (IFR) operations at towers and the number of IFR operations handled by en route centers will regain and exceed past peaks. The FAA must make capital investments now to modernize and expand the capacity of the airway system to

satisfy future demand and to avoid the congestion and delay levels experienced in the past.¹

Many of the busiest airports are operating at or near capacity. Delay is not a linear function of aviation growth at airports operating near capacity. As the number of operations approaches and then exceeds airport capacity, delays will increase dramatically. Unless capacity is added, either by building new runways or developing more sophisticated automation systems to squeeze more landings out of existing capacity, delays will persist. The CIP must address this capacity issue to avoid increases in aviation delays.

Developing new and more sophisticated automation systems to effectively increase capacity is more challenging than developing the first generation tools to automate air traffic control. This is partly because these sophisticated automation systems often depend on information from several interrelated systems. The enhancements these tools provide depend on very precise real time information. And the benefits of these tools cannot be realized, if critical infrastructure like electrical power systems and grounding to protect against lightning strikes is not funded. Given the capacity limitations of the current NAS, spending for automation systems in future years will need to increase in order to meet travel demand.

Figure 1 depicts the complexity of the NAS, caused by the interactions among its multiple components. In addition to the fundamental air traffic functions, which require air traffic facilities to communicate with pilots and receive surveillance data from radars, operating the NAS requires several other necessary data exchanges. These include automated connections among en route centers, terminal radar control facilities (TRACONs), and the air traffic control system command center (ATCSCC), and collecting information from a variety of sources to show weather conditions and the status of navigation and landing aids. Both controllers and pilots need to know the status of over 1,000 instrument landing systems (ILS) and 1,200 navigation aids to ensure that aircraft are able to fly the routes they have requested. All of these systems must work together smoothly to provide air traffic services. This interaction among systems is shown in the NAS Architecture.

¹ Information for the two preceding paragraphs was provided by the FAA's Office of Aviation Policy and Plans.

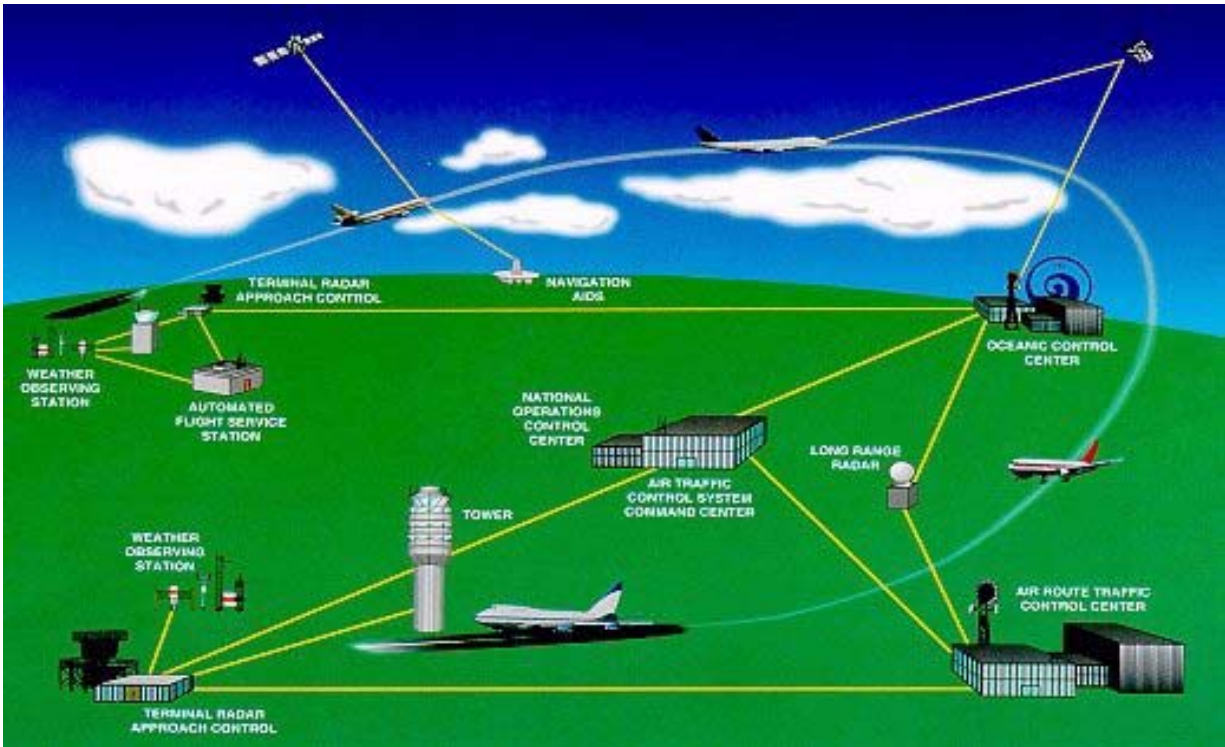


Figure 1 Components of the NAS

Another important factor in planning for future NAS expenditures is that the FAA uses commercial technology in systems that support NAS operations. Communication lines are leased from commercial providers; commercial software is integrated into the FAA systems; and the FAA normally buys commercial items like radios rather than design a unique system for FAA use. Computers, their component parts, and the peripheral equipment for larger systems, are commercial items. Some of these items have short lives on the commercial market as industrial technology can move at a very fast rate. New generations appear every 2 or 3 years. We must either keep pace with the commercial market for these items or take elaborate and expensive measures to maintain equipment that has become technologically obsolete.

In making our decisions about purchasing new equipment, we must consider the changes in technology that aviation users adopt. Avionics manufacturers are producing flight directors that can be programmed for fuel-efficient climb, descent, and en route flight profiles. Airlines are already taking advantage of data link communications with aircraft, and the FAA is planning to make more extensive use of the same technology. This requires coordinated planning with all users of the NAS. Users can realize the benefits of this new technology only if the FAA develops the equipment and procedures that support the airline investments.

2.3 The CIP Satisfies a Legislative Requirement

Beginning with the FY 2000 DOT Appropriations Act, legislation has required the FAA to submit a 5-year capital investment plan. The Act imposed a financial penalty, starting in FY 2001, if the CIP is not submitted with the President's Budget. The legislation requires that the plan estimate future spending by budget line item for all projects the FAA intends to carry out over the 5 year period.

2.4 The CIP is Based on Extensive Formal Planning

The FAA developed the CIP through a comprehensive process beginning with the most fundamental plans that define FAA's roles and the actions the FAA needs to take to accomplish them. The most basic statement of FAA's operating principles is the FAA Strategic Plan, which articulates FAA's goals for safely and efficiently serving air travel demand. The FAA Performance Plan, which is derived from the Strategic Plan, translates those fundamental goals into outcome goals that set targets for improvements in FAA performance. These targets are measurable goals for improving specific outcomes that affect the safety, reliability and financial concerns of aviation users.

To meet performance plan targets, the FAA has developed a group of closely related plans that define specific capital investments and other actions needed to improve safety and modernize the NAS. These plans include the NAS Architecture, the Aviation Capacity Enhancement Plan, the Operational Evolution Plan, and the CIP. All these plans consider the operating environment FAA expects for the future, as assessed in the FAA Aerospace Forecast (Forecast), the RTCA NAS Concept of Operations and Vision for the Future of Aviation (Concept of Operations) and the National Aviation Research Plan.

The FAA Forecast and the Concept of Operations underlie the engineering efforts that develop the NAS Architecture and set the pace of change. The Forecast estimates future air travel demand and the resulting FAA workload. The FAA uses this Forecast to gauge the size of the systems needed to accommodate future air travel demand and to ensure that the future air traffic system has the necessary capabilities. Once we forecast future demand, the Concept of Operations defines the procedures that FAA will use to handle the predicted volume of air traffic. Preparing the Concept of Operations is a critical step in deciding what equipment we need to control air traffic. The types of equipment and the configuration of this equipment are shown in the NAS Architecture.

The NAS Architecture describes the services provided in the NAS and the systems used to provide those services. The NAS Architecture contains operating diagrams for FAA systems, identifies the interactions between systems, and lays out the path to modernization. The architecture is the baseline for describing the configuration of the NAS. The FAA modifies it as needed to accommodate recommendations for improving capacity contained in the Airport Capacity Enhancement Plan (Capacity Plan) and the Operational Evolution Plan (OEP). These two plans analyze capacity issues related to present operations and recommend near-term changes that will enhance capacity and

improve NAS performance. The National Aviation Research Plan, in addition to describing projects that support FAA safety and environmental goals, describes the research projects that model future NAS behavior and explores more long-term solutions to capacity problems and design of the system of the future. These plans identify which CIP projects are necessary and the appropriate implementation schedules. The FAA Office of System Architecture and Investment Analysis uses the latest version of the NAS Architecture to do the financial planning for the individual projects and estimate the annual spending levels to create the CIP. The strength of coordinating all these plans is that the systems implemented are carefully integrated into the existing NAS and deliver the planned results.

2.5 Performance Goals are Integrated with the Capital Investment Plan

Consistent with efforts across the Federal Government to tie budgeting to performance plans, the FAA must ensure that its capital projects support its performance goals. Appendix A of the CIP describes how each project supports a performance goal. Appendix B details project accomplishments for Fiscal Year 2002 and planned accomplishments for current year appropriations and projects reflected in the budget request plus 4 future years. The number of goals is limited, because the intent of performance planning is to focus attention on the most important outcomes the FAA is trying to change. The FAA has also established supplemental goals to better measure progress toward meeting the major outcome goals. The supplemental goals represent narrower strategies to support performance goals, and they are based on an analysis of those factors that are most likely to affect performance outcomes.

Performance goals also play an important role in setting priorities for capital projects. As FAA plans for future expenditures, recognizing agency performance goals allows us to give a higher priority to those projects that contribute the most toward meeting a performance goal target.

3 FAA Performance Goals

3.1 Government Performance and Results Act Requires a Performance Plan

The Government Performance and Results Act (GPRA) of 1993 established Federal Government performance planning as a three-step process. The first step is developing a strategic plan containing a set of broad strategic goals describing the agency's mission. The second step is developing a Performance Plan, containing a limited number of outcome goals that guide decisions about resource allocation and agency management. The third step is preparing a report on the performance achieved compared to the goals established in the Performance Plan.

The FAA Strategic Plan contains the broad strategic goals that define the fundamental purposes of the agency. These goals articulate the agency's role in improving a measurable service provided to users or the environment in which users consume the

services provided by the agency. The FAA Strategic Plan is a long-term plan, updated every 3 years. FAA's strategic goals are:

- **Safety:** By 2007, reduce fatal accident rates by 80 percent from 1996 levels.
- **System efficiency:** Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.
- **Security:** Most of FAA's security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.
- **Organizational excellence:** Improve organizational excellence.

The annual Performance Plan flows from the FAA Strategic Plan. The Performance Plan translates the broad strategic goals into specific performance goals, stated in outcome terms. Outcomes are changes that improve fundamental aspects of human life, such as health, safety, and financial concerns. The Performance Plan sets specific targets for annual performance goals, so the agency's progress in meeting the goal can be measured. The annual Performance Plan contains targets for outcomes in the budget year and discusses the results of the previous year's actual performance compared to the targets set for that year.

The FAA GPRA and supplemental performance goals are:²

3.2 Safety

GPRA Safety Goals

1. By 2007, reduce the U.S. commercial aviation fatal accident rate per aircraft departure from a 1994-1996 baseline of 0.051 fatal accidents per 100,000 departures. The Fiscal Year (FY) 2004 target is 0.028 per 100,000 departures.
2. Reduce the number of general aviation fatal accidents. The FY 2004 target is no more than 349 fatal accidents.

Supplemental Safety Goals

- Reduce the number and rate (per 100,000 operations) of highest risk (category A & B) runway incursions. The FY 2004 target is no more than 47 category A & B runway incursions, which is a rate of .072 per 100,000 operations.
- Reduce the number of Category A & B (highest severity) operational errors. The FY 2004 target is no more than 629.

² All information on FAA GPRA and supplemental performance goals was provided by the FAA Office of Cost and Performance Management.

3.3 System Efficiency

GPR System Efficiency Goal

1. Increase the percentage of aircraft arriving no later than 15 minutes after the scheduled arrival time to 79.2 percent in FY 2004 at the 32 largest hub airports.

Supplemental System Efficiency Goals

- Increase the sum of facility-set arrival rates at the 35 airports identified in the Operational Evolution Plan (OEP). The target for FY 2004 is 49,120 arrivals.
- Increase the percent of time arrival demand is satisfied at the 35 airports identified in the OEP to 95.49 percent in FY 2004.

3.4 Human and Natural Environment

GPR Human and Natural Environment Goal

1. The number of people in the U.S. exposed to significant aircraft noise levels. The FY 2004 target is no more than 436,000 people.

Supplemental Goal

- Increase the number of people in residential communities that benefit from an airport improvement program noise compatibility project. The FY 2004 goal is 25,000 people.

3.5 Organizational Excellence

GPR Organizational Excellence Goals

1. Achieve a green rating for the following areas in the President's Management Agenda (A green rating is based on meeting several criteria established by the Office of Management and Budget for success in the areas listed below.)

- Strategic management of human capital
- Competitive outsourcing
- Improving financial performance
- Expanded electronic government
- Budget and performance integration

2. Improve the FAA score on the commercial pilot segment of the American customer satisfaction index (ACSI) survey. The FY 2004 performance target for the FAA score on the commercial pilot segment of the ACSI is 63.

3. Achieve 80 percent of designated acquisition milestones for critical programs and maintain program costs in 80 percent of critical programs as published in the Capital Investment Plan.

4 Performance Metrics

4.1 Performance Metrics Assist in Achieving Performance Goals

Achieving performance goals often requires a comprehensive set of actions – including policy, regulatory, organizational, operational, economic and technical activities. To track progress, we need clear measures that will evaluate the impact of individual programs. However, broad measures often capture results from several initiatives rather than the changes caused by an individual action, and it is often difficult to select a metric that discriminates the impact of a single action. Careful analysis is necessary to select metrics that gives meaningful data about outcome changes.

The Free Flight program has developed several metrics to measure the impact of improvements they have made to the air traffic control system. One of the metrics used is the change in arrival rates at a specific airport. The number of aircraft that can be accommodated at the airport is measured before new automation equipment is installed, and then the number accommodated is measured after it is installed. The FAA has found that Free Flight initiatives can increase the number of aircraft accommodated during peak hours by 3-5 percent. Metrics are a valuable tool for this program.

Performance metrics are needed to help us decide whether we are adopting the right strategies to meet performance targets or whether we need to adjust programs to address goals in other ways. In a complex environment such as the NAS, it is important to remember that initiatives are interdependent and performance metrics such as efficiency rates have multiple causes and influences.

4.2 Relationship of Performance Metrics to Performance Goals

The most useful metrics provide specific information about progress towards a performance goal. To establish a metric, the FAA analyzes the steps and most relevant factors needed to achieve the outcome stated in the goal. After identifying these key factors, FAA measures performance before the steps needed to meet the performance goal target are implemented and establishes baselines for associated metrics. As projects or procedures are implemented, FAA collects data to determine whether the project or procedure is contributing toward meeting the performance goal. Knowing the outcome of initiatives is an essential part of managing to performance goals.

In some cases, secondary metrics that do not directly measure an outcome but do measure a significant process are used to understand how we reach goals. For example, system reliability is not an explicit performance goal, but metrics can clarify the specific impact that reliability has on capacity and system efficiency. When the FAA must decide whether to upgrade existing equipment or install new capabilities, this metric can be very

valuable in determining which action will have the most impact on system congestion and delay issues. These secondary metrics play an important role in helping us meet performance goal targets.

4.3 Use of Performance Metrics

Some of the most valuable metrics are location specific. For example, determining the impact of new automation tools or new procedures on the arrival capacity at a specific airport is a precise measure of those tools and procedures. We can collect data at several airports to give an overall picture of performance improvements, but the data at the level of the individual airport often gives a unique and significant view of new tools, technologies and procedures.

Performance metrics describe short-term progress toward performance goals, providing early signals on the success or failure of a specific initiative. Over time, metrics can identify long-term trends and help us understand the success or problems with strategies to achieve goals. Metrics have a role in both short-term and long-range decision making.

4.4 Examples of Performance Metrics

The FAA has adopted clear sets of performance metrics tied to agency strategic goals. Metrics are both science and art, so the FAA is continually reviewing program measures to make sure they are useful to understanding progress towards goals and are part of data-driven decision making. The metrics below are part of the OEP Metrics Plan, and can be used along with other internal metrics such as project status measured against cost and schedule baselines to improve management.

- Average minutes late per flight
- Percent of flights on time
- Ground stop minutes
- Average daily arrival capacity
- Average daily flights
- Airport Efficiency Rate
- Airport Capacity in Visual Meteorological Conditions
- Airport Departure Rate
- Airport Arrival Rate
- Airport Capacity in Instrument Meteorological Conditions
- Airport Instrument Meteorological Conditions Index

5 Capital Investment Projects Relate to Performance Goals

5.1 Safety is the Highest Priority

Aviation safety is the primary mission of the FAA, and our performance goals reflect this commitment. The aviation industry also recognizes that air transportation could not thrive without the guarantee of safe operation. Safety is the first consideration in designing new programs. FAA will not implement a project unless it maintains or improves the safety of the NAS. The FAA has several safety programs, including operational programs that focus on regulating the design and operation of aircraft and licensing the aviation personnel who operate and maintain aircraft. Safety performance goal targets are used to stimulate new initiatives to improve our already high aviation safety standards.

Achieving the results articulated in the safety goals requires targeted initiatives. To ensure that the safety programs reflect best industry practices and are embraced by aviation users, the FAA has convened groups to identify strategies and capital improvements that hold promise for improving safety. Examples are the Safer Skies initiatives and the Commercial Aviation Safety Team (CAST). The organizations that support these efforts have access to safety data and analyze proposed actions to recommend improved safety practices. This analysis, a key element of performance management, evaluates present performance to determine which programs will improve performance in specific areas with the greatest risk. In the safety area, the Safer Skies initiative identified areas of risk for commercial aviation and general aviation. Examples of commercial and general aviation risk areas are:

- Uncontained engine failures (commercial)
- Controlled flight into terrain (both commercial and general aviation)
- Approach and landing (commercial)
- Loss of control (both)
- Weather (both)
- Pilot decision making (general aviation)
- Runway incursions (both)
- Survivability (general aviation)

The CIP contains several projects addressing those risk areas that can be reduced with improved NAS technology. We plan investments for:

- Weather systems that improve weather detection and reporting for both terminal and en route flight segments. By providing more timely and accurate forecasts of adverse weather, these systems will reduce weather related accidents.
- Systems to detect potential runway incursions. Detecting potential incursions and warning pilots addresses this significant safety issue and thus helps to prevent serious runway accidents.
- Projects that improve approach and landing safety, such as augmenting the global positioning system (GPS) to allow precision landing guidance at more airports and improvements to approach lighting and visual landing aids.

The paragraphs below discuss the major projects to support improvements in safety performance goal targets.

5.1.1 Weather Risks

Weather is a primary factor in more than 35 percent of commercial aviation fatal accidents. Wind shear near an airport and turbulence caused by convective activity (mainly thunderstorms) are among the greatest risks. Wind shear is often associated with severe thunderstorms and has caused jet aircraft approaching a runway to crash. Reducing the risk of accidents caused by wind shear and other weather phenomena depends on timely and accurate warnings to pilots, allowing them to avoid this hazardous weather. The following key projects provide the information for timely and accurate warnings:

5.1.1.1 Wind Shear Alerting Systems

The FAA has installed terminal Doppler weather radars (TDWR) at 45 large airports with the most wind shear risk. The TDWR displays show areas of wind shear and gust fronts, which enable tower controllers to warn pilots of existing wind shear conditions. The existing TDWR systems have experienced maintenance problems, and we need to invest capital in a Service Life Extension Program to ensure that these vital safety systems operate reliably through the year 2020. The FAA has also installed low level wind shear alert system (LLWAS) and the weather system processor (WSP) at additional airports to provide wind shear warnings. The LLWAS uses sensors to detect differences in winds at several locations on and around the airport. The WSP modifies the airport surveillance radar, used for air traffic control, so that it can display wind shear conditions. We are developing the medium intensity airport weather system (MIAWS) as a low cost warning system for wind shear at 40 medium sized airports. The MIAWS uses the National Weather Service radars to gather information on hazardous wind conditions. We will deploy the MIAWS in 2005 and 2006. The wind shear systems, already installed, have been a major factor in reducing the risk of accidents, but they must be updated to continue providing vital safety information. The challenge to FAA is to provide protection from wind shear consequences at as many airports as possible recognizing that benefits from these systems need to exceed the estimated costs

5.1.1.2 Better Information about Weather Conditions near Airports

The Integrated Terminal Weather System gathers data from several weather sensors and displays an image of current weather for airport towers. The system also provides 10 and 20-minute projections of how weather systems will move near and over the airport. Controllers use this information to provide weather alerts to pilots concerning hazardous weather and to decide which runways to use for takeoff and landing. Tower supervisors choose the runways that have the least risk of encountering hazardous weather conditions, but they try to avoid frequent changes in runway configurations for takeoff and landing that could disrupt air traffic and can cause delays. Having a detailed picture of weather affecting the airport and the path that weather is following helps controllers make better decisions on how to configure the traffic flows into and out of the airport and to provide more precise warnings to pilots flying near the airport. The 38 systems being purchased for this project are scheduled to be installed and tested during fiscal years 2002 to 2004.

5.1.2 Monitoring Aviation Safety

In addition to the projects that upgrade air traffic control equipment to ensure safe separation of aircraft, the CIP supports many other safety programs including:

- Issuing licenses and certificates to ensure that aviation personnel meet established qualifications and that manufacturing and repair facilities conform to standards for design and modification of aircraft
- Monitoring both the companies that provide aviation services and the aviation personnel who are employed by those companies to ensure that safety is always paramount in the industry.

There are approximately 20,000 aircraft in commercial service. Over 600,000 pilots and more than 300,000 mechanics are licensed by FAA. Because of the large number of commercial operators, aviation personnel and repair facilities, the FAA needs automated tools to track their safety records and to ensure adherence to regulations and standards. We have made substantial investments in information technology systems and efforts to keep these systems up to date and expand their usefulness.

5.1.2.1 Data Support for Aviation Safety Inspectors

The Aviation Safety Analysis System supports a number of databases used in the safety program. The databases include records of licenses and certificates, violations of FAA regulations, and accident and incident data for individuals and airlines. These databases support analysis and enforcement activities of FAA safety inspectors and certification staff. Without automated support, we could not inspect or certify the large number of aviation related entities efficiently.

5.1.2.2 Enhancing Safety Oversight

Meeting our goal for reducing fatal accidents depends on preventing accidents. The CIP includes three projects to enhance oversight of the aviation industry so we can discover safety issues before accidents occur. The System Approach for Safety Oversight program will develop and implement a proactive system safety approach to help identify and ensure compliance with best safety practices, to regulate the aviation industry, and to manage safety risks to eliminate accident causal factors. The Integrated Flight Quality Assurance program is in the testing phase for collecting data from individual airlines' flight operations quality assurance programs. The raw data from the airlines is collected from airline flight data recorders. It will be analyzed to uncover any safety issues in day-to-day operations. The Aviation Safety Knowledge Management Environment System supports aircraft certification by storing information relating to the design and certification of aircraft.

5.1.3 Preventing Runway Incursions

Runway incursions create dangerous situations that can lead to serious accidents. Reducing the number of runway incursions will lessen the probability of accidents that potentially involve fatalities, injuries and significant property damage. We are increasing our focus on preventing pilots or ground equipment operators from unintentionally entering the path of an aircraft taking off or landing. The FAA Office of Runway Safety studies the causes of runway incursions and develops strategies to prevent them. To support these strategies, we have developed training programs and technologies to aid controllers, pilots, and vehicle operators in recognizing potential runway incursions. The FAA continues to research alternative technologies to prevent runway incursions.

5.1.3.1 Airport Surface Detection Equipment – Model X

To protect against runway incursions at airports that do not have an airport surface radar, the FAA is developing 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. In addition to a radar sensor, other electronic aids are used to detect and locate aircraft and vehicles by processing position information provided by these electronic aids and then calculating the exact location of the vehicle or aircraft. We will deploy ASDE-X at 25 operational sites.

5.1.3.2 Airport Surface Detection Equipment

The FAA has installed airport surface detection system equipment - model 3 (ASDE-3) at more than 30 locations. This system provides controllers with a radar display of aircraft and vehicles in the airport operating area during low visibility conditions. The ASDE-3 is enhanced with the airport movement area safety system, which gives automated runway incursion warnings. Controllers can use these systems to alert pilots and ground vehicle operators of incursions to avert accidents. We need to invest capital to modernize these systems so that they continue to operate efficiently over the next 10 years. In

addition, we are adding the technology that uses electronic aids to detect aircraft and ground vehicle location, developed in the ASDE-X program, to seven of the ASDE-3 systems.

5.1.3.3 Preventing Aviation Accidents

FAA is demonstrating several advanced technologies that contribute to flight safety. These technologies include automatic dependent surveillance, data link and global positioning system (GPS) satellite navigation. The automatic dependent surveillance-broadcast (ADS-B) technology allows aircraft to automatically broadcast their position to air traffic control facilities and other aircraft. In areas with no, or limited, radar coverage ADS-B will give controllers more precise information on aircraft position.

Data link is another important new technology. Data link will eventually allow pilots to receive cockpit displays of aviation weather conditions. It can also be used to transmit air traffic control instructions. Pilots can use the data link information to avoid weather hazards and to ensure accurate interpretation of air traffic control instructions.

3.6.3.4 Preventing Controlled Flight into Terrain

In the recent past, there have been many fatal accidents involving controlled flight into terrain due to poor situational awareness. The Safe Flight 21 program is working with the aviation community to evaluate the benefits of providing additional information to pilots through an affordable terrain database and display. Use of this database coupled with the use of GPS navigation capability and the wide area augmentation system can provide warnings about high terrain near the flight path of the aircraft. Evaluating this technology is part of the Safe Flight 21 program being conducted in Alaska and the Ohio River Valley.

5.2 Improve System Efficiency To Support Future Growth in Aviation

The FAA has carefully analyzed several key measures of NAS capacity and efficiency to select the performance goal that is most closely aligned with the system efficiency strategic goal. The measure used for the 2004 performance goal, which is to increase the percentage of on-time arrivals, addresses one of the most important considerations in improving efficiency - delays. Maintaining schedule is important to both passengers and airlines. Airline operations can be severely impacted by delays in many ways; one of which is an increased risk of exceeding gate capacity at an airport. This results in holding aircraft outside the gate area causing further delay. Delays have many causes, and two subsidiary goals further refine the measurement of actions that the FAA has taken to increase on-time arrivals.

Just as in the safety area, industry is an important partner in defining the steps needed to meet the efficiency goal. Industry groups such as RTCA and independent research groups such as the Transportation Research Board have been key players in developing initiatives that will improve use of system capacity. For example, RTCA has provided

guidance for the Free Flight program and for use of satellite navigation. Broad industry cooperation has resulted in the Operational Evolution Plan (OEP), which contains several recommendations for operational changes and new technologies to reduce airport delays.

In response to suggestions from industry and research organizations, the FAA has developed several projects that promote system efficiency. These include automation systems for strategic management of the air traffic control system. The air traffic control system command center (ATCSCC) located at Herndon, Virginia tracks all air traffic in the United States and uses sophisticated software tools to predict problems or delays in the system. Using the collaborative decision-making tools, FAA can consult with commercial users, and the ATCSCC can regulate flows in the system to prevent large hub airports from being saturated with more traffic than the airport can handle. When delays are necessary, because of hazardous weather or runway closures, the delays can be taken on the ground, which is less costly. The ATCSCC also coordinates with traffic management units at the en route centers and the busiest tower/terminal radar control facilities (TRACONs). These units scan the flow of incoming traffic and recommend actions that smooth traffic flow to match it to runway capacity. Coordination with DoD and international air traffic control facilities is also necessary when military operations or international traffic are expected to influence operational flows.

The paragraphs below discuss the major projects that support system efficiency performance goals.

5.2.1 Adopt Modern Technology to Avoid Radio Congestion

As the number of aircraft using air traffic control services increases, the radio frequencies used by controllers for communication with pilots become more congested. To ensure enough capacity to handle future demand, we must upgrade the radios used by controllers. Two major projects are developing systems that make more efficient use of the radio frequencies assigned to FAA for voice communications. The next generation communication system (NEXCOM) uses digital technology and increases the number of channels per frequency to provide more capacity. The aeronautical data link program is developing a data link system so text messages can be transmitted and received from aircraft. This can provide controllers and pilots an automated communications path separate from the radio communications path that often is congested and can lead to miscommunication in busy airspace.

5.2.1.1 Radio Capacity and Capabilities

The NEXCOM uses the existing frequencies assigned to FAA, but it increases the capacity of these frequencies up to four times. Using a technology that provides four channels on one frequency, NEXCOM will increase the voice channels for communication between pilots and controllers and enable one of the new channels to support data link communications. The switch to digital technology will also provide technical advantages over the existing analog technology. We will implement NEXCOM

incrementally. We will switch to digital radios over the next ten years, and add enhancements during and after the transition.

5.2.1.2 Efficiency of Radio Communication

Data link technology allows text messages and, in later phases, graphics to be transmitted from the ground to aircraft in flight. Sending messages by data link can provide controllers and pilots an automated communication path separate from the voice radio communications path. It is also more accurate because the pilot can save the message and check it as necessary. Graphics messages can include weather maps and forecasts and displays of nearby air traffic. They will help pilots make better decisions. Data link applications will start with simple standard text messages. Currently, flight plan clearances are being sent by data link at 58 airports. We will add features as we test and prove the technology. Key issues in implementing data link are to ensure that the message being transmitted is not altered or truncated in transit and that both the pilots and controllers are assured that the source of the message is legitimate.

5.2.2 Increase System Capacity

Several capital investment projects will help increase NAS capacity by allowing additional operations at busy airports. The largest 31 airports handle 69 percent of commercial passenger travel³, and most of these airports are operating near capacity. As demand grows, they will need additional runways and more sophisticated air traffic management tools. The OEP addresses this issue and contains recommendations to maximize the capacity at airports with delay issues. Constraints on construction of new runways results in runway capacity growing more slowly than demand, and FAA must invest in systems that effectively add capacity by using the airspace more efficiently. The most significant projects that increase capacity are described below.

5.2.2.1 Instrument Landing Systems

Every year, the FAA installs several new instrument landing systems. The systems provide precision approach guidance to new and existing runways that could not otherwise be used safely when visibility is limited. They increase capacity because airports will either have low visibility capability for the first time or will have additional runways available during adverse weather conditions. Several other CIP projects are necessary to support the installation of additional instrument landing systems. The systems require one or more runway visual range sensors to report runway visibility to pilots and controllers. The systems also require approach lights for the runway to help the pilot see the runway after descending to the minimum altitude allowed. Status displays are needed in the tower to inform controllers whether the systems are operating correctly.

³ Information provided by the FAA Office of Airport Planning and Programming.

5.2.2.2 Free Flight Phase 1 and 2

The Free Flight Phase 1 and 2 programs include initiatives that promote more efficient use of existing capacity. In Free Flight Phase 1, FAA installed the traffic management advisor (TMA) in seven en route centers. All seven are operational. These automation systems can increase the number of aircraft handled during peak hours at an airport by up to 3 percent, which can have a significant impact on delays. When approaching aircraft exceed the capacity of the airport, controllers must increase the length of the routes used to line up aircraft to approach runways, which decreases efficiency. The TMA software coordinates actions taken by the center and a tower so that traffic flows are organized before they enter the boundaries of terminal airspace, which results in more efficient use of runway capacity.

Free Flight Phase 2 will complete the installation of TMA and the user request evaluation tool (URET) at all 20 en route centers. URET allows an air traffic controller to project an aircraft's flight route into the future and determine whether a change in route will create conflicts with other traffic. With this information, a controller can approve direct routing as requested by pilots, which normally saves flight time and fuel. Phase 2 will also sustain and improve several other automation systems installed during phase 1. An example is the collaborative decision making we use to communicate with airline operations centers. This allows us to determine the best way to deal with potential delays due to adverse weather or other airspace congestion problems.

5.2.2.3 Air Traffic Management

In past years, air traffic control relied on a first-come first-served rule. By the late 1980s, it was clear that this strategy was not the best way to deal with demand. Gradually, we installed traffic management units in the centers and busiest TRACONs. Some of the methods for traffic management were fairly simple, such as alternating east and west departures and controlling the mix of takeoffs and landings to keep from flooding sections of airspace. Others were more sophisticated and dealt with obtaining real-time data on airspace restrictions and managing traffic flows into the airport. The many tools developed in the early stages of the air traffic management program, coupled with the tools deployed by the Free Flight program, reduced delays and increased our ability to accommodate arriving aircraft by 5 percent. Managing air traffic through tactical and strategic planning has been very productive. Sustaining that productivity requires the hardware that supports this automation be modernized regularly to ensure we can maintain the efficiency of the system.

5.2.2.4 Other Capacity-Enhancing Projects

FAA has several other initiatives that will enhance NAS capacity. Using GPS navigation augmented with the wide area augmentation system, more pilots will have the opportunity to fly direct routes using a technique called area navigation (RNAV). The advantage of RNAV is that pilots can fly direct routes between geographic points rather

than having to fly between radio navigation aids, which often saves time and distance. We will commission the wide area augmentation system in December 2003.

The local area augmentation system will provide precision approach guidance to multiple runway ends. This will increase capacity of airports during low visibility conditions by allowing approaches to more runways than those equipped with an instrument landing system. The first unit will achieve initial operating capability during fiscal year 2006.

The FAA is also developing standards and procedures for reducing the separation for en route aircraft. Currently aircraft flying above 29,000 feet must have 2,000 feet of vertical airspace separation. Reducing separation to 1,000 feet makes more altitudes available for efficient flight profiles resulting in fuel savings and reduced controller workload.

Airspace redesign will also increase the number of aircraft that can be handled by allocating the airspace more efficiently in both en route and terminal operating areas.

5.2.3 Increase System Efficiency

Because of past limits of surveillance and communications technology, control of aircraft in oceanic areas has been less efficient than control of aircraft in domestic airspace. We must modernize both the control system and our procedures to accommodate the rapid growth in transoceanic travel. The FAA is buying a new automation system to automate oceanic control. Coupled with automatic dependent surveillance and satellite communications, this system will greatly improve efficiency in oceanic air traffic control. When controllers have more accurate reports on aircraft position and can communicate quickly and accurately with pilots flying over the oceans, they will be able to reduce separation below current levels. Aircraft then can fly shorter routes and at altitudes that minimize fuel consumption.

The FAA must also modernize the TRACON facilities, towers, surveillance systems and terminal automation systems to accommodate demand at airports. If demand increases in future years as expected, the FAA must use more sophisticated techniques to ensure optimal use of runway capacity. This requires additional capacity in the automation systems and new surveillance systems to provide information in a digital format. Facility upgrades are needed both to support the new capabilities and to accommodate new runways and construction at airports.

5.2.3.1 Advanced Technologies and Oceanic Procedures (ATOP)

The FAA is allocated 80 percent of the world's oceanic controlled airspace, defined as airspace beginning approximately 200 miles off shoreline and consisting of 3.3 million square miles in the Atlantic and 21.3 million square miles in the Pacific. FAA's Oakland, New York, and Anchorage air route traffic control centers manage oceanic air traffic. The new oceanic automation system sets the stage for reducing aircraft separation from 100 nautical miles to 30 nautical miles. Data indicates that for every dollar spent by the

FAA, approximately 8 to 10 dollars of benefits accrue to the airlines, to the flying public and to the FAA.

The ATOP program will obtain a single, integrated oceanic system for all three centers with common procedures, training and support. With initial operational capability, ATOP will move controllers away from manual bookkeeping with its paper strips and make use of the latest communications and surveillance technology for off-the-glass air traffic control. The new automation system is scheduled for initial operational capability at the three oceanic centers beginning with Oakland in 2003.

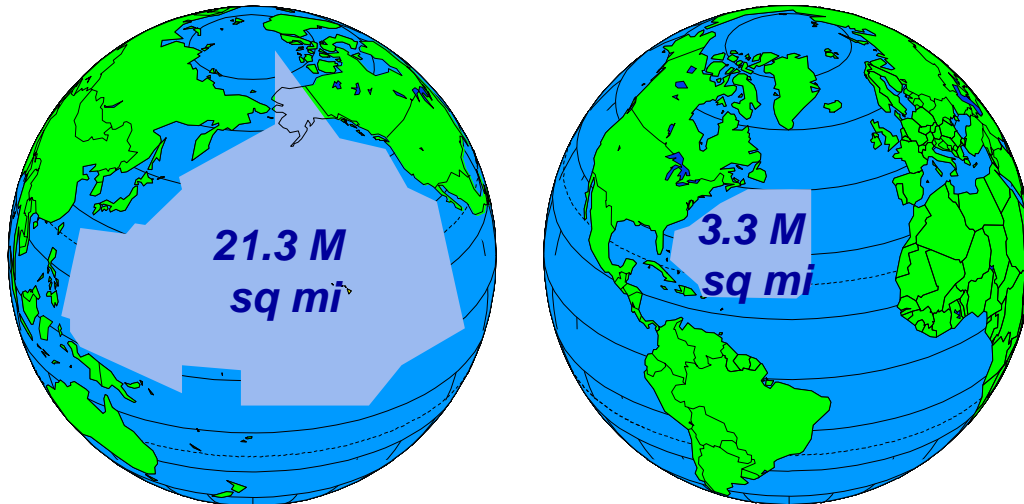


Figure 2 U.S. Oceanic Airspace

5.2.3.2 Operational and Supportability Implementation System (OASIS)

Flight service stations provide weather briefings for pilots and accept flight plans from them. OASIS is a replacement system for flight service station automation. When the flight plan indicates that the pilot will be flying in controlled airspace, the flight service station sends the appropriate flight plan information to air traffic facilities that will be controlling the aircraft's flight. The existing systems have inefficiencies that will be corrected by the replacement system.

5.2.3.3 Standard Terminal Automation Replacement System (STARS)

FAA operates three different models of automation systems for terminal area radar control (TRACON) facilities. TRACON facilities control air traffic as it approaches or departs airports. The existing automation systems were designed and installed in the 1970s and upgraded in the 1980s and 1990s. We are planning to replace terminal automation systems with STARS. After STARS is installed, the terminal facilities will be equipped with a standardized system scaled to its activity. The new system will also

expand computer capacity so that new automation tools can be used to increase efficient use of airspace

The FAA initially intended to buy an existing automation system for the STARS project, but we found that we had to modify the commercial systems to meet our needs. In order to address controller issues with the initial STARS systems, FAA has developed STARS software incrementally to incorporate needed features. Now that STARS is almost fully developed, we have deployed eleven systems, including the first two key sites at Syracuse, New York and El Paso, Texas, and a fully operational system at Philadelphia. We are testing incremental software improvements and will install them on all operational systems. We will be installing the additional STARS systems with all planned features.

5.2.3.4 Surveillance Systems

Several projects are underway to replace the surveillance radars and beacon interrogators that provide position information to controllers. In the terminal area the airport surveillance radar – model 11 (ASR-11) will be replacing ASR-8 radars and earlier models. The ASR-11 provides digital information to the terminal automation systems, which is compatible with the STARS design. Older air traffic control beacon interrogators (ATCBI) are being replaced by the new ATCBI-6. The FAA replaced a portion of the ATCBI systems with a system known as mode select and the remaining older systems are now being replaced with ATCBI-6. FAA is also renovating the terminal radar system used at larger airports, which is the ASR-9, to extend its life for several more years. All these projects reduce radar outages and improve the information that controllers have on their displays, so that they can be more effective in controlling air traffic.

5.2.3.5 Weather and Radar Processor (WARP)

Accurately depicting and forecasting weather is key to increasing the efficiency of air traffic control. The WARP provides timely weather radar information to the controllers, traffic management specialists and the center weather service unit meteorologists at the en route centers. They use this information to advise pilots of the routes least affected by weather and to help air traffic flow managers decide how to apply advanced air traffic management tools. Having better information about the weather and a shared situational awareness, center air traffic controllers can improve the efficiency of traffic flows and minimize delays caused by having to avoid bad weather. We will upgrade the system to be compatible with the upgrades to weather radars operated by the National Weather Service, add software products developed by the weather research program; and modernize the WARP hardware. We have installed the equipment at all en route centers. We will add improvements in phases over the next several years.

5.2.3.6 Terminal Air Traffic Control Facilities

The towers and TRACON facilities that control traffic in the terminal area require modernization for a number of reasons. In some cases, visibility of the runways and taxiways has been restricted by new construction, and the towers need increased height to provide controllers a clear view of the airport operating area. In other cases, the facility is too small for the installation of new automation equipment. A third reason is the age and condition of the facility. FAA has more than 400 air traffic control towers, and, as towers age, they require new infrastructure or replacement. FAA replaces about 10 towers per year and will continue replacing or modernizing towers well into the future.

5.2.3.7 New York Integrated Control Center

There are several inefficiencies in current airspace configuration in the New York area. We are in the early planning stages of airspace design changes for the metropolitan area. We are studying the option of replacing the existing consolidated TRACON and the en route center with a single facility that will address capacity constraints. Problems in the area currently include:

- Airspace restrictions that limit controller flexibility due to geographic proximity of the region's three major airports
- An airspace allocation that creates narrow one-way corridors that cannot handle increased levels of air traffic
- A route structure for arriving aircraft that cannot provide a uniform flow of traffic to airports

Consolidating the facilities and the airspace they control will allow more efficient use of the total airspace and reduce the artificial boundaries that inhibit better use of the airspace.

5.3 Sustain the Air Traffic Control System To Reduce Aviation Delays

All of the projects that improve system efficiency would be ineffective if the hardware and software that form the core of the air traffic control system became unreliable. Computers and software have a limited life. Manufacturers are constantly upgrading their hardware and normally discontinue making parts for older equipment once a new generation of equipment is in widespread use. Thus, spare parts are difficult and expensive to acquire. Also, as new software languages are developed, younger employees are not prepared to work with obsolete languages. All of these factors require existing equipment to be replaced or technically upgraded.

5.3.1 Prevent Air Traffic System Outages

Even short-duration air traffic outages can cause losses of several million dollars because of resulting delays and flight cancellations. The FAA has several projects that maintain, update and modernize both the buildings and equipment used in the NAS. We must

renew both physical infrastructure, such as electrical distribution systems and heating and ventilation systems, and the hardware and software that comprise the automation systems used for air traffic control. In addition, our experience shows us that once we install new equipment the electrical grounding systems that protect these systems from lightning-strike voltage spikes and commercial power irregularities are inadequate. The solid-state devices used in modern equipment are very sensitive to voltage spikes and we must install an elaborate system of electrical grounding to protect them.

The paragraphs below discuss the most important projects for sustaining the existing system and preventing outages.

5.3.1.1 En Route Automation

The En Route Automation Modernization program has several components. At the heart of the en route air traffic control system is the host computer system (HCS). It processes and formats flight plan and aircraft position information for portrayal on the air traffic controller workstations. It also calculates the speed at which the aircraft is moving over the ground and can project the aircraft's position for a short time into the future. This is important if there is a radar outage. We expect to replace these computers by 2009.

During the 1990s, the display system replacement program replaced en route controller workstations and displays. As the displays wear out, we must refurbish and eventually replace them. Production of the original large display tubes has been discontinued, and the FAA is assessing options for replacing the controller workstations as part of the en route system modifications project.

The software used in the HCS for automation applications is written in an obsolete programming language. When the HCS is replaced in 2009, we will not be able to port this software onto the next generation of computers. Furthermore, there are few computer programmers, who are interested in working in this obsolete language. This makes it difficult to maintain the software. The FAA has begun rewriting the host computer system software in a modern language.

Another computer system called the peripheral adapter module replacement item (PAMRI) supports the HCS. The PAMRI receives data from the radars that determine aircraft position, flight plan data from computer tapes, and communications from other air traffic facilities and formats the information for use by the HCS. In 2004 the FAA will replace the PAMRI with a new system called the en route communication gateway as part of our en route modernization program. The existing PAMRI is nearly 10 years old, and we must replace it to remain compatible with HCS upgrades.

If the HCS fails, a back up system called direct access radar channel can process the radar data directly from the PAMRI to the controller displays. This system has evolved over time and has some limitations in backing up a modernized en route automation system. The FAA will replace this system when we modernize the en route system.

In addition to the computer systems and software, we need to replace several outdated host computer system peripherals. Over the next five years FAA will be replacing obsolete and worn-out storage devices, printers and other input/output devices used with the HCS. The new peripherals have more capacity and be more efficient to operate.

5.3.1.2 Voice Switch Replacements

Good communication is essential for air traffic control. Radios used by pilots and controllers to communicate have a limited range. To extend the range of those radios, remote sites are located at the approximate distance from air traffic control facilities where there would not otherwise be clear radio communications. Radio communications between pilots and flight service specialists also must be enhanced by use of remote radio sites. The radio communications from these remote sites are usually carried on telephone lines to the air traffic control facility.

Controllers must also communicate with other air traffic control facilities either by voice or through system-generated messages. A communications switch that serves the entire facility transfers these messages from the telephone lines to the controllers. We must modernize these switches to take advantage of improvements in technology and to provide more efficient service. We are replacing 10-20 voice switches annually at towers, TRACON facilities, and flight service stations and will continue to do so over the next five years. In addition, we are examining strategies to modernize the large voice switches at the en route centers and will either modernize or replace the large switches installed under the voice switching and control system (VSCS) program. In the near term, the FAA is replacing the VSCS training and backup system at all the en route facilities.

5.3.1.3 Electrical Power Systems

Many FAA facilities have electrical generators and large battery banks that ensure continuity of electrical power during commercial power outages. The air traffic control system requires these back-up systems to maintain reliability and to avoid outages. Outages may require us to separate aircraft manually, which is very inefficient and severely restricts capacity. The existing emergency generators are very old, and, in many cases, the manufacturers have gone out of business. We must replace these systems to preserve reliability of the air traffic control facilities.

5.3.1.4 En Route Centers and Unmanned Facilities

The air route traffic control centers house the en route centers, and modernization is ongoing to keep these facilities in good operating condition and to accommodate the installation of new equipment. Roofs must be maintained, electrical wiring must be updated as new equipment is installed, and the heating and ventilating systems must be upgraded to protect the sensitive electronic equipment housed in the centers. This program is essential for NAS modernization and must be sustained well into the future.

The thousands of remote radios, navigation aids, and radars used for air traffic control are housed in permanent buildings that must be maintained to prevent damage to the electronic equipment. Outages of the equipment housed in these facilities can cause air traffic delays. The FAA must maintain and modernize these buildings to ensure continued and reliable operation of the equipment inside.

5.3.2 Improve Management Tools To Accommodate Expansion

Several projects in the CIP are designed to help FAA manage capital investment more efficiently. Any large organization can benefit from automated management tools and access to specialized technical information to deal with rapid change in business practices and technology. The FAA has contracted for information technology systems that automate cost and schedule estimates. As with private industry, we have benefited from using computer-aided design tools. Contractors also provide expertise in developing specifications and documentation of building and equipment configurations. This has helped us manage the large base of high technology equipment that comprises the air traffic control system. Other examples of improved management tools are:

5.3.2.1 NAS Infrastructure Management System (NIMS)

NIMS centralizes managing FAA maintenance functions. Growth in the number of FAA facilities has made this necessary. We have had to find more efficient ways to maintain all our new equipment. We manage our maintenance from a national operations control center and three regional operational control centers. All new FAA equipment has remote maintenance monitoring, and managers can detect problems from these central facilities. The regional maintenance centers can then send field technicians to prevent or repair outages. This reduces the number of technicians needed at remote locations and allows us to use them more efficiently. NIMS will reduce the number and length of unscheduled outages by managing the workforce and providing outage information and real-time status needed by the workforce.

5.3.2.2 FAA Telecommunications Infrastructure

The FAA controls air traffic over the entire United States and over international oceanic areas. The FAA needs an efficient and modern telecommunications system to perform its air traffic functions and manage our many dispersed facilities. We have contracted with a major telecommunications provider for support of communications among our facilities. This new approach will be more efficient than the existing system and provide us with more software tools to measure communications use and allocate the costs to organizations more accurately.

5.4 Protect FAA's Critical Infrastructure

Since September 11, 2001, there has been a heightened awareness of the need to protect the critical infrastructure of the United States. The air traffic control system is part of that critical infrastructure. There are many aspects to protecting critical infrastructure,

and FAA has two specific programs to protect it. One is protecting facilities and employees, and the other is protecting information technology systems.

5.4.1 Facility Security Risk Management

The first step in facility security risk management is to assess FAA's facilities to determine their vulnerabilities and compliance with Department of Justice security standards. We certify buildings in compliance and bring buildings needing additional security measures into compliance. We have developed a prioritized listing of our staffed facilities to identify modifications, procedures, and measures to enhance the security and safety of FAA personnel and facilities. Security systems include surveillance systems, intrusion detection systems, and access control systems.

5.4.2 Information Security

In the past, many air traffic control automation systems were closed systems with proprietary software. These systems were very resistant to unauthorized entry. As FAA has modernized its automation systems, more commercial software has been incorporated which creates a new vulnerability. We are assessing the vulnerabilities of all our critical systems and determining what protections we must add to prevent unauthorized access and disruption of the air traffic control system. We must also incorporate an intrusion detection system so we are aware of any efforts, successful or not, to gain access to our information technology systems. Improving information security will be a growing expense for many years into the future.

6 Appendices to the Capital Investment Plan

The CIP contains four appendices as shown below:

Appendix A

- Lists CIP projects
- Describes how projects relate to performance goals

Appendix B

- Lists CIP projects with over \$5 million in expenditures
- FY 2002 Program Accomplishments
- FY 2003 Output Goals
- FY 2004 Output Goals
- Key Events FY 2005-2008

Appendix C

- Provides estimated expenditures 2004–2008 by Budget Line Item

Appendix D

- Lists of Acronyms and Abbreviations

7 Conclusion

There are several important reasons for preparing the 5-year Capital Investment Plan (CIP). In addition to the legislative mandate to prepare the CIP, the FAA must look to the future to ensure that we are addressing capacity and reliability issues. If we do not plan for the system of the future, it will not be able to accommodate predicted travel demand, and NAS performance will deteriorate. The high standards of performance for FAA equipment and automation systems require lengthy testing and implementation schedules. We must plan now for modernization to keep pace with an industry that is technically sophisticated and demanding better services.

The CIP provides full visibility into the scope and planned schedule for capital expenditures. This information allows an informed dialogue on the pace and content of our modernization efforts. The FAA is facing many challenges in modernizing the NAS. Because the air traffic control system is complex and the rate of technology change is rapid, we must decide on the level of technology we want to incorporate in our systems now. Our partners in the aviation world are also pushing technology change and we must be attuned to the changes proposed by industry. These changes require resources, and we must articulate the need for these planned changes in a long-term plan—the CIP.

Federal Aviation Administration

National Airspace System

Capital Investment Plan

Appendix A

For

Fiscal Years 2004-2008

Appendix A

The projects are grouped under the strategic goal they support. The Narrative for Primary Outcome Goal describes the specific contribution made to a performance goal. The projects are numbered with the budget line item (BLI) used in the supplementary information for the fiscal year (FY) 2004 budget submission to Congress. Each BLI may contain one or more Capital Investment Plan (CIP) projects, but in order to be consistent with the budget presentation, the entire BLI is assigned to the goal area that best reflects the performance goal it supports. In general, many of the Federal Aviation Administration (FAA) capital investments will contribute to more than one goal, and in those cases where it clarifies the contribution of components of budget line items to a performance goal, there will be a separate narrative discussion of how that component supports a specific goal.

The relevant performance goal is shown above each line item to provide the connection between the goal and the line item. This is consistent with direction from the Office of Management and Budget (OMB), and the Department of Transportation (DOT) and is derived from the FAA list of performance goals.

BLIs with X in their number, for example 4C01X, represent programs ending in FY 2002 or FY 2003 or new projects not currently in the President's budget.

Format of Appendix A

The sections present information by facilities and equipment (F&E) projects organized in the following format:

BLI Number; BLI Name
Project Name #1

Primary Outcome Goal: FAA Goal: The primary goal that the capital investment supports.

Narrative for Primary Outcome Goal:

Description of the BLI outcome or outputs that contribute to reaching the target level set for the performance goal that this BLI supports.

Federal Aviation Administration Capital Investment Plan Goal Matrix

1. **Department of Transportation (DOT) Strategic Goal: Safety:** Promote public health and safety by working toward the elimination of transportation-related deaths and injuries.

- 1.1. **Federal Aviation Administration (FAA) Strategic Goal: Safety:** Reduce fatal aviation accident rates by 80 percent in 10 years.

Strategies to Achieve FAA Goal:

Accident Prevention: Prevent accidents before they happen through appropriate, targeted, systematic interventions in the aviation system.

Safety Information Sharing and Analysis: Develop partnerships with the aviation community to share data and information supporting safe, secure aviation.

Certification and Surveillance: Develop new approaches to working with others on certification, inspection, and surveillance; and target FAA resources.

FAA Annual Performance Goals:

- 1.1.1 **Air Carrier Fatal Aircraft Rate** – By 2007, reduce the U.S. commercial aviation fatal aviation accident rate per aircraft departure from a 1994-1996 baseline of 0.051 fatal accidents per 100,000 departures. The fiscal year (FY) 2004 target is 0.028 per 100,000 departures.
 - 1.1.2 **General Aviation (GA) Fatal Aircraft Rate** – Reduce the number of general aviation fatal accidents. The FY 2004 target is no more than 349 fatal accidents.
 - 1.1.3 **Operational Errors** – Reduce the number of Category A & B (highest severity) operational errors. The FY 2004 target is no more than 629.
 - 1.1.4 **Runway Incursions** – Reduce the number and rate (per 100,000 operations) of highest risk (Category A & B) runway incursions. The FY 2004 target is no more than 47 Category A & B runway incursions, which is a rate of 0.072 of 100,000 operations.
2. **DOT Strategic Goal: Mobility:** Shape an accessible, affordable, reliable transportation system for all people, goods, and regions.
 - 2.1. **FAA Strategic Goal: System Efficiency:** Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Strategies to Achieve FAA Goal:

Free Flight: Within safety and environmental considerations, work toward giving aircraft the opportunity to fly in a way that gives them the most benefit as they define it.

National Airspace System (NAS) Modernization: Using the NAS Architecture as the guideline, continually refine and update the NAS to achieve efficient aerospace systems and operations.

Systems Integration: Integrate airport and commercial space requirements into NAS planning and architecture.

FAA Annual Performance Goals:

- 2.1.1. **Airport Daily Arrival Capacity** – Increase the sum of facility-set arrival rates at the 35 airports identified in the Operational Evolution Plan (OEP). The target for FY 2004 is 49,120 arrivals.
- 2.1.2. **Airport Arrival Efficiency Rate** – Increase the percent of time arrival demand is satisfied at the 35 airports identified in the OEP to 95.49 percent in FY 2004.

2.1.3. **System Efficiency** – Increase the percentage of aircraft arriving no later than 15 minutes after the scheduled arrival time to 79.2 percent in FY 2004 at the 32 largest hub airports.

3. **DOT Strategic Goal: Economic Growth:** Support a transportation system that sustains America’s economic growth.

3.1. **FAA Goal: Economic Growth:** FAA also supports this DOT goal through its system efficiency goal that ensures a safe, secure aerospace system that is efficient for users.

Strategies to Achieve FAA Goal: See FAA Strategic Goal: System Efficiency: Strategies to Achieve FAA Goals.

FAA Annual Performance Goals:

3.1.1. See FAA Strategic Goal: System Efficiency: FAA Annual Performance Goals.

4. **DOT Strategic Goal: Human and Natural Environment:** Protect and enhance communities and the natural environment affected by transportation.

4.1. **FAA Performance Goal: Human and Natural Environment:** Increase the number of people in residential communities that benefit from an airport improvement program noise compatibility project.

Strategies to Achieve FAA Goal:

Understanding Aerospace Environmental Impacts: Participate in research to understand more fully the effect of aerospace on the atmosphere and the degree of regulation necessary to minimize those impacts.

Reducing Aerospace Environmental Impacts: Use combinations of regulations, research, technology, and procedures to reduce and mitigate adverse impacts from the aerospace.

Quantifying and Mitigating Environmental Impacts of FAA activities: Assess compliance with environmental regulations; honor the mandates to clean up contamination in accordance with existing agreements; reduce the use of hazardous materials at its facilities; and promote recycling.

FAA Annual Performance Goals:

4.1.1. **Noise** - The number of people in the U.S. exposed to significant aircraft noise levels. The FY 2004 target is no more than 436,000 people.

5. **DOT Strategic Goal: National Security:** Ensure the security of the transportation system for the movement of people and goods, and support the National Security Strategy.

5.1. **FAA Strategic Goal: National Security:** Most of FAA’s security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Strategies to Achieve FAA Goal:

Security Baseline: Continue to improve the baseline security system for FAA facilities.

Information Security: Develop and implement a comprehensive information system security (ISS) program and security activities to protect the national airspace and mission support systems.

Annual Performance Goal:

5.1.1 **Information Security** – Develop and implement a comprehensive ISS program and security activities to protect the national airspace and mission support systems.

6. **DOT Strategic Goal: Organizational Excellence:** Advance the Department's ability to manage for results and innovation.

6.1 **FAA Strategic Goal: People:** Prepare the workforce for the demands of the 21st century.

Reform: Become more businesslike while increasing customer responsiveness.

Strategies to Achieve FAA Goal:

People: Implement a productive and hospitable model work environment in which employees can develop to their potential and contribute fully to the organization; contributions of all employees are supported and encouraged; discrimination and harassment have been eliminated; and the nation's diversity is reflected.

Acquisition Reform: Reform acquisition processes to make them faster, simpler, and more mission-based.

Personnel Reform: Reform personnel systems to provide increased flexibility in hiring, pay, and placement; protect employee rights; increase productivity; promote high standards of accountability; enhance the agency's intellectual capital; and create incentives for change.

Financial Reform: Reform financial systems to enable a more performance-based management approach.

FAA Annual Performance Goals:

6.1.1. Achieve a green rating for the following areas in the President's Management Agenda:

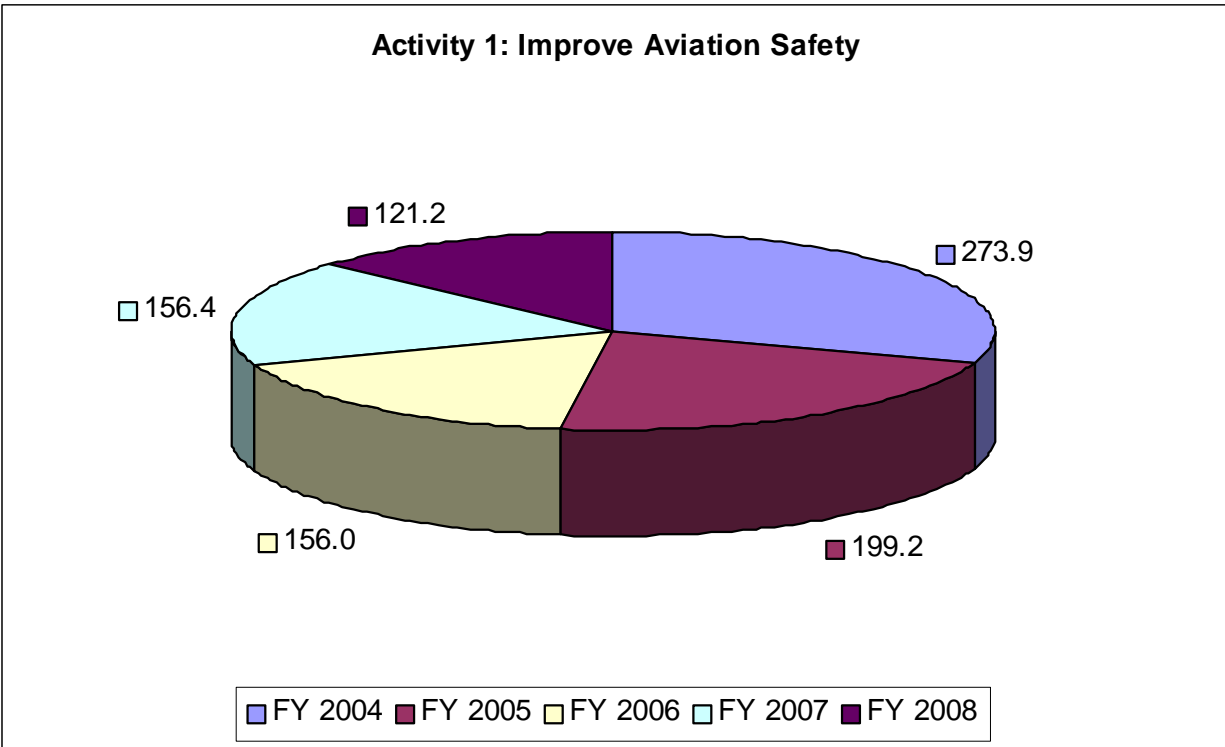
- Strategic Management of Human Capital
- Competitive Outsourcing
- Improving Financial Performance
- Expanded Electronic Government (e-Gov)
- Budget and Performance Integration

6.1.2. Improve the FAA score on the commercial pilot segment of the American customer satisfaction index survey. The FY 2004 performance target for the FAA score on the commercial pilot segment is 63.

6.1.3. Achieve 80 percent of designated acquisition milestones for critical programs and maintain program costs in 80 percent of critical programs as published in the Capital Investment Plan.

Activity 1: Improve Aviation Safety

The following graph indicates the five-year distribution of funding for F&E programs that improve aviation safety for FY 2004 to 2008. Funding is shown in millions of dollars.



1A01: Terminal Business Unit: 1A01A; Next Generation Weather Radar – Provide

- **Next Generation Weather Radar – Open Systems Upgrades**
- **Medium-Intensity Airport Weather System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal

The Next Generation Weather Radar (NEXRAD) project contributes to the FAA’s aviation safety goal of reducing fatal aviation accident rates by detecting and providing air traffic control facilities with displays of weather intensity. This project will incorporate technology upgrades to the existing NEXRAD system. There are 158 NEXRAD systems in operation. NEXRAD detects, processes, and displays critical weather information on air traffic controllers’ consoles, thus enabling better definition of location, timing, and severity of weather conditions, which results in enhanced flight safety and capacity. The open systems upgrades to the NEXRAD extend its capabilities through incorporating higher-technology equipment. Additionally, open systems architecture allows all compatible platforms to process the data to be used. This upgrade allows faster update rates for critical air traffic control (ATC) decision-makers and provides 6-month software updates for system advancements.

Fielding of 40 medium intensity airport weather systems (MIAWS) contributes to the air carrier and general aviation safety goal by providing information to controllers that enables them to warn pilots about severe wind shear conditions. The system will be deployed to those airports with limited wind shear detection capabilities. It makes near real-time weather information available to air traffic controllers and increases the number of airports that have wind shear warning capability. The MIAWS displays information collected by the NEXRAD radars that gives controllers awareness of severe weather conditions for areas controlled by their air traffic control facilities. The MIAWS will be used to alert the air traffic control system command center of the severity, location, movement, and expected duration of severe weather phenomena. Another significant benefit of MIAWS is that it extends weather flight information service (FIS) capabilities to air traffic controllers at locations not provided detailed weather displays. The timely relay of weather events to air traffic controllers may allow routing alternatives for pilots in the air and on the ground preparing for departure, which improves flight safety.

1A01: Terminal Business Unit: 1A01B; Terminal Doppler Weather Radar – Provide

- **Terminal Doppler Weather Radar – Product Improvements**
- **Terminal Doppler Weather Radar – Service Life Extension Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative of Primary Outcome Goal:

The Terminal Doppler Weather Radar (TDWR) project contributes to the FAA’s air carrier and general aviation safety goal of reducing fatal aviation accident rates by providing accurate and timely detection of hazardous aviation weather conditions such as wind shear and gust fronts. TDWRs are installed at higher-density airports with high occurrences of thunderstorms and provide controllers with information on severe weather so that warnings can be issued to pilots. TDWRs are operational at 45 airports and detect and display hazardous wind shear events in and near the airport’s approach and departure zones.

The product improvements contribute to safety goals by improving detection of microburst and gust fronts and by providing this information graphically on displays for use by air traffic controllers in the tower cab with aural alarms. Timely display of this information enables air traffic controllers to provide advisories to both aircraft in flight and aircraft on the ground preparing for departure.

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

1A01: Terminal Business Unit: 1A01C; Airport Surface Detection Equipment

- **Airport Surface Movement Detection Equipment – Service Life Extension Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Airport Surface Detection Equipment Model 3 (ASDE-3) project contributes to the FAA’s safety goals to reduce runway incursions and operational errors by providing air traffic controllers with a video display of aircraft, vehicles, and obstacles on an airport’s runways and taxiways. There are 32 operational ASDE-3s and two support systems. The ASDE-3 radar assists the ground controller in preventing collision situations and ensuring orderly movement of aircraft and ground vehicles on the airport surface when visibility restrictions prevent controllers, pilots, or vehicle operators from seeing other ground traffic on the airport surface. The ASDE-3 radar is the primary detection sensor providing input to the airport movement area safety system, which enhances ASDE-3 by providing automated alerts of potential conflicts. The service life extension program replaces obsolete parts to improve system reliability and maintainability and extends the useful life of the ASDE-3 an additional 10 years beyond its original 20-year lifecycle to 2015.

1A01: Terminal Business Unit: 1A01D; Airport Surface Detection Equipment – Model X

- **Airport Surface Detection Equipment - Model X**
- **Airport Surface Detection Equipment – Model X (Tech Refresh and Disposition)**
- **Upgrade Airport Surface Detection Equipment – Model 3 Sites with Multilateration/Automatic Dependent Surveillance - Broadcast for Initial 7 Sites**
- **Upgrade Surface Detection Equipment – Model 3 Sites with Multilateration/Automatic Dependent Surveillance – Broadcast for Initial 7 Sites (Tech Refresh and Disposition)**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Airport Surface Detection Equipment-Model X (ASDE-X) project contributes to the FAA’s safety goals to reduce runway incursions and operational errors. The primary benefit of the ASDE-X is that it increases airport safety by providing enhanced air traffic control situational awareness. The ASDE-X conflict detection alerting equipment with multilateration will provide detailed coverage of runways and taxiways and alert air traffic controllers to potential collisions. The alerts are both visual and aural. The ASDE-X system depicts aircraft and vehicle position with identification information overlaid on a color map showing the surface movement area and arrival corridors. The ASDE-X assists air traffic controllers by identifying the location of surface traffic during visual meteorological conditions as well as during instrument meteorological conditions when inclement weather impairs visibility from the tower.

ASDE-X is a modular surface surveillance system capable of processing 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 was designed for second-tier airports and as a product improvement/upgrade for ASDE-3 airport movement area safety system airports. The FAA announced in June 2000 that ASDE-X would deploy 25 operational systems and four support systems. Additionally, the ASDE-X product improvement/upgrade for ASDE-3 sites will be deployed at seven operational ASDE-3 sites, bringing the total deployment to 32 operational systems and four support systems.

1A01: Terminal Business Unit: 1A01X; Weather Systems Processor

- **Airport Surveillance Radar Weather Systems Processor**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Weather Systems Processor (WSP) project contributes to the FAA's safety goal of reducing fatal aviation accident rates by providing air traffic controllers with warnings of wind shear and microburst events that can be communicated to pilots in the air or while they are preparing for departure. WSP is a less costly alternative to TDWR and provides weather situational awareness for tower and TRACON ATC personnel. It provides prediction data for gust fronts and storm-cell motion that will impact flight operations. To improve flight safety, WSPs are installed at medium- and large-sized airports that do not have a TDWR to detect and warn pilots of hazardous wind shears and microbursts. A technology refresh program will be started in FY 2007 to replace obsolete hardware, which will enable the system to operate beyond 2010.

1A02: Aviation Weather Service Improvements:

- **Integrated Terminal Weather System – Development/Procurement**
- **Integrated Terminal Weather System – Corridor Integrated Weather System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Weather Service Improvement projects contribute to the FAA's safety goal of reducing fatal aviation accident rates by consolidating and processing weather information from multiple sensors, forecasting the future path of the weather, and delivering aviation weather information to pilots, airline operations centers, and air traffic controllers.

The Integrated Terminal Weather System (ITWS) project contributes to safety by providing aviation weather products to commercial and general aviation users and air traffic control facilities. Air traffic controllers use this information to issue advisories to ground and airborne aircraft that aid in preventing commercial- and general aviation-related accidents. The integrated products from sensors, including TDWR, NEXRAD, the low-level wind shear alert system (LLWAS), and automated surface observing system (ASOS) are relayed to the ITWS computers. ITWS will be deployed to 34 high-activity airports that have demonstrated a significant convective weather history. ITWS displays the current terminal weather situation and provides continuous predictions of anticipated weather conditions for 10 and 20 minutes into the future. Integrating data and products from various FAA and National Weather Service sensors and from weather data from aircraft (via the meteorological data collection and reporting system) provides the accuracy and sophisticated predictions that are essential to ITWS. Weather information provided to an ITWS at one terminal radar approach control (TRACON) can cover multiple airports. A total of 34 operational ITWSs will provide weather information for 49 airports.

The Corridor Integrated Weather System project contributes to the air carrier and general aviation safety goal by delivering information on aviation-related weather events that may impact safety to air traffic controllers responsible for flight operations in a given sector. The information provided is specific to corridors that pass through these air traffic control sectors. The corridor integrated weather system enables air traffic controllers to detect and display weather events from several sources, which the controller can use to provide flight advisories. The weather information may also be used to reroute airborne traffic to avoid adverse weather.

1A03: Low Level Wind Shear Alert System – Upgrade

- **Low Level Wind Shear Alert System – Upgrade Low Level Wind Shear Alert System to Expanded Network Configuration**
- **Low Level Wind Shear Alert System – Disposal/Decommissioning of Low Level Wind Shear Alert System Model 2**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Low Level Wind Shear Alert System (LLWAS) Upgrade project contributes to the FAA's safety goal of reducing fatal aviation accident rates by improving the sensors that provide the information to air traffic controllers to issue wind shear alerts to pilots. Wind shear conditions are common in the United States, especially in areas where thunderstorms are frequent. Hazardous wind shear and microburst conditions can occur at low altitudes near airports and pose a significant threat to aircraft during takeoff or landing. LLWAS provides real-time detection of these weather events that affect flight safety. LLWAS provides coverage at airports with no other wind shear detection capability, and it can also effectively complement radar detection of wind shear by measuring wind velocity at several points on an airport surface.

There are four components to the LLWAS program:

1. LLWAS network expansion (NE) upgrades nine existing LLWAS-2 sites to the LLWAS-NE configuration. LLWAS-NE is being used at airports where the airport radar with WSP is not located optimally for providing wind shear information.
2. The LLWAS pole relocation project improves current performance by relocating/replacing anemometers and poles.
3. The LLWAS sustainment project upgrades all standalone LLWAS-2 systems to the LLWAS-NE performance level. The relocation and sustainment upgrades result in the LLWAS-relocation/sustain configuration.
4. The LLWAS Disposal/Decommissioning project dismantles and disposes of LLWAS-2 systems that have been replaced by WSP or TDWR systems. Disposal of 40 LLWAS-2 systems is scheduled to begin in FY 2004 and will restore the sites to original condition.

1A04: Aviation Safety Analysis System

- **Aviation Safety Analysis System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Safety Analysis System project contributes to the FAA's air carrier and general aviation safety goals by providing automation hardware and software and communication process updates to support aviation safety information databases. The safety workforce can use these databases to support its work in certifying and regulating airlines, aircrew, and other licensed companies in aviation. Having the information improves the development of safety regulations and the oversight of the civil aviation industry. The information technology (IT) infrastructure and software systems can also be used to share data and information, which supports safe aviation practices through partnership with the commercial aviation community.

These tools can be used to meet FAA's certification, inspection, and industry surveillance mission responsibilities. Enhancements in safety and security information systems and infrastructure are essential to ensure development of effective safety standards; informed monitoring of aviation safety/security performance; and conduct of aviation safety education as a basis for safety and security research. Aviation safety analysis system information supports decisions to issue and update certificates for the design and manufacture of aircraft and to issue licenses for air operators and airmen, including medical certificates. These safety-related automation tools also enable monitoring performance of aviation designees. Information from the FAA accident investigation program is stored in the system for analysis and can be used for developing new safety policies and regulations.

1A05: Integrated Flight Quality Assurance System

- **Integrated Flight Quality Assurance System**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Integrated Flight Quality Assurance (IFQA) project contributes to the FAA's safety goal of reducing the fatal aviation accident rates by providing the electronic capability for collecting and analyzing individual aircraft flight data to discover operational safety issues. Airlines compile the data from aircraft flight data recorders and transmit it to the FAA. The project includes developing and maintaining a secure Internet-based FAA electronic data acquisition and information infrastructure, which will enable the FAA to access airline operational quality assurance trend data that is used for safety oversight. IFQA will be used to develop FAA policy on airline safety and to conduct informed decision-making regarding aviation safety initiatives for the airlines.

1A06: System Approach for Safety Oversight

- **System Approach for Safety Oversight**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The System Approach for Safety Oversight (SASO) project contributes to the FAA's air carrier and general aviation safety goals by providing the capability to identify aircraft accident causal factors. Through this approach, risk mitigation efforts are developed to address those causal factors. SASO enhances oversight analysis by providing tools to identify patterns of sub-critical individual failures that combine to create an accident and by providing a complete set of additional analytical tools to help target inspections and identify corrective actions in the areas of highest potential vulnerability with the highest probability of occurrence. SASO is an important tool in developing criteria for safety regulations.

1A07: Aviation Safety Knowledge Management Environment

- **Aviation Safety Knowledge Management Environment**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aviation Safety Knowledge Management Environment (ASKME) project contributes to FAA's air carrier and general aviation safety goals by providing a database of information to be used in certifying aircraft. The ASKME system will electronically store the FAA technical documentation and lessons learned in the aircraft certification process so that the information can be used to identify aircraft design and manufacturing issues that need to be addressed to avoid safety problems with new aircraft. ASKME can also be used to store such information as service and maintenance difficulty reports for existing aircraft to identify potentially dangerous conditions and remedy them before an accident occurs.

1B01: Safe Flight 21

- (A) **Safe Flight 21 – Alaska Capstone Initiative**
- (B) **Safe Flight 21 – Ohio Valley Prototype Project**
- (C) **Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping**

(A) Safe Flight 21 – Alaska Capstone Initiative

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Alaska Capstone Initiative (ACI) contributes to the FAA's air carrier and general aviation safety goals of reducing fatal aviation accidents in Alaska by using integrated interdependent technologies, such as satellite-based navigation and surveillance capabilities, which can be used for more precise air traffic control and other

improvements in flight safety. ACI provides an improved ground and air infrastructure that gives pilots near real-time information on the location and severity of hazardous weather and the aircraft's proximity to terrain. ACI also provides improved instrument approach capability for the runways at small airports. The improved surveillance information (which fills the gaps in radar coverage) is displayed for controllers on existing ATC automation equipment and is used in sequencing and separating flights, flight following, and search and rescue activities. ADS-B transmitted information will allow pilots to fly at lower altitudes for both en route and approach and departure routes under instrument flight rules conditions because it greatly reduces the risk of colliding aircraft with the terrain. The capability for pilots to know where they are in all weather conditions and the proximity to terrain, as well as location of other air traffic, has a high potential for reducing aviation accidents.

The Alaskan Region is conducting an operational demonstration of the necessary communication, navigation, and surveillance (CNS) technologies and associated procedures, techniques, and certifications necessary to realize the benefits of ACI. Avionics and ground infrastructure being used have passed testing, certification, and operational approval for safe introduction into the existing Alaskan operational environment.

Increased safety benefits from ACI utilization are:

- Text and graphical weather information can be provided to the pilot via data link so that pilots can avoid severe weather.
- Pilot situational awareness can be increased by providing terrain and obstacle information.
- Low-visibility terminal operations are improved by installing weather-sensing facilities and designing global positioning system (GPS) approaches for remote sites.
- Integrating ADS-B data with radar and ATC automation systems improves ATC capabilities.
- Using ADS-B provides additional surveillance coverage and fills gaps in current radar coverage.

(B) Safe Flight 21 – Ohio Valley Prototype Project

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

This Ohio Valley Prototype Project contributes to the FAA's air carrier and general aviation safety goals by providing improved aircrew and air traffic controller situational awareness through the direct transfer of cockpit data that allows for improved decision-making. Information is provided directly to the pilot through high-volume transmission and high-fidelity displays of all traffic in the airspace that the receiving aircraft occupies. As a result, the pilot can make decisions and flight route requests based on actual air traffic information. This allows aircraft to fly at their optimum altitude, speed, and routing, resulting in more efficient traffic flows while maintaining a high level of safety.

(C) Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Automatic Dependent Surveillance-Broadcast (ADS-B) project contributes to the FAA's air carrier and general aviation safety goals by developing systems standards for use of ADS-B technology in terminal, en route, and oceanic airspace and on the airport surface. Developing domestic and international ADS-B performance standards will result in system design that will enhance surveillance for pilots and controllers and result in improved safety. ADS-B technology potentially can enhance surveillance for air-to-air, air-to-ground, and airport surface applications. Being able to use fast-update rates of aircraft position and highly accurate information about aircraft and vehicle movements will be a significant improvement over present systems. An advanced prototype has used this technology to display data for pilots to use during flight.

1C01: Advanced Technology Development and Prototyping

- (A) Separation Standards**
- (B) Runway Incursion Reduction**
- (C) System Capacity, Planning, and Improvements**
- (D) Operations Concept Validation**
- (E) Software Engineering Resource Center**
- (F) Airspace Management Laboratory**
- (G) National Airspace System Requirements Development**
- (H) General Aviation/Vertical Flight Technology**
- (I) Domestic Reduced Vertical Separation Minima**
- (J) Safer Skies**
- (K) Information Security Architecture**
- (L) Safety Analysis and Assessment**
- (M) Required Navigation Performance**
- (X) Decision Support Tools**

(A) Separation Standards – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Separations Standards project contributes to the FAA's system efficiency goal by determining the regulatory steps and aircraft equipment necessary to allow aircraft to fly with 1,000 feet of vertical separation, rather than the currently required 2,000 feet, and with reduced horizontal separation over the oceans. Increased efficiency occurs because additional flight levels are made available to oceanic airspace users, so aircraft can fly more direct and fuel-efficient routes. Oceanic flight efficiency is further improved because fewer flights need to be held on the ground waiting for altitude assignments before departure is approved.

(B) Runway Incursion Reduction Program – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Runway Incursion Reduction Program (RIRP) contributes to the FAA's safety goals to reduce runway incursions and operational errors. The RIRP explores new techniques for reducing runway incursions through research, development, demonstration, and evaluation of new and emerging methods and operational procedures and through exploration of new technology to enhance those methods and procedures. Key initiatives in the RIRP research program are (1) expand and improve surface situational awareness for air traffic controllers, pilots, and airport vehicle operators; (2) make surveillance information readily available in all airport surface operational areas; and (3) develop procedures to explore new technologies when they are available.

(C) System Capacity, Planning, and Improvements – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The System Capacity, Planning, and Improvements project contributes to the FAA's system efficiency goal by analyzing improvements that increase capacity to handle air traffic, reduce system delays, and reduce the development time for new operational criteria and procedures. This analysis results in reduced implementation risks for projects planned for the OEP and the NAS Architecture. These studies also serve as the basis for discussion between the FAA and the industry on capacity issues. Specifically, this program provides dedicated resources to:

- Develop and improve aviation safety strategies.

- Deliver problem-solving research and implementation capability.
- Develop metrics data for customers.
- Analyze risk mitigation factors to increase operational efficiency.
- Conduct analysis and simulation studies for capacity improvement.
- Develop data systems designed to track, process, and analyze air traffic data.

(D) Operations Concept Validation – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Operations Concept Validation project contributes to the FAA’s system efficiency goal by providing well-defined “validated” operational concepts to support transition to new equipment planned in the NAS Architecture. It provides information to the aviation community for development of new procedures to use with the new technology being implemented in the NAS and the changes in aircraft equipment necessary to be compatible with that technology. Information developed includes system specification, roles and responsibilities, procedures, training, and certification requirements. Results also define requirements for future systems and help establish the specifications for acquisition (e.g., en route automation modernization). The operational concept development and validation outputs provide for the 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.

(E) Software Engineering Resource Center – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Software Engineering Resource Center (SERC) program contributes to the FAA’s system efficiency goal by optimizing the processes for developing, acquiring and fielding high-quality, mission-critical systems that require software. SERC’s mission is to improve the FAA’s software technology base and software engineering competencies. Leveraging expertise from government, academic, and industry sources, the SERC is a focal point for solving mission-critical software problems, conducting software systems engineering research, and providing unique educational opportunities for FAA personnel. The NAS is a worldwide ATC system that covers many different sites and locations requiring site-specific "adaptation". Each facility has its own set of airspace structures and air/ground infrastructure that defines the operating environment. Within each facility, internal settings, such as the number of devices and their connections (e.g., displays and radars), have to be determined. Because of all these varying factors, NAS software must be "adapted" to fit a particular site in order to provide efficient and safe air traffic control services.

Fielding NAS systems is a continuous process with many software challenges. The SERC is working to modernize the way the FAA collects, stores, standardizes, distributes, and manages aeronautical and adaptation data, which will enable NAS systems to be fielded faster.

(F) Airspace Management Laboratory – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Airspace Management Laboratory program contributes to the FAA’s system efficiency goal by providing traffic information data, metrics, and tools to analyze traffic and airspace configurations that optimize air space traffic flow. Traffic information is collected from the enhanced traffic management system and local facility data points to

construct historical traffic and system-loading metrics. Traffic specialists and analysts use this data to analyze, design, and benchmark existing and proposed airspace structures in the en route and terminal areas. The sector design and analysis tool is the primary tool that the FAA uses to perform this function.

(G) National Airspace System Requirements Development – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace Systems Requirements Development project contributes to the FAA’s system efficiency goal by providing specifications that are used for identifying and evaluating new technologies to meet the needs of aerospace users and improve system efficiency. The project also develops the plans and new procedures to transition from the existing technologies and practices to advanced capabilities that satisfy user needs and advance overall NAS system efficiency.

(H) General Aviation/Vertical Flight Technology – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The General Aviation/Vertical Flight Technology program contributes to the FAA’s general aviation safety goal by expediting implementation for components of new CNS technology into general aviation and helicopter operations. Implementing this new technology often involves using improved avionics and considering aircraft and aircrew performance capabilities. It enables increased numbers of aircraft to receive instrument flight rules services on a cost-efficient basis. The 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.

Examples of the new technologies that can benefit general aviation include the GPS, wide area augmentation system (WAAS) and local area augmentation system (LAAS) programs, dependent surveillance programs, and Safe Flight 21, the Safer Skies initiative.

(I) Domestic Reduced Vertical Separation Minima – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Domestic Reduced Vertical Separation Minima project contributes to the FAA’s system efficiency goal by developing standards that will allow use of six additional altitudes between 29,000 and 41,000 feet in domestic airspace. Using these altitudes will reduce airspace congestion and allow aircraft to fly at altitudes that are more fuel-efficient. Current standards require 2,000 feet of vertical separation between aircraft. To allow reduced vertical separation, FAA must develop new procedures and regulations to maintain the high level of safety for air travel.

(J) Safer Skies - Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

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. Safer Skies has identified the major types of accidents and evaluated pilot actions and equipment failures that lead

to the major types of accidents. This information can be used to develop and evaluate corrective actions that will reduce accident rates.

(K) Information Security Architecture

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Information Security Architecture project will improve the FAA's safety and security by providing effective and suitable, commercially based procedures and practices for developing information systems security assurance solutions that will guide the air traffic and acquisition communities within the FAA toward more standardized, interoperable, and repeatable solutions. Increasing emphasis on response to Homeland Security threats coupled with vulnerabilities inherent in acquiring commercial-off-the-shelf (COTS) products and services demand that FAA focus more on developing and implementing information systems security products, procedures, and engineering practices. This will reduce stovepipe strategies and approaches to security requirements and increase the pace of implementing technical and procedural solutions that provide more cost-effective, centralized management of ISS protection, detection, and response. Funding for advanced development and prototyping in this element leverages funds applied by NAS systems and programs toward corporate, NAS-wide security capabilities and services.

(L) Safety Analysis and Assessment – Advanced Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Safety Analysis and Assessment program contributes to the FAA's safety goal by executing a system engineering based safety management system (SMS) that will identify hazards in the NAS associated with introduction of new systems and capabilities. The SMS will assess each hazard for end-to-end safety risk, develop mitigation strategies and requirements, and verify the mitigation's effectiveness in maintaining or improving NAS safety. The SMS will enable the FAA to comply with internal (FAA Order 8040.4) and external (International Civilian Aviation Organization (ICAO) Annex 11) requirements for the agency to proactively manage the safety risk inherent in the providing air traffic services.

(M) Required Navigation Performance

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the need of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Required Navigation Performance (RNP) program will contribute to the FAA's system efficiency goal by providing improved capacity and efficiency in the NAS. RNP must be accounted for in new CNS technologies, as it enables precision lateral and vertical navigational guidance. The RNP program office will be required to develop criteria, standard operating procedures, training, and risk mitigation and safety strategies in each of the operating domains.

(X) Decision Support Tools – Advance Technology Development and Prototyping

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the need of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Decision Support Tools project contributes to the FAA's system efficiency goal by evaluating National Aeronautics and Space Administration and other research organizations' ideas and concepts for ATC and flow management tools and by providing applicability and feasibility feedback necessary for the tools to be useful at completion of their development cycles. The project will accomplish feasibility analyses and modeling of proposed uses of decision support tools before their prototyping and will provide independent evaluation testing of decision

support tool prototypes. Researchers and developers will be part of the analysis and evaluation teams and will receive test results and associated analyses and conclusions.

1C02: Aircraft Related Equipment Program

(A) Aircraft Related Equipment Program

(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

(A) Aircraft Related Equipment Program

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Aircraft Related Equipment Program contributes to the FAA's air carrier and general aviation safety goals by upgrading FAA aircraft used for safety-related work. Examples are: (1) FAA flight inspection aircraft, avionics, and related systems must be updated to ensure capabilities to validate and certify the accuracy and integrity of the electronic signals emitted by navigational aids used in the NAS by commercial and general aviation aircraft; (2) flight inspection aircraft must be equipped to validate and certify new instrument flight procedures developed for use by commercial and general aviation pilots to guide aircraft on approach and departure flight paths at airports; and (3) aviation safety inspectors use FAA aircraft to achieve and maintain their currency and proficiency so that they can regulate and certify pilot instructors and test pilots. The FAA aircraft used for this purpose must be equipped with the avionics and systems representative of the current and future aviation environment.

(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Boeing Simulator Replacement Program contributes to the FAA's air carrier safety goal by purchasing an aircraft simulator that has the modern configuration of the airline fleet, enabling the FAA to perform meaningful and relevant evaluations of projects affecting large-transport category aircraft. The simulator can be used for operational evaluation of the latest aviation technologies, equipment, and procedures using flight simulation rather than actual flight hours, which are very costly. Data gathered from flight simulation activities are used to support safety investigations and to develop regulations.

1C03: National Aviation Safety Data Analysis Center

- **National Aviation Safety Data Analysis Center**

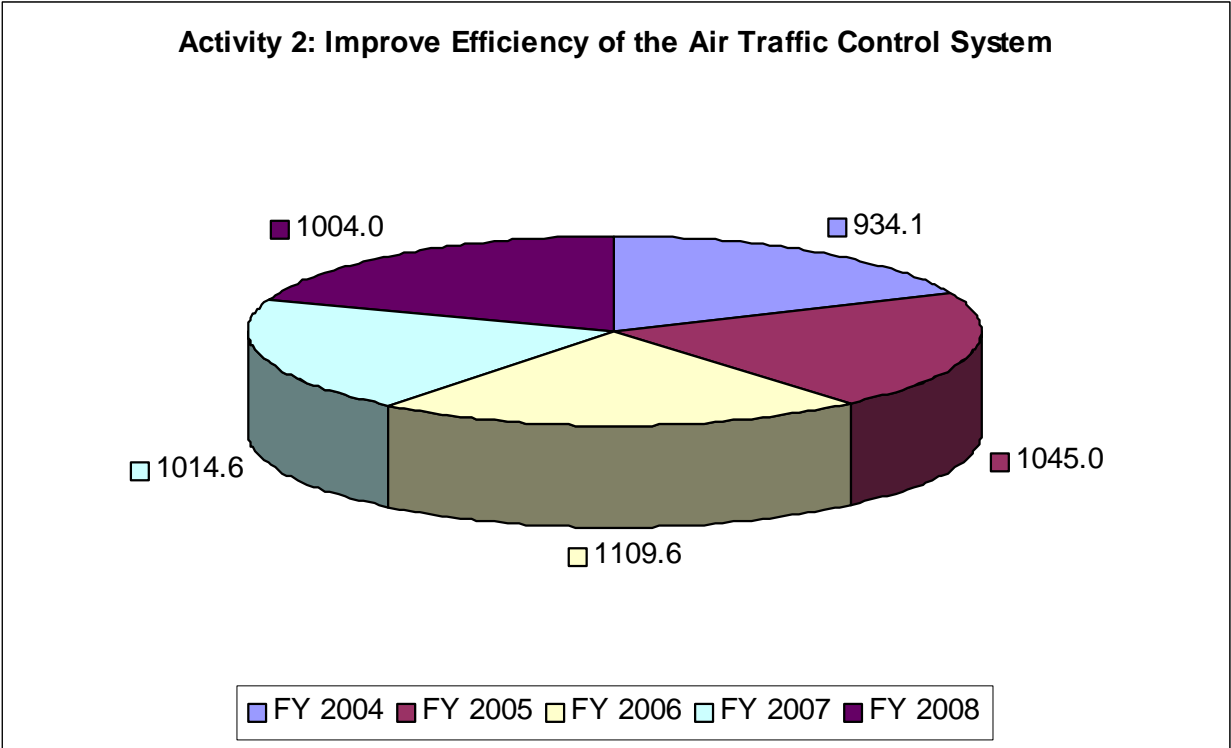
Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The National Aviation Safety Data Analysis Center contributes to the FAA's air carrier and general aviation safety goals by performing data analysis that is used to support identification and analysis of precursors to aviation accidents. Additionally, the center supports investigation and resolution of aviation accidents by acquiring and sharing analytical automation tools and automated analysis across multiple databases and distributing quality data to the FAA and aviation community.

Activity 2: Improve Efficiency of the Air Traffic Control System

The following graph indicates the five-year distribution of funding for F&E programs that improve efficiency of the air traffic control system for FY 2004 to 2008. Funding is shown in millions of dollars.



2A01: Terminal Business Unit: 2A01A; Terminal Automation Program

- **Standard Terminal Automation Replacement System – Development and Procurement**
- **Terminal Sustain**
- **Interim Tower Displays**
- **Standard Terminal Automation Replacement System – Technology Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Automation Program contributes to the FAA’s system efficiency goal of increasing the percentage of flights arriving on time and the percentage of arrival demand met by airports by modernizing terminal automation systems. New automation tools can be used to enhance the capacity to handle increased air traffic approaching and departing airports. The Standard Terminal Automation Replacement System (STARS) will provide new digital computer workstations with high-resolution color displays that allow the FAA to move toward a uniform configuration at all terminal facilities and add enhanced automation software to use airport runway capacity more efficiently.

The Interim Tower Display project gives controllers in the tower cab more accurate information on arriving flights by providing digital-capable displays for the air traffic control towers (ATCT) that do not have a radar display in the cab environment; the display extends the air traffic controller’s “eyes” in the cab environment.

The Terminal Sustain project supports the FAA’s system efficiency goal by providing support and upgrades of the automated radar terminal system and the digital bright radar indicator tower equipment radar displays used in the tower cab. Sustaining these systems prevents outages and potential delays.

2A01: Terminal Business Unit: 2A01B; Air Traffic Control Beacon Interrogator – Replacement

- **Secondary Surveillance - Air Traffic Control Beacon Interrogator – Replacement**
- **Air Traffic Control Beacon Interrogator Model 6 - Beacon Only Facility Establishment**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Traffic Control Beacon Interrogator (ATCBI) project contributes to the FAA’s system efficiency goal by replacing obsolete systems. The secondary surveillance system and aircraft position and altitude data, significantly enhance controllers’ ability to separate aircraft while reducing controller workload. The ATCBI-6 system replaces all en route ACTBI-4/5 beacon systems that have reached the end of their service life. The existing beacon interrogators are costly to maintain, repair, and support and have a higher risk of failure, which could contribute to severe air traffic delays throughout the NAS. The ATCBI-6 provides air traffic controllers with selective interrogation capability not available in the older systems that significantly improves the accuracy of aircraft position and altitude data provided to ATC automation systems. Additionally, the ATCBI-6, in conjunction with a co-located primary long range radar, provides aircraft position information and backup center radar approach surveillance service to numerous TRACON facilities in case of the loss of terminal radar services and/or scheduled maintenance downtime. The ATCBI-6 system is a low-cost, highly reliable, very accurate and more capable replacement for old, high-cost, and obsolete beacon interrogators with high failure rates.

The ATCBI-6 Beacon Only Facility Establishment project contributes to the FAA’s system efficiency goal by establishing buildings that will house the new beacon interrogators. The new buildings will help protect the beacon interrogators from outage caused by severe weather or other causes.

2A01: Terminal Business Unit: 2A01C; Air Traffic Control En Route Radar Facilities Improvements
• **Long Range Radar Program – Long Range Radar Improvement – Infrastructure Upgrades**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Long Range Radar Program contributes to the FAA's system efficiency goal by continuing to provide aircraft position information to air traffic controllers. Long range radars directly display aircraft position when the beacon interrogator is not functioning. These radars also detect aircraft that experience failure of onboard equipment that responds to beacon interrogators or aircraft that do not turn on the onboard equipment. This project finances upgrades to the radar transmitters, and antenna drive systems and improvements to the buildings that house these radars. Without these upgrades, operational problems that occur each year could limit controllers' ability to detect aircraft that do not cooperatively display identification and flight data.

2A01: Terminal Business Unit: 2A01D; Terminal Air Traffic Control Facilities – Replace
• **Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace – Air Traffic Control Tower/Terminal Radar Approach Control Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Air Traffic Control Facilities projects contribute to the FAA's system efficiency goal by replacing air traffic control towers 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 runways and taxiways. The average control tower is 27 years old, and, as volume and complexity of terminal air traffic control increases, additional positions in the ATCT/TRACON facilities are required.

2A01: Terminal Business Unit: 2A01E; Air Traffic Control Tower/Terminal Radar Approach Control Facilities – Improve

- (A) Air Traffic Control Tower/Terminal Radar Approach Control Modernization**
- (B) Large Terminal Radar Approach Controls - Advanced Facility Planning**
- (C) Standard Terminal Automation Replacement System Facility Upgrades**

(A) Air Traffic Control Tower/Terminal Radar Approach Control Modernization

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Traffic Control Tower/Terminal Radar Approach Control Modernization project contributes to the FAA's system efficiency goal by modernizing and improving terminal ATC facilities. TRACONs are modernized to support growth in air traffic or to provide additional capabilities that must be implemented to improve NAS efficiency. The improvements also modernize facility infrastructure, such as electrical distribution systems and heating and air-conditioning, while correcting structural problems to minimize outages that would delay air traffic.

(B) Advanced Facility Planning

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Advanced Facility Planning project contributes to the FAA's system efficiency goal by allowing a smooth and orderly transition of new equipment into existing or modernized facilities. Conducting studies to identify operational needs and physical details of the infrastructure helps in constructing a transition plan that minimizes transition cost and time. The changing dynamics of the FAA's ATC system infrastructure requires continual planning and assessments to achieve overall system efficiency. This project encompasses advanced studies to identify operational needs and opportunities for modernization, expansion, replacement, or consolidation of air traffic control facilities.

The Advanced Facility Planning project identifies operational, facility, and environmental deficiencies and provides alternative solutions to correct them. The project will identify the most cost-effective solutions to ensure that the facility operations, capacity, and infrastructure needs are met. It will also ensure that coordination and planning efforts will be carried out with city, state, industry, and other public agencies to determine the alternative evaluations and analyses.

This project will provide advanced studies that may consist of cost/benefit analyses; cost-effectiveness analyses; environmental, human resource requirement studies; and studies to determine solutions to capacity and delay issues.

(C) Standard Terminal Automation Replacement System Facility Upgrades

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Standard Terminal Automation Replacement System (STARS) Facility Upgrades project contributes to the FAA's system efficiency goal by completing ATC facility upgrades required to deploy STARS. Installing STARS will enable controllers to use enhanced automation aids to control air traffic. Facility-unique updates or improvements, such as electrical power systems, heating, ventilation and air-conditioning, and removal of hazardous materials, must be completed before delivery and installation of new systems.

2A01: Terminal Business Unit: 2A01X; Large Terminal Radar Approach Controls

- **Potomac Consolidated Terminal Radar Approach Control**
- **Northern California Terminal Radar Approach Control**
- **Dallas Ft. Worth Terminal Radar Approach Control**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Large TRACON projects contribute to the FAA's system efficiency goal by physically and operationally consolidating multiple, individual TRACONs—which provide air traffic control services in their respective metropolitan areas—into combined facilities. The consolidation will result in system efficiencies because of less restrictive allocation of airspace and more flexible procedures to deal with peak demand periods and adverse weather, and significant reductions in the amount of pilot/controller communications required. FAA controllers and traffic management will achieve increased productivity because of improved coordination and planning.

2A01: Terminal Business Unit: 2A01F; Terminal Digital Radar - Airport Surveillance Radar Model 11

- **Airport Surveillance Radar Model 11 - Airport Surveillance Radar Model 7/Model 8 Replacement**
- **Airport Surveillance Radar Model 11 – Technology Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Digital Radar Program contributes to the FAA’s system efficiency goal by replacing existing airport surveillance radar model 7/model 8 (ASR-7/8) radar systems and associated ATCBI 4/5 systems with the new ASR-11 digital radar system, which has an integrated primary and secondary sensor. The replacement improves surveillance service reliability and provides 6-level weather detection and display capability. Replacing the existing radars with modern technology decreases the probability of outages and resulting air traffic delays.

2A01: Terminal Business Unit: 2A01G; Airport Surveillance Radar - Airport Surveillance Radar Model 9

- **Airport Surveillance Radar Model 9 – Service Life Extension Program**
- **Airport Surveillance Radar Model 9 – Occupational Safety and Health**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Airport Surveillance Radar program contributes to the FAA’s system efficiency goal by upgrading the digital radar surveillance systems that have been installed at 135 airports. The ASR-9 serves the airports with high-activity levels and will not be replaced by the ASR-11. The Service Life Extension Program will determine those parts that are most prone to fail and replace them with more reliable components. This will improve reliability, preventing delays due to radar outages at the high-activity airports.

2A01: Terminal Business Unit: 2A01H; Terminal Applied Engineering

- **Terminal Applied Engineering**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Applied Engineering program contributes to the FAA’s system efficiency goal by providing an analysis of engineering issues involved in delivering and installing new equipment to ATCTs and TRACONs. Air traffic growth, changes in airspace structure, and equipment modernization require adjustments to air traffic facilities. The engineering analysis minimizes disruptions and delays, thereby decreasing the probability of delays at the affected airport.

2A01: Terminal Business Unit: 2A01I; Precision Runway Monitor

- **Precision Runway Monitor**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Precision Runway Monitor system project contributes to the FAA’s system efficiency goal by increasing the number of aircraft that can simultaneously approach an airport for landing. There are ATC restrictions on allowing aircraft to fly side by side as they approach parallel runways. These restrictions primarily affect aircraft during limited visibility conditions. The precision runway monitor system allows simultaneous independent approaches to runways closer than 4,300 feet by utilizing a radar that provides a 1-second update of aircraft position information (instead of 4.8 seconds for a conventional airport surveillance radar), which increases the number of aircraft that can be handled during adverse weather conditions, effectively increasing airport capacity.

2A01: Terminal Business Unit: 2A01J; Houston Area Air Traffic System

- **Houston Area Air Traffic System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Houston Area Air Traffic System project contributes to the FAA's system efficiency goal by providing air traffic control improvements and additional navigation aids in the Houston metropolitan area so that the new runway under construction at Houston can be used efficiently. New runways add capacity and reduce air traffic delays.

2A01: Terminal Business Unit: 2A01L; New York Integrated Control Complex

- **New York Integrated Control Complex**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal

The New York Integrated Control Complex project contributes to the FAA's system efficiency goal by combining the New York en route air route traffic control center (ARTCC) with the New York TRACON. This facility could improve air traffic service efficiencies of en route and radar facilities in different locations.

This project will replace the existing consolidated TRACON and the en route center with a single facility that will address capacity constraints in the New York area. There are several inefficiencies in current airspace configuration that will be addressed by a consolidated facility, such as:

- The airspace is not proportionally balanced due to geographic proximity of the region's three major airports.
- The present airspace design creates narrow one-way corridors that cannot handle increased levels of air traffic.
- The current route structure for arriving aircraft cannot provide a uniform flow of traffic to airports, which causes less efficient use of runways.
- Airspace limitations decrease air traffic controllers' efforts to improve efficiency by using multiple departure and approach paths to handle surges in air traffic.

Consolidating the facilities and the airspace they control will allow more efficient use of the total airspace and reduce the artificial boundaries that inhibit efficient use of the airspace.

2A01: Terminal Business Unit: 2A01M; Aeronautical Data Link - Tower Data Link Services – Replacement

- **Aeronautical Data Link - Tower Data Link Services – Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Tower Data Link Services project contributes to the FAA's system efficiency goal by replacing aging, obsolete ground data link systems and software that transmit ground clearances to pilots at multiple airports. Existing systems are old and require substantial maintenance.

2A01: Terminal Business Unit: 2A01X1; Flight Data Input/Output Phase II COTS Replacement

- **Flight Data Input/Output Phase II COTS Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Flight Data Input/Output Replacement project contributes to the FAA's system efficiency goal by replacing existing systems that produce the flight data information for controllers on planned aircraft travel routes. The replacement system transfers and prints the flight data information to assist controllers in anticipating arrival of aircraft in the sector under their control.

2A01: Terminal Business Unit: 2A01X2; Mode Select – Provide

- **Secondary Surveillance – Mode Select**
- **Secondary Surveillance – Mode Select - Service Life Extension Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Mode Select (Mode S) project contributes to the FAA's system efficiency goal by upgrading 144 Mode S systems, which air traffic controllers use to separate and control traffic. Increasing Mode S reliability reduces outages and potential for air traffic delays. Modifications to the terminal Mode S interrogators have also made the traffic information system available to appropriately equipped aircraft (e.g., general aviation). The traffic information system transmits surveillance data to properly equipped aircraft allowing the pilot to visually track other aircraft in the vicinity by the use of a cockpit display.

2A02: Aeronautical Data Link Applications

(A) Aeronautical Data Link – Flight Information Service

(B) Aeronautical Data Link – Controller Pilot Data Link Communications Build I/IA

(A) Aeronautical Data Link – Flight Information Service

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Flight Information Service (FIS) project contributes to the FAA's air carrier and general aviation safety goals by providing new weather hazard graphics directly to pilots via data link for cockpit display. FIS implements the flight information services data link systems that provide timely data link broadcasts of graphic and text FIS/weather products to the cockpit. Weather is a major factor in many aviation accidents.

(B) Aeronautical Data Link – Controller Pilot Data Link Communications Build 1/IA

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Controller Pilot Data Link Communications (CPDLC) Build I/IA project contributes to the FAA's system efficiency goal by reducing voice communication frequency congestion. CPDLC Build 1 allows non-time critical predefined free-text messages to be sent to aircraft equipped with digital radios via a service provider's very high frequency data link mode 2 digital network. Using CPDLC, the controller and pilot can exchange messages rapidly during the aircraft's flight. Potential benefits include increases in the traffic handled in air traffic control sectors. (In an experimental sector, miles in trail restrictions were relaxed based on the reduction in voice communications.)

2A03: Free Flight Phase 2

- (A) Free Flight Phase 2 – Integration**
- (B) Free Flight Phase 2 – User Request Evaluation Tool**
- (C) Free Flight Phase 2 – Traffic Management Advisor - Single Center**
- (D) Free Flight Phase 2 – Collaborative-Decision Making**
- (E) Free Flight Phase 2 – Priority Research Support Efforts**

(A) Free Flight Phase 2 – Integration

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

This Free Flight Phase 2 (FFP2) Integration project contributes to the FAA’s system efficiency goal by supporting field implementation teams for FFP2 and coordinating airspace redesign to implement FFP2 capabilities. FFP2 improves system efficiency through better use of existing system capacity, which enables more flights to reach destination airports without delays.

(B) Free Flight Phase 2 – User Request Evaluation Tool

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The User Request Evaluation Tool project contributes to the FAA’s system efficiency 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 of by 15 percent. Direct routes save flight time and fuel.

(C) Free Flight Phase 2 – Traffic Management Advisor - Single Center

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Traffic Management Advisor - Single Center project contributes to the FAA’s system efficiency goal by increasing capacity at selected airports by 3 percent. The program includes a tool that traffic management coordinators use to analyze traffic flow to major airports; it also allows aircraft spacing that optimizes use of runways at major airports.

(D) Free Flight Phase 2 – Collaborative Decision Making

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Collaborative Decision Making (CDM) project contributes to the FAA’s system efficiency by coordinating air traffic information with airline operations centers to minimize the number and impact of delays. The FAA coordinates with air carriers to reroute traffic from busy sectors and areas with severe weather; both conditions can reduce delays in subsequent/connecting flights. CDM also provides current information and delay status to all interested parties.

(E) Free Flight Phase 2 – Priority Research Support Efforts

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Priority Research Support Efforts contribute to the FAA's system efficiency goal by developing new automation tools for Free Flight that RTCA recommends and that would benefit users in the 2003–2005 timeframe. These include direct-to; problem analysis, resolution, and ranking; traffic management advisor – multi center; and surface management systems. If implemented, these projects could produce benefits by providing automation tools to reduce air traffic delays. Additional products under development are the advance vortex spacing system; active final approach spacing tool; en route descent advisor; and expedite departure path.

2A04: Air Traffic Management:

- **Air Traffic Management – Traffic Flow Management – Current Enhanced Traffic Management System Operations**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Enhanced Traffic Flow Management System project contributes to the FAA's system efficiency goal by providing automation tools to 83 air traffic facilities (both centers and TRACONs). Traffic management coordinators or specialists at these facilities use the tools to handle air traffic disruptions and organize traffic flows to minimize delays. The Traffic Flow Management System is installed, but this project maintains and upgrades the existing system with commercial hardware and software.

2A05: Free Flight Phase 1

- **Free Flight Phase 1 – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Free Flight Phase 1 (FFP1) Sustain program contributes to the FAA's systems efficiency goal by maintaining the automation tools developed in FFP1. Automation tools include the user request evaluation tool (URET), which allows more direct flights; CDM, which allows the FAA and aviation users to consult on air traffic congestion; and the surface movement advisor (SMA), which improves efficiency of aircraft movements on the airport surface. These tools allow more efficient use of runway capacity, which decreases delays, and allows aircraft to fly more efficient flight routes that save fuel.

2A06: Automated Surface Observing System

- **Automated Surface Observing System – Pre-Planned Product Improvements**
- **Automated Surface Observing System – Data Displays**
- **Automated Surface Observing System – Standalone Weather Systems**
- **Automated Surface Observing System Controller Equipment - Information Display System for Terminal Facilities**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automated Surface Observing System (ASOS) program contributes to the FAA's system efficiency goal by providing ground systems that automatically report surface weather data that is distributed to ATC users. Pilots,

commercial and general aviation, and air traffic personnel use the weather data to plan flights more efficiently, and they are able to avoid diversions because they have better information on visibility conditions at the airport at which they intend to land. The aviation surface weather observation network includes the automated weather observing system (AWOS), ASOS, automated weather sensors systems, stand-alone weather sensors, and the ASOS controller equipment information display system (ACE-IDS or data displays).

The ASOS provides air traffic controllers with critical weather parameters that are vital for deciding whether or not to approve aircraft landings and takeoffs, which impact the number of delays at airports. The automated weather sensors system provides pilots and other users with minute-by-minute weather data updates, such as changes in winds, altimeter readings, and visibility. The stand-alone weather sensors provide wind, temperature, and dew point information as a backup for ASOS at service level C sites. ACE-IDS presents required weather and other operational information in the tower and TRACON via a local area network or a wide area network. The ACE-IDS project contributes to the FAA system efficiency goal by depicting information the controller needs on weather and NAS status on a single display. The IDS can display data from a wide variety of sources, including weather-sensing systems, status of runway lights, status of navigational aids, and status of landing aids. Having quick access to all this information, the controller can better inform pilots of airport conditions and spend less time searching for information.

2A07: Flight Service Station Information Display System

- **Automated Surface Observing System Controller Equipment - Information Display System for Automated Flight Service Station**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Flight Service Information Display System project contributes to the FAA's system efficiency goal by providing a standardized information system to assist flight service specialists in briefing pilots on weather conditions and NAS status. This system will make flight service specialists more productive and provide more timely information to pilots. Improving the availability and timeliness of pilot briefings will save time and result in better flight planning.

2A08: Information Display System – Terminal Facilities

- **Automated Surface Observing System Controller Equipment - Information Display System for terminal facilities**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The ACE-IDS project contributes to the FAA's system efficiency goal by depicting information the controller needs on weather and NAS status on a single display. The IDS can display data from a wide variety of sources, including weather-sensing systems, status of runway lights, status of navigational aids, and status of landing aids. Having quick access to all this information, the controller can better inform pilots of airport conditions and spend less time searching for information. Next-generation nationwide data display project will add new information and weather display capabilities that will be deployed at facilities that currently lack data display capability.

2B01: Next Generation Very High Frequency Air-to-Ground Communications System

- **Next Generation Air-to-Ground Communications System – Segment 1a**
- **Next Generation Air-to-Ground Communications System – Segment 1b**
- **Next Generation Air-to-Ground Communications System – Segments 2/3**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Next Generation Very High Frequency Air-to-Ground (A/G) Communication System program contributes to the FAA's system efficiency goal by expanding the number of communication channels within the spectrum assigned to the FAA. This provides for quicker and accurate radio communications between the controller and pilot, which enables controllers to respond more quickly to pilot requests. The FAA will be acquiring new digital A/G radios (to replace aging analog radios) and other necessary equipment to provide an end-to-end digital A/G communications capability. This capability increases the capacity to meet current and near-term air traffic control radio communication demands. The next generation A/G communications segments will provide a significant increase in channel availability for communications between air traffic controllers and pilots.

2B02: En Route Automation Program

- **En Route Automation Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Automation Modernization (ERAM) program contributes to the FAA's system efficiency goal by modernizing the computer system that is the heart of air traffic control automation at the 20 ARTCCs in the continental United States. System efficiencies enabled by ERAM include availability of safety alerts during use of the backup mode; flexible routing around congestion, weather, and restrictions; increased number and type of surveillance information; and increased capabilities for incorporating future enhancements into the NAS. The ERAM solution will replace the current host computer system (HCS) software/hardware, the current direct access radar channel (DARC) (i.e., the backup system), and other associated peripherals. The solution will be standards-based, ICAO-compliant, secure, modular, and expandable.

2B03: Weather and Radar Processor

- **Weather and Radar Processor – Stage 3 – Sustain Weather Operations**
- **Weather and Radar Processor – Tech Refresh/Product Upgrades**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Weather and Radar Processor (WARP) projects contribute to the FAA's system efficiency goal by providing timely weather data acquisition and dissemination capability to help en route air traffic control facilities minimize delays and disruptions to air travel. The WARP is an automated processing system that continuously acquires, stores, distributes, and displays weather information and radar products from external sources. The WARP processes weather information from the NEXRAD Doppler weather radar and provides timely and accurate forecast weather products to other NAS systems, which contributes to NAS efficiency. The WARP Stage 3 upgrades accommodate changes made to WARP input sources (data, models, and sensors), which allows for continuation of weather data and distribution operations.

2B04X: Automatic Dependent Surveillance National Implementation – Future Program

- **Automatic Dependent Surveillance National Implementation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automatic Dependent Surveillance (ADS) National Implementation program contributes to the FAA’s system efficiency goal by providing improved surveillance of aircraft to pilots and ATC user tools that will enable more efficient traffic flows in the NAS. Implementation includes developing and deploying ADS ground stations in the en route, terminal, and surface domains, along with automation and communication system modifications necessary to support ADS capabilities.

Using ADS, aircraft can fly at optimum altitude, speed, and routing, which result in better schedule reliability while a high level of safety is maintained. This increased efficiency stems from implementing ADS-enabled capabilities throughout the NAS, including, but not limited to, the following:

- Provision of “radar-like” services in areas not currently covered by radar.
- Improved performance of ATC Decision Support Tools with availability of improved surveillance data.
- Improved pilot situational awareness through broadcasting of ground-based surveillance data to aircraft.
- Provision of common situational awareness between pilots and ATC, which is necessary to support Free Flight initiatives.

2C01: Air Traffic Operations Management System

- **Air Traffic Operations Management System/Local/Wide Area Network**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

At the heart of the Air Traffic Operations’ Management System (ATOMS) is a multi-tiered enterprise architecture named CATMIS – the Corporate Air Traffic Management Information System. The CATMIS goal is to provide a series of integrated systems, infrastructure and procedures that will coordinate the collection, storage, correlation and delivery of enterprise and operational information to the Air Traffic organization. At the core of the infrastructure is common data architecture. This architecture, comprised of the operational data store collects information from legacy systems, interactive web products and emerging facility systems.

Custom designed facility level applications employing techniques gained through the reengineering of administrative processes are needed to collect data to support the agency’s cost accounting system (CAS) while at the same time reducing the current level of administrative workload. Data collection systems and a methodology for moving the data upstream will complete the distribution system. Accuracy and standardization will occur by collecting data only once, at the source (field facilities), and then efficiently sharing that data through CATMIS tools. Once data systems are established and distributed, effective analytical tools will be provided to assist Air Traffic in making business-based decisions for tomorrow’s outcomes.

2C02: National Airspace System Management Automation Program

- **National Airspace System Management Automation Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goals:

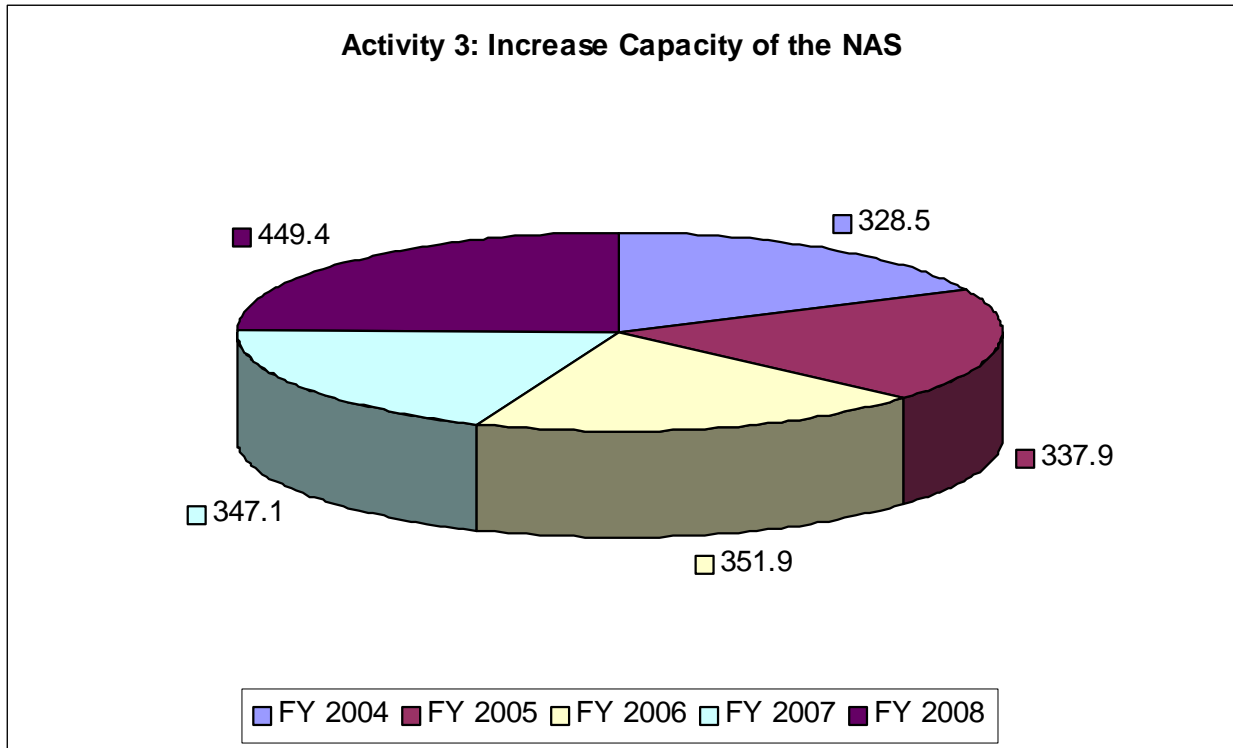
The National Airspace System Management Automation Program (NASMAP) has two main components: Air Traffic Services National Data Center (ATS NDC) and performance based Integrated Collaborative Environment (pb-ICE) tools.

The ATS NDC contributes to the FAA's system efficiency goal through the use of data sharing between NAS projects. The NASMAP establishes the central data repository of ATS corporate data for data sharing, develops interfaces between departmental and ATS NDC information systems, establishes the ATS data management program to achieve ATS standard data and data standardization, and develops the metadata repository to inventory ATS information systems. The final outcome of the NASMAP avoids redundant information system development efforts within ATS and increases the accuracy and integrity of ATS data.

The NASMAP pb-ICE tools contribute to the FAA system efficiency goal by providing a standard common collaborative toolset to use resources better. The pb-ICE toolset (e-Gov-compliant design) provides comprehensive coverage for performance-based organizations business operations, including a business portal to perform daily business activities, centralized information repository to retrieve related projects, workflow automation engine to automate repeatable business processes to improve efficiency and performance, and resource scheduling and tracking environment to plan and collaborate on activities and monitor the progress of NAS projects.

Activity 3: Increase Capacity of the National Airspace System

The following graph indicates the five-year distribution of funding for F&E programs that increase capacity of the NAS for FY 2004 to 2008. Funding is shown in millions of dollars.



3A01: Navigation and Landing Aids: 3A01A; Local Area Augmentation System for Global Positioning System

- **Local Area Augmentation System for Global Positioning System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Local Area Augmentation System (LAAS) for the Global Positioning System (GPS) program contributes to the FAA's system efficiency goal by providing a satellite-based precision approach capability that meets the requirements for all weather approach and landing capability. Providing precision approach guidance at additional airports will allow landings in low visibility conditions, which increases schedule reliability for commercial carriers. The LAAS complements the wide area augmentation system by providing Category (CAT) I and CAT II/III precision approach capabilities. A single LAAS can provide approach guidance to multiple runways, which allows use of additional runways during adverse weather conditions.

3A01: Navigation and Landing Aids: 3A01B; Wide Area Augmentation System for Global Positioning System

- **Wide Area Augmentation System for Global Positioning System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Wide Area Augmentation System (WAAS) for the GPS program contributes to the FAA's system efficiency goal by providing non-precision lateral navigation and vertical navigation (VNAV) capability to airports without such existing capabilities. Vertical guidance allows approaches to runways in low visibility conditions. After initial operational capability, expected in December 2003, pilots will be able to use lateral navigation with precision vertical guidance (LPV) approaches. LPV performance is within 50 feet of CAT I landing requirements, which supports close to CAT I minimums at many airports. WAAS also will reduce air traffic separation and provide more direct en route paths.

3A01: Navigation and Landing Aids: 3A01C; Very High Frequency Omni-Directional Radio Range with Distance Measuring Equipment

- **Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

This Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation (VORTAC) program contributes to the FAA's system efficiency goal by replacing, relocating, or converting VORTAC facilities used for aerial navigation. VOR and Tactical Air Navigation systems increase NAS system efficiency by providing necessary enhancements, upgrades, and relocations to VOR and VORTAC facilities that are experiencing signal deterioration due to various environmental factors, which negatively impacts system efficiency. General aviation, commercial carriers, and other groups use this navigation capability for en route navigation and approach operations into airports.

3A01: Navigation and Landing Aids: 3A01D; Instrument Landing System – Establish/Upgrade
• **Instrument Landing Systems**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Establish/Upgrade Instrument Landing System (ILS) program contributes to the FAA's systems efficiency goal by providing the necessary equipment to establish, replace, and maintain the precision approach capability for new runways and existing runways that do not have precision approach guidance capability. These systems provide pilots precision guidance to a runway end in low visibility conditions; without the systems, takeoffs and landings would be restricted, and flight cancellations would occur in the NAS. ILS also helps meet increasing traffic demands by providing all-weather landing capability at additional runways.

3A01: Navigation and Landing Aids: 3A01E; Approach Lighting System Improvement Program

- **Visual Navigation Aids - Approach Lighting System Improvement Program Continuation**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Approach Lighting System Improvement Program (ALSIP) contributes to the FAA's air carrier and general aviation safety goal by replacing rigid, non-frangible lighting support structures with frangible approach lighting structures. These structures support the approach lights that help pilots see the runway during limited visibility conditions. If aircraft hit non-frangible lighting structures, they are seriously damaged. ALSIP provides high intensity approach lighting system with sequenced flashers (ALSF) model 2 and medium intensity approach lighting system with runway alignment indicator lights (MALSR).

3A01: Navigation and Landing Aids: 3A01F; Runway Visual Range

- **Runway Visual Range – Replacement/Establishment**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal aviation accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Runway Visual Range (RVR) Replacement project contributes to the FAA's air carrier and general aviation safety goals by replacing aging, maintenance-intensive and difficult-to-support RVR legacy systems. These systems provide pilots critical meteorological visibility data they need to decide whether or not it is safe to take off or land during limited visibility conditions.

The new-generation RVR equipment is mounted on frangible, low-impact-resistant structures that break away if hit by aircraft during takeoff or landing. Replacement equipment also reduces maintenance downtime and service time required for existing older navigation and landing aid equipment. This project also provides the equipment for new sites, including new runways and existing runways that have had an ILS installed.

3A01: Navigation and Landing Aids: 3A01G; Distance Measuring Equipment – Sustain

- **Distance Measuring Equipment – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Distant Measuring Equipment (DME) Sustain project contributes to the FAA's system efficiency goal by replacing obsolete, tube-type DME with modern technology electronics that will improve operations and facilities 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.

The DME Sustain project also provides for procurement and installation of approximately 177 DME systems to support the recommendations of the Commercial Aviation Safety Team. The 177 DME systems are used to reduce controlled flight into terrain accidents at the most vulnerable locations in the NAS.

3A01: Navigation and Landing Aids: 3A01H; Non-Directional Beacon Facilities – Sustain

- **Non-Directional Beacons – Sustain**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Non-Directional Beacons (NDB) Sustain program contributes to the FAA’s system efficiency goal by replacing obsolete, tube-type NDB with current technology electronics that will upgrade equipment, which will improve operations and facilities performance. NDB systems help general aviation pilots and other users maintain correct position information and prevent controlled flights into terrain. Also, the replacement will reduce maintenance and repair downtime required for the antiquated DME systems.

3A01: Navigation and Landing Aids: 3A01I; Visual Navigation Aids – Establish/Expand

- **Visual Navigation Aids – Visual Navigation Aids for New Qualifiers**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Visual Navigation Aids project contributes to the FAA’s system efficiency goal by providing a visual reference to the glide slope as a pilot approaches an airport. Precision approach path indicators (PAPI) and runway end identifier lights are used at various airports to help pilots quickly identify the runway threshold and make stabilized descents to clear obstructions at airports. The visual navigation aids provide lower landing minima, and pilots can land at airports that otherwise would be closed because of limited visibility.

This program also requires procurement and installation of about 170 PAPI systems to support the recommendations of the Commercial Aviation Safety Team. The systems provide vertical glide slope indicators at the highest-risk runways to reduce controlled flight into terrain accidents.

3A01: Navigation and Landing Aids: 3A01J; Visual Approach Slope Indicator Replacement – Replace with Precision Approach Path Indicator

- **Visual Navigation Aids – Replace Visual Approach Slope Indicator with Precision Approach Path Indicator**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Precision Approach Path Indicator (PAPI) program contributes to the FAA’s system efficiency goal by replacing aging, obsolete visual approach slope indicators with the ICAO PAPI system. This system is an approach aid that gives pilots a visual reference to the runway, and it offers greater reliability and performance.

3A01: Navigation and Landing Aids: 3A01L; Navigation and Landing Aids – Service Life Extension Program

- **Visual Navigation Aids – Sustain, Replace, Relocate**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Navigation and Landing Aids Service Life Extension Program contributes to the FAA’s system efficiency goal by replacing aging, obsolete ground-based navigation and landing aids that are necessary to maintain approach and landing capabilities at various airports throughout the United States. The upgraded equipment improves system efficiency by reducing the maintenance and repair downtime required for the older systems. Equipment outages reduce the approach capability at airports. Equipment upgraded under this program includes approach lighting system with sequenced flashers model-2; medium intensity approach lighting system with runway alignment indicator lights; PAPIs; runway end identifier lights; VORs; DME; and NDBs.

3A02: Oceanic Automation System

- **Advanced Technologies and Oceanic Procedures**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Advanced Technologies and Oceanic Procedures (ATOP) program contributes to the FAA’s efficiency goal by modernizing FAA oceanic air traffic control systems and procedures. The new oceanic automation system sets the stage for reducing aircraft separation from 100 nautical miles to 30 nautical miles, which enables more planes to safely fly preferred routes. The ATOP program will provide a modernized oceanic air traffic control automation system. The ATOP system will collect, manage, and display oceanic air traffic data, including electronic flight-strip data on air traffic controllers displays and integrate such capabilities as flight data processing, radar data processing, automatic dependent surveillance, controller-pilot data link, and conflict probe.

The ATOP program will overcome capacity and efficiency limits due to lack of radar service over the oceans, limitations on surveillance of aircraft position, and delays in high-frequency voice communication relays. To do this, the program will marry more efficient data processing for faster, accurate, off-the-glass decision-making by controllers with procedures for safely handling more aircraft in the same airspace.

3A03: Voice Switching and Control System

- **Voice Switching and Control System – Voice Switching and Control System Control System Upgrade**
- **Voice Switching and Control System – Technology Refresh**
- **Voice Switching and Control System – Training and Backup Switch**
- **Voice Switching and Control System – Switch Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Voice Switching and Control System (VSCS) projects contribute to the FAA’s system efficiency goal by upgrading VSCS equipment at all en route ARTCCs, the Mike Monroney Aeronautical Center (used for training air traffic controllers) and the William J. Hughes Technical Center (WJHTC) (used for test and evaluation of all ATC tools and systems). These upgrades ensure that A/G communications capabilities are reliable and available for separating aircraft, coordinating flight plans, and transferring information between ATC facilities.

3A04: Instrument Approach Procedures Automation

- **Instrument Approach Procedures Automation**
- **National Aeronautical Charting Office Hardware Replacement**

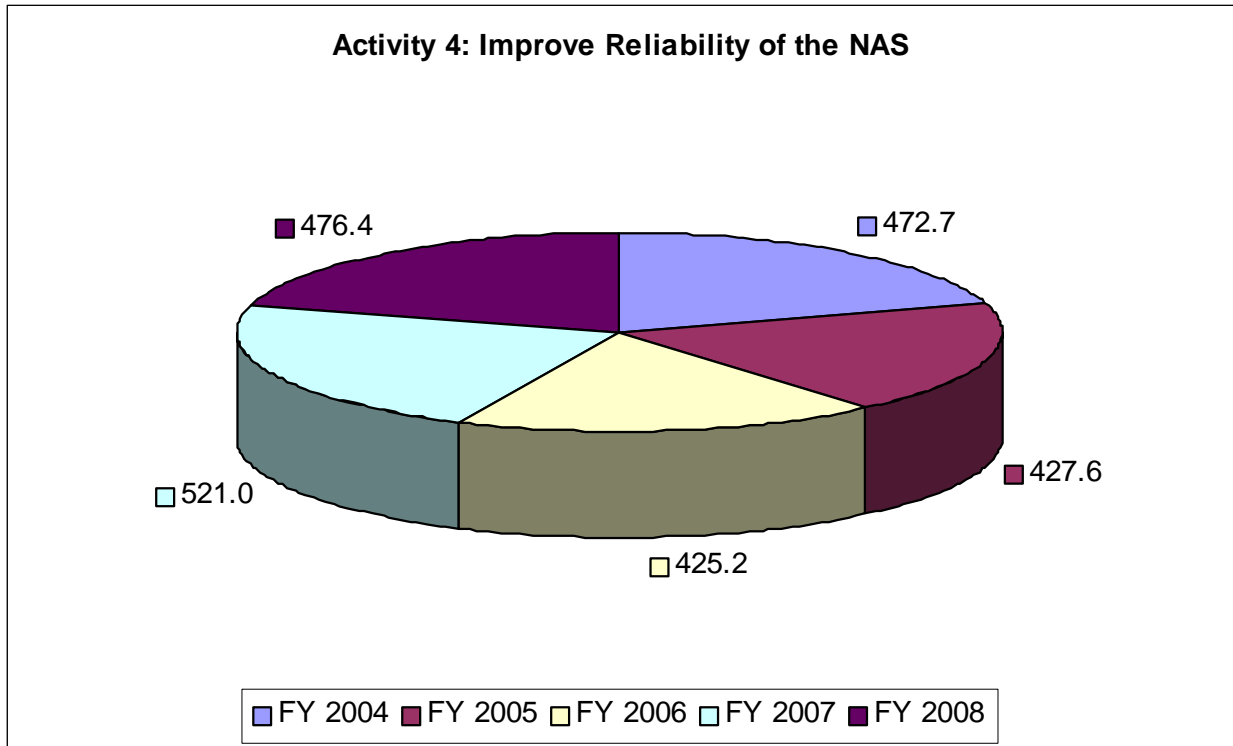
Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Instrument Approach Procedures Automation (IAPA) program contributes to the FAA's system efficiency goal by providing automated tools that enable FAA specialists to develop more timely and accurate instrument approach and departure procedures for pilots that ensure flight paths are clear of obstacles such as radio towers, buildings, and trees. Procedures developed by the IAPA program are provided to the National Aeronautical Charting Office and are used in the production of charts and maps for use by commercial and general aviation users. The automated tools reduce the time required to evaluate, revise, and update approach/departure procedures as requested by airports each year.

Activity 4: Improve Reliability of the National Airspace System

The following graph indicates the five-year distribution of funding for F&E programs that improve the reliability of the NAS for FY 2004 to 2008. Funding is shown in millions of dollars.



4A01: Guam Center Radar Approach Control - Relocate

- **Relocated Guam Center Radar Approach Control**

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Guam Center Radar Approach (CERAP) relocation project supports the FAA's system efficiency goal by replacing the air traffic control facility for Agana International Airport, which was severely damaged by typhoon Paka. Replacement of the facility will allow updated equipment to be installed, which improves the efficiency of air traffic control for international service.

4A02: Terminal Voice Switch Replacement/Enhancement Terminal Voice Switch

- **Enhanced Terminal Voice Switch**
- **Command Center Voice Switch**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Voice Switch Replacement (TVSR)/Enhancement program contributes to the FAA's system efficiency goal by replacing the electromechanical and aging electronic switches in all ATCTs and TRACON facilities with modern reliable voice-switching systems. These switches provide the capability to communicate with other air traffic control facilities and aircraft.

The TVSR program consists of several multiyear equipment contracts, including small tower voice switch systems, operational support telephone systems, enhanced terminal voice switch systems, rapid deployment voice switch model IIA systems, and voice switch by-pass systems. Modern voice switches, like enhanced terminal voice switch and related rapid deployment voice switch IIA, meet air traffic controller needs and enable more effective air traffic operations.

4A03: Airport Cable Loop Systems – Sustained Support

- **Airport Cable Loop Systems Sustained Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Airport Cable Loop Sustained Support program contributes to the FAA's system efficiency goal by providing modern electrical distribution system infrastructure that enables continued operation of airport ATC facilities and approach and lighting systems. Airport cable loops both distribute electrical power and gather data on the operational status of such airport equipment as ILS and runway lights. The information is sent to air traffic control and maintenance facilities. Another purpose of the project is to standardize the design and installation procedures for fiber optic transmission systems, which will simplify configuration management, training, and depot and logistics support.

4B01: En Route Automation Program

- (A) En Route Automation Program – En Route Enhancements**
- (B) En Route Automation Program – Flight Data Input/Output Replacement**
- (C) En Route Automation Program – Direct Access Radar Channel**
- (D) En Route Automation Program – Host/Oceanic Computer System Replacement**
- (E) En Route Automation Program – En Route Communications Gateway**
 - **En Route Automation Program – En Route Communications Gateway – Tech Refresh**
- (F) En Route Automation Program – En Route System Modification**
- (G) En Route Automation Program – En Route Monitor and Control**
- (H) En Route Automation Program – Aeronautical Information and Flight Planning Enhancements**
- (I) En Route Automation Program – FAA Aeronautical Training Systems (Initial Academy Training)**

(A) En Route Automation Program – En Route Enhancements

Primary Outcome Goal: FAA Goal: Capacity and Efficiency: Provide an aerospace transportation system that continues to meet the capacity needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Enhancements project contributes to the FAA's system efficiency goal by providing new capabilities and enhancements to the ARTCC host computer system (HCS) and display systems (DSR) software. The HCS and DSR are the primary processor and display system used to control air traffic in 20 ARTCCs. En Route Enhancements maintain and upgrade HCS and DSR system software at the ARTCCs, which enables air traffic control to separate air traffic in the en route portion of flight.

(C) En Route Automation Program – Direct Access Radar Channel

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Direct Access Radar Channel project contributes to FAA's system efficiency goal by upgrading the existing independent backup radar automation and display capability. This gives the ARTCC controllers full redundancy in providing radar ATC services. Legacy hardware and interfaces will be eliminated, and current software architecture will be replaced starting in FY 2004 with one that provides hardware independence.

(D) En Route Automation Program – Host/Oceanic Computer System Replacement

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Host/Oceanic Computer System Replacement (HOCSR) program contributes to the FAA's system efficiency goal by enhancing the reliability and performance of the existing HSC. The program provides the central computer and peripheral equipment that processes and radar data and flight plans used by controllers to control and separate air traffic in the en route environment. The HOCSR program also provides upgrades to the critical peripheral equipment components that enable air traffic control.

(E) En Route Automation Program – En Route Communications Gateway

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Communications Gateway (ECG) project contributes to the FAA's efficiency goal by providing a replacement for the computer gateway that processes and sends external information to the host computer. ECG enables integration of new surveillance technology, introduction of new interface standards and formats, and connectivity to additional remote radars. ECG infrastructure will provide additional automation system capacity and expandability required to support anticipated increases in air traffic and changes to the operational environment.

(F) En Route Automation Program – En Route System Modification

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route System Modification project contributes to the FAA's system efficiency goal by replacing aging or obsolete en route automation system components. The project will replace such obsolete components as system processors and upgrade and modernize the controller displays and the infrastructure that supports these displays. Replacing obsolete equipment helps to ensure reliability and maintainability of the en route automation system.

(G) En Route Automation Program – En Route Monitor and Control

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The En Route Monitor and Control (EMAC) project contributes to the FAA's system efficiency goal by supporting the separation of critical, essential, and routine functions of monitor and control throughout all en route facilities. This project will significantly reduce the number of ARTCC system operation center area monitor and control devices, which decreases software development and training costs, enables consolidated facility and legacy systems to interface with the NIMS provides space for implementation of new systems, and provides modern, open, and standardized monitor and control devices.

(H) En Route Automation Program – Aeronautical Information and Flight Planning Enhancements

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and as aerospace resources

Narrative for Primary Outcome Goal:

The Aeronautical Information and Flight Planning Enhancements project contributes to the FAA's system efficiency goal by transitioning en route automation systems from the current unique NAS flight data processing to ICAO compliant flight data processing. This will increase efficiency by taking advantage of the benefits of the ICAO standard and enabling cross-border data exchange to improve ATC efficiency.

(I) En Route Automation Program – FAA Aeronautical Training Systems (Initial Academy Training)

Primary Outcome Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and as aerospace resources

Narrative for Primary Outcome Goal:

The FAA Aeronautical Training Systems project contributes to the FAA's system efficiency goal by modernizing new training equipment to prepare and develop the required levels of knowledge and expertise within the ATC

workforce. This training and simulation system replicates the en route operational environment and provides a high fidelity, independent platform for the FAA Academy in Oklahoma City. The new Academy training system is necessary to meet the urgent requirement for new controller training.

4B02: Air Route Traffic Control Center Building Improvements/Plant Improvements

- **Air Route Traffic Control Center Modernization/Expansion – Air Route Traffic Control Center Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Route Traffic Control Center (ARTCC) Modernization/Expansion project contributes to the FAA's system efficiency goal by ensuring that buildings that house en route control equipment are modified, as necessary, to accept new equipment and maintained in good condition to avoid ATC outages because of failures in such infrastructure systems as electrical distribution systems. The project maintains the integrity of 21 ARTCCs, the Honolulu control facility (HCF) and two center radar approach control (CERAP) facilities, and upgrades these facilities for the integration and transition of new NAS systems. Modernizing ARTCC, HCF, and CERAP building infrastructure, such as electrical wiring, heating and ventilation systems, and structural components reduces the chances of outages, which cause air traffic delays.

4B03: Air Traffic Management

- (A) **Air Traffic Management Functionality Development/Deployment – Departure Spacing Program**
- (B) **Traffic Flow Management Infrastructure – Infrastructure Modernization**

(A) Air Traffic Management Functionality Development/Deployment – Departure Spacing Program

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The current Traffic Flow Management Infrastructure (TFM-I) project requires modernization to enable full traffic system integration. The Departure Spacing Program will be baselined as a formal NAS system and expanded into additional facilities in the Boston and Washington, DC, metropolitan areas. The program provides more efficient departure management tools to decrease the number of delays and lower associated costs of imposed delays, thus providing greater economic benefit to the user community.

(B) Traffic Flow Management Infrastructure – Infrastructure Modernization

Primary Outcome Goal: FAA Goal: System Efficiency: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Traffic Flow Management Infrastructure (TFM-I) is a NAS Architecture component connecting TFM decision support systems and tools that help balance growing flight demands with NAS capacity within a dynamic environment. The present TFM-I has evolved through several hardware and software generations. The software has become increasingly difficult to maintain and modify and will not support emerging system requirements. The architecture platform is overly complicated and congested with multiple communication and network threads, and existing hardware systems are approaching end of shelf life. Additional enhancements planned under the modernization program will increase integration and interoperability with the overall air traffic management structure. Modernization will establish a robust, commercially available and standards-compliant TFM-I and will support current and future TFM needs for availability, performance, security, expandability, and supportability, as well as human-computer interaction.

4C01: Critical Telecommunications Support

- **Critical Telecommunications Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Critical Telecommunications Support projects contribute to the FAA's system efficiency goal by providing modifications to existing telecommunications systems at more than 5,000 facilities within the NAS. The projects provide funds for air traffic communications diversity, telecommunications additions based on changes in air traffic patterns, facility relocations and modifications, and emergency requirements. Because of evolving changes in air traffic patterns, air traffic growth, and facilities destruction (caused by severe weather), there is a continuing need for this category of projects.

4C02: Federal Aviation Administration Telecommunications Infrastructure

- **Federal Aviation Administration Telecommunications Infrastructure**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Telecommunications Infrastructure (FTI) projects contribute to the FAA's system efficiency goal by replacing existing telecommunications networks with newer systems that provide more bandwidth and more efficient network management tools. The FTI will centralize management and security functions and provide telecommunications services with integrated network management and provisioning capabilities. Over the next decade, the FTI will incrementally replace existing NAS telecommunications systems, which, in using modern business practices, will reduce unit costs for telecommunications services and increase bandwidth utilization.

4C03: Air-to-Ground Communications Infrastructure

- **Communications Facilities Enhancement – Expansion**
- **Communications Facilities Enhancement – Air to Ground Communications Radio Frequency Interference Elimination**
- **Backup Emergency Communications - Replacement**
- **Ultra High Frequency Radio Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air-to-Ground (A/G) Communications Infrastructure projects contribute to the FAA's system efficiency goal by replacing aging and increasingly unreliable equipment, in addition to improving/upgrading associated sites and facilities. New communications sites are established to conform to new air traffic patterns and FAA changes to existing air traffic control facilities. Air traffic controllers use these sites to communicate with aircraft that are outside the range of radios located at their facilities. The A/G Communications Infrastructure program is a combination of the following FAA projects:

- **Communications Facilities Enhancements:** Provides new radio control facilities and/or modifies existing facilities to enhance the A/G communications between air traffic control and aircraft;
- **Radio Frequency Interference Elimination:** 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; and
- **Backup Emergency Communications:** Provides a dedicated channel/sector in place of a priority-based, shared outlet system and replaces 1970s technology system that is logistically unsupportable.

The Ultra High Frequency (UHF) Radio Replacement project contributes to the FAA's system efficiency goal by replacing aging equipment used to communicate with Department of Defense (DoD) aircraft. The FAA maintains the UHF A/G communications service for air traffic control of military operations in the United States. In August 2001, the office of the Secretary of Defense reaffirmed the military's continuing need for UHF A/G communications services for the foreseeable future. Subsequent events have served to demonstrate the need for the UHF service, especially during national emergencies.

4C04: Voice Recorder Replacement Program

- **Voice Recorder Replacement Program**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Voice Recorder Replacement Program contributes to the FAA's system efficiency goal by replacing aging, analog voice recording systems with modern digital voice recording systems. These systems record all voice communications between controllers, pilots, and other ground-based air traffic control facilities, which support safety investigations when accidents occur.

4C05: National Airspace System Infrastructure Management System

- **National Airspace System Infrastructure Management System – Phase 2**
- **National Airspace System Infrastructure Management System – Phase 2 Tech Refresh**
- **National Airspace System Infrastructure Management System – Phase 3**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Infrastructure Management System (NIMS) Phase 2 contributes to the FAA's system efficiency goal by centralizing information and technical expertise and providing remote monitoring and control capabilities. NIMS phase 2 fields a COTS-based information system that consists of distributed computers and integrated software/database applications for a national operational control center and three strategically located operational control centers to support air traffic services in meeting demand for increasing services with diminished resources while maintaining safety. Centralizing information such as maintenance history promotes informed, effective maintenance actions. Remote monitoring and control capabilities reduce maintenance personnel travel time and equipment downtime, saving time and money, improving efficiency, and reducing delays. With over 20,000 NAS facilities, many located far from maintenance personnel; reducing travel time and increasing maintenance personnel historical knowledge combine to yield increased service value at a reduced cost.

4C06: Flight Service Station Modernization

- **Flight Service Facilities – Automated Flight Service Stations Facilities Sustainment/Space Requirements**
- **Flight Service Facilities – Power Conditioning Systems Upgrade**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Automated Flight Service Station (AFSS) Facilities Sustainment program contributes to the FAA's system efficiency goal by upgrading and repairing AFSS/flight service station infrastructure, which includes heating/ventilation and air-conditioning systems, roofs, and fire and life safety upgrades. These upgrades ensure existence of proper environmental control in operations, equipment, and administrative areas.

4C07: Flight Services Automation System Operational and Supportability Implementation System

- **Flight Services Automation System Operational and Supportability Implementation System**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of the users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Flight Services Automation System (FSAS) Operational and Sustainment Implementation System (OASIS) program contributes to the FAA system efficiency goal by offering significant improvement in the computer-human interface for systems used to provide weather briefings and accept flight plans from pilots. Existing FSAS displays are upgraded with a graphical user interface. Flight service stations accept flight plans from pilots and transmit instrument rules flight plans to the en route centers so that controllers can plan for aircraft entering their sector. Flight service stations also provide weather briefings to general aviation pilots to help them avoid severe weather conditions and to predict weather visibility at destination airports.

4C08: Weather Message Switching Center Replacement

- **Weather Message Switching Center Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide and aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Weather Message Switching Center Replacement project contributes to the FAA's system efficiency goal by collecting and disseminating weather information to air traffic facilities more efficiently. The present system is obsolete and difficult to maintain. In addition, the weather information that is distributed from the switching center can be delayed during periods of high demand.

4C09: Flight Service Station Switch Modernization

- **Automated Flight Service Station Voice Switches**

Primary Outcome Goal: FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal:

The Flight Service Stations (FSS) Switch Modernization program contributes to the FAA's safety goal by replacing aging, non-supportable FSS voice switches with modern digital voice switches to enhance preflight and in-flight services. The Automated Flight Service Station Voice Switch Replacement project provides pilots with significantly improved access to flight planning, weather, communications, and emergency services deemed essential to conducting safe and efficient flight. The program replaces the voice switches at 61 AFSSs throughout the NAS and at 14 non-automated FSSs located in Alaska.

4C10: Alaskan National Airspace System Interfacility Communications System

- **Alaskan National Airspace System Interfacility Communications System Satellite Network – Phase II**
- **Alaskan National Airspace System Interfacility Communications System Tech Refresh**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Alaskan National Airspace System Interfacility Communications System (ANICS) Satellite Network Phase II supports the FAA's system efficiency goal by installing FAA-owned satellite earth stations to provide essential telecommunications engineered for FAA-standard 99.9 percent availability at remote Alaskan air traffic control sites. ANICS Phase II will improve availability of essential communications compared to the existing commercial telecommunications service. The system will also reduce leased telecommunications costs. ANICS Phase I has been successfully implemented at 51 operational sites, decreasing remote air-ground telecommunications line

outages to less than 70 hours in FY 2002. ANICS sites have substantially improved communications service reliability, performance, maintainability, and capacity.

4C11: Electrical Power Systems – Sustain/Support

- **Power Systems Sustained Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Power Systems Sustain/Support project contributes to the FAA's systems efficiency goal by providing reliable and high-quality power sources for the facilities used in delivering air traffic control services. The FAA requires and must maintain independent power-generating systems to provide electrical power when there are commercial power outages. An extended electrical power outage would result in significant aviation delays.

4C12: National Airspace System Recovery Communications

- **National Airspace System Command and Control Communications Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Recovery Communications project contributes to the FAA's system efficiency goal by ensuring that during emergencies the FAA's command, control, and communication (C3) structure is able to provide time critical public and NAS information for the Administrator to be shared with the Administrator's staff, key regional managers, the Secretary of Transportation, and other national-level executive personnel. The attackers of September 11 uncovered shortfalls within the existing systems and facilities.

The NAS C3 program provides and enhances a variety of fixed position, portable, and transportable C3 systems for use in support of emergency operations. Such C3 systems include the automatic digital network/defense messaging system, secure telephone unit third generation/secure telephone equipment, secure facsimile, VHF/frequency modulated, high-frequency single side band, satellite telephone network, wireless notification system, secure conferencing system, and communications support teams. These systems can operate independent of commercial communications in emergency situations. C3 also provides modernization of several "continuity of operations" sites, which ensures Agency executives command and communication during times of crisis.

4C13: Aeronautical Center Infrastructure Modernization

- **Aeronautical Center Infrastructure Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Aeronautical Center Infrastructure Modernization project contributes to the FAA's system efficiency goal by providing up-to-date facilities and supporting infrastructure for organizations that support NAS operation. The project includes the following support: Training is provided each year in resident and distance learning formats for more than 30,000 FAA and international students, including air traffic controllers, Airway Facility technicians and certification/inspection personnel; logistics services and supply support are provided to all FAA locations and about 70 DoD and international organizations; cost accounting and payroll services are provided to the DOT organizations and the Transportation Security Administration; engineering services are provided for NAS system modifications and repair; flight check aircraft are deployed for calibration and certification of radar/navigation aids at all nationwide locations; Airmen and Aircraft Records and Registry are maintained; aviation medical research and human factors research are conducted; and other support is provided to critical air navigation systems throughout the NAS.

4C14: Frequency and Spectrum Engineering

- **National Airspace System Spectrum Engineering Management – National Airspace System Spectrum Engineering Sustained Support**
- **National Airspace System Spectrum Engineering Management – Frequency Interference Support/Resolution**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Spectrum Engineering project contributes to the FAA's system efficiency goal by providing careful and detailed frequency and spectrum planning necessary to ensure that current and future aeronautical safety systems are provided adequate radio spectrum. Spectrum management support must be provided to both government and non-government offices involved in the operation of current systems and to organizations planning new aeronautical systems. Spectrum support is also provided for all other FAA non-aeronautical systems.

4C15: NAS Interference, Detection, Location and Mitigation

- **NAS Interference Detection, Location, and Mitigation**

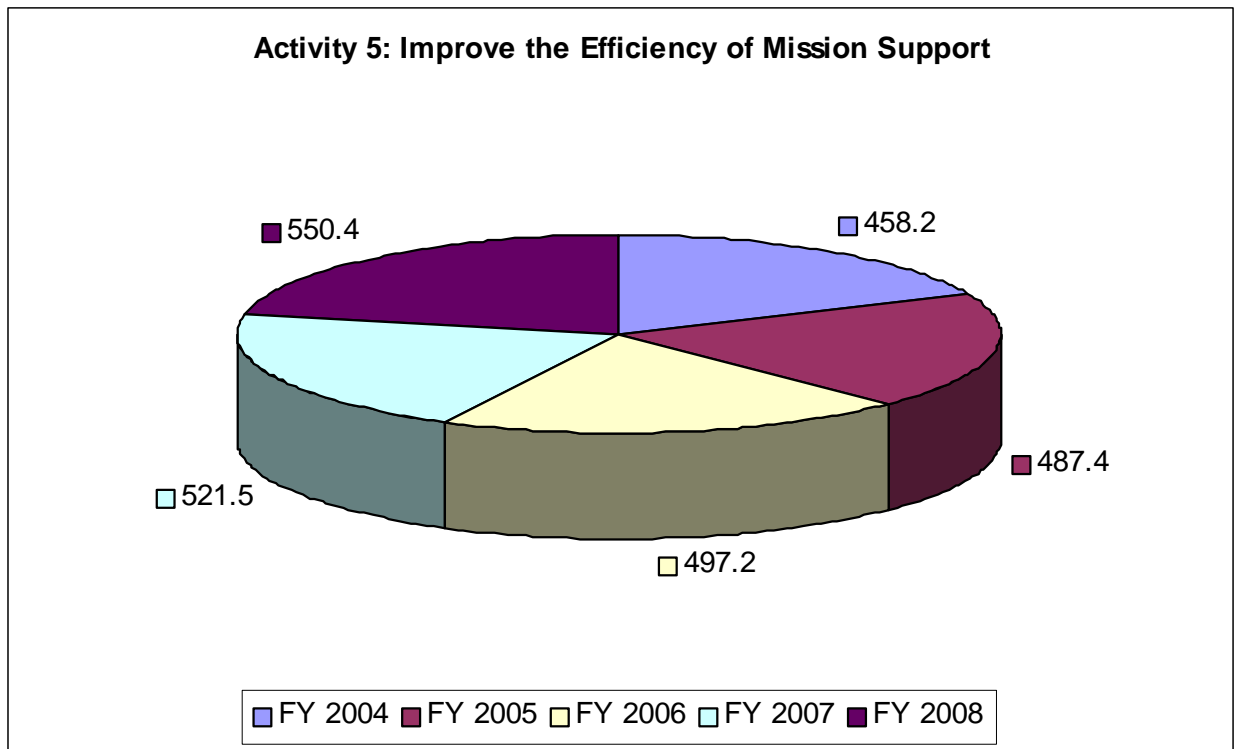
Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The NAS Interference Detection, Location, and Mitigation project contributes to the FAA's system efficiency goal by providing the equipment to quickly detect and locate radio frequency interference sources affecting FAA's equipment. Interference can disrupt air traffic control and cause delays. Rapid resolution leads to increased levels of aviation safety and more efficient use of airspace. In addition, this project includes upgrading existing radio frequency investigation capabilities to support interference detection to A/G communications and the global navigation satellite system.

Activity 5: Improve Efficiency of Mission Support

The following graph indicates the five-year distribution of funding for F&E programs that improve efficiency of mission support for FY 2004 to 2008. Funding is shown in millions of dollars.



5A01/5A02: National Airspace System Improvement of System Support Laboratory/ FAA William J. Hughes Technical Center Facilities

- National Airspace System Improvement of System Support Laboratory
- Technical Center Facilities

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Improvement of the System Support Laboratory and Technical Center Facilities projects contribute to the FAA's system efficiency goal by upgrading and improving the agency's laboratory infrastructure at the William J. Hughes Technical Center. The facility tests new equipment, provides analysis of modernization proposals for existing systems, and provides the more sophisticated second-level field support for ATC programs. Each laboratory-supported capital development program contributes to one or more of the FAA and DOT goals.

5A03: William J. Hughes Technical Center Building and Plant Support

- William J. Hughes Technical Center Infrastructure Sustainment

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The William J. Hughes Technical Center Infrastructure Sustainment project contributes to the FAA's system efficiency goal by refurbishing and replacing the center infrastructure. The existing infrastructure requires updating to ensure that the laboratories and other facilities operate properly and have the capacity to handle the electrical and heat loads generated by the equipment being tested.

5A04: En Route Communications and Control Facilities Improvements

- En Route Communications and Control Facilities

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

En Route Communication and Control Facilities project contributes to the FAA's system efficiency goal by upgrading and improving various communication facilities and equipment throughout the NAS. These communication facilities and equipment provide a means for continuous and reliable A/G communications between the air traffic control personnel and the pilot.

5A05: Department of Defense/Federal Aviation Administration Facilities Transfer

- Department of Defense/Federal Aviation Administration Air Traffic Control Facility Transfer/Modernization – Original Program

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that provides reliable and accurate information to air traffic controllers and pilots.

Narrative for Primary Outcome Goal:

The DoD/FAA Air Traffic Control Facility Transfer/Modernization program improves NAS reliability by replacing aged and unreliable facilities with modern reliable ones. Enhancements primarily include communications, weather, and surveillance systems. Consistent with the base closure process, DoD notifies DOT when military facilities are being closed. In some cases, the FAA must take over air traffic control responsibility. In other cases, air traffic or air navigation facilities are on DoD property and must be relocated or transferred to the FAA.

Modern communications, weather, and surveillance systems are essential to providing reliable and accurate information to air traffic controllers and pilots. The DoD Facility Transfer program implements multiyear projects. Past modernization projects have included fiber optic telecommunications, low-density microwave communications, electrical power supplies, short-term emergency power supplies, automated weather observation systems, digitized air traffic radar data, and facility security. These reliable, modern system enhancements meet air traffic control requirements and enable more effective air traffic operations.

5A06: Terminal Communications – Improve

- **Terminal Communications – Improve**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Terminal Communications Improve project supports the FAA’s system efficiency goal by providing for local projects to improve communications at air traffic control facilities that control traffic into and out of airports. Growth in aviation, relocation of facilities, and interference problems can require relocation or enhancement of terminal communications facilities. Communications problems can slow air traffic controllers and create delays at airports.

5A07: Flight Service Facilities Improvements

- **Flight Service Facilities Improvements**

Primary outcome Goal; FAA Goal: Safety: Reduce fatal accident rates by 80 percent in 10 years.

Narrative for Primary Outcome Goal

The Flight Services Facilities Improvements project contributes to the FAA’s safety goal by maintaining flight service facilities to ensure that they can perform safety of flight functions reliably. The flight service stations prevent accidents by providing weather briefings to pilots and accepting instrument flight plans that ATC facilities use to track pilots.

5A08: Navigation and Landing Aids – Improve

- **Navigation and Landing Aids – Improve**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Navigation and Landing Aids Improve project supports the FAA’s system efficiency goal by continually upgrading and improving the existing services required by users for navigation and landing. Ensuring that damaged navigation and landing aids are repaired and that other aids are relocated to accommodate traffic demands prevents delays and maintains system efficiency.

5A09: Federal Aviation Administration Buildings and Equipment

- **Federal Aviation Administration and Equipment Sustain Support – Modernize /Improve**
- **Seismic Safety Risk Mitigation**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Buildings and Equipment project contributes to the FAA’s system efficiency 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. Because some FAA facilities are

located in areas with high levels of seismic activity, they must be designed and rebuilt to protect personnel and equipment from future seismic events.

5A10: Air Navigational Aids and Air Traffic Control Facilities (Local Projects)

- **Continued General Support – Air Navigation Aids Facilities – Local Projects**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Air Navigation Aids and Air Traffic Control Facilities projects contribute to the FAA's system efficiency goal by ensuring that facilities and equipment failures do not jeopardize the safety and efficiency of the air traffic control environment. Communications, surveillance, weather information, and air traffic control facilities require alterations to support changes in local air traffic patterns, or replacement in case facilities are damaged by severe weather.

5A11: Computer-Aided Engineering Graphics Modernization

- **Computer-Aided Engineering Graphics Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Computer-Aided Engineering Graphics Modernization/Replacement program contributes to the FAA's system efficiency goal by using enhanced computer-aided design and drafting systems. This tool is coupled with a secure Web-based engineering system to facilitate drawing access, retrieval, and update, thus increasing the FAA's ability to implement capital improvements with correct and timely information. The system meets increasing user access needs by expanding and providing a flexible system interface to a suite of state-of-the-art graphical modeling and analysis tools. The computer-aided engineering graphics (CAEG) system provides transition planners and engineers with a set of software tools to support facilities and equipment modeling. The CAEG system also assists spectrum managers in protecting the radio frequency spectrum by providing them with effective tools to model radio coverage of existing and planned facilities. Using information collected from the enhanced traffic management system, terrain databases, existing facility data, and radio characteristics, the CAEG system aids in isolating radio frequency interference sources. The primary tool used by the FAA to perform this function is the radio coverage analysis system. In addition, airport engineers and consultants use CAEG to conduct obstruction evaluations to determine and isolate potential hazards to the navigable airspace. New construction in and around landing facilities is analyzed to determine violations to existing air safety constraints.

5A12: Information Technology Integration

- **Information Technology Integration**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Information Technology Integration project contributes to the FAA's system efficiency goal by decreasing the cost of delivering IT services without reducing service quality, and by optimizing IT decisions and resources across the agency. The e-Gov goal has specific targets for increasing business that the FAA conducts electronically. This will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at the key customer groups of citizens, businesses, other government agencies, and employees, as well as projects dedicated to improving internal efficiency and effectiveness. Expanding e-Gov is also one of the five main goals of the President's Management Agenda. As part of achieving this goal, the FAA will ensure that data and information that are used to conduct critical agency business, or disseminated outside the agency, are timely, accurate, accessible, understandable, and secure.

5A13: Operational Data Management System - NAS Aeronautical Information Management Enterprise System

- **National Airspace System Aeronautical System Resource**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Notice to Airmen (NOTAM) automated distribution system improves system efficiency by providing critical safety information to FAA ATC facilities in a timely and standardized format. In June 2001, an FAA memorandum identified two incidents, which highlighted some weakness in the current NOTAM system and emphasized the urgent need for a replacement system to help ensure critical safety information reaches the pilot and other users of the system. The NOTAM automated distribution solution includes towers/TRACONS, FSS, and ARTCCs of the NAS and also the air traffic control system command center in Herndon, VA. The automated distribution solution will provide standardization within the NAS, timeliness of delivery across the NAS, a centralized NOTAM source, and state-of-the-art entry and delivery of critical safety information using dedicated telecommunications network.

5A14: Logistics Support Systems and Facilities

- **Logistics Support Systems and Facilities – Asset and Supply Chain Management**

Primary Outcome Goal: FAA Goal: System Efficiency Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Logistics Support System and Facilities projects contribute to the FAA's system efficiency goal by providing full lifecycle management of spare parts and other supplies to ensure cost efficiency and rapid delivery of products to multiple customers. The logistics system must be able to manage and ship repair parts and other supplies on a timely basis to avoid system outages and delays.

The Asset and Supply Chain Management program improves operational efficiency and effectiveness by providing a single integrated planning, inventory, and asset management system that is capable of producing performance, financial, and logistics information. The Logistics Support System and Facilities and Asset and Supply Chain Management program are both integrated sets of business solutions that, when working correctly through established interfaces, will allow the FAA to accurately account for all of its assets.

5A15: Test Equipment – Maintenance Support for Replacement

- **Test Equipment Modernization/Replacement**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Goal:

The Test Equipment Modernization/Replacement project contributes to the FAA's system efficiency goal by procuring the test equipment that ensures reliable NAS operation. As the FAA modernizes the NAS, it must purchase appropriate equipment to test installed systems. With this equipment, systems can be repaired efficiently, and outages can be shortened.

5A16: Facility Security Risk Management

- **Facility Security Risk Management**

Primary Outcome Goal: FAA Goal: Safety: Most of FAA's security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Narrative for Primary Outcome Goal:

The Facilities Security Risk Management program contributes to the FAA's safety goal by ensuring that efforts are

in place to provide physical security at all FAA staffed facilities that conform to FAA Order 1600.69a. This order requires physical security protective measures and establishes standards, objectives, procedures, and techniques for protecting FAA employees, agency property, facilities, contractors, and the public. It implements mitigation measures and standards for facility security management, control, and safeguarding of assets and facilities.

5A17: Information Systems Security

- **Information Systems Security**

Primary Outcome Goal: FAA Goal: Safety: Most of FAA’s security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Narrative for Primary Outcome Goal:

The Information Systems Security (ISS) program contributes to the FAA’s safety goal by safeguarding information through various means, such as information security access, Web-based protection, and activities to “firewall” electronic access. International terrorism has become a major threat to U.S. national security, and there are nation-states that have cyber capability and are unfriendly to the United States. The phenomenal growth of the Internet and the worldwide proliferation of sophisticated computer skills have created a potential threat to the nation’s critical information infrastructure, including the air traffic control system. The FAA has three objectives in this area. The first objective is to ensure effective preparedness, detection, response, and recovery regarding cyber attacks. The second objective is to integrate information security efforts into all acquisition and operation phases to protect FAA people, buildings, and information. The third objective is to support the nation’s efforts to safeguard homeland security, in particular the aviation infrastructure and industry.

5A18: Distance Learning

- **Distance Learning**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Distance Learning program contributes to the FAA’s system efficiency goal by providing an alternative delivery mechanism for training the FAA workforce. Distance learning uses various technologies to make training infrastructure available at all significant FAA locations. Distance-learning products include advanced simulation and training course delivery capability at all field learning centers and the integration of NAS equipment subsystem mockups with computer-based instruction terminals.

5A19: National Airspace System Training Facilities

- **National Airspace System Training – Modernization**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Training Facilities Modernization program contributes to the FAA’s system efficiency goal by improving air traffic control tower training through replacement of the FAA’s outdated ATCT cab training simulator. In addition to the ATCT simulator, other improvements include:

- Upgrading classrooms to provide a more effective, efficient presentation and reduce course delivery costs;
- Replacing outdated laboratory equipment with more adequate numbers of actual current field test equipment, reducing class time and making the training more effective; and
- Improving communications between the FAA Academy, regional offices, Washington Headquarters, and field facilities. This results in significant cost savings achieved through increased accuracy and efficiency in the administration of training.

5A20: System Engineering and Development Support

- **System Engineering and Development Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Systems Engineering and Development Support project contributes to the FAA's system efficiency goal by providing support for designing and managing NAS modernization. With support contractor assistance, the FAA is able to increase the sophistication in planning and analyzing NAS system improvements.

5A21: Program Support Leases

- **Program Support Leases**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The FAA Program Support Leases project contributes to the FAA's system efficiency goal by providing funding for existing leases for land and space that directly support NAS operational facilities and such critical NAS components as radars and navigational aids. The leases are contractual commitments for facilities that are critical to ATC system operations.

5A22: Logistics Support Services

- **National Airspace System Regional/Center Logistics Support Services**

Primary Outcome Goal: FAA Goal: Mission Support: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace Regional/Center Logistics Support Services project contributes to the FAA's system efficiency goal by providing real estate, acquisition, and material management contractor support to regions and centers. 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.

5A23: Mike Monroney Aeronautical Center – Leases

- **Aeronautical Center Lease**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Aeronautical Center Lease project contributes to the FAA's system efficiency goal by providing up-to-date facilities and supporting infrastructure that meet the needs of FAA mission support organizations located at the Aeronautical Center. The center's lease provides more than 1,090 acres of land and more than 90 buildings, towers, streets, and infrastructure. Center functions include training each year for more than 30,000 FAA and international students in resident and distance-learning formats (the FAA Academy, Transportation Safety Institute, and U.S. Coast Guard); logistics and supply support to all FAA locations and about 70 DoD and international organizations; cost accounting and payroll services for the FAA and other DOT organizations; engineering services for NAS modification and repair; flight check for calibration and certification of radar and navigation aids at all nationwide locations; airmen and aircraft records and registry; aviation medical research and human factors research; maintenance, administrative, and other support services for the FAA; and support to critical air navigation systems throughout the NAS.

5A24: In-Plant NAS Contract Support

- **In-Plant NAS Contract Support**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for the Primary Outcome Goal

The In-Plant NAS Contract Support project contributes to the FAA's system efficiency goal by augmenting the number of government contract personnel who manage NAS modernization contracts. These additional personnel help monitor contract progress, compliance, and problems. Without this assistance, the FAA would have to slow down the pace – and thus defer the benefits – of modernization.

5A25: Transition Engineering Support

- **National Airspace System Implementation Support Contract**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The National Airspace System Implementation Support Contract (NISC) project contributes to the FAA's system efficiency support goal by providing highly technical engineering support services for the critical planning and transition of new equipment in FAA facilities for over 80 CIP projects within the NAS. The primary function of the NISC is to assist the FAA in ensuring that CIP projects are completed on schedule and within budget while meeting specifications and quality standards. This support helps integrate systems into the NAS and ensures that the equipment functions properly once delivered. NISC support ranges from establishing lightning protection standards that improve facility reliability and availability to providing planning support for installing ground transceivers in Alaska under the Capstone project. Support is also provided for planning new ATC systems, facility modernization, automation, information technology, and configuration management for FAA headquarters and field facilities.

5A26: Federal Aviation Administration Corporate System Architecture

- **Information Technology Infrastructure - Corporate Systems Architecture**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Information Technology Infrastructure project contributes to the FAA's system efficiency goal by developing an IT enterprise architecture that guides the designs for the FAA enterprise network, metropolitan area network, and Internet/Intranet Web pages. By developing a consistent architecture, the FAA information technology systems will be compatible and improve efficiency.

5A27: Technical Support Services Contract

- **Technical Support Services Contract**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal:

The Technical Support Services Contract contributes to the FAA's system efficiency by providing a vehicle that supplies a supplemental workforce to meet NAS modernization needs and schedules. The amount of skilled work needed to modernize the NAS far exceeds available in-house FAA resources. The FAA continues to deploy large quantities of new equipment in support of NAS modernization. Significant work is required for site surveys, and site preparation, and to install, modify, relocate, refurbish, or replace equipment by personnel with electronic, mechanical, and civil engineering skills. The Technical Support Services Contract also encompasses facility cleanup, and environmental and hazardous material remediation.

5A28: Resource Tracking Program

- **Resource Tracking Program**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of aerospace resources.

Narrative for Primary Outcome Goal:

The Resource Tracking Program (RTP) contributes to the FAA's system efficiency goal by providing a set of software tools that enhance F&E workforce productivity. These tools provide current schedules and cost information to engineers and managers regarding F&E projects, and support standardized project management processes across the ATS. They are also used to prepare the corporate work plan that the NAS implementation program uses to plan work and resources. NAS delivery schedules in the RTP are used to identify future budget requirements, prepare internal budgets, and plan for implementation. Additional functions of RTP include resource estimating, project tracking, performance measuring, and F&E project reporting from inception through capitalization.

5A29: Center for Advanced Aviation System Development

- **Center for Advanced Aviation System Development**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Narrative for Primary Outcome Goal

The Center for Advanced Aviation System Development project contributes to the FAA's system efficiency goal by assisting the agency in designing and developing new systems to increase the efficiency and effectiveness of NAS systems. The center performs analytical research, develops operational concepts, and tests new concepts. This support helps increase NAS efficiency by introducing new technology and procedures to handle growing air traffic demand.

5A30: Operational Evolution Plan

- **Operational Evolution Plan**

Primary Outcome Goal: FAA Goal: System Efficiency: Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources

Narrative for Primary Outcome Goal:

The Operational Evolution Plan (OEP) supports the FAA's system efficiency goal by analyzing the strategy to enhance NAS capacity and efficiency. This includes both terminal and en route assessments of procedures and capacity-related technologies to develop solutions for capacity bottlenecks. The OEP develops specific actions and strategies to improve air traffic flow and decrease delays.

5B01: National Airspace System Facilities Occupational Safety and Health Administration and Environmental Standards Compliance;

- **National Airspace System Facilities Occupational Safety and Health Administration**
 - (A) **Occupational Safety and Health Administration Compliance**
 - (B) **Fire Life Safety for Air Traffic Control Towers**
 - (C) **Energy Conversation Implementation**
 - (D) **Environmental Standards Compliance**
- **National Airspace System Facilities Occupational Safety and Health Administration - Environment Policy Development**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The NAS Facilities Occupational Safety and Health Administration and Environmental Standards Compliance program contributes to the FAA human and natural environment goal by providing funds that are used to implement programs to comply with occupational safety and health, environmental, fire life safety, and energy conservation requirements. The program implements new initiatives and modifies existing programs and facilities to meet that goal. In promoting a safe and environmentally sound workplace, agency liability costs associated with worker's compensation claims and environmental cleanup will be greatly reduced, as will adverse operational impacts to the NAS.

5B02: Fuel Storage Tank Replacement and Monitoring

- **Fuel Storage Tanks**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The Fuel Storage Tank Replacement and Monitoring program contributes to the FAA's goal of protecting and enhancing communities and the natural environment. The program ensures that FAA fuel storage tanks are properly designed, installed, monitored, and replaced to eliminate detrimental community and environmental damages resulting from leaking tanks. The program also ensures compliance with environmental and safety regulations of the U.S. Environmental Protection Agency in the Code of Federal Regulations, 40 Part 280; National Fire Protection Association standards; and pertinent state and local mandates.

5B03: Hazardous Materials Management

- **Environmental Cleanup/Hazardous Materials**

Primary Outcome Goal: FAA Goal: Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

Narrative for Primary Outcome Goal:

The Hazardous Materials Management program contributes to the FAA's goal of protecting and enhancing communities and the natural environment by ensuring proactive identification, assessment, remediation, and closure of contaminated FAA sites. The program also ensures compliance with environmental and safety regulations in U.S. Environmental Protection Agency Comprehensive Environmental Response Compensation and Liability Act; Occupational Safety and Health Administration requirements in the Code of Federal Regulations, 29; and pertinent state and local mandates.

Federal Aviation Administration

National Airspace System

Capital Investment Plan

Appendix B

For

Fiscal Years 2004-2008

Federal Aviation Administration Capital Investment Plan Goal Matrix

1. **Department of Transportation (DOT) Strategic Goal: Safety:** Promote public health and safety by working toward the elimination of transportation-related deaths and injuries.

1.1. **Federal Aviation Administration (FAA) Strategic Goal: Safety:** Reduce fatal aviation accident rates by 80 percent in 10 years.

Strategies to Achieve FAA Goal:

Accident Prevention: Prevent accidents before they happen through appropriate, targeted, systematic interventions in the aviation system.

Safety Information Sharing and Analysis: Develop partnerships with the aviation community to share data and information supporting safe, secure aviation.

Certification and Surveillance: Develop new approaches to working with others on certification, inspection, and surveillance, and target FAA resources.

FAA Annual Performance Goals:

- 1.1.1 **Air Carrier Fatal Aircraft Rate** – By 2007, reduce the U.S. commercial aviation fatal aviation accident rate per aircraft departure from a 1994-1996 baseline of 0.051 fatal accidents per 100,000 departures. The fiscal year (FY) 2004 target is 0.028 per 100,000 departures.
- 1.1.2 **General Aviation (GA) Fatal Aircraft Rate** – Reduce the number of general aviation fatal accidents. The FY 2004 target is no more than 349 fatal accidents.
- 1.1.3 **Operational Errors** – Reduce the number of Category A & B (highest severity) operational errors. The FY 2004 target is no more than 629.
- 1.1.4 **Runway Incursions** – Reduce the number and rate (per 100,000 operations) of highest risk (Category A & B) runway incursions. The FY 2004 target is no more than 47 Category A & B runway incursions, which is a rate of 0.072 of 100,000 operations.

2. **DOT Strategic Goal: Mobility:** Shape an accessible, affordable, reliable transportation system for all people, goods, and regions.

2.1. **FAA Strategic Goal: System Efficiency:** Provide an aerospace transportation system that meets the needs of users and is efficient in the application of FAA and aerospace resources.

Strategies to Achieve FAA Goal:

Free Flight: Within safety and environmental considerations, work toward giving aircraft the opportunity to fly in a way that gives them the most benefit as they define it.

National Airspace System (NAS) Modernization: Using the NAS Architecture as the guideline, continually refine and update the NAS to achieve efficient aerospace systems and operations.

Systems Integration: Integrate airport and commercial space requirements into NAS planning and architecture.

FAA Annual Performance Goals:

- 2.1.1. **Airport Daily Arrival Capacity** – Increase the sum of facility-set arrival rates at the 35 airports identified in the Operational Evolution Plan (OEP). The target for FY is 49,120 arrivals.
- 2.1.2. **Airport Arrival Efficiency Rate** – Increase the percent of time arrival demand is satisfied at the 35 airports identified in the OEP to 95.49 percent in FY 2004.

2.1.3. **System Efficiency** – Increase the percentage of aircraft arriving no later than 15 minutes after the scheduled arrival time to 79.2 percent in 2004 at the 32 largest hub airports.

3. **DOT Strategic Goal: Economic Growth:** Support a transportation system that sustains America’s economic growth.

3.1. **FAA Strategic Goal: Economic Growth:** FAA also supports this DOT goal through its system efficiency goal that ensures a safe and secure aerospace system that is efficient for users.

Strategies to Achieve FAA Goal: See FAA Strategic Goal: System Efficiency: Strategies to Achieve FAA Goals.

FAA Annual Performance Goals:

3.1.1. See **FAA Strategic Goal: System Efficiency:** FAA Annual Performance Goals

4. **DOT Strategic Goal: Human and Natural Environment:** Protect and enhance communities and the natural environment affected by transportation.

4.1. **FAA Performance Goal: Human and Natural Environment:** Increase the number of people in residential communities that benefit from an airport improvement program noise compatibility project.

Strategies to Achieve FAA Goal:

Understanding Aerospace Environmental Impacts: Participate in research to understand more fully the effect of aerospace on the atmosphere and the degree of regulation necessary to minimize those impacts.

Reducing Aerospace Environmental Impacts: Use combinations of regulations, research, technology, and procedures to reduce and mitigate adverse impacts from the aerospace.

Quantifying and Mitigating Environmental Impacts of FAA activities: Assess compliance with environmental regulations; honor the mandates to clean up contamination in accordance with existing agreements; reduce the use of hazardous materials at its facilities; and promote recycling.

FAA Annual Performance Goals:

4.1.1. **Noise** - The number of people in the U.S. exposed to significant aircraft noise levels. The FY 2004 target is no more than 436,000 people.

5. **DOT Strategic Goal: National Security:** Ensure the security of the transportation system for the movement of people and goods, and support the National Security Strategy.

5.1. **FAA Strategic Goal: National Security:** Most of FAA’s security functions have been transferred to the Transportation Security Administration and this strategic goal is under review.

Strategies to Achieve FAA Goal:

Security Baseline: Continue to improve the baseline security system for FAA facilities

Information Security: Develop and implement a comprehensive information system security (ISS) program and security activities to protect the national airspace and mission support systems.

Annual Performance Goal:

5.1.1 **Information Security** – Develop and implement a comprehensive ISS program and security activities to protect the national airspace and mission support systems.

6. **DOT Strategic Goal: Organizational Excellence:** Advance the Department’s ability to manage for results and innovation.

6.1 **FAA Strategic Goal: People:** Prepare the workforce for the demands of the 21st century.

Reform: Become more businesslike while increasing customer responsiveness.

Strategies to Achieve FAA Goal:

People: Implement a productive and hospitable model work environment where employees can develop to their potential and contribute fully to the organization. Contributions of all employees are supported and encouraged; discrimination and harassment have been eliminated; and the nation’s diversity is reflected.

Acquisition Reform: Reform acquisition processes to make them faster, simpler, and more mission-based.

Personnel Reform: Reform personnel systems to provide increased flexibility in hiring, pay, and placement; protect employee rights; increase productivity; promote high standards of accountability; enhance the agency’s intellectual capital; and create incentives for change.

Financial Reform: Reform financial systems to enable a more performance-based management approach.

FAA Annual Performance Goals:

6.1.1 Achieve a green rating for the following areas in the President’s Management Agenda:

- Strategic Management of Human Capital
- Competitive Outsourcing
- Improving Financial Performance
- Expanded Electronic Government
- Budget and Performance Integration

6.1.2 Improve the FAA score on the commercial pilot segment of the American customer satisfaction index survey. The FY 2004 performance target for the FAA score on the commercial pilot segment is 63.

6.1.3 Achieve 80 percent of designated acquisition milestones for critical programs and maintain program costs in 80 percent of critical programs as published in the Capital Investment Plan.

Format of Appendix B

The sections of this appendix present multiple Facilities and Equipment (F&E) projects organized into the following format:

Budget Line Item (BLI) Number; BLI Name;

- Capital Investment Plan (CIP) Project Name #1
- CIP Project Name #2

Appendix B Format Legend

Budget Category, Line Item, and CIP Program / Projects

↓
4A02; Terminal Voice Switch Replacement;
 • Enhancement Terminal Voice Switch

← **Primary Goal the Program Supports**

Primary Goal (s): 1.1/1.1.4

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
Enhanced Terminal Voice Switch (ETVS). Improve NAS system efficiency by replacing the electromechanical and aging electronic switches at all ATCTs and TRACON facilities. Through the deployment of modern voice switches, the ETVS Program provides terminal facilities with modern reliable voice-switching capabilities, which enables efficient and effective air traffic operations.	<ul style="list-style-type: none"> • Replaced an additional 24 of 212 terminal voice switches.

Program Title and Outcome Goal Description

FY 2002 Accomplishments

Program Plan FY2003 Performance Output Goals	Program Plan FY2004 Performance Output Goals	Key Events FY2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Replace an additional 17 of 212 terminal voice switches. 	<ul style="list-style-type: none"> • Replace an additional 21 of 212 terminal voice switches in 2004. 	<ul style="list-style-type: none"> • Replace remaining 87 of 212 terminal voice switches in 2005 through 2007.

**Ongoing Activities Planned for
this Fiscal Year**

Planned 2004 Activities

**Key Events Based on Expected
Fiscal Year 2005-08 Funding**

BLIs with X in their number, for example 1A0X, represent programs ending in FY 2002 or FY 2003 and provide FY 2002 accomplishments or FY 2003 program plans or new projects not currently in the Presidents budget. Additionally, due to the significant number of CIP projects, Appendix B does not include CIP Projects under \$5 million (as long as any 1-year does not exceed \$5 million) or leases and contract support projects.

Activity 1: Improve Aviation Safety

1A01: Terminal Business Unit: 1A01A; Next Generation Weather Radar – Provide;

- Next Generation Weather Radar – Open Systems Upgrade
- Medium Intensity Airport Weather System

Primary Goal: 1.1/1.1.1, 1.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Next Generation Weather Radar (NEXRAD) Programs. Improve the NAS safety through better detection and characterization of weather intensity, which is achieved by technology upgrades to the NEXRAD systems, and by implementing medium intensity airport weather system (MIAWS) to airports with limited wind shear detection capabilities. MIAWS will be used to alert air traffic control to the severity, location, movement, and expected duration of weather conditions.</p>		<ul style="list-style-type: none"> • Made available for operational use all 12 FAA NEXRAD sites with the open radar products generator upgrade. • Installed rotary uninterruptible power supply (UPS) at the five remaining FAA NEXRAD sites. • Made MIAWS initial investment decision-2a. • Installed prototype MIAWS at Little Rock, AR; Springfield, MO; and Jackson, MS.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Award production contract to supply 40 airports with MIAWS. • Continue NEXRAD radar data acquisition (RDA) development. 	<ul style="list-style-type: none"> • Award production contract to supply 40 airports with MIAWS. • Begin installing NEXRAD RDA upgrade. 	<ul style="list-style-type: none"> • Complete the last FAA NEXRAD site with the radar data acquisition upgrades for operational use by 2005. • Continue MIAWS installations. • Initiate technical enhancements to MIAWS systems.

1A01: Terminal Business Unit: 1A01B; Terminal Doppler Weather Radar – Provide;

- Terminal Doppler Weather Radar – Product Improvements
- Terminal Doppler Weather Radar – Service Life Extension Program

Primary Goal: 1.1/1.1.1, 1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Terminal Doppler Weather Radar (TDWR) – Product Improvements and TDWR Service Life Extension Program (SLEP) Programs. Increase aviation safety through accurate and timely detection of hazardous aviation weather conditions. The primary mission of the TDWR is to enhance the safety of air travel through timely detection and reporting of hazardous wind shear in and near an airport’s terminal approach and departure zone by detecting microburst and gust fronts.</p>	<ul style="list-style-type: none"> • Completed installing last 2 of 47 systems (Chicago Midway Airport and John F. Kennedy International Airport (JFK)). • Commissioned Chicago/Midway system. • Placed New York/JFK system in operational suitability demonstration phase.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete deployment of radar products generator rehost upgrade at 30 sites. • Commission last of 47 systems at New York/JFK airport. 	<ul style="list-style-type: none"> • Complete implementation of remaining product improvements, including backup communications. 	<ul style="list-style-type: none"> • Continue to implement major elements of the TDWR SLEP, including elevation bull gear replacement, direct digital controller replacement, antenna motor replacement, and RDA retrofit.

1A01: Terminal Business Unit: 1A01C; Airport Surface Detection Equipment;

- **Airport Surface Detection Equipment – Service Life Extension Program**

Primary Goal: 1.1/1.1.4

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Airport Surface Detection Equipment (ASDE) Model 3 Service Life Extension Program (SLEP). Provide positive ground surveillance and assistance to air traffic controllers in expediting aircraft flow during conditions of restricted visibility. The ASDE-3 radar assists the ground controller in preventing collision situations and provides orderly movement of aircraft and ground vehicles on the airport surface when visibility restrictions prevent controllers, pilots, or vehicle operators from seeing other ground traffic on the airport surface. The SLEP addresses obsolete parts issues and other parts impacting reliability and maintainability. SLEP activities will ultimately extend the useful life of the ASDE-3 at 34 high-activity airports an additional 10 years beyond the original 20-year lifecycle to 2015. Mid-life upgrade activities will improve the ability at 34 high-activity airports with the ASDE-3 to integrate its radar output with the ASDE-X processing equipment.</p>	<ul style="list-style-type: none"> • Continued SLEP. • Purchased and tested 80 percent of obsolete part replacements. • Completed designing interim microprocessor subsystem replacement for obsolete subsystem to increase maintainability. • Submitted congressionally requested Ronald Reagan Washington National Airport (DCA) relocation report. • Completed an 80/20 cost estimate report for a 6-year projection for obsolete parts requirements. • Awarded contract for redesigning transmitter amplifier components to correct transmitter reliability problems. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete relocating/reinstalling DCA ASDE-3. • Complete designing obsolete microprocessor subsystem replacement. • Complete design and begin procuring transmitter amplifier components. 	<ul style="list-style-type: none"> • Continue implementing the SLEP through 2004, including purchasing and deploying microprocessor kits and transmitter amplifier upgrades. 	<ul style="list-style-type: none"> • Continue procuring microprocessor subsystem replacement hardware and install at ASDE-3 sites as funding authority becomes available.

1A01: Terminal Business Unit: 1A01D; Airport Surface Detection Equipment – Model X;

- **Airport Surface Detection Equipment Model X**
- **Airport Surface Detection Equipment – X (Tech Refresh and Disposition)**
- **Upgrade Airport Surface Detection Equipment – 3 Sites with Multilateration/Automatic Dependent Surveillance – Broadcast for Initial 7 Sites**
- **Upgrade Airport Surface Detection Equipment – 3 Sites with Multilateration/Automatic Dependent Surveillance – Broadcast for Initial 7 Sites – ASDE 3X Tech Refresh**

Primary Goal: 1.1/1.1.4

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Airport Surface Detection Equipment (ASDE) Model X. Improve safety on the airport surface by preventing accidents resulting from runway incursions. The ASDE-X system will provide detailed coverage of runways and taxiways and will alert air traffic controllers, both aurally and visually, to potential collisions. Runway collision risks will be reduced because controllers will be provided with improved situational awareness, which will ultimately improve the safety of the nation’s runways.</p>		<ul style="list-style-type: none"> • Installed the interim contractor depot logistics support system at Hancock Airport in Syracuse, NY. • Delivered and installed system to key site (Milwaukee, WI, is the key site and Orlando, FL, is the alternate key site). • Conducted software coding, integration, and testing. • Conducted factory acceptance testing. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Complete site acceptance testing. • Complete ASDE-3X critical design review. • Complete operational testing. • Complete initial operating capability (IOC) at key site(s). • Complete final design review (FDR). • Complete in-service decision (ISD). • Conduct independent operational test and evaluation (IOT&E). • Deliver ASDE-3X prototype to Louisville, KY. 	<ul style="list-style-type: none"> • Achieve operational readiness date (ORD) at Raleigh-Durham, NC. • Achieve ASDE-3X interface ORD at Charlotte, NC. • Achieve safety logic ORD at Providence, RI. • Deliver and install 10 ASDE-X. • Deliver and install four ASDE-3 product improvement upgrades. 	<ul style="list-style-type: none"> • Deliver and install 13 sites out of 33 sites. • Achieve dual ASDE-3 radar ORD at Dallas/Ft. Worth, TX. • Achieve ASDE-3 and surface movement radar ORD at Atlanta, GA. • Achieve remote tower ORD at San Jose, CA. • Achieve dual surface movement radar ORD at Phoenix, AZ. • Achieve ORD at 28 sites out of 33 sites (includes the four mentioned above). 	

1A01: Terminal Business Unit: 1A01X1; Airport Movement Area Safety System;

- **Airport Movement Area Safety System**

Primary Goal: 1.1/1.1.4

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Airport Movement Area Safety System (AMASS). Improve runway safety at 34 high-activity airports by using AMASS’s automated visual and aural alarm alerts and warnings provided as an enhancement to the ASDE-3. The enhancements aid the tower controller in preventing accidents that may result from runway incursions and other incidents.</p>		<ul style="list-style-type: none"> • Completed test and acceptance of software build five that resolves remaining human factors open issues and improves overall system performance. • Installed 26 remote audio amplifier modifications (100 percent), which completed the final hardware installations required for commissioning. • Installed 40 computer access panel modifications (100 percent), which closed out IOT&E open item. • Started the operational suitability demonstration for 21 additional systems (57 percent).
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Start the operational suitability demonstration for 11 additional systems (87 percent). • Implement AMASS software build five for 37 systems (100 percent). 	<ul style="list-style-type: none"> • Start the operational suitability demonstration for the last of 37 systems (100 percent). • Implement software build 6 for all systems (100 percent). • Implement the data recording modification for 37 operational systems (100 percent). • Implement the Houston mosaic modification • Implement the terminal automation interface unit security modification for 40 systems and 40 spares (100 percent). 	<ul style="list-style-type: none"> • Not applicable.

1A01: Terminal Business Unit: 1A01X2; Weather Systems Processor;

- **Weather System Processor Tech Refresh/Product Improvements**

Primary Goal: 1.1/1.1.1, 1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Airport Surveillance Radar (ASR) Weather Systems Processor (WSP). Improve aviation safety by providing air traffic controllers with warnings of wind shear and microburst events for immediate issue to pilots. The WSP, a low-cost alternative to TDWR, provides hazardous weather situational awareness for tower and terminal radar approach control (TRACON) personnel, including prediction of gust fronts and storm-cell motion that will allow improved runway reconfiguration in advance of future wind shifts.</p>	<ul style="list-style-type: none"> • Delivered 26 systems.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Complete deployment and commissioning of all 37 systems. 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Address WSP SLEP efforts during phase IIB of ASR-9 SLEP.

1A02: Aviation Weather Services Improvements;

- 1A02A: Integrated Terminal Weather System (W07.01-00)
- 1A02X: Integrated Terminal Weather System – Corridor Integrated Weather System (W07.02-00)

Primary Goal: 1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Integrated Terminal Weather System (ITWS) Programs. Improve safety by the detecting, forecasting, processing, and delivering aviation weather information to pilots, airlines operations centers (AOC), and controllers. ITWS provides terminal aviation weather data and integrated products from other sensors, including TDWR, NEXRAD, low level wind shear alert system (LLWAS), and automated surface observing system (ASOS). ITWS will cover 47 high-activity airports that have significant convective weather.</p>	<ul style="list-style-type: none"> Procured six production systems, deliver six production systems, and installed five systems. Conducted security certification for first article systems. Continued to operate prototypes. Conducted a demonstration/validation of corridor integrated weather systems with additional sensor input. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Procure six production systems, deliver six production systems, and complete seven installations. Conduct acceptance testing, continue algorithm support, and complete information security certification on production. Continue operating prototypes. 	<ul style="list-style-type: none"> Procure, deliver, and install two production systems. Conduct acceptance testing, continue algorithm support, and test, procure, and accept delivery of the software engineering environment. Continue operating prototypes. 	<ul style="list-style-type: none"> Complete production/development efforts. Begin to implement advanced capability upgrades. Replace prototypes with production systems.

1A03: Low Level Wind Shear Alert System – Upgrade;

- **Low Level Wind Shear Alert System – Upgrade to Expanded Network Configuration**
- **Disposal/Decommissioning of Low Level Wind Shear Alert System Model 2**

Primary Goal: 1.1/1.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Low Level Wind Shear Alert System (LLWAS) Programs. Monitor the airport area and alert pilots through air traffic controllers when hazardous wind shear conditions are detected. Severe wind shear/microburst conditions occurring at low altitude near airports can pose a significant threat to aircraft during takeoff or landing. Wind shear conditions are common in the United States, especially in areas with frequent thunderstorms.</p>		<ul style="list-style-type: none"> • Delivered eight low level wind shear alert system relocation/sustainment systems (LLWAS-RS). • Made production decision for LLWAS-RS. • Made ISD for LLWAS-RS. • Completed installation at six operational sites. • Upgraded nine network expansion sites to network expansion++ sustainment configuration. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Deliver remaining 32 LLWAS-RS systems. • Complete installing 33 LLWAS-RS systems. 	<ul style="list-style-type: none"> • Complete last LLWAS-RS system installation. • Establish depot for logistics support. 	<ul style="list-style-type: none"> • Transition to operations (Operational Support Service (AOS-250)). 	

1A04: Aviation Safety Analysis System;

- **1A04A: Aviation Safety Analysis System**

Primary Goal: 1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Aviation Safety Analysis System (ASAS). Improve aviation safety and security through enhanced effectiveness in safety and security regulation and oversight of the civil aviation industry by improving the automation safety and security subsystems and tools that are essential for the safety workforces to accomplish their responsibilities. Provide information technology (IT) infrastructure and develop systems to facilitate partnerships with the aviation community to share data and information supporting safe and secure aviation.</p>	<ul style="list-style-type: none"> • Completed accident investigation quality assurance system upgrade; continued accident investigation duty room system upgrade. • Completed document imaging workflow subsystem (DIWS) automated correspondence; implemented improved telecommunication capabilities. • Completed administration and compliance tracking in an integrated office network Subsystem (ACTIONS)—CETS; implemented reporting modules (consisting of 24 reports); implemented security processes. • Completed covered position decision support subsystem (CPDSS); implemented historical search capability; implemented medication and diagnosis capabilities and an interface with a commercial medication database; implemented security processes. • Completed clinical health awareness program support (CHAPS), updating visit procedures; modified lobby login module; modified reports; displayed shot record and immunization history on screen; showed visit/follow-ups; identified individuals for follow-up procedures. • Acquired infrastructure and lifecycle replacing information technology resources and communication equipment. • Deployed airworthiness directives, notices of proposed rulemaking (NPRMs), Orders,

	<p>Exemptions, special federal air regulation (SFARs), and special conditions to the regulatory guidance library (RGL).</p> <ul style="list-style-type: none"> • Completed requirements phase of certificate management information system. • Deployed project activity file workflow process and policy database. • Fulfilled hardware requirements for national deployment of the parts reporting system. • Implemented a limited production operations specifications sub system solution with additional air carriers. • Developed a Web-based data collection and analysis system for air carrier airport inter reporting system. • Developed and implemented an information system for background checks. • Completed joint vulnerability analysis system. • Developed, tested, and implemented the automated exemption system and integrated rulemaking management information system (IRMIS) 2.0.
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Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Perform DIWS—application enhancements, analysis and design of airman medical examiner (AME) Internet data validation, and analysis of airman to access status information; begin implementing improved telecommunication capabilities and begin identifying, acquiring, and implementing improved viewing equipment. • Perform ACTIONS application enhancements; reengineer analysis and design of compliance assessment reporting system (CARS); integrate CARS data into CETS; and analyze and design reporting modules (for CARS). • Perform CPDSS application enhancement, analysis and design maintenance procedures for interface control document (ICD)-X and AME. • Perform CHAPS enhancement, analysis and design an interface with ICD-X codes and CHAPS diagnosis codes, and analysis and design information retrieval from the Cholestec machines. • Complete DRS upgrade; initiate National Transportation Safety Board recommendations system upgrade. • Deploy airmen certification rating application along with enhancements and database integration with other FAA systems. • Adopt Denver EPS system to replace aircraft certification subsystem as interim solution prior to FY 2003 rehost of ACOS. • Deploy designee information network functionality to select 	<ul style="list-style-type: none"> • Complete the President’s Management Plan for performance by integrating IRMIS with the mainframe historical Federal aviation regulations; migrate the mainframe historical Federal Aviation Regulations into the RGL—providing a link from one system to the other; and incorporate user and management functionality for these systems into IRMIS. • Perform DIWS planned system development, analysis and design of AME Internet data-printing capabilities. • Perform ACTIONS planned system development, develop user manual for CARS, and nationally deploy the system. • Perform CPDSS planned system development and analysis and design of a medical knowledge base procedure. • Perform CHAPS planned system development, reengineer personnel computer (PC) based system to a Web-based system analysis and design. • Deploy Office of Certification AVR-wide software. • Work on implementing the FAA IdMedia system. 	<ul style="list-style-type: none"> • Complete NRS upgrade; initiate accident investigation system consolidation. • Complete DIWS/phase VII and VIII planned enhancements: complete air carrier/airport information reporting system/system development—additional modules; aviation security data repository, technical remote support, and operational systems.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<p>and appointment designees online.</p> <ul style="list-style-type: none"> • Implement enhancements to integrated planning and budgeting system (IPBS). • Develop and Web-enable CARs, Joint Aviation Regulation, and Safety/STCs into RGL. • Incorporate Airport ACs into RGL. • Continue to develop enhancements in the facility security reporting system, the fingerprinting processing system, the crisis management system, and the joint vulnerability analysis system. 	<ul style="list-style-type: none"> • Continue developing and implementing the personnel access security system, a national access control and personnel directory. • Continue developing and implementing the security and investigations information retrieval system, a repository of documents relating to security functions. 	

1A05: Integrated Flight Quality Assurance;

- **Integrated Flight Quality Assurance**

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Integrated Flight Quality Assurance (IFQA) System. Develop and implement electronic capability for collecting and analyzing aggregate digital flight data from airline operations. The IFQA system will develop a secure Internet-based FAA electronic data acquisition and information infrastructure. Implementation will enable the FAA to access airline flight operational quality assurance (FOQA) trend data for NAS oversight purposes, as well as for use in formulating FAA policy and decision-making to improve safety.</p>	<ul style="list-style-type: none"> • Continued technical infrastructure design and development to accommodate growth. • Continued operational test and evaluation (OT&E) of system. • Developed user, administrator, and system documentation and training materials. • Achieved IOC of IFQA system (support for 10 air carriers). • Deployed offsite mirror site and FAA hot backup. • Continued refining ISS capability for emerging threats.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue developing hardware, communication, and technical infrastructure to accommodate growth (35 air carriers). • Implement FOQA training course for aviation safety inspectors. • Implement Web-based training materials and user aids. • Continue developing statistical indices for airline aggregate data submissions. • Continue designing and developing IFQA system data warehouse, data marts, and 	<ul style="list-style-type: none"> • Continue designing and developing expanded IFQA system data warehouse, data marts, template library, and metadata repository. • Evaluate and verify usability of initial deployment of maintenance and engineering applications. • Initiate development and implementation of techniques to support spatial analysis and advanced visualization. • Implement preplanned product improvements (P3I). 	<ul style="list-style-type: none"> • Achieve 100 percent development and implementation of maintenance and engineering applications. • Evaluate and verify usability of initial deployment of spatial analysis and advanced visualization applications. • Implement IFQA system training course for aviation safety inspectors. • Initiate development and implementation of techniques to supply near real-time alerts. • Initiate development and implementation of advanced search and analysis techniques. • Continue designing and developing expanded IFQA

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
metadata repository. <ul style="list-style-type: none"> Initiate separate FOQA applications for maintenance and engineering purposes. 	<ul style="list-style-type: none"> Continue implementing user aids, documentation, FOQA training course, and training materials for P3I releases. Initiate development of IFQA system training course for aviation safety inspectors. 	system data warehouse, data marts, template library, and metadata repository. <ul style="list-style-type: none"> Implement P3I. Continue implementing user aids, documentation, and training materials for P3I releases.

1A06: System Approach for Safety Oversight;

- System Approach for Safety Oversight**

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
System Approach for Safety Oversight (SASO). Improve safety by implementing new approaches to certification, inspection, and surveillance activities with integration of Flight Standards Service (AFS) tools and databases. This system will provide a comprehensive set of analytical tools to allow targeted inspections and actions in areas of highest potential vulnerability and probability of hazard.		<ul style="list-style-type: none"> Not applicable.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Assess the current status and identify the shortfalls of systems, AFS business processes, and aviation regulations and environment for Federal Aviation Regulation Part 121, 137, 142, and 119 operators. Establish and maintain an outreach program to inform and involve all interested parties in the SASO program. Establish and maintain an effective collaborative product team. Develop initial automation requirements. 	<ul style="list-style-type: none"> Develop system safety business processes. Develop risk metrics. Develop supporting analysis/decision tools. Integrate tools and databases.

1A07: Aviation Safety Knowledge Management Environment;
 • **Aviation Safety Knowledge Management Environment:**

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Aviation Safety Knowledge Management Environment. Provide Aircraft Certification Service (AIR), a repository of critical safety technical information and data, and 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.</p>		<ul style="list-style-type: none"> • Not applicable.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Not applicable. 	<ul style="list-style-type: none"> • Conduct system functional requirements gathering and analysis for knowledge management, safety analysis, and electronic file system. • Conduct system functional requirements gathering and analysis for two of AIR operational functions within its certification and regulation responsibilities. 	<ul style="list-style-type: none"> • Define, design, develop, and implement AIR’s automation of the airworthiness directive development process. • Design, develop, and implement AIR’s knowledge management/integrated safety management and analysis tools. • Define and design AIR’s integrated workload tracking requirements into its certification activities.

1A0X1: Safety Performance Analysis System;
 • **Safety Performance Analysis System**

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Safety Performance Analysis System (SPAS). Improve safety by providing aviation safety inspectors (ASI) with an automated tool to assist them in targeting critical areas for inspection. This system provides the capability to target certificate holders that pose a greater safety risk, thus dynamically modifying the surveillance work program. It also allows the FAA to monitor the status of aging aircraft, track the growing number of aircraft operations, and increase industry accountability for aviation safety.</p>	<ul style="list-style-type: none"> • Incorporated air transportation oversight system (ATOS) data repository into SPAS. • Included ATOS data in SPAS data arrays, profiles, and query and browse. • Developed and implemented repair station risk model.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Develop aircraft alias database. • Develop air operator analysis model. • Develop management profile. • Develop enhanced drill down. • Develop ATOS safety attribute inspection and element performance inspection summaries. 	<ul style="list-style-type: none"> • Last year of funding was FY 2003. 	<ul style="list-style-type: none"> • Not applicable.

1B01: Safe Flight 21;

(A) Safe Flight 21 – Alaska Capstone Initiative

(B) Safe Flight 21 – Ohio Valley Prototype Project

(C) Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping

(A) Safe Flight 21 – Alaska Capstone Initiative

Primary Goal: 1.1/1.1.1, 1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Safe Flight 21 – Alaska Capstone Initiative. Reduce the number and rate of accidents and fatalities and amount property damage, and improve aviation safety in Alaska by integrating interdependent technologies. Capstone provides an improved ground and air infrastructure that furnishes pilots with better information about the location and severity of hazardous weather, proximity to terrain, improved instrument approaches to small airports, and traffic information to reduce mid-air collisions. Additionally, Capstone provides improved surveillance information to controllers to assist in sequencing, separation, flight following, and search and rescue activities. A more useable instrument flight rules (IFR) infrastructure will be provided to enable lower en route and approach/departure routes.</p>	<ul style="list-style-type: none"> • Completed phase I (Bethel core) ground broadcast transceivers installations. All units are operational and provide either traffic information to the en route air route traffic control center (ARTCC) or weather information to the pilots. • Purchased enhanced terrain avoidance avionics and installed the first system in the University of Alaska Cessna 172 as part of risk reduction for future installations for participating aircraft in southeast Alaska scheduled to begin early 2003. • Installed automatic dependence surveillance-broadcast (ADS-B) display in Bethel tower to increase controller situational awareness. • Obtained Joint Resources Council (JRC) decision to harden phase I (Bethel core) systems and equipment and obtain operations and maintenance funding. • Defined surveillance requirements and concept of operations for Juneau area of southeast Alaska. • Obtained approval to use global positioning system (GPS) as a primary means of navigation and began developing applicable approaches for airports in southeast Alaska, which will also incorporate use of wide area augmentation system (WAAS) technology with Capstone avionics in southeast Alaska. • Installed and commissioned additional automated weather observing systems (AWOSs).

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Purchase and begin installing ADS-B avionics in participating aircraft in southeast Alaska. • Begin installing enhanced terrain avoidance avionics in participating aircraft in southeast Alaska. • Begin installing ADS-B ground-based transceivers in southeast Alaska. • Based on surveillance requirement and concept of operations, determine surveillance approach (e.g., multilateration, radar, etc.) for Juneau area of southeast Alaska. • Establish approach/terminal services at Juneau International Airport. • Enhance the phase I (Bethel) demonstration area by installing and commissioning additional AWOSs. • Upgrade the phase I ground broadcast transceivers to provide for simultaneous 2-way link for traffic information to the ARTCC and weather information to the pilots. • Obtain JRC decision to harden phase II (southeast Alaska) systems and equipment and obtain operations and maintenance funding. 	<ul style="list-style-type: none"> • Begin expansion of ADS-B ground stations, AWOS, and surveillance coverage for the remainder of the state. 	<ul style="list-style-type: none"> • Continue expansion of ADS-B ground stations, AWOS, and surveillance approach for statewide Alaska.

(B) Safe Flight 21 – Ohio Valley Prototype Project

Primary Goal: 2.1/2.1.1, 2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Safe Flight 21 – Ohio Valley Prototype Project. Improve flight route flexibility and reduce delays by using automatic dependence surveillance-broadcast (ADS-B) technology to achieve user-preferred routes and to maximize airspace and airport resources. ADS-B will serve as enabling technology for free flight capability in the NAS.</p>	<ul style="list-style-type: none"> • Completed developing call sign procedure using ADS-B for trial use in Louisville, KY. • Completed developing concept of use and business case for approach spacing and enhanced visual approach applications. • Supported effort to obtain supplemental-type certificate approval for surface moving map functionality on those aircraft with cockpit display of traffic information (CDTI) displays (working in conjunction with United Parcel Service Airline). • Conducted test and evaluation surveillance and information system contract efforts with avionics vendors to support dual-link interoperability between ADS-B links. • Surveyed 60 airports in the NAS to build map database in support of surface moving map functionality (working in conjunction with national geodetic survey). • Conducted testing of broadcast services using ASDE-X infrastructure. • Began development for integrating ADS-B and standard terminal automation replacement system (STARS).

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Obtain NAS change proposal approval for radar-like separation services, using ADS-B on Common automated radar terminal system (ARTS). • Continue development for integrating ADS-B and multilateration onto STARS. • Continue activities associated with developing and using procedures for CDTI and electronic flight rules in the terminal environment to allow descents through marine layers, etc. • Continue activities associated with developing surface moving map applications to include own vehicle positions on surface vehicles for situational awareness. • Begin activities associated with developing situational awareness tools for ADS-B equipped aircraft in the small airport environment. • Continue activities associated with providing real-time data feeds to the AOCs. 	<ul style="list-style-type: none"> • Continue development for integrating ADS-B and multilateration onto STARS. • Continue activities associated with developing and using procedures for CDTI and electronic flight rules in the terminal environment to allow descents through marine layers, etc. • Continue activities associated with developing surface moving map applications to include position and ADS-B-reported position of other aircraft/vehicles. • Continue activities associated with developing situational awareness tools for • ADS-B-equipped aircraft in the small airport environment. • Continue coordination to ensure ADS-B requirements are incorporated into en route automation modernization (ERAM). • Continue activities associated with providing “real-time” data feeds to include enhanced traffic management system (ETMS) and to support AOC decision tools. 	<ul style="list-style-type: none"> • Expand development and feasibility exploration of ADS-B applications in the en route and oceanic domains. • Continue coordination and begin development for integrating ADS-B and en route automation system. • Work to transition broadcast services for certified use at all ASDE-X locations (in conjunction with the ASDE-X Program). • Explore strategies for integrating CDTI functionality into glass cockpit aircraft. • Complete development for integrating ADS-B and STARS. • Complete activities associated with surface moving map applications to provide traffic information service-broadcast (TIS-B) on both aircraft and vehicles. • Continue activities associated with providing real-time data feeds to include ETMS and to support AOC decision tools.

(C) Automatic Dependent Surveillance Broadcast – Advanced Technology Development and Prototyping

Primary Goal: 1.1/1.1.1, 1.1.2, 1.1.4

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Automatic Dependent Surveillance Broadcast (ADS-B) – Advanced Technology Development and Prototyping (ATDP). Improve aviation safety by developing system standards for ADS-B technology in terminal, en route, and oceanic airspace, as well as on the airport surface. Developing domestic (RTCA) and International Civil Aviation Organization (ICAO) ADS-B performance standards through rigorous testing, simulation, and analysis will enhance surveillance for the pilots and controllers and overall system safety.</p>	<ul style="list-style-type: none"> • Completed RTCA universal access transceiver (UAT) minimum operations performance standards (MOPS). • Completed RTCA airborne separation assurance minimum aviation system performance standards (MASPS) for four ADS-B applications. • Completed Revision A of ADS-B MASPS. • Completed baseline MASPS for TIS-B • Completed Revision A of 1090 MHz ADS-B MOPS.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete baseline RTCA MOPS for airborne surveillance and separation assurance processing (ASSAP). • Complete Revision A of TIS-B MASPS. • Complete integrating CDTI and airborne surveillance and separation assurance MOPS into a single document. 	<ul style="list-style-type: none"> • Begin UAT ICAO standards and recommended practices. • Begin additional revisions of TIS-B MASPS for more ADS-B applications. • Begin additional revisions of airborne separation assurance minimum aviation system performance standard (MASPS). • Begin additional revisions of ASSAP MOPS for more ADS-B applications. 	<ul style="list-style-type: none"> • Complete UAT ICAO standards and recommended practices. • Complete additional revisions of TIS-B MASPS for more ADS-B applications. • Complete additional revisions of ASSAP MASPS. • Complete additional revisions of ASSAP MOPS for more ADS-B applications.

1C01: Advanced Technology Development and Prototyping;

- (A) Separation Standards
- (B) Runway Incursion Reduction Program
- (C) System Capacity, Planning, and Improvements
- (D) Operations Concept Validation
- (E) Software Engineering Resource Center
- (F) Airspace Management Laboratory
- (H) General Aviation /Vertical Flight Technology
- (J) Safer Skies

(A) Separation Standards – Advanced Technology Development and Prototyping

Primary Goal: 2.1/2.1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Separation Standards – Advanced Technology Development and Prototyping (ATDP). Improve oceanic system efficiency through introduction of reduced separation standard values in horizontal and vertical planes. Reduced separation standard values permit more aircraft to operate on fuel- and time-optimal routings during the oceanic phase of flight. Increased system capacity following from introduction of reduced separation standard values, as measured by availability of more fuel- and time-efficient routings, induces reduction in delays of oceanic flights at origin airports because increased system capacity allows more on-time departures.</p>	<ul style="list-style-type: none"> • Initiated safety oversight of Gulf of Mexico and West Atlantic airspace in connection with implementing reduced lateral-separation parallel ATS routes (T-Routes and Q-Routes) (10/01). • Implemented West Atlantic Route System reduced vertical separation minimum (RVSM) (11/01). • Completed safety assessment, readiness assessment, and international documentation to support Western Pacific/South China Sea RVSM implementation (01/02). • Implemented Western Pacific/South China Sea RVSM (02/02). • Conducted RVSM seminar for Caribbean/South American Regions (CAR/SAM) RVSM (08/02).

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Conduct training for RVSM regional monitoring agency for CAR/SAM Regions (10/02). • Conduct seminar for states and operators planning to participate in GOM/CAR RVSM (6/03). • Develop air traffic control operational concept for application of 30-nautical mile (nmi) lateral and longitudinal separation standards in FAA-administered oceanic airspace based on deployed FAA oceanic automation system, controller-pilot data link communications (CPDLC) and ADS (6/03). • Monitor 200 aircraft in connection with application of RVSM airworthiness approval process in North Atlantic and Pacific and with Pacific long-term monitoring requirements. 	<ul style="list-style-type: none"> • Expand use of 50-nmi separation standard based on CPDLC in Pacific airspace (12/03). • Complete analysis of operator equipment and planning for operational trial of 30-nmi lateral and longitudinal separation standards in portion of FAA-administered Pacific airspace (12/03) • Publish operator approval criteria for ADS-based 30-nmi lateral and longitudinal separation standards in portion of FAA administered Pacific airspace (06/04). • Begin pre-operational trial data collection for 30-nmi separation standards in Pacific (07/04) • Complete preliminary readiness and safety assessments for CAR/SAM RVSM (09/04) • Monitor 200 aircraft in connection with Asia Pacific RVSM requirements (09/04). 	<ul style="list-style-type: none"> • Implement CAR/SAM RVSM (12/04). • Implement operational trial of ADS-based 30-nmi lateral and longitudinal separation standards in FAA-administered Pacific oceanic airspace (03/05). • Begin work on horizontal-plane separation minima below 30-nmi for ICAO separation and airspace safety panel (05/06). • Expand use of 30-nmi lateral/longitudinal separation standards to wider area of Pacific (12/06). • Begin operational trial of horizontal-plane separation standard values below 30-nmi in selected portion of Pacific (03/08).

(B) Runway Incursion Reduction Program – Advanced Technology Development and Prototyping

Primary Goal: 1.1/1.1.4

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Runway Incursion Reduction Program (RIRP) – Advanced Technology Development and Prototyping (ATDP). Reduce the number and rate of runway incursions and improve surface safety at NAS airports through research, development, demonstration, and evaluation of new and emerging methods, procedures, and technologies.</p>	<ul style="list-style-type: none"> • Continued research on potential technology solutions for small- to medium-sized airports • Completed the operational evaluation of microwave motion sensors integrated with the pavement light-emitting diode light strip at Eppley Airport. • Conducted testing of runway status lights data fusion and safety logic subsystems. • Developed procedures, education, training, and airport improvements to reduce runway incursions. • Completed site surveys at 14 high runway incursion non-ASDE airports. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue research on potential technology solutions for small- to medium-sized airports. • Complete the technical and operational evaluation of runway status lights program. • Develop performance standards/requirements for selected runway incursion reduction technologies. 	<ul style="list-style-type: none"> • Continue research on potential technology solutions for small- to medium-sized airports • Continue developing performance standards/requirements for selected runway incursion reduction technologies. 	<ul style="list-style-type: none"> • Continue research on potential technology solutions for small- to medium-sized airports. • Continue developing performance standards/requirements for selected runway incursion reduction technologies.

(C) System Capacity, Planning, and Improvements – Advanced Technology Development and Prototyping

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>System Capacity, Planning, and Improvements – Advanced Technology Development and Prototyping (ATDP). This program supports the agency’s efforts to foster a performance-based organization by doing the following: (1) implementing a performance measurement tool that translates the organizations vision/mission and strategies into a set of performance indicators that are linked to activities and initiatives; (2) developing and expanding a computer-based tool that will collect, process, compute, analyze, and report performance-related data; (3) serving as the lead office for developing the Air Traffic Operations (ATO) metrics, which determines system performance in the areas of accessibility, efficiency, predictability, and flexibility.</p>	<ul style="list-style-type: none"> • Developed prototype plan for en route balance scorecard at the following sites: Indianapolis, Memphis, and Atlanta ARTCCs. • Developed en route cost and performance causal models. • Developed and populated Oracle software en route balance scorecard Web site. • Developed facility-level metrics (performance data analysis and reporting system) in support of system-level Government Performance and Results Act metrics. • Completed installing the performance data analysis and reporting system at all ARTCCs and major TRACONs Facilities within the western Pacific and southwest regions. • Developed and revised ATS customer performance metrics in support of Government Performance and Results Act. • Completed ATS performance plan supplement. • Completed executive summary and technical reports compact disc for the O’Hare- delay task force. • Completed capacity enhancement plan report for Washington Dulles International Airport design team study. • Completed the 2001 Aviation Capacity Enhancement Plan. • Completed phase I—simulation and analysis work for the Portland capacity enhancement task force to determine the most cost/benefit solution for airport improvement. • Completed initial developing the random navigation/area navigation capability that analyzes departure and arrival flight paths in the terminal area, and assesses the feasibility of proposed en route flight paths. • Completed the modeling of the along track separation procedure that established the boundaries for both collision and wake turbulence risks of the procedure.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<p>I. NAS Performance Measurement</p> <ul style="list-style-type: none"> • Initiate integration of terminal and en route balance scorecard to generate a parallel between strategy and performance in the regions and facilities. • Initiate the development of an overall ATS/ATO-based balance scorecard. 	<p>I. NAS Performance Measurement</p> <ul style="list-style-type: none"> • Continue developing and integrating the en route/terminal balance scorecard. • Refine facility level metrics tool to incorporate system enhancements and automated reporting. • Continue role as lead support for evolution of 	<p>I. NAS Performance Measurement</p> <ul style="list-style-type: none"> • Finalize integration of the ATS/ATO balance scorecard into ATS. • Initiate integration of facility level metrics into system level. • Revise safety and operational efficiency metrics in support of the ATO.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Develop en route capacity metrics to complement airport benchmark activity. • Provide primary analytical support for developing performance metrics for the new ATO. • Initiate development of Airway Facilities (AF) metrics into the facility. <p>II. Airport Development</p> <ul style="list-style-type: none"> • Complete 2003 aviation capacity enhancement plan. • Formulate a procedures/collision risk model for JFK, Los Angeles International, and Indianapolis airports for the new large aircraft program. <p>III. Capacity Improvement Opportunities</p> <ul style="list-style-type: none"> • Carry out OEP initiative—model effect of airspace redesign on carriers at Houston Airport. • Develop GPS scientific data for flight standards certifying procedures development. • Conduct San Francisco International Airport (SFO) Bay system analysis at Oakland International and San Jose (SJC) Airports. <p>IV. Architecture Deployment Support</p> <ul style="list-style-type: none"> • Participate in developing the simultaneous offset instrument approaches procedures at Lambert St. Louis International Airport 	<p>safety and efficiency metrics for the ATO.</p> <ul style="list-style-type: none"> • Conduct the small aircraft transportation system demonstration at Manassas Regional, Blacksburg, and Daytona Beach. • Expand AF metrics throughout the network. <p>II. Airport Development</p> <ul style="list-style-type: none"> • Formulate a procedures/collision risk model for SFO, Alaska-Anchorage, and ORD Airports for the new large aircraft program. • Complete 2004 Aviation Capacity Enhancement Plan. • Complete regional jets modeling for airports in the eastern and central regions to maximize airport capacity. <p>III. Capacity Improvement Opportunities</p> <ul style="list-style-type: none"> • Support development, promotion, demonstration, and implementation of capacity enhancements. <p>IV. Architecture Deployment Support</p> <ul style="list-style-type: none"> • Support implementation of required navigation performance (RNP) standard operations at SFO, Oakland International, SJC, and DCA Airports. 	<ul style="list-style-type: none"> • Evaluate en route capacity metric to formulate recommendations to improve the NAS. • Conduct the small aircraft transportation system demonstration at the following sites: Cleveland Hopkins International Airport, Langley AFB, and Moffett Federal Airfield. <p>II. Airport Development</p> <ul style="list-style-type: none"> • Formulate a procedures/collision risk model for Miami, Newark, and Oakland Airports for the new large aircraft program. • Continue Aviation Capacity Enhancement Plan development. • Support the capacity benchmark through analysis at pacing airports. • Complete regional jets modeling for airports in the Western Pacific region. <p>III. Capacity Improvement Opportunities</p> <ul style="list-style-type: none"> • Mitigate capacity impacts of wake turbulence. <p>IV. Architecture Deployment Support</p> <ul style="list-style-type: none"> • Conduct benefit assessment of RNP standards.

(D) Operations Concept Validation – Advanced Technology Development and Prototyping

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Operations Concept Validation – Advanced Technology Development and Prototyping (ATDP). Develop and deliver validated operational concepts to identify the transition steps in NAS Modernization and support developing the NAS Architecture and new operational requirements.</p>		<ul style="list-style-type: none"> • Developed detailed scenarios of operational changes in support of architecture and research requirements. • Conducted a comparison of traffic flow management (TFM) techniques (Europe and the United States). • Established a validation data repository for reuse of experimental data and results. • Delivered an analysis of the core factors related to common trajectory. • Developed detailed workload assessments of traffic situations for use in validating density concepts and alerts for collaborative decision making (CDM) and TFM products. • Develop concept for and analysis of separation normalization (3 miles everywhere). 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Deliver an information model to translate concept into NAS interface requirements. • Complete study of the technical and human factor parameters in using flight strip replacements. • Deliver concept of use for future of TFM. Deliver concept of use for management by trajectory. • Develop concept and measures for required total system performance, extending ICAO concept. 	<ul style="list-style-type: none"> • Expand high altitude concept through analysis (strategies for point-to-point—no verbal exchange of latitude/longitude nor inclusion in flight plans (cognitive and situational awareness issues)). • Conduct analysis and develop concept for change in cross-facility coordination (terminal and en route) • Provide capability to model air traffic management (ATM) influences (strategic simulator). 	<ul style="list-style-type: none"> • Develop and demonstrate the concept for dynamic resectorization for just-in-time delivery of capability with ERAM deployment. • Conduct evaluations and demonstrations on the complementary human performance, controller roles and acceptance for the increased functionality supported by delivery of ERAM, TFM, etc., in support of capacity enhancements and efficiency. 	

(E) Software Engineering Resource Center – Advanced Technology Development and Prototyping

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Software Engineering Resource Center (SERC) – Advanced Technology Development and Prototyping (ATDP). Reduce the cost of delivering IT services without reducing service quality, and acquire and maintain critical IT knowledge, skills, and abilities.</p>		<ul style="list-style-type: none"> • Brought together recognized experts and FAA personnel to solve software problems • Evaluated/validated improved software processes, methods, and engineering tools • Improved and modernized FAA software engineering skills and capabilities. • Investigated through research and prototyping better and cheaper ways to ensure that NAS hardware and software are safe, reliable, secure, and efficient. • Adapted NAS systems more rapidly and correctly. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Bring together recognized experts and FAA personnel to solve software problems. • Evaluate/validate improved software processes, methods, and engineering tools. • Improve and modernize FAA software engineering skills and capabilities. • Develop standards and guidelines for commercial-off-the-shelf/non-development items (COTS/NDI) software to improve system cost estimation. • Investigate through research and prototyping better and cheaper ways to ensure that NAS hardware and software are safe, reliable, secure, and efficient. • Modernize obsolete IT infrastructure elements in headquarters and the regions. • Ensure development of effective Web-based service delivery capabilities in support of the electronic government (e-Gov) initiatives. 	<ul style="list-style-type: none"> • Bring together recognized experts and FAA personnel to solve software problems. • Develop procedures that define, refine, and streamline in order to get software products and services fielded faster and cheaper • Support continuation of applied research and prototyping of advanced Air Traffic-related adaptation data management services. • Improve the process for acquiring software-intensive systems integrated with COTS/NDI products. • Explore and develop new ways to reduce costs in selected NAS domains through application of technology in support of the e-Gov initiatives. • Increase the business value targets of e-Gov to ensure that the aeronautical and adaptation data used to conduct critical agency business, or for public dissemination, are timely, accurate, accessible, understandable, and secure. 	<ul style="list-style-type: none"> • Bring together recognized experts and FAA personnel to solve software problems. • Evaluate/validate improved software processes, methods, and engineering tools. • Improve and modernize FAA software engineering skills and capabilities. • Increase the business value targets of e-Gov to ensure that the aeronautical and adaptation data used to conduct critical agency business, or for public dissemination, are timely, accurate, accessible, understandable, and secure. • Investigate through research and prototyping better and cheaper ways to ensure that NAS hardware and software are safe, reliable, secure, and efficient. • Modernize obsolete IT infrastructure elements in headquarters and the regions. • Improve standards and guidelines for COTS/NDI software system cost estimation. • Develop standards and guidelines for COTS/NDI software/system assurance. • Develop standards and guidelines for certifying safety critical software-intensive systems. 	

(F) Airspace Management Laboratory – Advanced Technology Development and Prototyping

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Airspace Management Laboratory – Advanced Technology Development and Prototyping (ATDP). Improve NAS efficiency by providing the data, metrics, and tools to analyze traffic and airspace configuration to optimize traffic flows through sector design and analysis using historical and projected traffic loads.		<ul style="list-style-type: none"> • Completed deployment of first-generation obstruction evaluation legacy system to all FAA regions. • Completed replacing legacy sector design analysis tool (SDAT) functionality on to the PC platform; began integrating data services into SDAT. • Began higher resolution traffic repository for national airspace redesign analysis and deployment of data as an integrated service to SDAT. • Began Web-based airspace metrics.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Expand obstruction evaluation system to handle workflow requirements of non-air traffic divisions. • Enable public to enter obstruction evaluation–airport/airspace analysis (OE-AAA) case. • Expand SDAT coverage to include advanced functionality for terminals and TRACONS. • Integrate noise analysis tools as service to SDAT. • Extend next-day drill-down capabilities of airspace metrics to cover FAA points of delivery from terminal to center. 	<ul style="list-style-type: none"> • Initial external site for public submission of OE-AAA form 7460. • Integrate FAA waiver and violators data systems. • Integrate NASR and OE-AAA geo-spatial systems. • Streamline public access for NASR and OE –AAA systems using Web-enabled technologies. • Integrate weather and navigational aids (NAVAID) facility status with data systems and metrics. • Enhance collection and distribution of the traffic-based metrics throughout FAA and public. • Develop airspace structure configuration management system to support regional and facility airspace design. 	<ul style="list-style-type: none"> • See paperless OE-AAA processing from public entry through workflow processing to resolution. • 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 processes. • Evaluate performance (using airspace metrics) of advanced drill-down capabilities for all FAA points of delivery from terminal to center.

(H) General Aviation/Vertical Flight Technology – Advanced Technology Development and Prototyping

Primary Goal: 1.1/1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
General Aviation (GA)/Vertical Flight (VF) Technology – Advanced Technology Development and Prototyping (ATDP). Reduce GA accident rate by integrating new navigation, communication, and surveillance technology; improved avionics, and aircraft performance capability, in addition to airman training requirements. This will enable a greater number of GA and VF aircraft to receive IFR services and to enable visual flight rules (VFR) aircraft to navigate with a higher level of precision and awareness of the proximity of other aircraft and obstacles.	<ul style="list-style-type: none"> • Conducted flight tests to ascertain maximum descent angles for visual segment of helicopter instrument approaches. Data will be used for terminal instrument procedures (TERPS) criteria and helicopter instrument flight rule (IFR) certification procedures. • Developed initial procedure design for simultaneous non-interfering (SNI) operations in terminal areas. Coordinated procedure development work with Eastern Region staff. • Developed procedures for flight locating (Code of Federal Regulations Part 135.79 requirement) using Safe-Flight 21 concepts. • Completed helicopter instrument landing systems (ILS) lighting simulation evaluation report.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Initiate helicopter steep-angle approach and departure TERPS criteria work. • Complete criteria and standards for revising helicopter ILS lighting standards. • Plan and initiate a demonstration of SNI procedures in the Northeast corridor. Conduct a simulation of SNI procedures to optimize route design. • Initiate research into heliport lighting for instrument operations. Conduct survey into new technology for VFR heliport lighting. • Initiate testing of currently available synthetic vision technology to enhance light general aviation safety. • Complete plan for aircraft regulatory work required for implementing elements of Safe Flight 21. 	<ul style="list-style-type: none"> • Refine Northeast corridor SNI demonstration using WAAS-derived separation standards and the results of simulating procedures to optimize design of routes. • Continue developing complex and steep angle approach and departure criteria for vertical flight aircraft. • Complete research into IFR heliport lighting and new technology for lighting VFR heliports. • Develop Flight Standards guidance materiel for use of enhanced vision equipment and ground proximity equipment for light general aviation aircraft. 	<ul style="list-style-type: none"> • Complete helicopter steep-angle approach and departure TERPS criteria work. • Develop helicopter TERPS for safe, reduced noise segmented approaches. • Develop improved lighting systems for heliports. • Complete SNI demonstration in the northeast Corridor and publish SNI criteria and procedures. • Plan and complete an SNI demonstration in a second major hub area. • Complete aircraft regulatory criteria for small aircraft moving map displays, synthetic displays, and enhanced vision.

(I) Safer Skies

Primary Goal: 1.1, 1.1.1, 1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Safer Skies. Improves safety by analyzing causes of accidents and developing and implementing intervention strategies to prevent or reduce factors that are the leading causes of aviation accidents. Safer Skies has identified the major types of accidents and evaluated pilot actions and equipment failures that lead to the major types of accidents. With this information, corrective actions can be developed and evaluated that will reduce accident rates.</p>	<ul style="list-style-type: none"> • Not applicable. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Develop criteria for WAAS/LAAS airplane and helicopter TERPS. • Develop criteria and standards for the use of private sector communications/spectrum in mountainous terrain. • Develop course on airport surface movement operations and digital data link pilot usage. 	<ul style="list-style-type: none"> • Conduct advanced technology RNP concept development and analysis. • Develop operator and inspector guidance on risk assessment tool usage and interactive checklist and smart alerting systems. • Develop guidance for new standards and procedures surrounding communication, navigation, and surveillance technology. 	<ul style="list-style-type: none"> • To Be Determined

1C02: Aircraft Related Equipment Program;
(A) Aircraft Related Equipment Program
(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

(A) Aircraft and Related Equipment Program

Primary Goal: 1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Aircraft Related Equipment Program. Improve air safety by ensuring that (1) flight inspection aircraft/systems are equipped/modified to validate/certify accuracy of navigational aids' electronic signals and validate/certify the flyability of approach/departure flight procedures and terminal routes at all airports in the NAS; (2) research and development (R&D) aircraft and flight simulators are equipped to test/evaluate new aviation technologies for proof of concept, systems integration, equipment, procedures, and related human factors impacts; and (3) support flight/training mission aircraft are equipped to provide meaningful and relevant aviation safety inspector (ASI) pilot currency/proficiency experience and training required for ASIs to regulate/certify all pilot instructors and test pilots and validate/certify all NAS commercial and civil aircraft operations. Each of these flight program missions serves to reduce fatal aviation accident rates through investigation and incorporation of accident prevention techniques, safety information sharing/analysis, and certification/surveillance via in-flight inspection, testing, evaluation, and validation of activities directly serving safety initiatives benefiting all air carrier and GA users of the NAS.</p>		<ul style="list-style-type: none"> • Installed/evaluated ILS/VOR receivers in one flight inspection aircraft. • Expanded computerized flight monitoring scheduling system (CFMSS) capabilities. • Developed WAAS/LAAS software. • Installed/checked out terrain awareness and warning system (TAWS) in five aircraft. • Continued automated flight inspection system (AFIS) enhancement in 28 aircraft. • Acquired/installed low-earth orbit (LEO) satellite communications (SATCOM) in 10 flight inspection aircraft.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete ILS/VOR receiver installation in all 33 flight inspection aircraft. • Continue expansion of CFMSS capabilities • Acquire WAAS/LAAS receivers (fleet). • Acquire/install TAWS in 22 aircraft. • Install LEO SATCOM in 12 aircraft. • Continue AFIS enhancements in 29 aircraft • Acquire cockpit voice recorder/flight data recorder (CVR/FDR) upgrade (fleet). • Acquire radio frequency interference (RFI)/direction finder (DF) equipment (18 aircraft). • Begin developing modular flight inspection system (MFIS). • Continue developing/integrating ASIS. 	<ul style="list-style-type: none"> • Continue CFMSS expansion. • Continue WAAS/LAAS receiver acquisition/begin installation. • Acquire/install TAWS in 20 aircraft. • Install LEO SATCOM in 11 flight inspection aircraft and two aircraft at Federal Aviation Technical Center (FAATC) and Hangar 6. • Complete AFIS enhancements; four aircraft. • Install RFI/DF capability in 18 aircraft. • Continue acquiring/begin installing CVR/FDR upgrade (fleet). • Continue developing MFIS. • Begin acquiring aircraft collision avoidance system (ACAS II) capabilities for international aircraft. • Begin new technology AFIS development. • Begin cockpit avionics technology refresh for nine flight inspection aircraft for area navigation/required navigation performance capability. 	<ul style="list-style-type: none"> • Complete/implement cockpit avionics technology refresh for 21 flight inspection aircraft. • Develop/implement six MFIS units. • Acquire ACAS II for domestic aircraft; complete ACAS II installation in international and domestic aircraft. • Complete acquisition/installation of CVR/FDR upgrade (fleet). • Develop/implement automated aircraft/scheduling performance system • Develop/implement new AFIS technology • Complete/implement full ASIS capability • Complete WAAS/LAAS receiver's acquisition/installation (fleet).

(B) Aircraft Related Equipment Program – Boeing Simulator Replacement

Primary Goal: 1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Aircraft Related Equipment Program – Simulator Replacement. Improve air safety, through acquiring an advanced technology flight simulator, by performing meaningful and relevant R&D operational evaluations for large transport category aircraft representative of the U.S. air carrier industry. Also, provide capability for ASI pilot training and currency/proficiency experience required in regulating/certifying all activities comprising U.S. aircraft operations.</p>		<ul style="list-style-type: none"> • Solicited vendor interest. • Obtained and evaluated proposals from qualified vendors. • Initiated preparation of updating facilities. • Completed preliminary selection process for vendor for new simulator. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Acquire new simulator. • Upgrade facilities for new simulator. • Complete memorandum of understanding with the Mike Monroney Aeronautical Center for operation and support of new simulators. • Complete programmatic milestone reviews required by contract provisions. 	<ul style="list-style-type: none"> • Complete acquiring new Boeing simulator. • Certify simulator to FAA Level D requirements. • Install/test/accept new simulator. • Conduct simulator operations/maintenance training. • Achieve partial implementation. • Acquire logistics and support equipment. • Implement operational evaluation program. 	<ul style="list-style-type: none"> • Achieve full implementation. 	

Activity 2: Improve the Efficiency of the Air Traffic Control System

2A01: Terminal Business Unit: 2A01A; Terminal Automation Program;

- **Standard Terminal Automation Replacement System – Development and Procurement**
- **Terminal Sustainment**
- **Interim Tower Displays**
- **Standard Terminal Automation Replacement System – Technology Refresh**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Terminal Automation Program. The Standard Terminal Automation Replacement System (STARS) program will provide a digital capable system to meet expanding air traffic control needs. The STARS will provide new computer workstations with high-resolution color displays and commercially based software to allow the FAA to move toward uniform configuration at all terminal facilities. The Terminal Sustain program will maintain the existing FAA automation infrastructure (ARTS IIIA, ARTS IIE, ARTS IIIE, and associated displays) until transitioned to the STARS. The interim tower display program will procure remote ARTS color displays and stand lone tower displays and will relocate existing digital bright radar indicator tower equipment assets to satisfy tower display needs until the STARS Tower Display Workstations can be fielded. The STARS Technology Refresh program will keep the STARS hardware and software current as technology evolves.</p>		<ul style="list-style-type: none"> • Delivered full STARS full service (FS) 2+ to Philadelphia. • Delivered STARS early display configuration-2 (EDC) to seven sites. • Upgraded El Paso and Syracuse to full STARS FS-1. • Continued deployment of lifecycle maintenance builds for EDC-2 and STARS initial systems configuration (ISC). • Procured 18 STARSs. • Commissioned ARTS IIIE at Minneapolis-St. Paul, St Louis, Atlanta phase II, and Northern California. • Delivered final 17 remote ARTS color displays. • Completed ARTS IIIE Power PC upgrade. • Deployed three interim tower displays. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Upgrade El Paso and Syracuse to full STARS FS-2+. • Begin operations with full STARS FS 2+ at Philadelphia. • Conduct STARS FS-2+ IOT&E. • Receive ISD for STARS FS-2+. • Procure 23 STARS and deliver 18 STARS. • Deliver STARS EDC-2+ to four sites. • Start EDC-2 upgrades to FS-2+. • Continue deployment of lifecycle maintenance builds for EDC-2, ISC, and FS-2+. • Complete ISC upgrades to FS-2+. • Deploy 20 interim tower displays. • Commission ARTS IIIE at Potomac. 	<ul style="list-style-type: none"> • Procure 10 STARSs. • Deliver 23 STARSs. • Continue EDC-2 upgrades to FS-2+. • Continue deployment of lifecycle maintenance builds for EDC-2 and FS-2+. • Deploy 10 interim tower displays. 	<ul style="list-style-type: none"> • The STARS program for FY 2005-2008 is currently under review. • Procure 84 STARSs; deliver 106 STARSs; and deploy four interim tower displays. • Develop and implement lifecycle maintenance builds. • Continue planning, developing, and implementing additional STARS enhancements. • Implement STARS technology refresh (e.g., new sun operating systems). 	

2A01: Terminal Business Unit: 2A01B; Air Traffic Control Beacon Interrogator – Replacement;

- **Secondary Surveillance – Air Traffic Control Beacon Interrogator – Replacement**
- **Air Traffic Control Beacon Interrogator Model 6 - Beacon Only Buildings**

Primary Goal: 2.1/2.1.3

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Secondary Surveillance – Air Traffic Control Beacon Interrogator (ATCBI-6) – Replacement. Replace existing surveillance ATCBI-4/5 equipment that has reached the end of its lifecycle. ATCBI-6 selectively interrogates individual aircraft and provides precise tracking information to the host system. This improved automation tool is designed to support Free Flight.</p>	<ul style="list-style-type: none"> • Placed an order for 36 ATCBI-6 production systems. • Received ISD. • Commissioned the first article system at Tinker Air Force Base, OK. • Procured remaining 99 monopulse beacon test sets. • Continued monopulse beacon test sets interface. • Continued developing Occupational Safety and Health Administration (OSHA) ladders. • Procured additional system depot and site spares. • Completed NAS infrastructure management system (NIMS) interface on fixed position surveillance and ARSR-1/2. • Began NIMS interface on BOS, ARSR-3, and ARSR-4. • Continued rotary joint, antenna, and mounting kit installation. • Delivered a total of 17 ATCBI-6 systems. • Conducted site surveys at 17 sites for a total of 76 to date. • Continued the ARSR-3 and ARSR-4/Mode 4 Interfaces. • Supported commissioning efforts. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Place the order for the remaining 42 ATCBI-6 systems. • Complete development on fixed position surveillance and ARSR-1/2 and begin procuring OSHA ladders. • Complete ARSR-3 development of OSHA ladders. • Continue ARSR-4/Mode 4 Interface development. • Complete NIMS interface on BOS, ARSR-3 and continue on ARSR-4. • Continue testing and installing ATCBI-6 systems. • Continue rotary joint and antenna installations. • Establish FAA program support facility. • Complete ARSR-3 rotary joint cut over plan. • Complete NAS/NOM training course. • Complete development and begin production/installation of Mode S antenna modification/antenna trolley system. • Continue to conduct site surveys. • Continue to support commissioning efforts. <p>Estimate: 30 percent of work complete.</p>	<ul style="list-style-type: none"> • Continue to support delivery, installation, and site testing of ATCBI-6 systems and site spares. • Complete testing and installation of the ARSR-4/Mode 4 Interface. • Procure and conduct additional maintenance and operational training. • Continue contractor depot-level support services. • Complete NIMS interface on ARSR-4. • Complete the FAA program support facility. • Continue to support commissioning efforts. <p>Estimate: 50 percent of work complete</p>	<ul style="list-style-type: none"> • Continue to support delivery, installation, and site testing of ATCBI-6 systems and site spares. • Continue contractor depot-level support services. • Conduct additional maintenance and operational training. • Continue to support commissioning efforts. • Complete full transition of FAA depot support in FY 2006. • Complete ATCBI-6 commissioning efforts in FY 2008.

2A01: Terminal Business Unit: 2A01C; Air Traffic Control En Route Radar Facilities Improvements;

- Long-Range Radar Program – Long Range Radar Improvement – Infrastructure Upgrades
- En Route Radar Facilities Improvements-In-Service Engineering

Primary Goal: 2.1/2.1.3

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Long-Range Radar (LRR) Improvements – Infrastructure Upgrades. Improve NAS efficiency by ensuring that aircraft positional information and identification derived from LRR sites remain available to support air traffic control services (including separation assurance, traffic management, navigation, and flight information).</p>		<ul style="list-style-type: none"> • Completed infrastructure upgrades at 25 additional en route LRR facilities; 50 of 126 facilities (or 40 percent) have been completed to date; refurbished or replaced heating, ventilating, and air-conditioning (HVAC) systems and power panels, made improvements to grounding systems, and replaced equipment shelters where necessary. • Performed in-service engineering.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Attain 56 percent completion by performing facility infrastructure upgrades at 20 additional en route LRR facilities out of 126. Refurbish or replace HVAC systems and power panels, make improvements to grounding systems, and replace equipment shelters, where necessary, at ATCBI-6 sites. • Perform in-service engineering 	<ul style="list-style-type: none"> • Attain 62 percent completion by performing facility upgrades at about eight additional en route LRR facilities out of 126 sites. Upgrade environmental control systems; lightning, grounding, bonding, and shielding systems; and power control systems; as well as modify or replace equipment shelters. • Perform in-service engineering 	<ul style="list-style-type: none"> • Attain 90 percent completion by upgrading en route, beacon-only, ARSR 1/2, 2, and 3 and fixed-position surveillance sites receiving ATCBI-6 systems, including refurbishing 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.

2A01: Terminal Business Unit: 2A01D; Terminal Air Traffic Control Facilities – Replace;

- Air Traffic Control Tower/Terminal Radar Approach Control Replacement

Primary Goal: 2.1/

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Air Traffic Control Tower (ATCT)/Terminal Radar Approach Control (TRACON) Replacement. Improve system efficiency and availability of NAS service by replacing existing ATCTs and TRACONs that cannot meet the needs of present-day airport operational requirements. The average age of control towers is 27 years, and some are as old as 40 years. As the volume and complexity of terminal air traffic control increases, so does the need to have additional positions in the ATCTs/TRACONs. The FAA provides air traffic control services from over 270 ATCTs/TRACON facilities and must continually replace these buildings to meet demands.</p>	<ul style="list-style-type: none"> • Procured equipment for 10 sites. • Started construction at five sites. • Commissioned five sites.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Start construction at five sites. Commission six sites. 	<ul style="list-style-type: none"> Start construction at four sites. Commission 11 sites. 	<ul style="list-style-type: none"> Start construction at 21 sites. Commission 25 sites.

2A01: Terminal Business Unit: 2A01E; Air Traffic Control Tower/Terminal Radar Approach Control Facilities - Improve;
(A) Air Traffic Control Tower/Terminal Radar Approach Control Modernization
(B) Advanced Facility Planning
(C) Standard Terminal Automation Replacement System Facilities Upgrades

(A) Air Traffic Control Tower/Terminal Radar Approach Control Modernization

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
Air Traffic Control Tower (ATCT)/Terminal Radar Approach Control (TRACON) Modernization. Improve system efficiency and availability of service in the NAS by modernizing and improving terminal facilities to meet current and future operational requirements.	<ul style="list-style-type: none"> Improved, repaired, and sustained 40 ATCTs/TRACON facilities. Added additional positions at two ATCTs/TRACON facilities. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Improve, repair, and sustain 42 ATCTs/TRACON facilities. Add additional positions at six ATCTs/TRACON facilities. 	<ul style="list-style-type: none"> Improve, repair, and sustain 114 ATCTs/TRACON facilities. Add additional positions at four ATCTs/TRACON facilities. 	<ul style="list-style-type: none"> Continue facility sustainment and modernization activities (subject to available funding).

(C) Standard Terminal Automation Replacement System Facilities Upgrades

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
Standard Terminal Automation Replacement System (STARS) Facilities Upgrades (F01.01-01). Complete facility upgrades required providing a stable platform for deployment of STARS.	<ul style="list-style-type: none"> Provided facility upgrades for STARS deployment at 14 TRACONs and/or associated ATCTs. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Provide facility upgrades for STARS deployment at 56 TRACONs and/or associated ATCTs. 	<ul style="list-style-type: none"> Provide facility upgrades for STARS deployment at 33 TRACONs and/or associated ATCTs. 	<ul style="list-style-type: none"> Provide facility upgrades for STARS deployment for remaining TRACONs and/or associated ATCTs. <p>Note: Last year of funding for this program is FY 2006.</p>

2A01: Terminal Business Unit: 2A01X1; Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace

- **Large Terminal Radar Approach Controls - Potomac TRACON**

Primary Goal: 2.1/2.1.5

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace – Potomac Consolidated TRACON (PCT). Consolidate the Andrews Air Force Base, Baltimore-Washington International, Dulles International, Reagan National, and Richmond International TRACONs into a single new facility at Vint Hill, VA, and redesign the Washington/Baltimore Metropolitan Area airspace.		<ul style="list-style-type: none"> • Completed installing most equipment and declared IOC on September 30, 2002. Commissioned December 14, 2002. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • PCT commissioning (phase 1) assumed IAD TRACON operations in December 2002. • Consolidate DCA, Andrews Air Force Base, Baltimore-Washington International, and Richmond International (phases 2-4). • Implement new PCT airspace following successful completion of National Environmental Policy Act process and TRACON collocation. 	<ul style="list-style-type: none"> • Not applicable. 	<ul style="list-style-type: none"> • Not applicable. 	

2A01: Terminal Business Unit: 2A01X2 ; Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace

- **Large Terminal Radar Approach Controls - Northern California TRACON**

Primary Goal: 2.1/2.1.5

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Air Traffic Control Tower/Terminal Radar Approach Control Establish/Sustain/Replace – Northern California TRACON. Consolidate air traffic control services of Sacramento, Bay, Monterey, and Stockton TRACONS into a new facility at Sacramento.		<ul style="list-style-type: none"> • Commissioned NCT phase 1 (Sacramento TRACON) operations August 28, 2002. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Consolidate air traffic control services of Sacramento, Bay, Monterey, and Stockton TRACONS into a new Sacramento facility (phase 2). • Transfer some Oakland ARTCC airspace. 	<ul style="list-style-type: none"> • Not applicable. 	<ul style="list-style-type: none"> • Not applicable. 	

2A01: Terminal Business Unit: 2A0F; Terminal Digital Radar (Airport Surveillance Radar Model 11);

- Airport Surveillance Radar Model 11, Airport Surveillance Radar Model 7, and Airport Surveillance Radar Model 8 Replacement
- Airport Surveillance Radar Model 11 - Tech Refresh

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>The Terminal Digital Radar Programs/ASR-11 (ASR-7/-8 Replacements). Improve system efficiency and availability of service in the NAS by replacing existing ASR-7/8 systems and associated ATCBI 4/5. Replacing existing systems with new digital ASR-11 radar systems will ensure continuation of surveillance service with improved and expanded six-level weather detection/display capability. New digital ASR-11 systems will also provide the input required for STARS and eliminate the need and cost to reengineer/replace obsolete parts required to sustain existing ASR-7/8 systems.</p>		<ul style="list-style-type: none"> • Procured three of 112 production systems. • Installed one ASR-11 system at Department of Defense (DoD) site. • Completed construction at eight ASR-11 facilities. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Procure four production systems. • Achieve ORD at Key Site, Stockton, and first operational feed at Willow Grove. • Complete construction at four ASR-11 sites. • Deliver and commission four ASR-11 systems. • Conduct IOT&E. 	<ul style="list-style-type: none"> • Procure 10 production systems. • Complete 16 site surveys. • Complete construction of 16 ASR-11 sites. • Deliver and commission 12 ASR-11 systems. 	<ul style="list-style-type: none"> • Complete construction at 69 ASR-11 sites. • Deliver and commission 70 ASR-11 systems. 	

2A01: Terminal Business Unit: 2A01G; Terminal Radar Program – Airport Surveillance Radar Model 9;

- Airport Surveillance Radar Model 9 - Service Life Extension Program
- Terminal Radar Program – Airport Surveillance Radar Model 9 – Occupational Safety and Health

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>The Airport Surveillance Radar (ASR) Model 9 Programs. Completed the ASR-9 system acquisition program, with all systems delivered and commissioned, but numerous outages at specific locations have impacted critical ASR-9 operations. Due to increases in power outages, equipment outages, OSHA concerns, and diminishing manufacturing sources (obsolete parts), a SLEP is necessary to maintain the functionality currently provided by these systems.</p>	<ul style="list-style-type: none"> • Initiated OSHA modifications, including wave-guide relocation, lift cart, and safe sail access. • Installed 20 ASR-9 jackscrew and box-beam emergency fixes. • Exercised option for procuring receiver/protectors that have exceeded their service life. • Initiated nonrecurring engineering effort for SLEP. • Completed surveillance and communication interface processor emulator for Potomac TRACON project.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Conduct OSHA modifications; including wave-guide relocation, lift cart, and safe sail access. • Complete antenna box-beam and jackscrew fixes. • Complete SLEP preliminary design review (PDR) and working engineering model. • Exercise option for procuring receiver/protectors that have exceeded their service life. 	<ul style="list-style-type: none"> • Continue OSHA modifications, including wave-guide relocation, lift cart, and safe sail access. • Exercise option for procuring receiver/protectors that have exceeded their service life. • ASR-9 SLEP JRC 2B decision. 	<ul style="list-style-type: none"> • Complete OSHA modifications, including wave-guide relocation, lift cart, and safe sail access. • Exercise final option for procuring receiver/protectors that have exceeded their service life. • Conduct SLEP.

2A01: Terminal Business Unit: 2A01X3; Mode Select – Provide;

- **Mode Select**
- **Mode Select – Service Life Extension Program**

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>The Mode Select (Mode S) Programs. Implement a National Upgrade II. The current 68020 processor does not have enough capacity to meet initial and future Mode S requirements. The national upgrade to replace the 68020 processor with the newer 68040 processor is required to install dynamic reflectors to mitigate a critical beacon reflection problem, traffic information system (TIS), site identifications to support deployment of beacon interrogator model 6 and ASR-11/monopulse secondary surveillance radar (MSSR). Also, procuring time of year clock replacement, reworking the digital power supply, and modifying the modulation control unit board will improve performance, reliability, and supportability.</p>	<ul style="list-style-type: none"> • Initiated Mode S national upgrade. • Installed time of year clock, modified modulation control unit, and reworked the digital power supply. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue installing 68040 processor boards in conjunction with Mode S national upgrade. • Continue installing time of year clock, modifying modulation control unit, and reworking the digital power supply. • Expand TIS coverage. 	<ul style="list-style-type: none"> • Complete last ORD in FY 2004. • Complete installing 68040 processor boards in conjunction with Mode S national upgrade. • Initiate advanced message format. 	<ul style="list-style-type: none"> • Complete installing time of year clock, modulation control unit modification, and rework of the digital power supply. • Implement advanced message format. • Implement ASR-9 SLEP activities.

2A01: Terminal Business Unit: 2A01H; Terminal Applied Engineering;

- **Terminal Applied Engineering**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Terminal Applied Engineering. Support system efficiency by streamlining deployment of FAA resources to conduct surveys and by providing a benchmark for future terminal facility planning.</p>		<p>An additional 15 out of 400 TRACON and ATCT facilities achieved the following outcomes:</p> <ul style="list-style-type: none"> • Completed government transition evaluations (GTE) and facility condition assessments (FAA Order 6480.17), including initial cost estimates for the FY 2005 budget submission. • Created or redlined facility drawings for configuration management. • Achieved approval of the NAS terminal facilities master plan guidelines for existing terminal facilities, FAA-STD-059, August 9, 2002, by the • NAS CCB. • Completed phase II for the facilities information and analysis tool (FIAT). • Developed initial training plan for the FIAT. • Integrated existing GTE report format into the new FIAT tool. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<p>An additional 47 out of 400 TRACON and ATCT facilities will achieve the following outcomes:</p> <ul style="list-style-type: none"> • Perform GTEs and facility condition assessments (FAA Order 6480.17), including initial cost estimates for the FY 2006 budget submission. • Create or redline facility drawings for configuration management. • Complete and execute training plan for the FIAT. • Develop nine terminal facility master plans, including final cost estimates. 	<p>An additional 52 out of 400 TRACON and ATCT facilities will achieve the following outcomes:</p> <ul style="list-style-type: none"> • Perform GTEs and facility condition assessments (FAA Order 6480.17), including initial cost estimates for the FY 2007 budget submission. • Create or redline facility drawings for configuration management. • Develop terminal facility master plans, including final cost estimates. • Perform 15 followup GTE's from previous evaluations. 	<p>An additional 133 out of 400 TRACON and ATCT facilities will achieve the following outcomes in 2005 through 2007:</p> <ul style="list-style-type: none"> • Perform GTEs and facility condition assessments (FAA Order 6480.17), including initial cost estimates for the FY 2008–FY 2010 budget submissions. • Create or redline facility drawings for configuration management. • Develop terminal facility master plans, including final cost estimates. • Per year, perform 15 followup GTEs from previous evaluations. • Maintain 30 percent of existing terminal facility master plans continuously on a 2-year lifecycle. 	

2A01: Terminal Business Unit: 2A01I; Precision Runway Monitor;

- Precision Runway Monitor

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Precision Runway Monitor. Provide the capability to conduct simultaneous independent approaches on closely spaced parallel runways less than 4,300 feet apart during adverse weather conditions and thereby reducing delays.</p>	<ul style="list-style-type: none"> • Completed contractor acceptance inspection on the San Francisco International Airport system • Initiated System #6 Type “C” configuration upgrade. • Completed site construction at the John F. Kennedy International Airport. • Completed information security testing on the Philadelphia system. • Initiated the San Francisco International Airport commissioning activities • Initiated phase IV testing on the John F. Kennedy International Airport system. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete production of system #6 to Type “C” configuration upgrade. • Commission the San Francisco International Airport system. • Commission the John F. Kennedy International Airport system. • Award the contract for systems #1-5 Type “C” configuration upgrade kits. • Award the system #6 contract for site construction and system installation. • Deliver system #6 to the installation site and commence installation activities. • Initiate procuring system #7 materiel components. • Build a system for use as a training table. 	<ul style="list-style-type: none"> • Complete system #6 installation and testing. • Continue procuring system #7. • Initiate system #6 commissioning activities. • Continue installing systems #1-5 Type “C” configuration upgrade kits. • Begin site evaluation/site preparation activities for system #7. 	<ul style="list-style-type: none"> • Complete procuring system #7. • Award the system #7 contract for site construction and system installation. • Complete installing systems #1-5 Type “C” configuration upgrade kits. • Commission system #6 in February 2005. • Complete system #7 construction, site testing, and system integration. • Commission system #7 at the end of calendar year 2006.

2A01: Terminal Business Unit: 2A01J; Houston Area Air Traffic System;

- Houston Area Air Traffic System

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Houston Area Air Traffic System. Provide air traffic control improvements and additional navigation aids in the Houston metropolitan area so that the new runway under construction can be used efficiently. New runways add capacity and reduce air traffic delays.</p>	<ul style="list-style-type: none"> • Funding profile being developed for the TRACON replacement 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Conduct generic design and site selection. 	<ul style="list-style-type: none"> • Conduct site adaptation. 	<ul style="list-style-type: none"> • Conduct environmental assessment. • Conduct site acquisition. • Award construction contract.

2A01: Terminal Business Unit: 2A01L; New York Integrated Control Complex

- **New York Integrated Control Complex**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>New York Integrated Control Complex. Replace the existing consolidated TRACON and the en route center with a single facility that will address capacity constraints in the New York area. Consolidating the facilities and the airspace they control will allow more efficient use of the total airspace and reduce the artificial boundaries that prevent efficient use of the airspace.</p>		<ul style="list-style-type: none"> • Not applicable. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Conduct generic design and site selection. 	<ul style="list-style-type: none"> • Conduct site adaptation. 	<ul style="list-style-type: none"> • Conduct environmental assessment. • Conduct site acquisition. • Award construction contract. 	

2A01: Terminal Business Unit: 2A01M; Aeronautical Data Link Tower Data Link Services

- **Aeronautical Data Link Tower Data Link Services – Replacement**

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Tower Data Link Services: Provide data link capabilities and associated benefits to 58 high-density airport traffic control towers.</p>		<ul style="list-style-type: none"> • Obtained ISD for technology refresh; performed technology refresh at 13 sites (goal: 11 sites). 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Complete technology refresh at remaining 45 sites. • Deliver first software upgrade release to field. • Establish NIMS interface requirements. 	<ul style="list-style-type: none"> • Continue with scheduled software releases. • Connect to NIMS. 	<ul style="list-style-type: none"> • Establish requirements for replacement program • Develop replacement product (function). 	

2A02: Aeronautical Data Link Applications;

(A) Aeronautical Data Link - Flight Information Service

(B) Aeronautical Data Link - Controller-Pilot Data Link Communication Build I/IA

(A) Flight Information Service

Primary Goal: 1.1/1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Flight Information Service (FIS). Improve the safety of the NAS by providing new weather hazard graphics directly to pilots via data link for cockpit display relative to current position and route of flight, and by improving the quality of aviation weather hazard advisories (en route and terminal) through input of aircraft-derived weather data from low-altitude commuter and package-carrier operations via the tropospheric airborne meteorological data reporting (TAMDAR) program.</p>	<ul style="list-style-type: none"> • Achieved operational flight information service data link (FISDL) service through activation of 70 ground stations out of 200 planned (35 percent). • Achieved more than 450 active users of FISDL services; target 5,000 by FY 2008 (9 percent). • Published performance criteria for determining continuation and/or extension of FISDL service. • Published government-industry standards for FIS-B data link communications prepared by RTCA Special Committee 195.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Expand national coverage and operational FISDL services through activation of 100 more ground stations, resulting in 170 operational out of 200 total (85 percent). • Achieve at least 1,000 active users of FISDL services out of 5,000 planned (20 percent). • Establish FAA monitoring and quality control of FISDL services. • Publish advisory circulars and technical standards order supporting FISDL implementation. 	<ul style="list-style-type: none"> • Complete activation of 30 remaining FISDL ground stations, resulting in 200 operational sites (100 percent). • Achieve at least 1,500 active users of FISDL services out of 5,000 planned (30 percent). • Evaluate solution alternatives for implementing TAMDAR, a national system for collecting and disseminating automated meteorological reports from low-altitude aircraft operations in the NAS. 	<ul style="list-style-type: none"> • Achieve at least 1,000 additional active users of FISDL services each year; target at least 5000 by FY 2008 (100 percent). • FAA decision to implement TAMDAR in FY 2005. • Publish standards guidance (RTCA, ACs, technical standards orders) supporting introduction of TAMDAR service in FY 2006. • Implement initial TAMDAR service in FY 2008; equip at least 10 aircraft of planned 200 aircraft (5 percent). • Evaluate technology alternatives to FISDL service (FIS/NEXT).

(B) Controller-Pilot Data Link Communication Build I/IA

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Controller-Pilot Data Link Communication (CPDLC) Build I/IA. Combine reduced voice communications workload and distribute communications responsibility to provide benefits by increasing flight efficiency—which is reflected by less time and fewer miles flown in sector as well as increased airspace capacity, which is reflected by increased sector traffic throughput (miles in trail restrictions relaxed in an experimental sector based on voice communication reduction) and reduced delay.		<ul style="list-style-type: none"> Completed CPDLC Build I evaluation at Miami ARTCC.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Complete CPDLC Build I initial daily use (IDU) at Miami ARTCC. 	<ul style="list-style-type: none"> Install and check out Build IA system at William J. Hughes Technical Center. 	<ul style="list-style-type: none"> Complete CPDLC Build IA IDU at Miami ARTCC.

2A03: Free Flight Phase 2;

- (A) Free Flight Phase 2 Integration
- (B) Free Flight Phase 2 User Request Evaluation Tool
- (C) Free Flight Phase 2 Traffic Management Advisor - Single Center
- (D) Free Flight Phase 2 Collaborative Decision-Making
- (E) Free Flight Phase 2 Priority Research Support Efforts
- (F) Free Flight Phase 2 Sustain

(A) Free Flight Phase 2 Integration

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Free Flight Phase 2 – Integration. Improve system efficiency by supporting the IDU/planned capability available activities for the Free Flight Phase 2 tools/capabilities.		<ul style="list-style-type: none"> Established Free Flight Phase 2 tracking milestones during JRC-2B in June 2002. Prepared risk management plan/report, human factors (HF) report, and security certification authorization plans (SCAP) for FFP2. Publish semiannual Metrics Report.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Update risk management plan/report, HF report, and SCAPs, as necessary. Publish semiannual metrics report. 	<ul style="list-style-type: none"> Update risk management plan/report (reduce Risk Management meetings to bimonthly), HF report (defer some TBD HF activities to FY 2005), and SCAPs, as necessary. Publish single annual metrics report only. 	<ul style="list-style-type: none"> Update risk management plan/report, HF report, and SCAPs, as necessary. Publish semiannual metrics report.

(B) Free Flight Phase 2 User Request Evaluation Tool

Primary Goal: 2.1/2.1.1, 2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Free Flight Phase 2 – User Request Evaluation Tool (URET). Provide a tool that identifies conflicts in requested flight paths and allows air traffic controllers to evaluate pilot requests. Contribute to an increase in direct routings by 15 percent.		<ul style="list-style-type: none"> Established Free Flight Phase 2 tracking milestones during JRC-2B in June 2002.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Achieve IDU at four URET site. 	<ul style="list-style-type: none"> Achieve IDU at 10 URET sites. 	<ul style="list-style-type: none"> Attain planned capability available on build six in FY 2006. Turn support over to ATS in FY 2007.

(C) Free Flight Phase 2 Traffic Management Advisor - Single Center

Primary Goal: 2.1/2.1.1, 2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Free Flight Phase 2 - Traffic Management Advisor (TMA) – Single Center (TMA-SC). Contribute to an increased capacity at selected airports by three percent.		<ul style="list-style-type: none"> Established Free Flight Phase 2 tracking milestones during JRC-2B in June 2002.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Deploy TMA-SC to one site. 	<ul style="list-style-type: none"> Continue spiral development enhancements/fixes as prioritized by National User Team using current year funding level (enhancements/fixes are “to-do” items maintained by national user team in response to input from end-item users). Support existing site. 	<ul style="list-style-type: none"> Deploy TMA-SC to remaining three FFP2 sites by end of FY 2007.

(D) Free Flight Phase 2 Collaborative Decision Making

Primary Goal: 2.1/2.1.1, 2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Free Flight Phase 2 - Collaborative Decision Making (CDM). Contribute to an increased capacity at selected airports by three percent and contribute to an increase in direct routings by 15 percent.		<ul style="list-style-type: none"> Established Free Flight Phase 2 tracking milestones during JRC-2B in June 2002.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Develop and implement CDM functional enhancements in periodic (6 months) deliveries (enhancement items are prioritized by National User Team using current year funding level). 	<ul style="list-style-type: none"> Develop and implement CDM functional enhancements in periodic (6 months) deliveries (enhancement items are prioritized by National User Team using current year funding level). 	<ul style="list-style-type: none"> Develop and implement CDM functional enhancements in periodic (6 months) deliveries (enhancement items are prioritized by National User Team using current year funding level).

(E) Free Flight Phase 2 Priority Research Support Efforts

Primary Goal: 2.1/2.1.1, 2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Free Flight Phase 2 - Priority Research Support Efforts. Develop new tools to help increase NAS capacity and efficiency.		<ul style="list-style-type: none"> Conducted lab and field evaluations of priority research tools. Established JRC investment decisions for incremental development of problem analysis, resolution, and ranking.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Conduct lab and field evaluations of traffic management advisor - multi center; direct-to problem analysis, resolution, and ranking; and surface management system. 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Prepare investment analysis documents for final investment decision. Deploy operational prototype, if technology is sufficiently mature. Transition prototype to production (if research is successful).

2A04: Air Traffic Management;

- Traffic Flow Management Infrastructure – Current Enhanced Traffic Management System Operations**

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
Traffic Flow Management (TFM) Infrastructure – Current ETMS OPS. Improve system efficiency in utilizing national-scale traffic management. Sustain and upgrade mission-essential TFM operations mandated congressionally to handle the expected increase in air traffic and TFM message traffic that will be generated by full implementation of new delay reduction initiatives and free flight.	<ul style="list-style-type: none"> Installed ETMS in new Potomac TRACON and Gateway (STL) TRACON. Completed bandwidth manager circuit upgrade initiatives. Finalized communications upgrade to support current requirements and new FFP1 functionality, including additional ground delay program enhancements and collaborative routing tools. Software/memory upgrades to increase efficiency and functionality for configuration at traffic management units (TMUs), hub, and lab facilities. Completed all scheduled ETMS/ runway visual range (RVR) interface installations Completed SCAP.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • ATM (ETMS) to continue functional upgrades to provide national-scale traffic management tools to balance traffic loads. • Support continued safe flight operations and maximize air traffic flow performing the mission of managing en route air traffic flow at the air traffic control system command center (ATCSCC) using data from the TFM hub. • Report traffic conditions from local TMUs and coordinate delay reduction initiatives with the airlines. • Develop and initiate new software releases and related data integration affecting hub operations at VOLPE. • Install ETMS in Louisville TRACON and Philadelphia TRACON. • Integrate sector traffic management tools, Web-based situational display, dynamic sector realignment, and monitor alert-flight database restructuring. • Continue all scheduled ETMS/RVR interface installations. • Update SCAP to reflect new functionalities as required. • Implement departure spacing programs (DSP) at selected sites. 	<ul style="list-style-type: none"> • ATM (ETMS) to continue functional upgrades to provide national-scale traffic management tools to balance traffic loads. • Provide Free Flight integration and utilization of additional CDM tools. • Provide upgrades to enhanced hardware and site integration until new platform is in place. • Continue implementing DSP at selected sites. • Update SCAP to reflect new functionalities as required. 	<ul style="list-style-type: none"> • Continue TFM operations at all facilities • Continue Free Flight Phase 2 integration and use of CDM tools for sustainment into the TFM infrastructure. • Begin infrastructure re-engineering modernization. • Determine future requirements to for ETMS transitioning to Operations.

2A05: Free Flight Phase 1;

- **Free Flight Phase 1 Sustain**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
Free Flight Phase 1 – Sustain. Improve system efficiency by continuing to derive capacity gains realized from Free Flight Phase 1 systems.	<ul style="list-style-type: none"> • Not applicable. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Maintain FFP1 sites prior to OPS budget takeover. 	<ul style="list-style-type: none"> • Maintain FFP1 sites prior to OPS budget takeover. 	<ul style="list-style-type: none"> • Maintain FFP1 sites prior to OPS budget takeover.

2A06: Automated Surface Observing System;

- Automated Surface Weather Observing System – Automated Surface Observing System Pre-Planned Product Improvements
- Automated Surface Weather Observing System – Data Displays
- Automated Surface Weather Observing System – Standalone Weather Systems

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Automated Surface Observing System (ASOS) Programs. Support system efficiency by supplying automated surface weather observations to meet the needs of pilots, operators, and air traffic personnel. The aviation surface weather observation network includes automated weather observing system (AWOS), ASOS, automated weather sensors systems, standalone weather sensors (SAWS), and ASOS controller equipment information display system (ACE-IDS or data displays).</p>		<ul style="list-style-type: none"> • Began SAWS delivery. • Implemented product improvements and upgrades to the base ASOSs. • Commissioned 12 SAWSs. • Delivered five ACE-IDSs. • Completed ASOS commissioning. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Implement product improvements and upgrades to the base ASOSs. • Deliver 33 SAWSs. • Deliver two ACE-IDSs. 	<ul style="list-style-type: none"> • Implement product improvements and upgrades to the base ASOSs. • Deliver 54 SAWSs. • Install one ACE-IDSs. 	<ul style="list-style-type: none"> • Implement product improvements and upgrades to the base ASOSs. • Deliver 144 SAWSs. 	

2A08: Information Display System – Terminal Facilities;

- Automated Surface Observing System Controller Equipment Information Display System for Terminal Facilities

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Automated Surface Observing System Controller Equipment (ACE) Information Display System (IDS) for terminal facilities. The ACE-IDS project contributes to the FAA system efficiency goal by depicting information the controller needs on weather and NAS status on a single display. This project will provide systems which are intended to integrate the agency’s information display and control systems and provide immediate access to a wide range of operational information and support data; provide display for external systems; provide consolidated control and monitoring of airfield systems; and provide standardized human-machine interface to all systems. The system is to function as the display and interface portion of other systems, eliminating the need to introduce additional displays and control panels into air traffic control towers. The system will provide a dependable, stable, versatile, and expandable platform to display operational data, weather information, control and monitoring status, and administrative records to specialists, managers, maintenance personnel, and outside users.</p>	<ul style="list-style-type: none"> • Not applicable.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Not applicable. 	<ul style="list-style-type: none"> • Install 275 workstations at sites with the most compelling needs. 	<ul style="list-style-type: none"> • Not applicable.

2B01: Next Generation Very High Frequency Air-to-Ground Communications System;

- **Next Generation Air-to-Ground Communications System Segment 1A**
- **Next Generation Air-to-Ground Communications System Segment 1B**
- **Next Generation Air-to-Ground Communications System Segments 2 and 3**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Next Generation Air-to-Ground (A/G) Communications (NEXCOM) System Segments 1A, 1B, and 2 and 3. Provide a new communications system to satisfy requirements that cannot be met using the current voice communications system. NEXCOM will increase the current communications capacity three to four times.		<ul style="list-style-type: none"> • Established government/industry partnership for avionics development.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Provide NEXCOM notice of proposed rulemaking (NPRM) and submit for internal agency review. • Complete NEXCOM system demonstration #1. • Complete source selection activities for the NEXCOM rapid preliminary development effort • Produce 325 NEXCOM multi-mode digital radios. 	<ul style="list-style-type: none"> • Provide NEXCOM NPRM and submit for OMB review; publish NPRM. • Complete NEXCOM system demonstration #2. • Release full-scale development final screening information request plan. • Produce 450 NEXCOM multi-mode digital radios. 	<ul style="list-style-type: none"> • Complete NEXCOM system demonstration #3. • Award NEXCOM full-scale development contract in 2005. • Publish final rule in 2005. • Conduct NEXCOM system ISD in 2007.

2B02: En Route Automation Program;

- **En Route Automation Modernization**

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
En Route Automation Modernization (ERAM). ERAM acquisition will result in installation of a new en route automation system at each ARTCC that will provide: (1) flight data processing capabilities that allow flexible routing around congestion, weather, and restrictions; (2) increased number and type of surveillance sources with improved surveillance coverage; (3) availability of safety alerts when using the backup mode and; (4) enhanced capabilities for incorporating future enhancements and new operational concepts.	<ul style="list-style-type: none"> • Deployed en route information display system developmental system to Salt Lake City, Boston, and Jacksonville ARTCCs. • Completed initial evaluation of deployed en route information display system developmental system. • Conducted flight plan preprocessing phase 1 prototype evaluations. • Completed flight plan preprocessing phase 2 prototype development with dynamic restrictions and initiated evaluation activities. • Completed JRC-2A for the ERAM Solution contract.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Award ERAM solution contract. • Conduct ERAM JRC 2b. 	<ul style="list-style-type: none"> • Testing, synchronization, and Government Acceptance of first direct access radar channel (DARC) replacement capability. • Synchronization with display system replacement (DSR) and URET builds. • Perform technical review of system segment specification for host replacement. 	<ul style="list-style-type: none"> • Achieve first site IOC for ERAM capabilities.

2B03: Weather and Radar Processor;

- **Weather and Radar Processor – Stage 3**
- **Weather and Radar Processor – Tech Refresh/Product Upgrades**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Weather and Radar Processor – Stage 3. Collect, process, and disseminate NEXRAD data and other weather data to ARTCC controllers, traffic management specialists, and ARTCC weather service unit meteorologists. The weather radar processor provides the most timely and accurate weather forecast products to other NAS subsystems.</p>	<ul style="list-style-type: none"> • Completed IOC of NEXRAD products on DSR. • Completed weather information network system deployment at all ARTCCs. • Provided enhancements to National Mosaics. • Continued Stage 3 and provide systems changes as required by users. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Make quality enhancements to National Mosaics. • Implement security enhancements in accordance with SCAP. • Develop operational changes to accommodate NEXRAD hardware and software upgrades. • Implement weather information network system at additional ARTCCs to provide critical weather data to Free Flight Phase 1 and 2 programs. 	<ul style="list-style-type: none"> • Implement security enhancements in accordance with SCAP. • Complete NEXRAD hardware and software upgrades. 	<ul style="list-style-type: none"> • Initiate hardware upgrade acquisition activities in FY2006.

2B04X: Automatic Dependent Surveillance National Implementation;
 • **Automatic Dependence Surveillance National Implementation**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Automatic Dependence Surveillance (ADS) National Implementation. Provide improved surveillance to pilot and ATC user tools to enable more efficient traffic flows in the NAS. National implementation includes the development and deployment of ADS ground stations in the en route, terminal, and surface domains, along with the automation and communication system modifications necessary to support ADS capabilities. ADS will allow aircraft to fly at their optimum altitude, speed, and routing, resulting in better schedule reliability while maintaining a high level of safety.		<ul style="list-style-type: none"> • Not applicable.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Conduct Investment Analysis for first segment (pocket) of national implementation. 	<ul style="list-style-type: none"> • Conduct JRC 2 for first segment (pocket) of national implementation. 	<ul style="list-style-type: none"> • Conduct investment analyses for subsequent segments (pockets) of implementation. • Conduct JRCs for subsequent segments as required • Initiate deployment of ground infrastructure for first segment

2C02: National Airspace System Management Automation Program;
 • **National Airspace System Management Automation Program**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
NAS Airspace System Management Automation Program. Contribute to the FAA system efficiency goal by performing the following tasks: <ul style="list-style-type: none"> • Establish metadata repository of ATS information systems, including NAS mission support and administrative systems. • Provide ATS information systems and manage a single data source for all key mission support and business areas. • Provide a common toolset for managing finance, planning, performance, and schedule of all ATS business units. • Provide technology refresh, including hardware, software, and infrastructure, for ATS national data center (NDC) and pb-ICE tools. 	<ul style="list-style-type: none"> • Became focal point of access of DELPHI data for all ATS information systems. • Consolidated all DELPHI data requirements from ATS expanded data acquisition to satisfy new data requirements. • Signed memorandum of agreement and built interfaces for eight new system subscribers for data feeds. • Deployed pb-ICE tools to Terminal Business Service users and users at headquarters. • Began developing secure executive toolset – emergency management (SET-EM) for emergency management. • Built NAS support integration process repository by collecting metadata about all ATS information systems, including NAS mission support/administrative systems. • Launched NAS support integration process to begin evaluation of ATS information systems.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Map DELPHI data to DAFIS data requirements and build DELPHI interfaces for 26 ATS information systems. • Continue expansion of ATS NDC database, data sources and subscribers for ATS corporate data sharing. • Continue development and deployment of SET-EM for emergency management. • Upgrade hardware, software, and infrastructure for ATS NDC and pb-ICE tools. • Continue deployment of pb-ICE tools to regional offices. • Continue the NAS support integration process and evaluate ATS information systems. • Begin conducting ATS information system security certification and authentication. • Become compliant with e-Gov, GPEA, and Section 515 guidelines. 	<ul style="list-style-type: none"> • Continue expansion of ATS NDC database, data sources, and subscribers for ATS corporate data sharing. • Continue development and deployment of SET-EM for emergency management. • Upgrade hardware, software, and infrastructure for ATS NDC and pb-ICE tools. • Continue deployment of pb-ICE tools to regional offices. • Continue conducting ATS information system security certification and authentication. • Become compliant with e-Gov, GPEA, and Section 515 guidelines. 	<ul style="list-style-type: none"> • Continue expansion of ATS NDC database, data sources and subscribers for ATS corporate data sharing. • Upgrade hardware, software, and infrastructure for ATS NDC and pb-ICE tools • Continue deployment of pb-ICE tools to regional offices. • Continue conducting ATS information system security certification and authentication. • Become compliant with e-Gov, GPEA, and Section 515 guidelines.

Activity 3: Increase Capacity of the National Airspace System

3A01: Navigation and Landing Aids: 3A01A; Local Area Augmentation System for Global Positioning System;

- Local Area Augmentation System

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Local Area Augmentation System (LAAS) Program. Provide a satellite-based precision approach capability that meets the requirements for all weather approach and landing capability. Providing precision approach guidance at additional airports will allow landings in low visibility conditions, which increases schedule reliability for commercial carriers. The LAAS for the GPS complements the WAAS by providing category (CAT) I and CAT II/III precision approach capabilities. A single LAAS can provide approach guidance to multiple runways, which allows use of additional runways during adverse weather conditions.</p>		<ul style="list-style-type: none"> • Received and evaluated proposals from industry.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Award contract for CAT I LAASs. 	<ul style="list-style-type: none"> • Continue CAT I LAAS acquisition activities, including system design, documentation, and development. • Further develop advanced procedures. • Perform CAT II/III R&D efforts, including technical design and engineering support. 	<ul style="list-style-type: none"> • Procure 10 limited rate initial production systems. • Complete CAT I LAAS buys. • Award contract for CAT II/III LAAS.

3A01: Navigation and Landing Aids: 3A01B; Wide Area Augmentation System for Global Positioning System;

- Wide Area Augmentation System

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Wide Area Augmentation System (WAAS) Program. Provide non-precision lateral navigation (LNAV) and vertical navigation (VNAV) capability to airports without such existing capabilities. Vertical guidance allows approaches to runways in low visibility conditions. After IOC, expected in December 2003, pilots will be able to use lateral navigation with precision vertical guidance (LPV) approaches. LPV performance is within 50 feet of CAT 1 landing requirements, which supports close to CAT 1 minimums at many airports. WAAS also will reduce air traffic separation, provide more direct en route paths, and provide low visibility approach capability at new locations.</p>	<ul style="list-style-type: none"> • Integrated all required software modifications onto the WAAS signal-in-space. • Reached technical concurrence on the WAAS integrity. • Concluded the 60-day stability test on September 16, 2002. • Supported the Associate Administrator for the Office of Certification and Regulation Safer Skies initiative (cornerstone for Free Flight). • Demonstrated that WAAS systems architecture achieves deliverable performance objectives. • Developed LNAV/VNAV procedures for additional runway ends.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<p>WAAS performance parameters for Level I:</p> <p style="text-align: center;">En Route/Non-Precision Approach</p> <p>Integrity 10⁻⁷ Horizontal accuracy 7.6 meters or less Vertical accuracy 7.6 meters or less Time to alarm 10 seconds Availability 99.9 percent Coverage 90 percent of CONUS or more</p> <ul style="list-style-type: none"> • Continue reduction rate of volume and equipment-related delays. • Complete contractor acceptance inspection. • Award geo-stationary communication and control segment contract by March 2003. • Definitize the full operational capability (FOC) on task order with Raytheon by September 30, 2003. 	<ul style="list-style-type: none"> • Commission WAAS IOC for LNAV/VNAV December 2003. • Continue definitization of the full operating capability task with Raytheon. • RNP: operations concept, TERPS criteria, policy, guidance, and procedure development in support of RNP procedures. 	<ul style="list-style-type: none"> • Have the first geo-stationary communication and control segment satellite on orbit. • Continue to develop GPS approach procedures to serve all IFR runway ends. • Develop LPV procedures for additional runway ends. • Acquire additional wide-area reference stations. • Develop an electromagnetic interference detection and location capability. • Complete WAAS FOC in 2007.

3A01: Navigation and Landing Aids: 3A01C; Very High Frequency Omni-Directional Range with Distance Measuring Equipment;

- **Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Very High Frequency Omni-Directional Range Collocated with Tactical Air Navigation (VORTAC). Improve system efficiency in the NAS by replacing, relocating, or converting VOR and VORTAC facilities in order to maintain a reliable, safe, and efficient air navigation system used for en route and approach purposes.</p>	<ul style="list-style-type: none"> • Performed field installment of about 29 tactical air navigation antenna retrofit kits. • Completed relocation process of one VOR facility. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Perform field installation of about 25 tactical air navigation antenna retrofit kits. • Procure four Doppler VOR antennas and fund one Doppler conversion. 	<ul style="list-style-type: none"> • Procure four Doppler VOR antennas. • Fund two Doppler conversions and 25 Antenna retrofit. • Fund one relocation antenna. 	<ul style="list-style-type: none"> • Continue facility relocations, retrofits, conversions, and upgrades as required.

3A01: Navigation and Landing Aids: 3A01D; Instrument Landing System – Establish/Upgrade;

- Instrument Landing Systems

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Instrument Landing Systems (ILS). Improve NAS efficiency by establishing and maintaining precision approach capability at large- and medium-sized hub airports and their associated reliever airports. ILS will help meet expanding air traffic control needs for increased airport capability by increasing capacity through lowering of visual minimums required for landing.		<ul style="list-style-type: none"> • Commissioned two approach lighting systems with sequence flashes-2 (ALSF-2) systems. • Commissioned four medium-intensity approach light system with runway alignment indicator lights (MALSR) systems. • Commissioned six ILS systems. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Commission two ALSF-2 systems. • Commission 10 MALSR systems. • Commission or return to services 15 ILS systems. 	<ul style="list-style-type: none"> • Install three MALSR systems. • Install two ALSF-2 systems. • Install four ILS systems (CAT I, CAT II/III) 	<ul style="list-style-type: none"> • Continue to procure and install ILSs and associated equipment. 	

3A01: Navigation and Landing Aids: 3A01E; Approach Lighting System Improvement Program;

- Approach Lighting System Improvement Continuation

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Approach Lighting System Improvement Program Continuation. Improve safety in the NAS by replacing rigid, non-frangible lighting support structures with frangible approach lighting equipment.		<ul style="list-style-type: none"> • Commissioned one ALSF-2 systems. • Commissioned two MALSR systems. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Deploy two MALSR at various locations. • Deploy one ALSF-2 at various locations. 	<ul style="list-style-type: none"> • Install eight MALSR systems at various locations. • Install four ALSF-2 systems at various locations. 	<ul style="list-style-type: none"> • Install 18 MALSR systems at various locations. • Install four ALSF-2 at various locations. 	

3A01: Navigation and Landing Aids: 3A01F; Runway Visual Range;

- **Runway Visual Range – Replacement/Establishment**

Primary Goal: 1.1/1.1.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Runway Visual Range (RVR) – Replacement/Establishment. Improve safety in the NAS by replacing the older, maintenance-intensive, and difficult to support legacy systems. RVR systems provide critical meteorological visibility information that is necessary for takeoff and landings on precision approach equipped runways. These older systems are frequently supported by rigid, steel, non-frangible structures.</p>		<ul style="list-style-type: none"> • Commissioned six RVR systems at various airports. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Commission or Return to Services 10 RVR systems. 	<ul style="list-style-type: none"> • Install 12 RVR systems. • Procure 20 RVR systems. 	<ul style="list-style-type: none"> • Continue to procure and install RVR systems to meet demand for visibility information at precision approach equipped runways. 	

3A01: Navigation and Landing Aids: 3A01G; Distance Measuring Equipment – Sustain;

- **Sustain Distance Measuring Equipment – Sustain**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Distance Measuring Equipment (DME) – Sustain. Improve system efficiency in the NAS by replacing obsolete, tube-type DME that provides critical distance information to pilots during preparation for landing.</p>		<ul style="list-style-type: none"> • Commissioned three DME systems. • Began site preparation at 10 DME locations to support Commercial Aviation Safety Team (CAST) requirements. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Commission or return to services three low-power DME. 	<ul style="list-style-type: none"> • Install 22 CAST DME systems. • Install 14 sustain DME systems. 	<ul style="list-style-type: none"> • Continue to procure and install low-power DME to replace the current older, tube-type equipment in the NAS. 	

3A01: Navigation and Landing Aids: 3A01H; Non-Directional Beacon Facilities – Sustain;

- **Non-Directional Beacons Sustain**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Non-Directional Beacons (NDB) Sustain. Improve system efficiency in the NAS by replacing obsolete, tube-type NDBs with current technology electronics that continue to provide navigational direction information.		<ul style="list-style-type: none"> • Procured and installed NDB equipment at about 13 regional locations. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Procure and install NDB equipment at about 14 regional locations. 	<ul style="list-style-type: none"> • Procure and install 14 NDB systems. 	<ul style="list-style-type: none"> • Continue to procure and install NDB equipment at about 16 regional locations. 	

3A01: Navigation and Landing Aids: 3A01I; Visual Navigation Aids – Establish/Expand;

- **Visual Navigation Aids for New Qualifiers**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Visual Navigation Aids for New Qualifiers. Improve system NAS efficiency by providing visual approach slope guidance and runway threshold identification to increase landing capability at designated airports throughout the United States.		<ul style="list-style-type: none"> • Commissioned 18 precision approach path indicator (PAPI) systems at various airports. • Began site preparation at 39 CAST locations. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Install 25 PAPI systems. 	<ul style="list-style-type: none"> • Install 21 CAST PAPI systems. • Install 14 new establish PAPI systems. • Procure and install 10 runway end identifier lights (REIL) systems. 	<ul style="list-style-type: none"> • Continue to procure and install PAPI and REIL equipment to meet demand for visual approach guidance at required airports. 	

3A01: Navigation and Landing Aids: 3A01J; Visual Approach Slope Indicator Replacement – Replace with Precision Approach Path Indicator;

- **Replace Visual Approach Slope Indicator with Precision Approach Path Indicator**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Replace Visual Approach Slope Indicator (VASI) with PAPI. Improve system efficiency in the NAS by replacing aging, obsolete VASI with newer technology—the more standardized PAPI.		<ul style="list-style-type: none"> • Commissioned six PAPI systems at various locations. 	

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Commission or Return to Services 15 PAPI at various locations. 	<ul style="list-style-type: none"> Continue to procure and install PAPI equipment to replace the current inventory of VASI systems in the NAS (36 PAPI). 	<ul style="list-style-type: none"> Continue to procure and install PAPI equipment to replace the current inventory of VASI systems in the NAS.

3A01: Navigation and Landing Aids: 3A01L; Navigation and Landing Aids – Service Life Extension Program;

- Visual Navigation Aids – Sustain, Replace, Relocate (N04.04-00)**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Visual Navigation Aids – Sustain, Replace, Relocate. Improve system efficiency in the NAS by replacing aging, obsolete visual navigational aids as well as other ground-based navigation and landing aids that are necessary to maintain en route, approach, and landing capabilities at various airports throughout the United States.</p>		<ul style="list-style-type: none"> Deployed one ALSF-2.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Deploy two ALSF-2. Deploy two MALSRS. 	<ul style="list-style-type: none"> Install seven ILS systems. Install two MALSRS systems. Install one ALSF-2 system. Install eight REIL systems. Sustain 65 direction finders (phase II). 	<ul style="list-style-type: none"> Continue procuring and installing various visual navigational aids as well as other ground-based navigation and landing aids.

3A02: Oceanic Automation System;

- Advanced Technologies and Oceanic Procedures**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Advanced Technologies and Oceanic Procedures (ATOP). Increase system efficiency and capacity in all oceanic ARTCCs through the modernization of the oceanic air traffic control systems. The new oceanic automation system sets the stage for reducing aircraft separation from 100 nmi to 30 nmi, enabling more planes to safely fly preferred routes. The ATOP program will provide a modernized oceanic air traffic control automation system, installation, testing, training, and common procedures and lifecycle system maintenance along with preplanned product improvements. The ATOP system will collect, manage, and display oceanic air traffic data, including electronic flight-strip data, on the computer displays used by air traffic controllers and integrate capabilities such as flight data processing, radar data processing, automatic dependent surveillance, controller-pilot data link, and conflict probe.</p>	<ul style="list-style-type: none"> Delivered “test bed” procedural system to the WJHTC.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Complete Oakland (key site) ARTCC procedural system IOC. Conduct IOT&E. 	<ul style="list-style-type: none"> Complete New York ARTCC procedural system IOC. 	<ul style="list-style-type: none"> Complete Anchorage ARTCC radar/system IOC in FY 2005.

3A0X: Gulf of Mexico Offshore Program;

- Gulf of Mexico Offshore Program**

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Gulf of Mexico (GOM) Offshore Program. Develop an approach to improve efficiency and capacity while enhancing the currently inadequate communication coverage over the GOM. This project is composed of two systems: the buoy communications system (BCS) and the VHF extended range network (VERN). They are directed at expanding direct controller-pilot VHF radio communications. The combination of the BCS and VERN will improve efficiency and capacity through enhanced communications in the en route portion of the GOM above 18,000 ft. These enhancements answer current shortfalls as well as proactively address future anticipated growth and user demand for efficient use of the GOM airspace.</p>	<ul style="list-style-type: none"> Transferred VERN to operational control of Houston ARTCC in support of NAS Handoff. Completed construction/refurbishment of production buoys # 2, 3, and 4. Conducted and completed the BCS provisioning conference. Completed environmental test, production acceptance test, site acceptance test, system integration, and multi-buoy test and operational test for two out of four production buoys. Conducted and completed functional configuration audit/physical configuration with national data buoy center. Conducted several 4-day BCS training course with airway facilities technicians. Initiated multi-buoy upgrades at Houston ARTCC. Delivered first operational buoy. Completed IOC for two production buoys. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Program cancelled. 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Not applicable.

3A03: Voice Switching and Control System;

- **Voice Switching and Control System - Control System Upgrade**
- **Voice Switching and Control System - Tech Refresh**
- **Voice Switching and Control System - Training and Backup System**
- **Voice Switching and Control System - Switch Replacement**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Voice Switching and Control System (VSCS) Programs. Improve operational efficiency and effectiveness of the NAS by replacing and upgrading the obsolete, nonsupportable VSCS hardware and software in all ARTCCs. The sustainment activities planned under this program include software upgrades, power supply upgrades, position electronic module upgrades, display module upgrades, and system expansions. By performing these sustainment activities, the VSCS Program will provide improved air traffic control services within the en route environment.</p>		<ul style="list-style-type: none"> • Procured 21 of 21 VSCS servers for the ARTCCs. • Delivered VSCS hardware to additional eight choke-point sectors, providing expanded air traffic operations in the NAS. • Initiated procurement to replace/upgrade the contractor traffic simulation unit, which is used to perform system-loading requirements for all formal baseline verifications of VSCS functions. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Initiate technology refresh activities for sustainment of the VSCS to include workstation upgrades. • Initiate investment analysis activities for the VSCS replacement. 	<ul style="list-style-type: none"> • Continue technology refresh activities to include power supply replacements and video display module replacements. • Continue investment analysis activities for VSCS replacement program. 	<ul style="list-style-type: none"> • Continue technology refresh activities for the sustainment of VSCS in FY 2005–2008. 	

Activities 4: Improve Reliability of the National Airspace System

4A01: Guam Center Radar Approach Control – Relocate;

- Guam Center Radar Approach Control – Relocate

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Guam Center Radar Approach Control (CERAP) – Relocate. Relocate the Guam CERAP from Andersen Air Force Base to the Guam International Airport in Agana to support the FAA system efficiency goal by replacing the facility that was severely damaged by super typhoon Paka. Replacing the damaged facility will allow updated equipment to be installed, which improves the efficiency of air traffic control for international service.		<ul style="list-style-type: none"> • Completed Guam CERAP project design to relocate CERAP from Andersen Air Force Base to Agana International Airport. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Complete construction of the new CERAP. 	<ul style="list-style-type: none"> • Complete electronics installation. 	<ul style="list-style-type: none"> • Restore facility at Anderson Air Force Base to its original condition. 	

4A02: Terminal Voice Switch Replacement/Enhanced Terminal Voice Switch;

- Enhanced Terminal Voice Switch
- Command Center Voice Switch

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Enhanced Terminal Voice Switch (ETVS). Improve NAS system efficiency by replacing the electromechanical and aging electronic switches at all ATCTs and TRACON facilities. Through deployment of modern voice switches, the ETVS program provides terminal facilities with modern reliable voice-switching capabilities, which enables efficient and effective air traffic operations.		<ul style="list-style-type: none"> • Replaced an additional 25 of 212 terminal voice switches. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Replace an additional 20 of 212 terminal voice switches. 	<ul style="list-style-type: none"> • Award new contract vehicle for procuring terminal voice switches. • Replace an additional 15 of 212 terminal voice switches in 2004. 	<ul style="list-style-type: none"> • Replace remaining 73 of 212 terminal voice switches in 2005 through 2007. 	

4A03: Airport Cable Loop Systems – Sustained Support;

- **Airport Cable Loop Systems Sustained Support**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Airport Cable Loop Systems Sustained Support. Improve the FAA system efficiency goal by providing sustainability to existing operational airport copper communication infrastructure and new installation of fiber optics infrastructure at high-traffic airport ATC facilities. The program provides the primary pathway for data collection and distribution of power to terminal operational systems and navigation aids.</p>		<ul style="list-style-type: none"> • Continued to replace airport system communication cabling system where airport construction or system installations occur.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue to replace airport system communication cabling system where airport construction or system installations occur. 	<ul style="list-style-type: none"> • Complete technical review of airport cable loop system design. • Research retrofit plans for obsolete fiber optic systems. • Develop standardized fiber optic systems parts list. • Develop airport cable loop system parts database. 	<ul style="list-style-type: none"> • Continue to replace airport system communication cabling system where airport construction or system installations occur. • Develop and implement an Integrated Logistics Support Plan. • Install new underground fiber optic cable loops at about eight OEP airport locations.

4B01: En Route Automation Program;

- (A) En Route Enhancements
- (B) Flight Data Input/Output Replacement
- (C) Direct Access Radar Channel
- (D) Host/Oceanic Computer System Replacement
- (E) En Route Communications Gateway
 - En Route Communications Gateway Tech Refresh
- (F) En Route Modifications
- (G) En Route Monitor and Control
- (H) Aeronautical Information and Flight Planning Enhancements
- (I) FAA Aeronautical Training Systems (Initial Academy Training System)

(A) En Route Enhancements

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals		
<p>En Route Enhancements Program. Support FAA system efficiency goals by maintaining and enhancing host computer system (HCS) and DSR system software at the ARTCCs.</p>	<ul style="list-style-type: none"> • Completed software adaptation of up to 50,000 fixes to support route structuring. • Enhanced safety and controller efficiency by adding fourth line to the DSR full data block. • Provided interface for transitioning from peripheral adapter module replacement item to en route communications gateway (ECG). • Upgraded common message set functionality for URET CCLD, center terminal radar approach control automation system, and ETMS enhancements. • Facilitated display of RVSM capability for micro en route automated radar terminal system. • Sourced national and local patches, as space allows, reducing maintenance burden. • Implemented improvements to facilitate system operations and maintenance. • Developed radar-console display replacement enhancements. • Developed upgrades with such features as interactive data block and toolbar enhancements. • Performed upgrades to support URET. 		
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Accommodate national RVSM capability. • Accommodate national equipment-restricted route enhancements. • Enhance ICAO-compliant flight plan processing to facilitate exchange of ICAO-compliant flight plan messages with Canada and Mexico. • Source national and local patches, as space allows, reducing maintenance burden. • Implement improvements to facilitate system operations and maintenance. • Provide command support enhancements. • Enhance target-filtering capability. • Provide upgrades to computer readout device. • Enhance surveillance range settings. • Enhance range readout. • Complete radar-position display replacement. 	<ul style="list-style-type: none"> • Continue providing software evolution, as prioritized and approved by air traffic and airway facilities, to provide new capabilities and enhancements to the host and DSR software and to address critical software problems. 	<ul style="list-style-type: none"> • Continue providing software evolution, as prioritized and approved by air traffic and airway facilities, to provide new capabilities and enhancements to the host and DSR software and to address critical software problems. • Support ERAM initiative. 	

(B) Flight Data Input/Output Replacement

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Flight Data Input/Output (FDIO) Replacement. Support the FAA system efficiency goal by maintaining and replacing obsolete FDIO equipment.</p>	<ul style="list-style-type: none"> • Complete installation of 80 FDIO at terminal facilities.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete installation of 80 FDIO at terminal facilities. 	<ul style="list-style-type: none"> • Complete installation of 80 FDIO at terminal facilities. 	<ul style="list-style-type: none"> • Complete installation of 80 FDIO at terminal facilities

(C) Direct Access Radar Channel

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
En Route Automation Program – Direct Access Radar Channel (DARC). Maintain an enhanced independent backup radar automation system capable of continuous improvements to functionality. Eliminate legacy hardware and interfaces and replace current software architecture with one that provides hardware independence.		<ul style="list-style-type: none"> • Supported implementing new sustained DARC hardware at 16 ARTCCs. • Developed and deployed DARC functional software versions RAP02 and RAP03 nationally. • Procured and deployed replacement disk drives for obsolete legacy drives that could not be maintained.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue SLEP on seven items identified as significant risk to operations. • Provide funding for reverse engineering and manufacture of selected components. • Maintain system operations until replacement system allows some decommissioned systems to be harvested for key parts needed to sustain remaining systems. 	<ul style="list-style-type: none"> • Replace DARC at 20 ARTCCs. 	<ul style="list-style-type: none"> • Not applicable.

(D) Host/Oceanic Computer System Replacement

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Host/Oceanic Computer System Replacement (HOCSR). Maintain the reliability and performance of the host and oceanic computer systems within the NAS so that future major outages of air traffic control services do not occur. The host and oceanic systems are the central computer and peripheral equipment that processes radar data and formats for the display used by an air traffic controller to control air traffic. The HOCSR program provides upgrades to the critical equipment components that enable air traffic control.</p>		<ul style="list-style-type: none"> • Completed government acceptance of phase 3 at 13 en route operational sites (13 sites out of 23). • Completed phase 4 of keyboard video display terminal printer replacement procurement and general aviation for all 23 sites. • Completed phase 4 high-speed printer procurement for all 23 sites. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • ORD for HOCSR phase 3 systems at three last sites. • Complete HOCSR phase 4 printer replacement at all 23 operational sites. 	<ul style="list-style-type: none"> • Plan and deploy keyboard video display terminals to all operational sites. 	<ul style="list-style-type: none"> • Plan/deploy tape replacement. • Sustain other peripherals through 2008. 	

(E) En Route Communication Gateway

- **En Route Communication Gateway Tech Refresh**

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>En Route Communications Gateway (ECG) Tech Refresh. Increase system capacity and expandability by enabling integration of new surveillance technology, introduction of new interface standards and formats, and connection to additional remote equipment. ECG also mitigates end of life risks faced by the currently fielded equipment. The ECG infrastructure will provide the automation system capacity and expandability required to support anticipated increases in air traffic and changes in the operational environment. Because ECG is providing the flexible and expandable architecture required for the introduction of new services, systems, and capabilities, it must be deployed before introducing new services, systems, and capabilities.</p>		<ul style="list-style-type: none"> • Delivered equipment to WJHTC labs (PAMRI support facility, ECG maintenance support system, standalone simulator, system support facility, and instruction and interoperability facility). 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Achieve WJHTC government acceptance. • Deliver Federal Aviation Administration Aeronautical Center (FAAAC) equipment. • Achieve FAAAC government acceptance. • Deliver equipment to key site (Seattle ARTCC). 	<ul style="list-style-type: none"> • Complete IOT&E at key site (Seattle). • Complete in service review and obtain ISD. • Conduct IOT&E. 	<ul style="list-style-type: none"> • Achieve key site government acceptance. • Achieve ORD at 21 of 21 sites. • Commence tech refresh. 	

(F) En Route Modifications

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>En Route Modifications. Improve the FAA system efficiency goal by replacing aging or obsolete components of the en route automation system. The En Route Modification project will replace obsolete components such as system processors and upgrade and modernize the controller displays and the infrastructure that supports those displays. Replacing obsolete equipment is a necessary part of ensuring reliability and maintainability of the en route automation system.</p>		<ul style="list-style-type: none"> Continued to develop DSR radar-console display processing technical upgrade. Developed and began deployment activities for main display monitor (MDM) replacement, accompanied by relocation of VSCS electronic module (VEM) and position electronic module (PEM) hardware. Coordinated and demonstrated display and display thread computer-human interface (CHI) development and functional upgrade requirements definitions with air traffic display system replacement evolution team, Professional Airways System Specialists, and National Air Traffic Controllers Association. Developed design specifications and change packages for technology refresh of DSR storage and support devices
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> Continue developing data-console processor technical upgrade, simultaneously providing critical capacity and performance improvements supporting URET functionality. Deploy MDM replacement and associated hardware accommodating VEM/PEM relocation. 	<ul style="list-style-type: none"> Continue deployment of MDM replacement and associated hardware accommodating VEM/PEM relocation. Complete development of data-console processor technical upgrade and initiate deployment. Initiate engineering and development of radar-console processor and display thread technical upgrade solution, simultaneously providing critical infrastructure upgrades supporting ERAM. 	<ul style="list-style-type: none"> Complete MDM replacement and associated hardware accommodating VEM/PEM relocation. Complete radar-console processor and display thread technical upgrade development for primary and backup channels; initiate and continue deployment of upgrades. Complete deployment of data-console processor upgrade.

(G) En Route Monitor and Control

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>En Route Monitor and Control (EMAC). Improve the FAA system efficiency by supporting the separation of critical, essential, and routine functions of monitor and control throughout all en route facilities. This project will significantly reduce the number of ARTCC system operation center area monitor and control devices, which decreases software development and training costs, enables consolidated facility and legacy systems to interface with NIMS, provides space for implementing new systems, and provides modern, open, and standardized monitor and control devices.</p>	<ul style="list-style-type: none"> Continued EMAC, which is still in mission analysis phase. Completed exploratory activities. Completed feasibility studies at the Instruction and Interoperability Facility (WJHTC). Completed evaluation report with recommendations.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue EMAC (still in mission analysis phase). • Develop requirements document. • Develop concept of operations. 	<ul style="list-style-type: none"> • Move EMAC to investment analysis phase. • Issue screening information request. • Award integrator contract. 	<ul style="list-style-type: none"> • Deploy phase 1 system. • Achieve IDU for phase 1 system. • Evaluate remaining unconsolidated systems and select highest priority systems for phase 2. • Plan for subsequent phases.

(H) Aeronautical Information and Flight Planning Enhancements

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Aeronautical Information and Flight Planning Enhancements. Support FAA system efficiency goals by enabling cross-border flight data processing and seamless handoff capability that will ultimately lead to NAS-like, efficient cross-border operations between the United States, Mexico, and Canada.</p>	<ul style="list-style-type: none"> • Developed relevant system software, interface, and telecommunications requirements for HCS, DSR, URET, and aeronautical fixed telecommunications network. • Began formal initial requirements document. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Begin operational test of automated international flight plan interface between Houston ARTCC and Mexico area control center. • Complete flight data processing updates for HCS, DSR, and URET. • Complete transition planning activities for the operational use of extended flight plan data NAS-wide in the en route domain. • Complete engineering impact analysis detailing the effect of en route flight data processing enhancements on other domains and systems. 	<ul style="list-style-type: none"> • Begin operational use of the extended flight plan data needed to support cross-border operations. • Complete software updates allowing cross border amendment, modification, and cancellation of previously transmitted flight plan data. • Provide acknowledgement and reject messages to direct-filers for international flight plans. 	<ul style="list-style-type: none"> • Complete software updates allowing automated handoffs across borders. • Support transition of NAS systems in other domains to support international flight data. • Complete transition to a single flight plan format for all domestic and international operations.

(I) FAA Aeronautical Training System - Initial Academy Training System

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>FAA Aeronautical Training System – Initial Academy Training System (IATS). Provide training for students to meet a projected shortfall in certified en route air traffic control specialists due to retirement. The IATS will provide a state-of-the-art replica of the en route environment to meet the complex NAS technical 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, DSR workstations, ghost pilot workstations, master instructor workstations, a local area network, and VTABS communication system.</p>		<ul style="list-style-type: none"> • Not applicable.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Develop system/segment specification, system architecture design document, bill of materials, ICD, software requirements document, CHI specification, software design document, hardware design document, and a master test plan. • Conduct an FAA Academy site survey; develop an FAA Academy training system site activation plan. • Conduct system requirements review/system design, and preliminary design/critical design review. 	<ul style="list-style-type: none"> • Complete design. • Develop and produce IATS. • Conduct product integration test and developmental test. • Install and check out IATS system at the FAA Academy. • Achieve government acceptance. 	<ul style="list-style-type: none"> • Conduct operational test. • Conduct field familiarization test and declare IOC. • Conduct ORD. • Begin training new students. • Continue maintenance of system. • Perform tech refresh of servers, ghost pilot personal computers, and master instructor workstations.

4B02: Air Route Traffic Control Center Building Improvements/Plant Improvements;

- **Air Route Traffic Control Center Modernization**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Air Route Traffic Control Center (ARTCC) Modernization. Support operational efficiency and effectiveness in maintaining the integrity of 21 ARTCCs, three CERAP facilities, and the ATCSCC; and ensure facility sustainment, modernization, and expansion to support air traffic control operations. This will aid in the integration and transition of new NAS systems within ARTCCs, CERAPs, and the ATCSCC and in managing the lifecycle of these facilities.</p>	<ul style="list-style-type: none"> • Initiated two M-1 control room/automation wing, second floor, and modernization projects. • Initiated two M-1 control room modernization projects. • Identified and funded mini-modification facility sustainment projects at 21 sites. • Initiated implementation of seven ARTCC fire alarm upgrade projects. • Funded nine facility condition assessments. • Conducted facility administrative space requirements analysis. <p>Transition/Integration Management:</p> <ul style="list-style-type: none"> • Developed standard ARTCC layout drawings and standard transition plan and initiated site-specific, end-state drawings. • Initiated integrated resource requirement document for en route facilities in NAS system deployment and facility modernization.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Modernize air traffic control automation wing, second floor, and M-1 control room at two sites. • Initiate implementation of 14 ARTCC fire alarm upgrade projects. • Conduct seven condition assessments. • Identify and fund mini-modification sustainment projects at 21 sites. • Manage implementation of nine ARTCC fire alarm upgraded projects. <p>Transition/Integration Management:</p> <ul style="list-style-type: none"> • Continue end-state, site-specific drawing revisions. • Conduct facility administrative space requirements analysis. • Manage smooth transition and integration of the NAS system and the en route facility. 	<ul style="list-style-type: none"> • Modernize/renovate M-1 control room at two sites. • Modernize/renovate control wing basement at four sites. • Identify and fund mini-modification sustainment projects at 21 sites. <p>Transition/Integration Management:</p> <ul style="list-style-type: none"> • Complete remaining site-specific, end-state, drawing revisions. • Complete facility administrative space requirements analysis. • Conduct seven condition assessments. • Complete implementation of 21 ARTCC fire alarm upgrade projects. • Manage smooth transition and integration of the NAS system and the en route facility. 	<ul style="list-style-type: none"> • Modernize air traffic control automation wing, second floor, and M-1 control room at five sites. • Modernize/renovate M-1 control room only at four sites. • Modernize Administration wing rehabilitation/expansion at four sites. • Modernize/renovate M-1 control room and control wing basement at one site. • Modernize/renovate control wing basement at 13 sites. • Modernize/renovate automation wing, second floor, only at two sites. • Identify and fund mini-modification sustainment projects at 21 sites. • Conduct seven condition assessments/year <p>Transition/Integration Management:</p> <ul style="list-style-type: none"> • Manage smooth transition and integration of the NAS system and the en route facility.

4B03: Air Traffic Management;

(A) Air Traffic Management Functionally Development/Deployment – Departure Spacing Program

(B) Traffic Flow Management Infrastructure – Traffic Flow Management Infrastructure Modernization

(A) Air Traffic Management Functionally Development/Deployment– Departure Spacing Program

Primary Goal: 2.1/2.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>ATM Functionality Development/ Deployment – Departure Spacing Program (DSP). Continue sustainment of the DSP prototype, transition of DSP to a formal NAS system, and eventual integration of DSP functionality into a modernized TFM infrastructure. This will reduce systemwide delays while facilitating achievement of CDM and free flight operating concepts.</p>	<ul style="list-style-type: none"> • Continued incremental software enhancements/sustainment at New York Metro area facilities. • Completed all site surveys for system expansion prior to suspension of expansion plan. • Deployed phase I systems at Washington ARTCC and PCT. • Deployed DSP integration and operations (DIO) Lab at WJHTC. • Initiated benefits analyses/metrics development for New York operational system.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Expand DSP to selected facilities in Boston area. • Continue to sustain DSP at existing facilities in New York metro area. • Begin planning and activities to baseline existing New York system/prepare for transition to a formal NAS system. • Perform DSP operational concept/operational procedures validation in DIO Lab. • Complete benefits analyses/metrics development for New York metro area operational system. 	<ul style="list-style-type: none"> • Continue activities and documentation to prepare for transition of DSP to formal NAS system/operations funding and execution. • Complete DSP operational concept/operational procedures validation in DIO Lab • Continue to sustain DSP at existing facilities in New York and Boston areas. • Expand DSP to selected facilities in Washington, DC, area. • Consider user requests for enhancements after expansion to Washington is complete 	<ul style="list-style-type: none"> • Complete activities and documentation to transition DSP to formal NAS system. • Transition DSP to operations funding and execution. • Decommission DIO Lab.

(B) Traffic Flow Management Infrastructure – Traffic Flow Management Infrastructure – Infrastructure Modernization

Primary Goal: 2.1/2.1.2/2.1.3

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Traffic Flow Management Infrastructure (TFM-I) Modernization. Increase integration and interoperability with the overall ATM structure. The TFM-I is a component of the NAS Architecture and provides the TFM decision support systems and tools that help balance growing flight demands with NAS capacity within a dynamic environment. The present TFM-I has evolved through several generations of hardware and software. The software has become increasingly difficult to maintain and modify and will not support emerging system requirements. The architecture platform is overly complicated and congested with multiple communication and network threads, and existing hardware systems are approaching end of shelf life. Additional enhancements planned under modernization will increase integration and interoperability with the overall ATM structure. Modernization will establish a robust, commercially available, and standards-compliant TFM-I. It will support current and future TFM requirements for availability, performance, expandability, human-computer interaction, supportability, and security.</p>	<p>Initiated planning documents for acquisition of TFM-I, requirements definition for platform development, communications efficiency studies, and development of software architecture requirements. Accomplishments include completion of:</p> <ul style="list-style-type: none"> • TFM-I Baseline Functional Audit • Software complexity and software lines of code analysis • TFM-I Business Case • Updated mission needs statement #307 • Initial requirements document (draft) • Statement of work (draft) • System load analysis (ongoing) • Investment analysis (ongoing) • Needs assessment (ongoing)

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue hardware refresh, software redesign and development, and integration of standalone prototype capability. • Communicate program goals and objectives to 	<ul style="list-style-type: none"> • Evaluate and determine final design of modernized TFM-I. • Award contract for final design, development, and deployment. 	<ul style="list-style-type: none"> • Perform site planning, analysis, and key site implementation to refresh current field site workstations; develop database management system consistent with projected capabilities,

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
industry and solicit industry feedback. <ul style="list-style-type: none"> • Finalize acquisition documents. • Award multiple contracts for phase 1 of TFM modernization acquisition; design competition phase. • Obtain JRC 2A Approval. 		planned hardware/software, and communications requirements. <ul style="list-style-type: none"> • Reengineer TFM architecture that supports improved access to TFM information and integration of standalone capabilities.

4C02: Federal Aviation Administration Telecommunications Infrastructure;

- **Federal Aviation Administration Telecommunications Infrastructure**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
Federal Aviation Administration (FAA) Telecommunications Infrastructure (FTI). Improve system efficiency by integrating operational telecommunications services and by providing highly reliable telecommunications that are critical to the NAS. These services will provide lower costs, improved bandwidth utilization, improved flexibility and security, and modern business processes.		<ul style="list-style-type: none"> • Awarded FTI contract. • Completed development of telecommunications information management system ordering capability for FTI. • Completed ARTCC telecommunications modernization for FTI at New York Center.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete factory test for transition baseline. • Complete development of network management and operations user interface. • Complete integration testing at WJHTC. • Complete operational testing at WJHTC. 	<ul style="list-style-type: none"> • Achieve SCAP. • Begin phase I transition of 27 sites (includes ARTCC to ARTCC trunks). • Initiate transition of leased interfacility NAS communications system and national Airspace data interchange network II. • Achieve initial ISD for FTI. • Initiate phase II of the transition schedule (325 sites). • Complete development of integrated business system user interface. 	<ul style="list-style-type: none"> • Complete phase I transition. • Complete transition of phase II (325 sites).

4C03: Air-to-Ground Communications Infrastructure;

(A) Communications Facilities Enhancement

- Communications Facilities Enhancement – Expansion
- Communications Facilities Enhancement – Air-to-Ground Communications Radio Frequency Interference Elimination
- Backup Emergency Communications Replacement

(B) Communications Facilities Enhancement - Ultra High Frequency Radio Replacement

- Ultra High Frequency Radio Replacement

(A) Communications Facilities Enhancement

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Communications Facilities Enhancement (CFE) - Air-to-Ground (A/G) Communications Infrastructure Programs. Enhance operational efficiency and effectiveness through planned improvements to the A/G communications infrastructure (in all NAS environments, both en route and terminal) that include replacing aging and increasingly unreliable equipment, associate sites, and facility improvements, including the establishment of new facilities intended to broaden communications coverage.</p>		<ul style="list-style-type: none"> • Procured CFE 375 replacement radios, equipment racks, antennas, and towers. • Delivered CFE equipment for the next eight choke-point sectors. • Procured and installed radio frequency interference (RFI) equipment to maintain existing communications infrastructure. • Continued backup emergency communications (BUEC) systems integration, site preparation, and installation. Completed one ARTCC. • Procured radio control equipment for new requirements, continued software upgrades, and installed 200 channels.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue BUEC systems integration, site preparation, and installation. Complete two ARTCCs. • Continue BUEC Program: 50 percent complete. 	<ul style="list-style-type: none"> • Conduct CFE site preparation at six sites. • Procure and install RFI equipment to maintain existing communications infrastructure. • Continue BUEC systems integration, site preparation, and installation; complete three ARTCCs. • BUEC Program: 64 percent complete. 	<ul style="list-style-type: none"> • Conduct CFE site preparation at 100 sites. • Procure and install RFI equipment to maintain existing communications infrastructure. • Complete all BUEC systems integration, site preparation, and installation. • Complete 100 percent of BUEC Program.

(B) Communications Facilities Enhancement - Ultra High Frequency Radio Replacement

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Ultra High Frequency (UHF) Radio Replacement Programs. Improve efficiency of communications with the Department of Defense by replacing aging equipment. UHF Radios are required to support military operations.</p>	<ul style="list-style-type: none"> • Not applicable.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete source selection activities for UHF radio replacement program. • Conduct IOT&E. 	<ul style="list-style-type: none"> • Deploy 367 UHF radios. • Complete nine9 percent of UHF radio replacement. 	<ul style="list-style-type: none"> • Deploy 2,036 UHF replacement radios. • Complete 62 percent of UHF replacement.

4C04: Voice Recorder Replacement Program;

- **Voice Recorder Replacement Program**

Primary Goal: 1.1/1.1.1, 1.1.2

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Voice Recording Replacement Program. Improve NAS system efficiency by replacing aging analog voice recording systems with modern digital voice recording systems. These recording systems enable air traffic controllers to effectively record all voice communications between the controllers, pilots, and other ground-based air traffic control facilities, meeting the statutory requirement.</p>	<ul style="list-style-type: none"> • Replaced 61 of 530 voice recording systems. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Replace an additional 46 of 530 voice recording systems. 	<ul style="list-style-type: none"> • Replace additional 30 of 530 voice recording systems in 2004. • Perform 27 of 346 retrofits to previously delivered systems to bring them up to current hardware and software configurations in 2004. 	<ul style="list-style-type: none"> • Replace final 47 of 530 voice recording systems. • Award follow-on contract to perform remaining 319 of 346 retrofits to previously procured systems to bring them up to current hardware and software configurations in FY 2005–2007, which will complete all the replacements planned for voice recorder replacement program.

4C05: National Airspace System Infrastructure Management System;

- **National Airspace System Infrastructure Management System – Phase 2**
- **National Airspace System Infrastructure Management System – Phase 2 Tech Refresh**
- **National Airspace System Infrastructure Management System – Phase 3**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>National Airspace System (NAS) Infrastructure Management System (NIMS) – Phase 2. Improve the FAA system efficiency by centralizing information and technical expertise and providing remote monitoring and control capabilities. NIMS phase 2 fields a COTS-based information system that consists of distributed computers and integrated software/database applications for a national operational control center and three strategically located operational control centers (OCC) to support air traffic services in meeting demand for increasing services with diminished resources while maintaining safety. Centralizing information, such as maintenance history, promotes informed, effective maintenance actions. Remote monitoring and control capabilities reduce maintenance personnel travel time and equipment downtime, saving time and money, improving efficiency, and reducing delays. With over 20,000 NAS facilities, many located far from maintenance personnel, reducing travel time and increasing maintenance personnel historical knowledge combine to yield increased service value at a reduced cost.</p>		<ul style="list-style-type: none"> • Deployed enterprise manager functionality at national operations control center and three OCCs. • Consolidated 12 general national airspace systems maintenance control centers into OCCs. • Initiated technology refresh of maintenance data terminals. • Began transitioning fielded remote maintenance monitoring systems to NIMS. • Completed seven7 percent of the system; total completed: 13 percent.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete general national airspace systems maintenance control center into OCC consolidation. • Commission enterprise manager. • Continue technology refresh of maintenance data terminals. • Connect to one NAS legacy systems (Low Power DME Model 1118). • Initiate NIMS connectivity with new NAS systems (ITWS, ATCBI-6). • Complete 8 percent of the system; total completed: 21 percent. 	<ul style="list-style-type: none"> • Deploy facility maintenance logging tool at key site. • Connect to one NAS legacy system. • Connect to seven new NAS systems. • Continue technology refresh. • Complete 14 percent of the system; total completed 35 percent. 	<ul style="list-style-type: none"> • Complete deployment of NIMS functionality to 33 service operations centers and over 300 work centers. • Retire legacy maintenance processor subsystem hardware and software. • Complete technology refresh of maintenance data terminals and servers from phase 1. • Connect to 47 NAS legacy systems—two legacy systems remain entering FY 2009. • Initiate NIMS technology refresh for phase 2 components. • Complete 63 percent of the system; total completed: 98 percent.

4C06: Flight Service Station Modernization;

- Automated Flight Service Stations Facilities Sustainment
- Flight Services Automation System – Power Conditioning Systems Upgrades

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Automated Flight Service Stations (AFSS) Facilities Sustainment. Improve FAA system efficiency by upgrading and repairing AFSS/FSS infrastructure, which includes heating/ventilation and air-conditioning systems, roofs, and fire and life safety upgrades. These upgrades ensure the proper environmental control in operations, equipment, and administrative areas.</p>		<ul style="list-style-type: none"> • Completed uninterruptible power systems (UPS) installations at nine sites. • Completed HVAC upgrades at three sites. • Performed minor infrastructure improvements at 10 sites, including roof and fire life safety, to OSHA standards. • Improved NAS system efficiency by procuring power-conditioning systems for the AFSS to alleviate power problems and accommodate any new load requirement from future systems.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete UPS installations at nine sites. • Complete HVAC upgrades at three sites. • Perform minor improvements at 10 sites, including roof and fire light safety, to meet OSHA standards. • Improve NAS system efficiency by procuring power-conditioning systems for the AFSS to alleviate power problems and accommodate any new load requirement from future systems. 	<ul style="list-style-type: none"> • Remove old facility and infrastructure at four sites. • Complete HVAC replacements at eight sites. • Complete HVAC improvements at two sites. • Reconfigure power distribution at nine sites. • Replace engine generators at five sites. • Perform improvements at 10 sites. • Perform facility expansion at one site. • Improve NAS system efficiency by procuring power-conditioning systems for the AFSSs to alleviate power problems and accommodate new load requirement from future systems. 	<ul style="list-style-type: none"> • Complete UPS installations at 20 sites. • Complete HVAC upgrades at 28 sites. • Perform major rehabilitation at 30 sites, including roof and fire light safety, to OSHA standards. • Improve NAS system efficiency by procuring power-conditioning systems for the AFSS to alleviate power problems and accommodate any new load requirement from future systems.

4C07: Flight Services Automation System Operational and Supportability Implementation System;

- Operational and Supportability Implementation System

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Operational and Supportability Implementation System (OASIS). Provide ongoing operational support, enabling flight service specialists to more efficiently provide weather and flight information to GA pilots. The existing flight services automation system equipment is 1980s technology and is difficult to maintain and support. OASIS will provide significant improvement in the CHI by replacing the existing flight services automation system display with a graphical user interface. Additionally, new ergonomic equipment consoles will be installed.</p>	<ul style="list-style-type: none"> • Procured 15 OASIS systems and installed one OASIS system. • Procured new replacement consoles for 17 AFSSs and installed replacement consoles at 17 AFSSs. • Completed IOT&E. • ISD—deployment to the first 25 AFSSs, approved 6/21/02. • Completed operational readiness declaration—Anderson, SC, AFSS, 7/29/02.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Install up to 12 OASIS systems at AFSSs. • Install new replacement consoles at up to nine AFSSs. 	<ul style="list-style-type: none"> • Procure and install up to 12 OASIS systems. • Conduct IOT&E. 	<ul style="list-style-type: none"> • Procure and install remaining OASIS systems. • Procure and install remaining new replacement consoles. • Install OASIS lease service last system for operational use.

4C09: Flight Service Station Switch Modernization;

- **Automated Flight Service Station Voice Switches**

Primary Goal: 1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Automated Flight Service Station (AFSS) Voice Switches. Provide pilots with significantly improved access to flight planning, weather, communications, and emergency services deemed essential to conducting safe and efficient flight. This modernization program will replace the aging, nonsupportable voice switches at 61 AFSSs throughout the NAS and at 14 non-AFSSs located in Alaska. The principal enhancement of this program is a call transfer capability, enabling AFSSs to transfer A/G calls to other AFSSs during periods of low demand. When fully implemented, the call transfer capability will significantly reduce operational costs. Through deployment of modern digital voice switches, the AFSS Voice Switches Program will significantly improve the operational and maintenance aspects of flight service operations.</p>	<ul style="list-style-type: none"> • Awarded automated FSS voice switches contract. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete PDR. 	<ul style="list-style-type: none"> • Conduct factory qualification testing. • Procure three AFSS voice switches systems for OT&E. 	<ul style="list-style-type: none"> • Conduct OT&E and IOT&E in 2005. • Install seven of 61 voice switches to AFSSs in 2006. • Install 11 of 61 voice switches to AFSSs in 2007. • Install 11 of 61 voice switches to AFSSs in 2008.

4C10: Alaskan National Airspace System Interfacility Communications System;

- Alaskan National Airspace System (NAS) Interfacility Communications System (ANICS) Satellite Network – Phase II
- ANICS (Tech Refresh)

Primary Goal: 2.1/2.1.5

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Alaskan National Airspace System (NAS) Interfacility Communications System (ANICS) Satellite Network – Phase II. Improve system NAS efficiency by installing a new satellite telecommunications facility at locations where the FAA has experienced poor performing telecommunications. The increase of telecommunications availability provided by implementing ANICS sites corresponds to a direct increase in the availability of the NAS and improves air safety in Alaska.</p>		<ul style="list-style-type: none"> • Negotiated a firm-fixed price for new ANICS Phase II sites. • Purchased and engineered two Phase II ANICS sites. • Installed one new Phase II ANICS sites; site is undergoing acceptance testing.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Purchase and engineer six Phase II ANICS sites. • Install eight new Phase II ANICS sites. • Bring online eight Phase II ANICS sites. • Improve communications at eight sites. • Correct any installation discrepancies. • Correct joint acceptance inspection (JAI) discrepancies. • Cut over circuits to operational sites. 	<ul style="list-style-type: none"> • Install seven new Phase II ANICS sites. • Bring online seven Phase II ANICS sites. • Improve communications at seven sites. • Correct any installation discrepancies. • Correct JAI discrepancies. • Cut over circuits to operational sites. 	<ul style="list-style-type: none"> • Install three new Phase II ANICS sites. • Bring online three Phase II ANICS sites. • Improve communications at three sites. • Correct any installation discrepancies. • Correct JAI discrepancies. • Cut over circuits to operational sites.

4C11: Electrical Power Systems – Sustain/Support;

- Power Systems Sustained Support

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Power Systems Sustained Support. Improve NAS facilities availability and reliability by reducing the potential for power outages. The electrical power systems program sustains existing power systems and training maintenance personnel, resulting in improved efficiency, and will increase the safety of FAA employees working on power projects.</p>	<ul style="list-style-type: none"> • Replaced UPS at 13 of the 176 TRACONs. • Replaced ARTCC critical essential power system batteries at 12 of the 21 ARTCCs. • Improved ARTCC critical essential power system at five of the 21 ARTCCs. • Replaced 66 engine generators out of the 2,250-engine-generator inventory.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Replace UPS at five of the 176 ATCTs/TRACONs. • Improve ARTCC critical essential power system at five of the 21 ARTCCs. • Sustain existing NAS power systems at about 100 facilities by replacing engine generators, power cable, direct current bus system; batteries; and lightning protection, grounding, bonding and shielding. 	<ul style="list-style-type: none"> • Sustain existing NAS power systems at about 130 facilities by replacing engine generators, power cable, direct current bus system; replacing batteries, and UPS, and lightning protection, grounding, bonding, and shielding. 	<ul style="list-style-type: none"> • Critical power distribution system training facility at Oklahoma City, OK (FY 2005). • Sustain existing NAS power systems at about 420 facilities by replacing engine generators, power cable, direct current bus system, replacing batteries, and UPS, and lightning protection, grounding, bonding, and shielding.

4C12: National Airspace System Recovery Communications;

- **National Airspace System Command and Control Communications Program**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Recovery Communications – Command and Control Communications (C3) Program. Provide system efficiency to the NAS by ensuring that during emergencies, C3 will be able to provide time-critical public and NAS information between the Administrator, the Administrator’s staff, key regional managers, the DOT, and other national-level executive personnel. Because of September 11, 2001, modernization of several Agency Command and Control facilities was required to ensure continuity of operations.</p>	<ul style="list-style-type: none"> • Modernized the Washington Operations Command Complex • Delivered 211 of 490 secure telephone equipment (STE) items. • Designed VHF operational test network. • Delivered and installed 81VHF equipment units. • Tested and implemented wireless notification system (WNS) equipment at three of 30+ sites. • Procured WNS software for 30 sites. • Delivered, installed, and provided training for 55 secure facsimile machines. • Modernized other classified facilities. • Implemented two automated message-handling systems.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
<ul style="list-style-type: none"> • Award VHF/FM contract. • Design and install defense messaging system network at 30 of 40+ sites. • Implement 105 out of the remaining 174 STE. • Implement 695 VHF/FM handhelds out of 5000+. • Implement 109 VHF/FM repeaters out of 1200+. • Implement 50 out of 600+ VHF/FM base stations. • Enhance and upgrade communications support 	<ul style="list-style-type: none"> • Upgrade and enhance satellite telephone network phones at 39 of 39 sites. • Delivered two out of two secure conferencing systems. • Implement seven additional secure fax machines. • Modernize other classified facilities. • Implement remaining (95 out of 125) portable and fixed satellite systems. 	<ul style="list-style-type: none"> • Complete deployment of the VHF/FM network. • Complete procurement of C3 high-frequency systems. • Implement P3I. • Complete modernization of classified facilities. • Provide communication support team support as required.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005-2008 Performance Output Goals
team equipment (12 teams). <ul style="list-style-type: none"> • Implement six additional secure fax machines. • Procure and implement 30 out of 125 portable and fixed satellite systems. • Implement 28 sites with WNS. • Procure secure cell phones (10 out of 40). 	<ul style="list-style-type: none"> • Complete the current defense messaging system design implementation (10+ sites). • Implement remaining STE requirements (174). • Procure remaining secure cell phones (30 units). 	

4C13: Aeronautical Center Infrastructure Modernization;

- **Aeronautical Center Infrastructure Modernization**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Aeronautical Center Infrastructure Modernization. Improve operational efficiency and effectiveness by providing up-to-date facilities and supporting infrastructure that meet the needs of the FAA mission support organizations located at the Aeronautical Center.</p>	<ul style="list-style-type: none"> • Completed construction of the first construction phase of the logistics support facility (LSF) structural upgrade and began second phase. • Started designing third phase of the LSF structural upgrade. • Installed telecommunications equipment, including telephone system cabling, network equipment, and NOTEL telephone switch upgrade. • Designed and awarded first phase of Civil Aeromedical Institute (CAMI) building renovation. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Begin construction of third phase of the LSF structural upgrade; complete design for fourth phase. • Install telecommunications equipment, including telephone system cabling, network equipment, and NORTEL telephone switch upgrade. • Design and award second construction phase of CAMI renovation. 	<ul style="list-style-type: none"> • Complete third phase of the LSF structural upgrade; complete design for the fifth phase; and begin fourth phase construction. • Provide NORTEL telephone switch upgrade; install telecommunications equipment. • Design and award third construction phase of CAMI renovation. • Design flight inspection building renovation. • Design storm sewer expansion. 	<ul style="list-style-type: none"> • Complete design and construction of remaining phases of the LSF structural upgrade. • Complete installing telecommunications systems. • Upgrade NORTEL switch. • Begin next-generation telecommunications system modernization and provide telephone switch upgrade. • Complete design and construction of remaining phases of the CAMI Building renovation. • Complete renovation of flight inspection building. • Complete expansion of storm sewer system. • Design and construct multipurpose building; complete renovation, except final phase.

Activity 5: Improve the Efficiency of Mission Support

5A01/5A02: National Airspace System Improvement of System Support Laboratory /FAA William J. Hughes Technical Center Facilities;

- National Airspace System Improvement of System Support Laboratory
- Technical Center Facilities

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>National Airspace System Improvement of System Support Laboratory. Improve system efficiency in the NAS by providing the agency’s laboratory infrastructure at the WJHTC for the development, testing, upgrades, and second level field support of CIP programs. Each CIP program supported by these laboratories contributes to one or more of the FAA and DOT goals.</p>		<ul style="list-style-type: none"> • Sustained and supported FAA WJHTC Laboratories and Test Facilities; supported testing and development of new NAS programs and provided second-level support to operational sites.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Sustain and support FAA WJHTC Laboratories and Test Facilities. 	<ul style="list-style-type: none"> • Sustain and support FAA WJHTC Laboratories and Test Facilities. 	<ul style="list-style-type: none"> • Sustain and support FAA WJHTC Laboratories and Test Facilities.

5A03: Technical Center Building and Plant Support;

- William J. Hughes Technical Center Infrastructure Sustainment

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>William J. Hughes Technical Center (WJHTC) Infrastructure Sustainment. Improve system NAS efficiency by refurbishing and replacing aging, obsolete facilities, systems, and equipment. These activities will ensure the WJHTC’s ability to sustain its physical structures in its efforts to develop and support a safe, secure, and efficient global aviation system.</p>		<ul style="list-style-type: none"> • Performed infrastructure upgrades at five R&D facilities at the WJHTC (refurbished/replaced HVAC systems, electrical power panels, lighting systems, and exterior glazing). • Completed building #301 interior renovation/emergency generator synchronization.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Replace the exterior glazing in building #301. • Replace the building #303 boiler stack. • Complete the building #300 interior upgrade design. 	<ul style="list-style-type: none"> • Replace building #300 mechanical equipment (phase 1). • Make water distribution system improvements. • Perform building #303 fire-suppression upgrades. • Replace building #300 primary feeder. 	<ul style="list-style-type: none"> • Conduct building #300 mechanical equipment replacement program (phase 2). • Renovate building #275 and expand building #277. • Replace electrical transformers at various WJHTC facilities. • Complete roadway improvements at WJHTC. • Replace one refrigeration machine in building #303. • Remediate storm water system. • Replace underground electric cable.

5A05: Department of Defense/Federal Aviation Administration Facilities Transfer;

- **Department of Defense/Federal Aviation Administration Air Traffic Control Facility Transfer/Modernization**

Primary Goal: 2.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
Department of Defense (DoD)/Federal Aviation Administration (FAA) Air Traffic Control Facility Transfer/Modernization. Engineer, deploy, and modernize new civilian airspace transferred to the FAA by the Department of Defense. The outcome goals are improved reliability and capacity of the NAS.		<ul style="list-style-type: none"> • Enhanced the reliability of communications in northern California via a long distance radio communications link backbone loop (Vandenburg/Pt. Mugu/Edwards/Paso Robles, with telecommunications, microwave, power supply, short-term emergency power, security, etc.). • Enhanced the reliability of communications at Pt. Lay, AK. • Digitized radar at Castle, CA. • Engineered requirements to upgrade radar at 29 Palms and El Centro, CA. • Supported the air traffic operations of Ft. Sill, OK, Army radar approach control. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Acquire new systems to enhance radar data accuracy and reliability. • Resolve unsatisfactory condition reports. 	<ul style="list-style-type: none"> • Acquire new systems to enhance radar data accuracy and reliability. • Resolve unsatisfactory condition reports. 	<ul style="list-style-type: none"> • Acquire new systems to enhance radar data used by air traffic controllers. • Resolve unsatisfactory condition reports. 	

5A09: Federal Aviation Administration Buildings and Equipment;

- (A) **Federal Aviation Administration Buildings and Equipment Sustain Support**
- (B) **Seismic Safety Risk Mitigation**

(A) Federal Aviation Administration Buildings and Equipment Sustain Support

Primary Goal: 2.1/2.1.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
Federal Aviation Administration (FAA) Buildings and Equipment Sustain Support. Achieve the optimum level of customer satisfaction that should result from sustainment actions, expansions, and modifications. This also includes improving NAS efficiency by providing facility replacements and upgrades to reduce maintenance requirements associated with an aging infrastructure.	<ul style="list-style-type: none"> • Performed projects at the facilities supporting the benchmark airports. • Performed about 503 projects in FY 2002. • Upgraded five unstaffed facilities. • Replaced or refurbished 10 shelters. • Installed 23 engine generators.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Support the OEP to sustain the navigation aid (NAVAID) and General NAS facilities at the benchmark airports. • Completely refurbish at least five unstaffed facilities. • Install a minimum of 10 engine generators. • Replace a minimum of 10 shelters. • Reduce the deferred maintenance backlog. • Implement the RESTORE Web tool. 	<ul style="list-style-type: none"> • Support the OEP to sustain the NAVAID and General NAS facilities at the benchmark airports. • Completely refurbish at least five unstaffed facilities. • Install a minimum of 10 engine generators. • Replace a minimum of 10 shelters. • Reduce the deferred maintenance backlog. 	<ul style="list-style-type: none"> • Continue to repair and upgrades the most in-need/critical facilities. • Support the OEP to sustain the NAVAID and General NAS facilities at the benchmark airports. • Completely refurbish at least five unstaffed facilities annually. • Install a minimum of 10 engine generators annually. • Replace a minimum of 10 shelters annually. • Continue power and HVAC repairs/replacements to facilitate installation of new equipment, as appropriate. • Reduce the deferred maintenance backlog.

(B) Seismic Safety Risk Mitigation

Primary Goal: 4.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Seismic Safety Risk Mitigation Program. Complete evaluation of at risk buildings at the end of FY 2006 and mitigate the unacceptable risks by the end of FY 2020.</p>	<ul style="list-style-type: none"> • Initiate seismic evaluations of Memphis ARTCC, Seattle AFSS and ARTCC, and Salt Lake City ARTCC. • Briefed three product teams on seismic safety requirements for new equipment and new construction. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Complete seismic evaluations of Seattle AFSS and ARTCC, and Salt Lake City ARTCC. • Initiate Seismic evaluation of Puerto Rico ARTCC, Anchorage ARTCC, Oakland ARTCC, and Los Angeles ARTCC. • Compile biennial seismic safety report for the Office of the Secretary of Transportation. • Continue to brief product teams and new programs. 	<ul style="list-style-type: none"> • Complete seismic evaluations of Puerto Rick ARTCC and Anchorage ARTCC. • Award the contract for seismic safety training. • Initiate seismic safety training for FAA building design engineers, architects, Real Estate Contracting Officers, Regional Associate Program Managers, and others. • Continue to brief product teams and new programs. 	<ul style="list-style-type: none"> • Not applicable.

5A11: Computer Aided Engineering and Graphics Modernization;

- **Computer-Aided Engineering Graphics Replacement**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Computer-Aided Engineering Graphics (CAEG) Replacement. Improve system efficiency at all regions and centers by using enhanced computer-aided design and drafting systems, coupled with a secure Web-based engineering drawing access system to facilitate drawing access, retrieval, and update. This increases the FAA’s ability to implement capital improvements with correct and timely information. The system meets increasing user access needs by expanding the system and by providing a flexible system interface to a suite of state-of-the-art graphical modeling and analysis tools. This will be done in conjunction with access to an underlying secure and reliable engineering library to augment the transition engineering process.</p>	<ul style="list-style-type: none"> • Fielded the airport system v 1.0 with requisite training material and curriculum. • Upgraded airport system v 1.0 to include 7460-1 aeronautical case studies; upgraded to threshold siting analysis. • Migrated radio coverage analysis system (RCAS) v10.2.1 to the Windows NT platform and server via a centralized CITRIX solution. • Upgraded/increased CITRIX server licenses by 30 percent for additional access points to the RCAS/Airport System applications. • Completed beta testing of RCAS v11. • Upgraded CAEG database engine to v Oracle 9i to increase system access time, reliability, and maintainability. • Provided rapid application of all Windows security patches to prevent security breach of CAEG system. • Sustained national CAEG system maintenance vehicle to ensure optimum system availability. • Installed electronic document management system at a central site and completed implementation testing at a regional site. • Developed an engineering database for 3,000 engineering drawing file images with metadata for 16,650 drawings. • Began testing new licensing concept (Bentley Portfolio), offering enhanced management and flexibility in terms of breadth of applications.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Implement next generation of Microsoft operating system and CAEG servers. • Provide national training to the nine regions for the RCAS v11. • Finish implementing the CAEG backup/recovery plan. • Provide rapid application of all Windows security patches to prevent breach of CAEG system. • Replace CITRIX servers and begin the deployment of a secondary backup site. • Sustain national CAEG system maintenance vehicle to ensure optimum system availability. • Complete feasibility study for adoption of COTS spatial analysis tools as a possible complement or replacement for the 	<ul style="list-style-type: none"> • Complete the CAEG SCAP. • Upgrade the underlying operating system and database management system software to the latest revision. • Expand access to the electronic document management system to as many as 300 additional users. • Upgrade estimated 16 low-production plotters with more modern and versatile plotters. • Replace outdated 200 MHz NT servers with modern servers for improved performance. • Further develop the engineering database with 	<ul style="list-style-type: none"> • Phase in next generation of CAEG hardware and software systems. • Provide rapid application of all current operating system security patches to prevent breach of CAEG system. • Sustain national CAEG system maintenance vehicle to ensure optimum system availability. • Investigate virtual public network solution for the CAEG system and develop study.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<p>in house developed software.</p> <ul style="list-style-type: none"> • Further develop an engineering database with 3,000 engineering drawing file images and corresponding metadata and serve via a secure intranet mechanism with the planned inclusion of the remaining 13,650 drawings. • Institute performance metrics for the CAEG program. • Implement and publish CAEG Web services for distribution throughout the agency. 	<p>3,000 engineering drawing file images and corresponding metadata and serve via the intranet with a remainder of 10,650 drawings.</p> <ul style="list-style-type: none"> • Monitor and enhance CAEG performance metrics. • Update/replace existing COTS spatial analysis tools per the recommendation of feasibility study. 	<ul style="list-style-type: none"> • Complete engineering library with the remaining 10,350 engineering drawing file images and metadata. • Provide enhancements to the RCAS and airports system as needed.

5A12: Information Technology Integration;

- **Information Technology Integration**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Information Technology (IT) Integration. Improve operational efficiency and effectiveness by reducing the cost of delivering IT services, without reducing service quality, by optimizing IT decisions and resources across the agency.</p>	<ul style="list-style-type: none"> • Continued to integrate improved processes for certifying software aspects of airborne and ground systems to ensure safety. • Enhanced the FAA metadata repository from a limited IOC to a COTS solution with expanded capability. • Completed phase I of the Enterprise Architecture for Administrative Systems. • Achieved a rating of “green” on the e-Gov scorecard through completion of the e-Gov Strategy, Section 508 Compliance Plan, and enterprise architecture development plan. • Developed the Agency’s business planning and portfolio management initiatives. • Established the Section 508 Compliance Program. • Established a governance process for implementing NAS data standards.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue to integrate improved processes for certifying software aspects of airborne and ground systems to ensure NAS safety. • Complete identification and adoption of “best practices” for safety and security engineering and begin integrating safety/security processes into the FAA’s acquisition management and systems engineering lifecycle processes. • Implement the initiatives of the agency’s Data Management Program and Business Planning and Portfolio Management Programs to achieve increased business value. • Complete phase II of the Enterprise Architecture to include development of the Architecture for Mission-Support Systems, and baseline the “to be” Architectures for Administrative Systems and Mission-Support Systems. • Achieve full compliance with the Government Paperwork Elimination Act to automate information collections and processes, including digital signature capability. • Train Webmaster, Web designers, and managers in Section 508 Compliance requirements. • Identify mission-critical data elements and develop an additional 250 data element standards. 	<ul style="list-style-type: none"> • Implement initiatives that reduce software costs, software-induced cost overruns, schedule slippages, and post-deployment defects in NAS and other systems. • Develop guidelines for FAA systems to enhance safety and reliability characteristics. • Continue integrating safety and security engineering processes to better NAS and non-NAS systems • Incorporate best practices for IT capital planning and investment control into the agency lifecycle management policies and processes, and establish a capital planning process for significant IT investments not currently covered under the existing acquisition management system process. • Implement a model of the enterprise architecture consistent with the OMB and DOT guidance. • Fully implement Section 508 Compliance requirements in all electronic information technology procurements. • Standardize remaining mission-critical data elements. 	<ul style="list-style-type: none"> • Continue to integrate improved processes for certifying software aspects of airborne and ground systems to ensure NAS safety. • Continue to implement the initiatives of the agency’s Data Management Program and Business Planning and Portfolio Management Programs to achieve further business value • Extend, align, and evolve process improvement models, methods, and tools that reflect best practices to enable improvement in performance of both NAS and non-NAS systems.

5A13: Operational Data Management System - National Airspace System Aeronautical Information Management Enterprise System;

- **National Airspace System Aeronautical System Resource**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>National Airspace System Aeronautical System Resource. Provide through the Notice to Airmen (NOTAM) automated distribution system standardization within the NAS, timeliness of delivery across the NAS, a centralized NOTAM source, and state-of-the-art entry and delivery of critical safety information using dedicated telecommunications network. This project stems from the fact that in June 2001, an FAA memorandum identified two incidents that highlighted some weakness in the current NOTAM 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 NOTAM automated distribution solution includes towers/TRACONS, FSSs, and ARTCCs of the NAS and also the ATCSCC in Herndon, VA.</p>	<ul style="list-style-type: none"> • Installed Web-based NOTAM capability at Federal contract towers. • Procured telecommunication network for 32 proofs of concept sites. • Conducted user testing on tower/TRACON automated NOTAM software that will replace Web-based NOTAM capability. • Began developing and testing flight service and air route traffic control software.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Install automated NOTAM software capability at FAA tower (Peachtree DeKalb, Atlanta, GA). • Conduct automated NOTAM test at 32 proof of concept sites in southern and northwest mountain regions. • Make production rollout decision. 	<ul style="list-style-type: none"> • Procure hardware/spares for NOTAM automated solution. • Install 75 sites with NOTAM automated solution. • Procure dedicated telecommunications network for 75 sites. • Develop and train air traffic/airways facilities workforce on NOTAM automated solution. 	<ul style="list-style-type: none"> • Procure hardware/spares and install remaining NOTAM automated solutions. • Train air traffic/airways facilities workforce on NOTAM automated solution. • Commission systems.

5A14: Logistics Support Systems and Facilities;

- **Logistics Support Systems and Facilities – Asset and Supply Chain Management**

Primary Goal: 2.1/2.1.5

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Logistics Support Systems and Facilities – Asset and Supply Chain Management (ASCM). Improve operational efficiency and effectiveness throughout the agency by exercising effective control of assets and providing full lifecycle management.</p>	<ul style="list-style-type: none"> • Acquired 540 scanners for asset tagging and data harvesting and developed agency-specific applications for scanners. • Released screening information request and completed screening information request evaluation process. • Completed ASCM phases 2 and 3, A to G, build plan. • Identified and developed definitions for 1,000 FAA asset data elements. • Acquired development hardware for logistical center support system (LCSS). • Began LCSS modeling. • Acquired COTS software for prototyping LCSS business models. • Interface legacy systems to meet DELPHI requirements.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Begin tagging field spares inventory, real property, personal property, and government-furnished property at contractor depots. • Field 540 scanners. • Complete ASCM request for offer development. • Complete investment analysis following JRC-2a investment decision. • Complete union negotiations for fielding personal property scanners. • Acquire and install production platforms for data harvesting. • Identify host sites for national ASCM servers. • Incorporate ASCM enterprise asset management (EAM) structure into FAA Chief Information Officer's (CIO) Enterprise Architecture. • Complete LCSS business scenarios and develop methodology for integrating LCSS with DELPHI. • Continue prototyping LCSS business scenarios on COTS software package. 	<ul style="list-style-type: none"> • Acquire and field 600 scanners. • Continue tagging personal and real property. • Complete JRC-2b Investment Decision. • Release Request for Offer and evaluate proposals. • Continue EAM CIO data stewardship development efforts; goal = 300 data elements stewardship identified. • Complete prototyping LCSS software suites, acquire production platform, and license 3,000 LCSS users. 	<ul style="list-style-type: none"> • Field 600 scanners. • Continue tagging real and personal property. • Award ASCM contract and acquire development platform and software. • Complete development to ASCM build A (replaces legacy personal property system software), acquire 500 licenses for fielding the same, and continue EAM CIO data stewardship development efforts; goal = 300 data elements stewardship identified. • Complete LCSS licensing. • Field 600 scanners to continue the tagging effort. • Acquire developmental software and field ASCM builds B to E and continue EAM CIO data stewardship development efforts; goal = 900 data elements stewardship identified.

5A15: Test Equipment – Maintenance Support for Replacement;

- **Test Equipment Modernization/Replacement**

Primary Goal: 2.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals
<p>Test Equipment Modernization and Replacement. Improve FAA's system efficiency by procuring the test equipment necessary to ensure reliable NAS operation. As the FAA modernizes the NAS, it must purchase appropriate test equipment designed to test the systems being installed. Without such equipment, equipment cannot be repaired efficiently, and outages would be unnecessarily prolonged.</p>	<p>The National Test Equipment Program procured the following test equipment items in FY 2002:</p> <ul style="list-style-type: none"> • 18 signal generators. • Four electronic counters. • Five power meters. • 130 oscilloscopes.

Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<p>The test equipment national program office will purchase:</p> <ul style="list-style-type: none"> • 10 signal generators, which are used as a source to test, align, and verify NAS equipment. • 40 scope meters. • 40 oscilloscopes to support higher frequency requirements such as radar. • 12 spectrum analyzers. • Three frequency counters, which determine the frequency of an unknown signal or a nonworking transmitter 	<ul style="list-style-type: none"> • Purchase 556 oscilloscopes to support higher frequency requirements such as radar. 	<ul style="list-style-type: none"> • Purchase signal generators, frequency counters, and test sets.

5A16: Facility Security Risk Management;

- **Facility Security Risk Management**

Primary Goal: 5.1

Program Name and Outcome Goal	FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Facility Security Risk Management. Improve and/or enhance physical security at all FAA staffed facilities in accordance with FAA Order 1600.69a. This order delineates 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. This 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.</p>	<ul style="list-style-type: none"> • Upgraded and accredited 227 facilities. • Developed statement of work for contract maintenance. • Started engineering design at 18 ARTCCs. • Began impact assessment and implementation with bargaining units. • Installed positive access control at 235 facilities. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Upgrade and accredit 42 facilities. • Start engineering design at two ARTCCs. • Start construction at four ARTCCs. • Award maintenance contract for security equipment. • Install positive access control at 19 additional facilities. 	<ul style="list-style-type: none"> • Upgrade and accredit 68 security level I and II facilities. • Start phase II construction at 10 ARTCCs. 	<ul style="list-style-type: none"> • Continue to upgrade and accredit 491 level I, II, III, and IV facilities.

5A17: Information Security;

- **NAS Information Security - Information Systems Security**

Primary Goal: 5.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals
<p>National Airspace System (NAS) Information Security – Information Systems Security. Improve FAA safety by safeguarding information through various means, such as information security access, Web-based protection, and activities to “firewall” electronic access. International terrorism has become a major threat to U.S. national security, and there are nation-states that have cyber capability and are unfriendly to the United States. The phenomenal growth of the Internet and the worldwide proliferation of sophisticated computer skills have created a potential to threaten the nation’s critical information infrastructure, including the air traffic control system. The FAA has three objectives in this area. The first objective is to ensure effective preparedness, detection, response, and recovery to cyber attacks. The second objective is to integrate information security efforts into all of acquisition and operation phases to protect FAA people, buildings, and information. The third objective is to support the nation’s efforts to safeguard homeland security, in particular the aviation infrastructure and industry.</p>		<ul style="list-style-type: none"> • Completed construction and achieved FOC of the computer security incident response center (CSIRC). • Completed certification and authorization packages on 6 new National Airspace Systems in accordance with FAA policy. • Completed integrated facility protection at three ARTCCs. • Awarded a technical services support contract for policy, plans, and engineering services to provide subject matter experts to assist in developing FAA-wide cyber policy and guidance.
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals
<ul style="list-style-type: none"> • Continue to update the detection tools used by cyber security professionals. • Implement cost-effective countermeasures based on risk assessment reports and intrusion detection analysis of CSIRC data to protect against cyber vulnerabilities. • Conduct penetration testing to ensure electronic boundaries are secure. • Develop policy, plans, and standards to support an agency’s public key infrastructure approach. • Install boundary protection into 10 ARTCCs 	<ul style="list-style-type: none"> • Expand the initial public key infrastructure to key NAS facilities that include ARTCC and TRACON facilities. • Continue the deployment of 10 electronic boundary protection at ARTCCs and begin work on three TRACON facilities. • Continue work on the FAA’s information systems security architecture that calls out the relationships among systems and applications in providing cyber security. • Implement secure applications and data within the boundary of key NAS information systems that exchange air traffic control data. • Improve intrusion detection and analysis capability at the CSIRC, which monitors FAA-wide area networks. • Develop architecture and engineering efforts for alternative solutions to secure the local area network from external and internal cyber threats. Prototype alternatives to assist the FAA in determining which designs meet the needs of the NAS. 	<ul style="list-style-type: none"> • Continue work in integrated facility protection until all ARTCC and TRACON facilities are completed. • Evaluate and acquire enhanced tools used by the CSIRC to address complex and rapidly changing cyber threats and vulnerabilities. • Evaluate and acquire enhanced countermeasures/protection devices that address discovered cyber threats and vulnerabilities.

5B01: National Airspace System Facilities Occupational Safety and Health Administration and Environmental Standards Compliance;

- **National Airspace System Facilities Occupational Safety and Health Administration**
 - (A) Occupational Safety and Health Administration Compliance**
 - (B) Fire Life Safety for Air Traffic Control Towers**
 - (C) Energy Conversation Implementation**
 - (D) Environmental Standards Compliance**
- **National Airspace System Facilities Occupational Safety and Health Administration - Environment Policy Development**

Primary Goal: 4.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>National Airspace System (NAS) Facilities Occupational Safety and Health Administration (OSHA)/ Environmental Standards Compliance. Implement programs for OSHA and Environmental Compliance, fire life safety (FLS), and energy conservation; ensure a safe and healthful workplace for FAA employees; and protect the environment through sound environmental and energy efficient practices.</p>		<ul style="list-style-type: none"> • Developed fall protection program to protect employees working at heights. • Developed electrical safety program to protect employees from electrical hazards. • Developed confined space entry program to protect employees from confined-space hazards. • Developed lockout/tagout program to protect employees from electrical shocks. • Supported the acquisition management organizations by providing occupational safety and health (OSH) and environmental technical assistance throughout the acquisition process. • Performed environmental compliance plan (ECP) follow-up reviews in two regions/centers. • Reduced energy consumption in FAA administrative buildings by 4 percent. • Continued to provide maintenance training for technicians responsible for FLS systems in ATCTs; initiated training for technicians responsible for FLS systems in ARTCCs; and continued FLS upgrades to ATCTs. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Implement a fall protection program to protect employees working at heights. • Support the acquisition management organizations by providing OSH and environmental technical assistance throughout the acquisition process. • Perform ECP followup reviews in three regions/centers. • Implement energy-efficient/conservation efforts. • Continue to provide maintenance training for technicians responsible for FLS systems in ATCTs and ARTCCs and continue FLS upgrades to ATCTs. 	<ul style="list-style-type: none"> • Support the acquisition management organizations by providing OSH and environmental technical assistance throughout the acquisition process. • Perform ECP followup reviews in two regions/centers. • Continue to implement FLS upgrades for ATCTs. • Continue to implement agencywide fall protection program to protect employees working at heights. • Continue to implement electrical safety program to protect employees working on electrical systems. • Continue to implement lockout/tagout program for energy-isolating devices to protect employees working on machines or equipment. • Continue to implement confined-space safety program. • Fund local energy efficiency initiatives that comply with Executive Order 13123. 	<ul style="list-style-type: none"> • Continue to implement FLS upgrades for ATCTs. • Continue to implement energy-efficient/conservation efforts. • Support the acquisition management organizations by providing OSH and environmental technical assistance throughout the acquisition process. • Complete ECP followup reviews in all regions/centers. • Continue to implement written safety programs. 	

5B02: Fuel Storage Tank Replacement and Monitoring;

- **Fuel Storage Tanks**

Primary Goal: 4.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Fuel Storage Tanks. Sustain fuel storage tank systems in the FAA’s operational inventory to support continued operation of mission-critical activities and to reduce or eliminate environmental damage to communities and the environment.</p>		<ul style="list-style-type: none"> • Conducted a pilot test of fuel storage tank optical monitoring system with remote monitoring maintenance capability. • Finalized FAA Order 1050.16. • Integrated environmental compliance program goals into FY 2002 spend plan categories and into Fuel Storage Tank Operation Management Plans. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Continue tank-removal efforts associated with decommissioned Beacon sites. 	<ul style="list-style-type: none"> • Continue replacement/sustainment of about 3,000 fuel storage tanks. • Complete closure of storage tank efforts associated with decommissioned sites. 	<ul style="list-style-type: none"> • Provide lifecycle replacement/sustainment of fuel storage tank systems. • Provide remediation efforts after fuel storage tank system replacements through 2008. 	

5B03: Hazardous Materials Management;

- **Environmental Cleanup / Hazardous Materials**

Primary Goal: 4.1

Program Name and Outcome Goal		FY 2002 Program Accomplishments/Status Performance Output Goals	
<p>Environmental Cleanup/Hazardous Materials. Ensure compliance with statutory mandates and identify appropriate procedures for proactively managing hazardous materials to prevent future environmental contamination and notices of violations. This program will improve the quality of human health and the environment by removing hazardous carcinogenic materials and materials that destroy living organisms (animal or plant).</p>		<ul style="list-style-type: none"> • Performed surface debris removal at Annette Island, AK. • Initiated assessment of mercury contamination at FAATC, Atlantic City, NJ. • Performed environmental assessments at multiple ARSR sites. • Continued remedial actions for environmentally contaminated sites. • Completed contaminated soil and water remediation at Area of Concern 29, Atlantic City, NJ. 	
Program Plan FY 2003 Performance Output Goals	Program Plan FY 2004 Performance Output Goals	Key Events FY 2005–2008 Performance Output Goals	
<ul style="list-style-type: none"> • Continue remedial assessments of contaminated areas at FAATC, Atlantic City, NJ. • Identify extent of contamination at Annette Island, AK. • Develop Federal Interagency Remediation Plan for Annette Island, AK. • Complete remediation activities at seven ARSR sites (five in southern region and two in northwest mountain region). 	<ul style="list-style-type: none"> • Continue remedial actions for environmentally contaminated sites. • Perform remediation activities for contaminated areas at FAATC, Atlantic City, NJ. • Conduct environmental assessments for 10 ARSR sites. 	<ul style="list-style-type: none"> • Treat and dispose of hazardous wastes at Annette Island, AK. • Treat and dispose of fuel-contaminated soil at Tanuna, AK. • Treat and dispose of PCB (polychlorinated biphenyl) and fuel-contaminated soil at McGrath, AK. • Perform remediation activities for contaminated areas at FAATC, Atlantic City, NJ. 	

Federal Aviation Administration

National Airspace System

Capital Investment Plan

Appendix C

For

Fiscal Years 2004-2008

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.

Appendix D

List of Acronyms and Abbreviations

A

ACAS II	aircraft collision avoidance system
ACE	aviation capacity enhancement
ACE-IDS	automated surface observing system controller equipment information display system
ACI	Alaska Capstone Initiative
ACSI	American customer satisfaction index
ACTIONS	administration and compliance tracking in an integrated office network subsystem
ADS	automatic dependent surveillance
ADS-B	automatic dependent surveillance broadcast
AF	Airway Facilities
AFIS	automated flight inspection system
AFS	Director of Flight Standards Service
AFSS	automated flight service station
AIR	Aircraft Certification Service
A/G	air-to-ground
ALSF	approach lighting system with sequence flasher
ALSIP	approach lighting system improvement program
AMASS	airport movement area safety system
AME	airman medical examiner
ANICS	Alaskan national airspace system interfacility communications system
AOC	airline operations center
AOS	Operational Support Service
ARSR	air route surveillance radar
ARTCC	air route traffic control center
ARTS	automated radar terminal system
ASAS	aviation safety analysis system
ASCM	asset supply chain management
ASDE	airport surface detection equipment
ASI	aviation safety inspector
ASKME	aviation safety knowledge management environment
ASOS	automated surface observing system
ASR	airport surveillance radar
ASR-11	airport surveillance radar – model 11
ASSAP	airborne surveillance and separation assurance processing
ATC	air traffic control
ATCBI	air traffic control beacon interrogator
ATCSCC	air traffic control system command center
ATCT	air traffic control tower
ATDP	advanced technology development prototyping
ATM	air traffic management
ATO	Air Traffic Operations
ATOMS	air traffic operations' management system
ATOP	advanced technologies and oceanic procedures
ATOS	air transportation oversight system
ATS	Air Traffic Services
AWOS	automated weather observing system

B

BCS	buoy communications system
BLI	budget line item

BUEC	backup emergency communications
C	
C3	command, control, and communications
CAEG	computer-aided engineering graphics
CAMI	Civil Aeromedical Institute
CAR	Caribbean
CARS	compliance assessment reporting system
CAS	cost accounting system
CAST	Commercial Aviation Safety Team
CAT	category
CATMIS	corporate air traffic management information system
CCLD	core capability limited deployment
CDM	collaborative decision making
CDTI	cockpit display of traffic information
CERAP	center radar approach control
CFE	communications facilities enhancements
CFMSS	computerized flight monitoring and scheduling system
CHAPS	clinic health awareness program support
CHI	computer-human interface
CIO	Chief Information Officer
CIP	Capital Investment Plan
CNS	communications, navigation, and surveillance
CONOPS	concept of operations
COTS	commercial off-the-shelf
CPDLC	controller-pilot data link communications
CPDSS	covered position decision support subsystem
CSIRC	Computer Security Incident Response Center
CTAS	center terminal radar approach control automation system
CTS	critical telecommunications support
CVR	cockpit voice recorder
D	
DARC	direct access radar channel
DCA	Ronald Reagan Washington National Airport
DF	direction finder
DIO	DSP integration and operations
DIWS	document imaging workflow subsystem
DME	distance measuring equipment
DoD	Department of Defense
DOT	Department of Transportation
DSP	departure spacing program
DSR	display system replacement
E	
EAM	enterprise asset management
ECG	en route communication gateway
ECP	Environmental Compliance Plan
EDC	early display configuration
e-Gov	electronic-Government
EMAC	en route monitor and control
ERAM	en route automation modernization
ETMS	enhanced traffic management system
F	

FAA	Federal Aviation Administration
FAATC	Federal Aviation Administration Technical Center
FDIO	flight data input/output
FDR	flight data recorder
F&E	facilities and equipment
FFP1	Free Flight Phase 1
FFP2	Free Flight Phase 2
FIAT	facilities information and analysis tool
FIS	flight information service
FISDL	flight information services data link
FLS	fire life safety
FM	frequency modulated
FOC	full operational capability
FOQA	flight operational quality assurance
FPS	fixed position surveillance
FS	full service
FSAS	flight services automation system
FSS	flight service station
FTI	Federal Aviation Administration telecommunications infrastructure
FY	fiscal year

G

GA	general aviation
GNAS	general national airspace system
GOM	Gulf of Mexico
GOMP	Gulf of Mexico offshore program
GPRA	Government Performance and Results Act
GPS	global positioning system
GTE	government transition evaluations

H

HCS	host computer system
HF	human factors
HOCSR	host/oceanic computer system replacement
HVAC	heating, ventilating, and air-conditioning

I

IAPA	instrument approach procedures automation
IATS	initial academy training system
ICAO	International Civil Aviation Organization
ICD	interface control document
IDU	initial daily use
IFQA	integrated flight quality assurance
IFR	instrument flight rules
ILS	instrument landing system
IOC	initial operating capability
IOT&E	independent operational test and evaluation
IPT	integrated product team
IRMIS	integrated rulemaking management information system
ISC	initial systems configuration
ISS	information systems security
IT	information technology
ITWS	integrated terminal weather system

J

JAI joint acceptance inspection
JFK John F. Kennedy International Airport
JRC Joint Resources Council

L

LAAS local area augmentation system
LCSS logistical center support system
LEO low-earth orbit
LLWAS low-level wind shear alert system
LLWAS-NE low-level wind shear alert system network expansion
LLWAS-RS low level wind shear alert system relocation/sustainment
LNAV lateral navigation
LPV lateral navigation with precision vertical guidance
LRR long-range radar
LSF logistics support facility

M

MALSR medium-intensity approach light system with runway alignment indicator lights
MASPS minimum aviation system performance standard
MDM main display monitor
MDR multi-mode digital radio
MFIS modular flight inspection system
MHz megahertz
MIAWS medium intensity airport weather system
MicroEARTS micro en route automated radar terminal system
MMAC Mike Monroney Aeronautical Center
Mode-C mode c (altitude reporting)
Mode S mode select
MOPS minimum operational performance standard

N

NAS National Airspace System
NASDAC national aviation safety data analysis center
NASMAP national airspace system management automation program
NAVAID navigation aid
NDB non-directional beacon
NDC national data center
NDI non-developmental item
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
nmi nautical mile
NORAD North American Air Defense Command
NOTAM notice to airmen
NPA non-precision approach
NPRM notice of proposed rulemaking

O

OASIS operational and supportability implementation system
OCC operational control center
ODAPS oceanic display and planning system
OE - AAA obstruction evaluation - airport/airspace analysis.
OEP Operational Evolution Plan

OMB	Office of Management and Budget
ORD	operational readiness date
OSHA	occupational safety and health administration
OSH	occupational safety and health
OT&E	operational test and evaluation

P

P3I	pre-planned product improvement
PAPI	precision approach path indicator
pb-ICE	performance based Integrated Collaborative Environment
PCB	polychlorinated biphenyl
PCB&T	personnel, compensation, benefits, and travel
PCT	Potomac consolidated terminal radar approach control
PDR	preliminary design review
PEM	position electronic module
pFAST	passive final approach spacing tool

R

RCAS	radio coverage analysis system
R&D	research and development
RDA	radar data acquisition
REIL	runway end identifier lights
RFI	radio frequency interference
RGL	regulatory and guidance library
RIRP	runway incursion reduction program
RNP	required navigation performance
RTP	resource tracking program
RVR	runway visual range
RVSM	reduced vertical separation minima

S

SAM	South American
SASO	system approach for safety oversight
SATCOM	satellite communications
SCAP	Security Certification Authorization Plan
SDAT	sector design analysis tool
SERC	software engineering resource center
SET-EM	secure executive toolset – emergency management
SFAR	Special Federal Air Regulation
SFO	San Francisco International Airport
SIR	screening information request
SJC	San Jose, CA Airport
SLEP	service life extension program
SMA	surface movement advisor
SMS	surface management system
SNI	simultaneous non-interfering
SPAS	safety performance analysis system
STARS	standard terminal automation replacement system
STE	secure telephone equipment

T

TAMDAR	tropospheric airborne meteorological data reporting
TAWS	terrain awareness and warning system
TDWR	terminal Doppler weather radar
TERPS	terminal instrument procedures

TFM	traffic flow management
TFM-I	traffic flow management-infrastructure
TIS	traffic information service
TIS-B	traffic information service-broadcast
TMA	traffic management advisor
TMA-SC	traffic management advisor-single center
TMU	traffic management unit
TRACON	terminal radar approach control
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
VEM	voice switching and control system electronic module
VERN	very high frequency extended range network
VF	vertical flight
VFR	visual flight rules
VHF	very high frequency
VNAV	vertical navigation
VOR	very high frequency omni-directional range
VORTAC	very high frequency omni-directional range collocated with tactical air navigation
VSCS	voice switching and control system
W	
WAAS	wide are augmentation system
WARP	weather and radar processor
WJHTC	William J. Hughes Technical Center
WNS	wireless notification system
WSP	weather systems processor