U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

MAY 10 2010

The Honorable James L. Oberstar
Chairman, Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

As authorized under the Vision 100 – Century of Aviation Reauthorization Act - (P.L. 108-176) the Joint Planning and Development Office (JPDO) is charged with creating an Integrated Plan for the Next Generation Air Transportation System (NextGen) by engaging and collaborating with multiple partner agencies. NextGen will be realized through a combination of research, development, and implementation actions performed and managed by each agency partner. For example, the Federal Aviation Administration is responsible for implementing NextGen systems and procedures into our Nation's air traffic management infrastructure.

During 2008, the JPDO, with the assistance of its government and industry partners, made important strides in its multi-agency mission to plan and coordinate the development of NextGen. This included fielding a multi-agency implementation plan, the Integrated Work Plan v1.0 (IWP), along with enabling user-friendly access to key planning documents. In addition, the JPDO, working with its government and industry partners, facilitated several important multi-agency initiatives.

Vision 100 requires the FAA to submit an annual report to the Committee on Commerce, Science and Transportation in the Senate and the Committee on Transportation and Infrastructure and the Committee on Science and Technology in the House of Representatives. This report represents an interagency progress report highlighting the cross-agency NextGen accomplishments towards implementing the Integrated Plan. It is not intended to provide detailed NextGen progress, which is reported by the individual agencies. For example, both the FAA and National Aeronautics and Space Administration (NASA) have information on detailed NextGen activities on their websites that can be found at www.faa.gov/nextgen or www.aeronautics.nasa.gov respectively.

Background

America's air traffic system, while considered to be the safest in the world, is nonetheless limited in its ability to grow and adapt to a new and changing environment. The nation's air traffic system is based on World-War-II-era technologies that rely on radar, ground control of aircraft, voice communications, and navigation using point-to-point connections. While the need for flexibility in aircraft operations has increased, the current system – with its structural and technological limitations – cannot keep up. The future requires a system with greater capacity, efficiency, and flexibility.

In 2003, Congress recognized the need to transform the Nation's aviation system, and, as a result, made a commitment to an unprecedented, major multi-agency initiative to develop NextGen. A key element of the Vision 100 legislation is its emphasis on cross-agency collaboration, long-term planning, and private sector involvement. This legislation created the JPDO within the FAA to carry out that mission. Since its founding in 2004, the JPDO has produced a national vision statement, a multi-agency research and development roadmap, a description of operational concepts to meet performance requirements, a multi-agency enterprise architecture, and, in 2008, an IWP. With the delivery of the IWP, the JPDO completed several of the major deliverables required by Vision 100. Further, the JPDO continues to have a responsibility for providing assistance to the Government-wide implementation of NextGen by encouraging and facilitating cooperation among partner departments and agencies and sponsoring industry participation in NextGen planning and development. JPDO also continues to be responsible for the development of a long-term vision for the air transportation system and alignment of the necessary cross-departmental research to support that vision.

The IWP captures at a high level the NextGen planning of all the JPDO partner agencies. JPDO must continue to work with the partner agencies to develop an updated and appropriate integrated plan and the partner agencies must move forward with implementation. The JPDO's government partners include the Department of Defense (DoD), National Aeronautics and Space Administration (NASA), Department of Commerce (DOC), Department of Homeland Security (DHS), and Department of Transportation (DOT), including FAA. The Office of Science and Technology Policy within the Executive Office of the President also participates as a member of the NextGen Senior Policy Committee (SPC).

The JPDO enabling legislation stresses the importance of industry in the JPDO planning process. Through the NextGen Institute, the JPDO has been able to involve industry and include representatives of corporations, associations, and universities in NextGen planning and analysis. The Institute, which is governed by an Institute Management Council, has approximately 250 members.

One of the most important roles for the Institute is populating the NextGen working groups. These groups are made up of both non-Federal and Federal members, and are jointly led by non-Federal and Federal sector co-chairs. Each of the working groups is focused on a key NextGen area: weather, global harmonization, airports, aircraft, air navigation services, safety, net-centric operations, security, and environment.

This type of coordination and collaboration in planning and technology development, combined with the active participation of non-Federal stakeholders, represents a new paradigm in the way that Government plans for future capabilities. The JPDO has been working to strengthen and improve the important relationship with industry.

2008 Initiatives and Accomplishments

JPDO Integrated Work Plan

NextGen is a large and demanding undertaking and requires an unprecedented level of sustained, coordinated, and integrated effort across the public and private sectors. The JPDO is responsible for leading an annual process to analyze, define, coordinate, and synchronize planning for NextGen research, development, and implementation across the Federal agencies.

Critical to the success of NextGen is an extensive and well-coordinated planning initiative. In 2008, JPDO, in collaboration with the NextGen Partners, developed IWP Version 1.0 as the initial outline of steps needed to achieve the NextGen vision. The IWP is intended to be used as a tool to support the collaborative planning and deliberation needed among partners and stakeholders to prioritize needs, establish commitments, coordinate efforts, and focus resources on the work needed to achieve NextGen. Specific research activities, program steps, resources, and implementation elements such as facility roll-out, training, or decommissioning are the responsibility of the NextGen partner that has accepted the element as part of their overall mission.

This initial plan will require ongoing refinement and updates and as NextGen matures, JPDO will work with partners to analyze, review, and modify the planning elements of the IWP. Thus, the IWP can help identify cross-agency integration issues and opportunities. Moving forward, JPDO is tasked to maintain that visionary role – continuing to look out to the future and identify research requirements, while it helps all the agencies align their activities for the near, mid, and far-term.

The Joint Planning Environment (Access and Transparency)

This year, the planning work – that began with the development of a concept of operations, continued with the enterprise architecture, and most recently led to the completion of the IWP – has come together as an online tool called the "Joint Planning Environment" (JPE). The JPE is a user-friendly, online database that offers an unprecedented level of access and transparency to the JPDO planning process. It provides a life-cycle picture of NextGen's operational improvements, key enablers, schedules, and respective departmental and agency responsibilities. The JPE is on the Web at www.jpdo.gov.

Gap Analysis

Performing detailed gap analyses will aid in establishing priorities and foster improved decision making for NextGen across the partner agencies. As critical gaps between the cross-department NextGen architectures and planning are identified, requirements for addressing the identified shortfalls will be defined. Careful planning and comprehensive analysis will significantly reduce risks associated with the development and implementation of NextGen.

Along those lines, the JPDO has completed an initial gap analysis of NextGen partner agency programs against the current IWP. The analysis identified seven critical interagency focus areas, including various air traffic management research topics, research to mitigate environmental constraints, security risk management, and the verification and validation of complex systems. FAA was identified as the lead for three of the focus areas, NASA for two, DHS for one, and JPDO for one. Working with the partner agencies, the JPDO will incorporate operational improvements that address these gaps into the IWP and through the governance process, including the JPDO Board and Senior Policy Committee (SPC), will encourage partner agencies to include activities that support these operational improvements in their implementation plans and future year budgets.

Cross-Agency Collaboration

The contributions to NextGen resulting from cross-department and cross-agency cooperation have increased significantly. Progress has been made in each of the six performance goals – global leadership, capacity, safety, environment, security, and defense. The following activities are examples of work in 2008 that has been either completed or is underway through the cross-agency support provided by the JPDO and its SPC. Additional information on some of the activities is included in the following sections of the report:

- FAA established a Government-wide Safety Management System standard for implementation at the agencies;

- FAA is working on integrated aviation surveillance with the DoD and DHS;

- DoD, DHS, and FAA jointly invested in a demonstration of Network Enabled Operations (NEO) technology and are developing plans for a follow-on demonstration with a leave-behind capability;

- NextGen's collaborative weather initiative includes the active participation of DOC, DoD, NASA, and the FAA;

- FAA and NASA are working to establish a research consortium to accelerate development of lower energy, emissions, and noise technologies called the Continuous Low Emissions, Energy and Noise (CLEEN);

- FAA, NASA, DOC, and U.S. Department of Agriculture (USDA) are fostering sustainable alternative fuels;

- Technology transfer from NASA to FAA has been facilitated with the formation of Research Transition Teams (RTT);

- DoD has established a net-centric division within the JPDO and is working with the FAA and other partner agencies on net-centric information sharing; and

- DoD formed an office within the Air Force to act as their coordinating office for all NextGen matters.

Weather

The JPDO, working with the DOC, National Oceanic and Atmospheric Administration (NOAA), DoD, NASA, and FAA, has developed a first-of-its-kind, cross-agency vision for the future of aviation weather management. The focus of their vision is on the aviation user and how to best incorporate weather information in a format that will support air traffic decision-making as well as other users of weather information. This concept is called the "Four-Dimensional (4-D) Weather Cube." The 4-D Weather Cube focuses on synchronizing existing weather assets, providing users with probabilistic forecasts, and most importantly, making this information available to all users of the National Airspace System. During the July 2008 SPC meeting, the DOC (NOAA) agreed to lead this initiative. The DOT/FAA will be responsible for the integration of weather information into the civil operational system, and the DoD will coordinate its activities as appropriate.

In addition, the FAA, DOC, NOAA, and the DoD formed a NextGen Executive Weather Panel (NEWP), with senior executive agency principals to guide and review planning, budgeting, and implementation of required NextGen weather capabilities. The NEWP will monitor the progress of the 4-D Weather Cube initiative and resolve emerging issues. The NEWP has provided continuous oversight into the development of a detailed interagency plan to deliver an initial NextGen weather information database with an initial operational capability date of 2013, as well as an integrated strategy to incorporate the weather information directly into legacy and future NextGen systems. The interagency plan will be completed this fiscal year and implementation activities have already commenced.

Safety

One of the challenges in the development of NextGen is ensuring that, as new systems come online and capacity increases, the United States maintains the unparalleled record of safety, which is the hallmark of our National air transportation system. That is the focus of several critical JPDO safety initiatives, each of which has been approved by the SPC.

In July 2008, the SPC endorsed the national Safety Management System (SMS) Standard. The goal is to ensure that this standard is implemented by all JPDO Government partner agencies. This will represent a first-of-its-kind, cross-agency safety initiative.

Environment

Improving environmental protection and addressing the energy challenge are vital elements to ensure continued U.S. air transportation viability and global leadership. The overarching environmental goal for NextGen is *environmental protection that allows sustained aviation growth.* The primary environmental and energy issues that will significantly influence the future capacity and flexibility of the NAS are aircraft noise, air quality, global climate effects, energy availability, and water quality.

A strategic environmental management system (EMS) approach will provide the foundation for integrating environmental and energy objectives into the planning, decision-making, and operation of NextGen. EMS will be used to manage the environmental and energy aspects of NextGen. The implementation of EMS by organizations contributing to NextGen will play an important role in achieving the environmentally sustainable growth of air transportation.

Global Harmonization

NextGen represents the United States' portion of the Global Air Navigation System, and therefore is innately international in scope. Airspace users who make investments in aircraft, avionics, or other infrastructure to support their operations need to be assured that those investments will allow them to fly anywhere in the world, as seamlessly as possible, using the same systems and procedures. Recognizing this, it is essential to build NextGen to global standards and to integrate the development with similar modernization efforts taking place under other service providers across the world.

To that end, the United States continues to collaborate with the International Civil Aviation Organization to ensure the right standards and procedures are available at the right time to support our needs. Additionally, the United States maintains a very close working relationship with its European counterparts to ensure technical and operational harmonization with their Single European Sky Air Traffic Management Research (SESAR) initiative. Formal agreements have been in place there for years and have recently been refocused to ensure collaboration is focused on the more specific needs of NextGen. The alignment of SESAR with NextGen extends from concept to architecture all the way to implementation. To ensure success of this complex alignment, the JPDO and the FAA, with European Union counterparts, are developing a unique process for collaboration on priority areas of integration with executive oversight. On March 17, 2009, the FAA signed a joint Memorandum of Understanding with the European Commission to further ensure a strong framework for cooperative research and development of NextGen and SESAR.

The United States is also engaged in a number of other bilateral and multilateral collaborative efforts related to NextGen. The United States, Canada, and Mexico have signed a joint statement to pursue cooperation on next generation air transportation systems, and are working to ensure their respective developmental and operational roadmaps stay consistent with one another. Agreements have also been signed with the Civil Aviation Bureau of Japan to ensure integration and with China to ensure its modernization plans are consistent with NextGen to the extent

possible. The JPDO Global Harmonization Working Group will be updating the NextGen International Strategy this year to broaden the international approach beyond these already successful efforts.

Integrated Surveillance

Integrated surveillance – the correlation of cooperative and noncooperative surveillance data to create a user-defined operational picture – is a fundamental component of NextGen. However, the responsibility for cooperative and noncooperative surveillance by Government agencies can be more clearly defined.

Successfully dealing with this issue requires that it be considered from a multi-agency perspective since the overlapping roles, responsibilities, authorities, and capabilities have created cross-dependencies. Accordingly, the JPDO, working with the DoD, DHS, FAA, and DOC, established a joint Interagency Surveillance Study Team to assess the issue. This team recommended establishing a formal, institutionalized interagency mechanism for responsibility, management, and ownership of elements of integrated surveillance (to include funding). In December 2008, DHS sponsored a summit on surveillance. As a result of recommendations coming out of that summit, the SPC agreed to an interim governance role for surveillance and, in January 2009, directed the JPDO to:

- Coordinate development of an operational concept for interagency aviation surveillance. DoD has the lead for this activity;

- Coordinate development of an interagency integrated surveillance enterprise architecture and funding profile. FAA has the lead for this activity; and

- Identify existing and potential executive bodies to provide interagency governance of aviation surveillance activities and make a recommendation as to which alternative should be submitted to the Deputies Committee for consideration.

Research Transition Teams

NASA is a principal source of foundational air traffic and aviation research. To meet the expanded needs of NextGen, it is imperative that NASA's research efforts targeting NextGen operational requirements are identified, conducted, and effectively transitioned to the FAA.

With this in mind, and working collaboratively across agencies, FAA and NASA have established four RTTs to manage and foster the cross-agency interactions effectively. The RTTs are designed to coordinate the development of key research requirements and to better coordinate the evolution of research into operational improvements and new capabilities. The RTTs build upon the FAA's prior successful deployments of NASA-developed technologies, such as the Traffic Management Advisor with enhancements for major metropolitan areas and surface management tools. The four teams cover near-, mid-, and long-term capabilities stretching from the enroute airspace to the terminal and surface including traffic flow management. The near term focus is the technology transfer of mature concepts and research; for the mid-term the FAA

and NASA are now jointly engaging earlier in the research to develop the products needed for transfer; and for the long-term research the FAA is providing NASA with subject matter expertise to support the research.

While focusing to address the long-term needs of NextGen, the Efficient Flow Into Congested Airspace and the Integrated Arrival/Departure and Surface RTTs are also addressing some near-term objectives. The Efficient Flow RTT builds on the Traffic Management Advisor capabilities that NASA developed and FAA deployed by adding enhancements developed through additional NASA research. The effort includes developing implementation requirements through joint demonstrations, such as Three-Dimensional Path Arrival Management to reduce fuel consumption and noise and emissions generated by arriving aircraft, while NASA researchers are gathering data for their research into trajectory based operations and NextGen long-term needs through the same demonstration.

The Integrated Arrival and Departure and Surface RTT focuses on the interactions between runway and surface operations, building on the surface traffic management research activities that were conducted by NASA and that were extended by the FAA into locations such as Memphis and New York. The efforts here focus on helping the FAA as it moves to an investment decision and implementation of a Surface Traffic Management System while supporting NASA's mid- and long-term research to further refine and enhance these capabilities and address the integrated arrival, departure, and surface operations.

Through the Flow-Based Trajectory RTT, the FAA and NASA are working together to develop mid-term requirements for managing of flow in a trajectory based environment. The Dynamic Airspace Configuration RTT is focused on long-term concepts, where the FAA is engaging with operational expertise to support NASA's research into airspace management in a full trajectory based operation environment.

By engaging earlier in the research, the FAA and NASA are now able to synchronize their plans to ensure that NASA-developed products meet the needs of and are successfully implemented by FAA.

Through coordinated planning, the RTTs show good integration between implementation and research organizations. The current teams do not cover the whole range of NASA activities or the FAA's implementation plans, and so more teams may be added as a body of research work grows.

The Future

The role of the JPDO, with its multi-agency mission, is unique. Rarely have so many Government agencies and departments been involved in the collaborative development of such a large and long-term initiative.

In 2008, the JPDO partner agencies were successful in developing cross-agency initiatives and new opportunities for collaboration.

We have sent an identical letter to Chairmen Costello, Rockefeller, Dorgan, Gordon, and Giffords; Senators Hutchinson and DeMint, and Congressmen Mica, Petri, Hall, and Olson.

Sincerely,

J. Randolph Babbitt
Administrator