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United States Government Accountability Office  
Washington, DC 20548

May 29, 2007

The Honorable Mark Udall  
Chairman  
Subcommittee on Space and Aeronautics  
Committee on Science and Technology  
House of Representatives

Subject: *Responses to Questions for the Record; Hearing on JPDO and the Next Generation Air Transportation System: Status and Issues*

Dear Chairman Udall:

This letter responds to your April 24, 2007, request that we address questions submitted for the record by Members of the Subcommittee related to the March 29, 2007, hearing entitled *JPDO and the Next Generation Air Transportation System: Status and Issues*. As agreed with your Office, in addition to the responses that we provided on May 18, 2007, to two of the questions you submitted regarding the role of JPDO, we are answering the remaining questions submitted by you and by Representative Calvert on behalf of the Minority Members of the Committee. Our attached responses to these questions are based on our previous and ongoing work and our knowledge of the areas addressed by the questions. We prepared our responses during May 2007 in accordance with generally accepted government auditing standards. Because our responses are based on our previously issued products<sup>1</sup> for which we sought and incorporated agency comments, as well as updates that we obtained through interviewing FAA officials and reviewing their documentation, we did not seek agency comments on our responses to these questions.

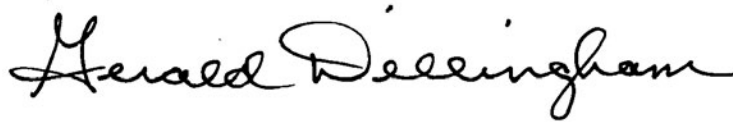
We are sending copies of this report to the Administrator, Federal Aviation Administration, and the Director, Joint Planning and Development Office. We will make copies available to others on request. The report is also available on GAO's Web site at [www.gao.gov](http://www.gao.gov).

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<sup>1</sup> GAO, *Next Generation Air Transportation System: Status of the Transition to the Future Air Traffic Control System*, [GAO-07-784T](#) (Washington D.C.: May 9, 2007); GAO, *Joint Planning and Development Office: Progress and Key Issues in Planning the Transition to the Next Generation Air Transportation System*, [GAO-07-693T](#) (Washington, D.C.: Mar. 29, 2007); GAO, *Federal Aviation Administration: Key Issues in Ensuring the Efficient Development and Safe Operation of the Next Generation Air Transportation System*, [GAO-07-636T](#) (Washington, D.C.: Mar. 22, 2007) and GAO, *Next Generation Air Transportation System: Progress and Challenges Associated with the Transformation of the National Airspace System*, [GAO-07-25](#) (Washington, D.C.: Nov. 13, 2006).

If you have any questions or would like to discuss the responses, please contact me at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov).

Sincerely yours,

A handwritten signature in black ink that reads "Gerald Dillingham". The signature is written in a cursive style with a large initial "G" and a long, sweeping tail on the "m".

Gerald L. Dillingham, Ph.D.  
Director  
Physical Infrastructure Issues

Enclosure

***Responses to Post-Hearing Questions for the Record***  
***“JPDO and the Next Generation Air Transportation System: Status and Issues”***  
**Subcommittee on Space and Aeronautics**  
**Committee on Science and Technology**  
**U.S. House of Representatives**  
**Hearing held on March 29, 2007**

**Questions for Dr. Gerald L. Dillingham, Director**  
**Physical Infrastructure Issues**  
**U.S. Government Accountability Office**

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**Questions for the Record Submitted by Chairman Mark Udall**

**1. How long should the Joint Planning and Development Office (JPDO) exist, and should its role evolve from its current one? If so, in what ways?**

JPDO was established to plan and coordinate the development of the next generation air transportation system (NextGen) and should exist for the duration of those tasks. The basic planning documents that JPDO is developing for NextGen are near completion, but further iterations of these planning documents will be needed as NextGen technologies are developed and implemented. As NextGen has progressed from the initial planning to the early implementation phase, JPDO's role has evolved to include coordination and facilitation activities, as well as planning activities. GAO believes this is a reasonable evolution and a proper role for JPDO and is consistent with the language of JPDO's authorizing legislation.

One example of this evolution is the role JPDO has begun to play in incorporating NextGen goals and activities into the Air Traffic Organization's (ATO) strategic plans. ATO has expanded and revamped its Operational Evolution Partnership (OEP) to become the Federal Aviation Administration's (FAA) implementation plan for NextGen. The Review Board that oversees the OEP is cochaired by JPDO and ATO. If JPDO ceased to exist before NextGen was more fully developed, some alternative means of planning and coordinating NextGen's development would have to be established, which could delay NextGen's implementation. Similar developments are expected to occur with other partner agencies as JPDO completes a Memorandum of Understanding with these agencies.

JPDO's role could further evolve to include more coordination and oversight activities. For example, JPDO could establish a program oversight capacity that would enable it to perform such functions as (1) harmonizing the enterprise architectures among the partner agencies; (2) coordinating the research, development, and systems-engineering and integration activities of the cooperating agencies and industry; (3) overseeing multi-agency projects; (4) overseeing, with FAA, the selection of products or outcomes of research and development that would be moved to the next stage of a demonstration project through the Joint Resources Council (JRC);<sup>1</sup> (5) overseeing the fundamental research activities that support the long-term strategic investments of NextGen by managing a research portfolio among NASA, academia, federally funded research and development centers, and industry; and (6) maintaining a baseline modeling and simulation

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<sup>1</sup> FAA's Joint Resources Council establishes and manages acquisition program baselines which define cost, schedule, performance, and benefit parameters for programs over the full lifecycle of the program.

environment for testing and evaluating alternative concepts to satisfy NextGen enterprise architecture requirements.

Another example of the evolution of JPDO's role is the organizational shift from integrated product teams to working groups. This shift reflects the extension of JPDO's role beyond planning to development of work products or "outcomes" that will contribute to the early development of NextGen and facilitate its implementation. As JPDO assumes more responsibility for facilitating NextGen's implementation, greater authority and resources would allow it to do more to coordinate the efforts of the partner agencies and work with the Office of Management and Budget as the principal NextGen point of contact. With adequate funding and authority, JPDO could acquire staff with the project management and systems engineering skills needed for JPDO to be an effective oversight and coordinating office.

**2. Should JPDO be moved out of the Federal Aviation Administration's Air Traffic Organization to be given greater visibility and authority? For example, should it report directly to the Office of the Secretary of Transportation? Why or why not?**

Currently, JPDO is located within FAA and reports to both the FAA Administrator and the Chief Operating Officer of ATO. In GAO's view, JPDO should not be moved out of FAA. Since JPDO provides the vision for the future air traffic control (ATC) system and ATO is to be the principal implementer of that vision, the two organizations need to continue working closely together.

However, JPDO's dual reporting status hinders its ability to interact on an equal footing with ATO and the other partner agencies. On one hand, JPDO must counter the perception that it is a proxy for the ATO and, as such, is not able to act as an "honest broker." On the other hand, JPDO must continue to work with ATO and its partner agencies in a partnership in which ATO is the lead implementer of NextGen. Therefore, it is important for JPDO to have some independence from ATO. One change that could begin to address this issue would be to have the JPDO Director report directly to the FAA Administrator. This change may also lessen what some stakeholders now perceive as unnecessary bureaucracy and red tape associated with decision making and other JPDO and NextGen processes.

As a part of any change in the dual reporting status of JPDO's Director, consideration could be given to the possibility of creating the position of Associate Administrator of NextGen and elevating the JPDO Director to that post. This would give greater credibility, authority, and visibility to this important position.

JPDO should not report to the Secretary of Transportation because placing JPDO in the Secretary's office would remove it too far from the implementation and operations of NextGen.

**3. What are the specific roles of the Department of Homeland Security (DHS) and the Department of Defense (DOD) in JPDO?**

**a. Do we know how much DOD plans to spend on NextGen for its development and implementation? If so, how much will it be?**

**b. Do we know how much DHS plans to spend on NextGen for its development and implementation? If so, how much will it be?**

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The specific role of DHS in JPDO is to lead the Security Working Group and to develop an effective security system for the national airspace system (NAS) without limiting mobility or civil liberties. DHS carries out this role through its Transportation Security Administration (TSA). More specifically, DHS's task, through TSA, is to develop and implement a real-time network to share information with appropriate parties about passengers, cargo, and aircraft and to create a transparent set of security layers that will deliver security without causing undue delays, limiting access, or adding excessive costs and time.

The specific role of DOD in JPDO is to lead the Net-Centric Operations Working Group and to establish user-specific situational awareness. Situational awareness means that each user of the NAS, including DOD and the civilian sectors, has the awareness needed to reach decisions through the creation of a combined information network. All users of the system will have access to the air transportation system data they require for their operations.

The specific roles of both DHS and DOD in JPDO are related to the "curb-to-curb" approach to air traffic management that Vision 100 established for NextGen. Under this approach, JPDO envisions an expansion of the air transportation system that includes airport departures and arrivals as well as flights. The JPDO working groups, which evolved from FAA's former integrated product teams (IPT), focus on eight strategies, such as how to use weather information to improve the performance of the NAS. The working groups are composed of personnel from FAA, other federal agencies, and the private sector. Each of the working groups is headed by a steering committee under both a federal agency—in this case, DHS or DOD—and a private sector representative.

We do not know how much either DOD or DHS plans to spend on NextGen. However, we are aware that DOD, FAA, and DHS each plan to provide \$5 million for net-centric (i.e., a continuously-evolving network of information sharing and situational awareness) demonstrations. Both DOD and DHS also provide a variety of "in-kind" services through personnel assigned to the JPDO working groups and through the potential leveraging of mission-specific research that could support the development and implementation of NextGen.

- 4. NextGen technologies will increase flight efficiency by means of automated flight operations and reduced separations.**
  - a. Will this render the system more brittle against disturbances such as terrorism and equipment failure and acts of nature?**
  - b. How will we ensure the continued safe operation of the system in the event of such disturbances?**

NextGen technologies will not render the system more brittle than the current system. Although no system is 100 percent safe, GAO has not seen any data or other information indicating that the planned satellite based navigation system is more vulnerable to security threats than the current ground based radar system. JPDO's plans call for robust security system protocols and firewalls to increase protection, as well as sufficient redundancies within the system to reduce vulnerabilities and offset any disruptions. Security will exist in "layers of defense" designed for early detection of threats from terrorism, equipment failure, and natural disasters and will provide appropriate intervention. Additionally, although the

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system will become more automated, there will still be opportunities for human intervention if the system fails.

## **Questions for the Record Submitted by Rep. Calvert**

### **Implementation by Other Federal Partners**

**1. In your written statement, when discussing the planning efforts of the JPDO partner agencies (exclusive of NASA and FAA), you stated that they are not as far along developing implementation plans and institutionalizing JPDO goals into their planning documents. Why is that? Does this reflect a lack of commitment?**

The current situation does not necessarily reflect a lack of commitment on the part of the partner agencies. JPDO partner agencies face competing mission and resource demands. In addition, NextGen is an extraordinarily complex undertaking, and some agencies are still learning to work collaboratively. By contrast, FAA and NASA have a long history of working with each other, and the core effort of JPDO is within their purview.

The partner agencies will engage more collaboratively as NextGen's processes and mechanisms mature. For example, the Department of Transportation (DOT) was recently designated as the Managing Partner responsible for ensuring collaboration among the partner agencies in implementing NextGen-related research and development. DOT is also responsible for submission of the OMB 300 for the NextGen as a portfolio project after review by JPDO.<sup>2</sup> JPDO's decision to develop a Memorandum of Understanding to broadly define the roles and responsibilities of the partner agencies is another positive step. Additionally, the extent to which Congress provides JPDO with the authority and resources it needs for program oversight will affect the nature and scope of the partner agencies' collaboration.

### **FAA Financing Proposal**

**2. What would be the effect, if any, on the NextGen budget if Congress does not enact the Administration's proposed aviation financing reform package (ticket taxes; aviation fuel taxes) as part of a new authorization, but instead leaves the current ticket and fuel taxes in place?**

The current FAA funding structure can provide sufficient funding for NextGen—with some caveats. Congress has used the current funding structure—excise taxes plus a General Fund contribution—to fund FAA for many years. As the number of air travelers has grown, so have excise tax revenues. Even though revenues fell during the early years of this decade as the demand for air travel fell, they began to rise again in fiscal year 2004, and FAA estimates that if the current taxes remain in effect at their current rates, revenues will continue to increase. According to projections prepared by the Congressional Budget Office (CBO),<sup>3</sup> revenues obtained from the existing funding structure will increase substantially. Assuming the General Fund continues to provide about 19 percent of FAA's budget, CBO estimates that through 2016 the Airport and Airway Trust Fund (Trust Fund) can support about \$19 billion in additional spending over the baseline FAA spending levels CBO has calculated for FAA (the fiscal year 2006 funding level, with projected growth for inflation) provided that most of the spending occurs after fiscal year 2010. How far this money will go to fund modernization is subject to a number of uncertainties—including the future cost of NextGen investments, the volume of air traffic, the future cost of operating the NAS, and the levels of future appropriations for the Airport Improvement Program, all of which influence the amount of funding available for FAA.

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<sup>2</sup> Section 300 of OMB Circular No. A-11, Preparation, Submission, and Execution of the Budget (Nov. 2, 2005), sets forth requirements for federal agencies for planning, budgeting, acquiring, and managing information technology capital assets.

<sup>3</sup> Congressional Budget Office, *Financing Investment in the Air Traffic Control System* (Washington, D.C.: Sept 27, 2006)

However, if the desired level of funding exceeded what was likely to be available from the Trust Fund at current tax rates, Congress could make changes within the current structure to provide FAA with additional revenue. Congress could raise more revenue from airspace system users for NextGen or for other purposes by raising the rates on one or more of the current excise taxes. Congress could also provide more General Fund revenues for FAA, although the nation's fiscal imbalance may make a larger contribution from this source difficult.

### **JPDO Organizational Authority**

#### **3. Would GAO recommend any changes to the authorities and resources now provided to JPDO to enhance its effectiveness in coordinating the partner agencies, and if so, what would they be?**

Yes, providing JPDO with the authority and the resources to establish a program oversight capacity would enable JPDO to perform such functions as (1) harmonizing the enterprise architectures among the partner agencies; (2) coordinating the research, development, and systems-engineering and integration activities of the cooperating agencies and industry; (3) overseeing, with FAA, the selection of products or outcomes of research and development that would be moved to the next stage of a demonstration project through the Joint Resources Council (JRC); (4) overseeing the fundamental research activities that support the long-term strategic investments of NextGen by managing a research portfolio among NASA, academia, federally funded research and development centers and industry; and (5) maintaining a baseline modeling and simulation environment for testing and evaluating alternative concepts to satisfy NextGen enterprise architecture requirements.

JPDO will need additional funding and staff to expand its role in coordinating the efforts of the partner agencies and working with the Office of Management and Budget as the principal NextGen point of contact.

However, JPDO's dual reporting status hinders its ability to interact on an equal footing with ATO and the other partner agencies. Therefore, it is important for JPDO to have some independence from ATO. One change that could begin to address this issue would be to have the JPDO Director report directly to the FAA Administrator. This change might also lessen what some stakeholders now perceive as unnecessary bureaucracy and red tape associated with decision making and other JPDO and NextGen processes. As a part of any change in the dual reporting status of JPDO's Director, consideration could be given to the possibility of creating the position of Associate Administrator of NextGen and elevating the JPDO Director to that post. This would give greater credibility, authority, and visibility to this important position.

### **NASA's Role in JPDO**

#### **4. Traditionally NASA has developed promising technologies to a high maturity level, enabling FAA to incorporate them into its air traffic control system without too much additional development. Now that NASA is confining its development work to a basic level of technical maturity, do FAA and the other federal partners have the resources and capability to fill this void?**

It is not clear whether FAA and the other federal partners have the resources and capability to fill this void. As your question indicates, the National Aeronautics and Space Administration (NASA) formerly conducted the type of intermediate research and development (R&D) and demonstration projects that will be needed for the NextGen program, but the funding for these efforts was discontinued when NASA's aeronautical research portfolio was restructured to focus



more on fundamental research. Although FAA has not fully determined the impact of the NASA restructuring on the R&D needs for NextGen, some additional R&D funds will be needed and are critical for the timely development of NextGen. FAA recognizes that this is a critical issue and has already taken some action to address it. For example, in the President's fiscal year 2008 budget request for FAA, funds have been included for developmental and transition research in the Facilities and Equipment (F&E) Activity 1 account. In light of the NASA restructuring, FAA has also undertaken a study to assess the nature and scope of its NextGen R&D needs. According to JPDO officials, this study will be completed in August 2007. More work remains to completely assess the research and development needs of NextGen and the ability of FAA and the other JPDO partner agencies to budget for and conduct the necessary initiatives. One way to fill an identified research and development need might be to make more use of the resources available at the FAA Technical Center in Atlantic City, New Jersey, and the FAA Aeronautical Center in Oklahoma City, Oklahoma.

### **Certification**

**5. In his statement before the Subcommittee, the President and CEO of the Aerospace Industries Association, Mr. Douglass expressed concerns about the time required to prototype, validate, and certify new technologies required for NextGen, in addition to the time required for rulemakings. Do you share Mr. Douglass's concerns? How much of a risk do these processes pose to the timely development of NextGen?**

Yes, we share Mr. Douglass's concerns. The time required to prototype, validate, and certify a technology can present a significant risk to the timely and cost effective implementation of NextGen. We have studied the lead times required to prototype, validate, and certify new technologies. JPDO or FAA do not currently have sufficient resources to prototype, validate, and certify new technologies, and cannot currently develop them internally without causing significant delays in the implementation of NextGen. In addition, stakeholders have expressed concern over the time it takes to develop rules for new equipment and the problems caused when equipment is fielded before rules are finalized. Any activities that will be required to implement new policies, demonstrate new capabilities, set parameters for the certification of new systems, and develop technologies will take time. Just as important, the time required to prototype, validate, and certify a new technology must be balanced against the need to ensure the reliability of the technology and the safety of the flying public.

### **Accountability**

**6. In his statement before the Subcommittee, Mr. Douglass raised concerns about the potential lack of accountability and authority in the current JPDO structure, especially with regard to partner agencies. He recommends that each partner agency designate a senior-level official as the responsible individual for all NextGen-related programs. Do you share Mr. Douglass's concerns? Should agencies designate a senior program official?**

Yes, we share Mr. Douglass's concerns and further note that these fundamental leadership issues are exacerbated by the apparent inactivity of JPDO's Senior Policy Committee (SPC). This committee is responsible for overseeing the work of JPDO, but has met only four times in 3 years and has not convened as a body since November 2005. The committee is chaired by the Secretary of Transportation and includes senior leaders from the partner agencies and the Director of the White House Office of Science and Technology Policy. SPC was established to provide policy guidance and review; make legislative recommendations; and identify and align resources. A more regular schedule of meetings and an agenda for SPC could lead to more participation and accountability on the part of the partner agencies.

## Enclosure

Additionally, assigning sole responsibility for supporting NextGen to a senior official from each agency would be a positive step. As a point of contact and coordinator for NextGen activities, that person should, within prescribed limits, have access to, and authority from, the SPC member from their agency to make decisions and act on behalf of their agency.

Finally, to the extent that the pending Memorandum of Understanding (MOU) between the partner agencies defines the roles and responsibilities of each agency, it will, when signed, be a useful document for ensuring accountability.

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