A COMPREHENSIVE REVIEW OF FAA'S NEXTGEN PROGRAM: COSTS, BENEFITS, PROGRESS, AND MANAGEMENT

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HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

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U.S. House of Representatives
Committee on Transportation and Infrastructure

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Washington, DC 20515
October 5, 2011

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MEMORANDUM

TO: Members, Subcommittee on Aviation

FROM: The Honorable Thomas E. Petri, Chairman, Subcommittee on Aviation

SUBJECT: Hearing on a Comprehensive Review of FAA's NextGen Program: Costs, Benefits, Progress, and Management

Wednesday, October 5, 2011, 10:00 a.m. in room 2167 Rayburn House Office Building.

PURPOSE

The Subcommittee on Aviation will receive testimony from Federal government and industry witnesses regarding the costs, benefits, progress and management of the Federal Aviation Administration's (FAA) NextGen program. The discussion will focus on the FAA's progress in delivering measureable benefits to aviation users so far, as well as the agency's projections for future benefits to be gained from federal and industry investment.

BACKGROUND

The present-day national airspace system (NAS) consists of a network of en route[1] airways, much like an interstate highway grid in the skies. Airways are routes in space between

[1] The Federal Aviation Administration (FAA) uses three types of facilities to control traffic: *Airport towers* control airport surfaces and the airspace immediately surrounding airports; *Terminal Radar Approach Control Facilities (TRACONs)* sequence and separate aircraft in terminal airspace – i.e., as they approach and leave airports, beginning about five nautical miles and ending about 50 nautical miles from the airport and generally up to 10,000 to 14,000 feet above the ground; and *Air route traffic control centers* control aircraft in high-altitude en route

fixed points that include navigational radio beacons and waypoints defined by latitude and longitude coordinates and unique names. Because aircraft operating at high altitudes must follow these airways, they often cannot fly the most direct routing from their departure points to their destinations.

Surveillance and separation of aircraft is largely provided by an extensive network of radar sites and air traffic controllers who are directly responsible for ensuring adequate separation between aircraft receiving radar services. Maintaining this separation is achieved through extensive use of voice communications between controllers and pilots over open two-way radio frequencies, not so different from the technologies used in World War II.

Under the current system, controller workload, radio frequency voice-communication congestion, limitations of air traffic control (ATC) radar accuracy, and the coverage and accuracy of ground-based navigational signals impose practical limitations on the capacity and throughput of aircraft in the system, particularly in busy terminal areas near major airports and around choke-points where many flight paths converge.

Currently, the U.S. air transportation system transports about 730 million passengers a year and, combined with general aviation activity, results in about 70,000 flights over a 24-hour period. The FAA predicts that, by 2025, increases in passengers (up 53 percent to 1.1 billion per year) and general aviation activity will result in air traffic increasing to more than 85,000 flights every 24 hours.[2] It is widely acknowledged that the current U.S. air transportation system will not be able to meet these air traffic demands. In 2003, Congress passed H.R. 2115, Vision 100 – the Century of Aviation Reauthorization Act (Vision 100) (P.L. 108-176), which created the Joint Planning and Development Office (JPDO) within the FAA, and tasked it to plan for and coordinate with Federal and nonfederal stakeholders the transformation from the current air traffic control system to the NextGen system to meet anticipated traffic demands of 2025.

The NextGen plan consists of new concepts and capabilities for air traffic management and communications, navigations, and surveillance that involves: transitioning from a ground-based radar system to a more automated, aircraft-centered, satellite-based surveillance system; developing more direct and efficient routes through the airspace; improving aviation weather systems; developing data communications capabilities between aircraft and the ground to reduce controller and pilot workload per aircraft; and creating shared and distributed information technology architectures.

To date, the FAA has focused its effort to implement NextGen on deploying seven core infrastructure programs: Automatic Dependent Surveillance – Broadcast (ADS-B); System Wide Information Management (SWIM); NextGen Networked Enabled Weather (NNEW); Data Communications; NAS Voice Switch (NVS); En Route Automation Modernization (ERAM); and Collaborative Air Traffic Management Technologies (CATMT).[3]

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airspace – i.e., in transit and during approaches to some airports, generally controlling the airspace around and above terminal areas.

[2] FAA email to Bailey Edwards, Aviation Subcommittee Staff, 9-29-11.

[3] *ATC Modernization and NextGen: Near-Term Achievable Goals,* Before the H. Comm. on Transportation and Infrastructure, 111th Cong. vii-xx (2009).

Estimated NextGen Benefits

The FAA has promised efficiency gains through NextGen by optimizing air traffic controller performance, consolidating obsolete facilities, enhanced safety improvements, and improved operational efficiency of the national airspace system. However, before airspace users are likely to invest in the expensive avionics from which the benefits are derived, they must have confidence in both the business case (ie: cost accounting of benefits) for NextGen as well as FAA's ability to manage the NextGen program so the agency can deliver the benefits in a timely manner (ie: within the needed return on investment window).

According to the FAA, there are significant, quantifiable benefits associated with the proper implementation of NextGen. FAA estimates show that by 2018, NextGen air traffic management improvements will reduce total delays, in flight and on the ground, about 35 percent, depending on fuel prices and traffic, compared with what would happen if no NextGen program was pursued. The delay reduction will provide $23 billion in cumulative benefits from 2010 through 2018 to aircraft operators, the traveling public and the FAA. With the airspace management improvements planned from 2010 forward, the FAA estimates that airspace users could save about 1.4 billion gallons of aviation fuel during this period, cutting carbon dioxide emissions by 14 million tons.[4] As new avionics are approved for installation in aircraft, the purchase and installation of the NextGen avionics will also drive job growth in the U.S. aviation sector. With as much as $41 billion in total costs to the U.S. economy annually, NextGen has a significant benefit to the broader economy in reduction of delay.[5]

A study released by Deloitte, LLP in May 2011 concurred that the timely implementation of airspace reforms as in the FAA's NextGen plan would produce significant benefits. The study estimates that completing planned NextGen efforts would yield an overall $281 billion net benefit to the U.S. economy.[6]

On January 26, 2010, FAA Administrator Randy Babbitt summed up his vision of NextGen benefits in the next ten years:

> Aviation is changing all around us, and the FAA is changing along with it. We have to open our minds to new and innovative ways of keeping our aviation system on the leading edge — whether it's technology, or creative funding mechanisms. We're getting high marks for safety, but we will not stop there.

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[4] http://www.faa.gov/nextgen/benefits/

[5] "Your Flight Has Been Delayed Again", A report by the Joint Economic Committee, United States Congress, May 2008.

[6] Tom Captain, Deloitte, LLP, *Transforming the Air Transportation System: A business case for program acceleration.* May 2011.

> So let me share with you what my vision of a flight in 2020 would be like. Our clearance is delivered and accepted with Data Link. The radio will only be used for emergencies. We'll taxi out and takeoff without touching the brakes with no chance of a runway incursion. We'll fly the most efficient course for departure and enroute at our most efficient altitude. Complete high fidelity weather information will be will be available to the pilots and controllers for the full projected route and avoided using predictive weather tools. We will descend and reach our destination using a continuous descent approach. Our airports and airways will be funded with a transparent blend of lower taxes and fees not subject to variations of the economy and supplemented with savings in time, fuel and carbon emissions. We'll deplane through multiple jet bridges, move through the terminal on high speed vehicles and moving sidewalks, only to find out our bags didn't make it.[7]

Key NextGen programs

As mentioned above, there are seven key FAA programs critical to the delivery of NextGen benefits. Some of these programs have been underway for years, and the witnesses will discuss the FAA's progress in terms of program management as well as cost and delivery timelines. Below are brief descriptions of the key NextGen programs managed by FAA.

a. Automatic Dependent Surveillance-Broadcast (ADS-B)

Often characterized as the "backbone of NextGen," ADS-B is the satellite surveillance and tracking method that the FAA has chosen to replace radar. FAA claims that eventually ADS-B, for the first time in aviation history, will allow both controllers and pilots to simultaneously see nearby aircraft. ADS-B is meant to provide enhanced and shared situational awareness for controllers and pilots with far more enhanced precision information of air traffic location, aircraft type, heading, altitude, and speed. ADS-B is expected to enhance safety, capacity, and reduce fuel burn and emissions. While far more complex, ADS-B is a bit like having GPS in your car. Unfortunately, most aircraft are not yet equipped with ADS-B.

There are two key components to ADS-B implementation. One is the FAA's deployment of ground infrastructure for controllers. The Agency awarded this contract to ITT Corporation in August 2007 and expects to complete this task by 2013. While radar simply collects radar information from ground-based radar stations, ADS-B technology relies on avionics in the aircraft to broadcast information to ADS-B ground stations. This is a change from the passive surveillance where radars send out a signal that bounces off of the aircraft skin and is collected again by the radar station to an active surveillance system where aircraft actually broadcast more

[7] "Focus and Vision: Moving Forward", J. Randolph Babbitt, Washington, D.C. January 26, 2010

precise and extensive information from the aircraft. This active surveillance is heavily avionics-dependent. So the second part of ADS-B implementation is avionics equipage in order to transmit ADS-B data to controllers and to other aircraft. Given the financial challenges facing aircraft owners, many have suggested that the FAA develop operational and financial incentives that will accelerate aircraft equipage.

b. En Route Automation Modernization (ERAM)

The computer system used at the FAA's high altitude en route centers processes flight radar data, provides communications, and generates display data to air traffic controllers. The current system, called the "Host", is being replaced by ERAM, a key automation platform, built with NextGen in mind, that will enhance air traffic controller productivity.

According to the FAA, ERAM hardware has been installed by Lockheed Martin at 20 en route centers. Software testing is currently underway at key sites, including Salt Lake City, Seattle and Minneapolis. Salt Lake City and Seattle were chosen as the first two sites to test ERAM communication and data transmissions between facilities.

c. Data Communications (DataComm)

In the current operational environment, communications between pilots and air traffic controllers is largely voice communications over two-way radio. Pilots are required to read back air traffic controllers' instructions to confirm that they have properly understood the instructions. In addition, frequency congestion can also interfere with pilots' efforts to contact controllers, or vice versa. At times, even with the "read back" and "acknowledge" requirements, errors are made that can jeopardize aviation safety. In addition, voice communications are time consuming and limit an air traffic controller's productivity.

FAA's answer to these challenges is the DataComm program. According to the FAA, DataComm will improve safety and efficiency by replacing voice communications with text-message instructions which for controllers would be generated by the air traffic control automation platforms. NextGen communications between controllers and flight crews will be handled by Data Comm transmissions, relieving radio frequency for more complex maneuvers and allowing complicated instructions to be provided electronically.

According to the FAA, deployment of DataComm could happen in the 2015-2018 timeframe, but it is unclear as to the exact cost and deployment schedule the FAA will pursue because the program has not been formally baselined. DataComm was originally supposed to be deployed in the 2014 timeframe.

d. System Wide Information Management (SWIM)

For years, the FAA has managed the national airspace system using a patchwork of different legacy systems that were not necessarily designed to share data with each other. Since NextGen relies on the interoperability of NextGen systems to more efficiently operate the NAS, as well as make information available to users, the FAA embarked on creating a common data platform for FAA systems, called SWIM.

According to the FAA, SWIM is an information platform that will allow all of the FAA systems in NextGen to "speak" to one another – as well as to the systems used by other parts of the aviation community, including the airlines, the military and the Department of Homeland Security. SWIM is an essential part of NextGen, since the safe and efficient use of airspace depends on how well the different parts of the airspace system communicate with one another.

SWIM's cost and timeline is broken into two Segments, Segment 1 and Segment 2. Segment 1 was rebaselined in 2009 with a $100 million program cost increase and a 2 year delay (to 2015). Segment 2 has not yet been formally baselined.[8]

e. NAS Voice Switch (NVS)

The NAS Voice Switch (NVS) is a forward-looking program to replace national airspace system (NAS) voice switches more than 20 years old with a new technology switching system capable of supporting future requirements for NextGen. The current inventory has 17 different NAS voice switches, each with different training and logistics requirements and tech refresh approaches. Many of these switches are experiencing increasing obsolescence and failures and are in need of replacement. They are not capable of supporting flexible reallocation of access to communications resources, and lack security needed for a network-based communications infrastructure, which is a key concept in modernization of the NAS. The NVS program will provide a key transitional element in the air traffic control voice communications infrastructure as it moves toward realizing the NextGen vision, Operational Evolution Partnership (OEP) goals, and a more operationally efficient and
economic NAS.

Improvements provided by NVS will benefit the FAA and the airspace user. Fewer switch baselines in the NAS will significantly simplify and cut costs of training, logistics, and support. As NextGen infrastructure is put into place, the benefits of networked communications that NVS supports are planned to manifest in numerous ways. Flexible access to communications assets will support dynamic response to contingencies of weather, equipment or facility outages and other events that demand load balancing or sharing, dynamic airspace reconfiguration, or business continuity planning operations. These operations lead, in turn, to better balance of air traffic controller workloads and more efficient use of the airspace.

It is unclear as to the status of this program due to lack of clear baselines and program schedule from the FAA.

[8] FAA Brief to Subcommittee Staff, SWIM and Weather, June 8, 2011.

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f. NextGen Network Enabled Weather (NNEW)

According to FAA statistics, weather accounts for 70 percent of all delays in the national airspace system. The FAA's NextGen Network Enabled Weather (NNEW) program is intended to improve aircraft operations over the nation's skies by reducing the impact of weather. According to the FAA, NNEW will provide better weather forecasts, particularly for severe conditions such as thunder storms and icing. This will allow FAA air traffic managers and those who use the system to better manage traffic flow in bad weather.

It is unclear as to the status of this program due to lack of clear baselines and program schedule from the FAA.

g. Collaborative Air Traffic Management Technologies (CATMT)

According to the FAA, Collaborative Air Traffic Management Technologies (CATMT) is a NextGen transformational program that provides enhancements to the existing Traffic Flow Management System (TFMS). This program is meant to develop an assortment of tools to best manage air traffic flows throughout the National Airspace System, taking into account big weather systems, automated delay and ground-stop delay programs at airports, improved route planning tools, and shared information about Special Use Airspace Restrictions. More efficient air traffic management is key to delivery of NextGen benefits—after all, the shorter the flight, the less fuel burn and carbon emissions.

The FAA plans to spend roughly $174 million through 2015 on this solution set.

RTCA Task Force

While NextGen has been planned over a long horizon, with a target date of 2025, many stakeholders have come to the conclusion that more can and must be done now to address inefficiencies and delay in the system. This could be done by more fully taking advantage of existing technologies, procedures, and capabilities rather than waiting for deployment of new systems and equipping aircraft with new technology. Due to the airline industry's economic distress, there has been more urgency to improve the efficiency and effectiveness of the air traffic control system in the near-term (2-3 years) to mid-term (by 2018) without damaging the long-term (2025) NextGen goals. In addition, industry stakeholders have urged the FAA to provide more detail on commitments needed to deliver quantifiable operational benefits in the mid-term that would help the industry justify and plan for the investments it needs to make in aircraft equipage.

On January 16, 2009, Hank Krakowski, then the Chief Operating Officer (COO) of the FAA Air Traffic Organization (ATO), and Margaret "Peggy" Gilligan, FAA Associate Administrator for Aviation Safety (AVS), sent a letter to RTCA, Inc. (RTCA).[9] The letter

[9] RTCA is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management system issues. RTCA functions as a Federal

request that RTCA establish a government-industry NextGen Mid-Term Implementation Task Force (RTCA Task Force) to forge an aviation community consensus on NextGen operational improvements to be implemented between now and 2018. The goal was to maximize NextGen benefits in the near-term, and develop a business case for industry investment. On September 9, 2009, the RTCA Task Force issued its final report.

The RTCA Task Force consisted of approximately 335 individuals from 141 different organizations. Aviation industry stakeholder participants included users from the four major operating communities (airlines, business aviation, general aviation and the military), manufacturers, suppliers, vendors, and the analytic resources of MITRE-Center for Advanced Aviation System Development (MITRE).[10]

The RTCA Task Force report recommended a prioritized list of desired operational capabilities (and corresponding technologies, procedures, pilot and controller training, policies, etc. needed to achieve those capabilities) to be fully deployed by 2018. In addition, the RTCA Task Force sought to maximize the benefits of existing aircraft equipage.

The RTCA Task Force recommended a total of 29 operational capabilities in seven key areas: 1) Surface Operations (i.e., safer, more efficient movement of aircraft on the airport surface), 2) Runway Access (i.e., improving the utilization and capacity of airport runways), 3) Metroplex (i.e., deconflicting airspace and traffic flows among adjacent airports in major metropolitan areas), 4) Cruise (i.e., high altitude/en route airspace); 5) Access to the NAS (i.e., access to low altitude airspace and smaller airports – primarily for General Aviation operators); 6) Data Communications Applications (i.e., implementing controller-pilot data/text communications); and 7) Integrated Air Traffic Management (including pre-flight FAA/system operator flight planning collaboration).

Moreover, in addition to identifying operational capabilities and specific operators willing to commit to those capabilities, the RTCA Task Force attempted to define when and where each capability should be implemented.[11]

Regarding *where* capabilities should be implemented, it is important to note that the Task Force report represents a sort of localized, "airport centric" approach to early NextGen improvements – delivering measurable efficiency improvements through targeted deployment of capabilities at the key airports and large metropolitan areas, the bottlenecks where problems are most acute and most likely to ripple through the NAS before implementing NextGen solutions across the entire NAS.

Advisory Committee and includes roughly 335 government, industry, and academic organizations from the United States and around the world. Members represent all facets of the aviation community, including government organizations, airlines, airspace users and airport associations, labor unions, aviation service and equipment suppliers.

[10] MITRE is a non-profit organization and the CAASD was established in 1990 within MITRE. MITRE-CAASD is sponsored by the FAA as a Federally Funded Research and Development Center (FFRDC). A FFRDC meets certain special long-term research or development needs that cannot be met as effectively by existing in-house or contractor resources.

[11] RTCA, *NextGen Mid-Term Implementation Task Force Report,* (Sep. 9, 2009).

Additionally, the RTCA Task Force report memorialized the commitment on the part of users that if the FAA implements the elements of a recommended operational capability for which it is responsible, the operators who requested that capability would commit to making all necessary investments (e.g., training and equipage) in coordination with a rational and definable plan to be able to fly and achieve the benefits of such capability.

a. Streamlining Operational Procedure Approval

One of the key RTCA Task Force recommendations was to accelerate the FAA's approval of operational procedures. Operational approval is a process the FAA uses to authorize an operator to conduct operations using a specific aircraft and associated equipment in a specific operating environment. FAA's certification process ensures, among other things, the safety of aircraft equipment entering the NAS. For example, an operator must obtain operational approval, from FAA's Flight Standards Service, to use Required Navigation Performance (advanced satellite landing) procedures.

The RTCA Task Force recommended streamlining the environmental and operational approval and certification processes. It pointed out that failure to streamline these processes will likely have far-reaching implications and negatively impact FAA and industry progress toward NextGen implementation.

According to the Government Accountability Office (GAO), stakeholders, including airlines, general aviation groups, and avionics manufacturers, have said that these processes take too long and impose costs on industry that discourage them from making the investment in NextGen aircraft equipment. For example, stakeholders have expressed concern over the time FAA takes to certify Required Navigation Performance routes. The longer it takes to get more efficient procedures certified, the weaker the business case for operators to equip with costly NextGen avionics.[12]

b. Performance Metrics

Another key challenge for the FAA is the establishment of performance metrics that accurately measure the extent to which NextGen benefits are achieved. Some stakeholders have expressed concern that the performance metrics currently used by FAA do not, in some cases, measure the achievement of value provided to FAA or the industry. One stakeholder has suggested that FAA adopt "outcome" based metrics that would measure whether FAA's actions yielded beneficial outcomes to both FAA and the industry.

The RTCA Task Force report identified the establishment of performance metrics as an important part of following up and tracking its recommendations. Included in H.R. 658, "FAA Air Transportation Modernization and Safety Improvement Act," is a requirement for the FAA to

[12] Government Accountability Office Audit GAO-11-14, "Aviation Safety: Certification and Approval Proceses are Generally Viewed as Working well, but Better Evaluative Information Needed to Improve Efficiency," October 7, 2010.

collect data on output metrics for NextGen to measure the performance of FAA's efforts to deliver NextGen benefits. Examples of outcome-based metrics would include:

- Safety – Yearly improvement in accident rates;
- Capacity – Change in allowable/schedulable runway operations per hour at major airports;
- Capacity – Number of new runways enabled in high density regions;
- Fuel, Environment and Airspace Efficiency – Reduction in scheduled block time between major city pairs; and
- Air Navigation Service Provider (ANSP) Efficiency – FAA Unit Cost per Operation.

Witnesses:

Panel I:

The Honorable Michael P. Huerta
Deputy Administrator
Federal Aviation Administration

Captain Lee Moak
President
Air Line Pilots Association International

Mr. Edward M. Bolen
President and CEO
National Business Aviation Association

Mr. Tom Captain
Vice Chairman, Principal
U.S. Aerospace and Defense Sector Leader
Deloitte LLP

Panel II:

The Honorable Calvin L. Scovel, III
Inspector General
U.S. Department of Transportation

Dr. Gerald L. Dillingham
Director, Physical Infrastructure Division
Government Accountability Office

Mr. Thomas L. Hendricks
Vice President for Operations and Safety
Air Transport Association

A COMPREHENSIVE REVIEW OF FAA'S NEXTGEN PROGRAM: COSTS, BENEFITS, PROGRESS, AND MANAGEMENT

WEDNESDAY, OCTOBER 5, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON AVIATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:02 a.m., in Room 2167, Rayburn House Office Building, Hon. Thomas Petri (Chairman of the subcommittee) presiding.

Mr. PETRI. Well, the hearing will come to order.

And today we will hear from witnesses about the anticipated benefits of NextGen and the Federal Aviation Administration's effort to modernize our national airspace system.

But first I want to recognize Jerry Costello. As he announced I think this weekend, he is not planning to seek reelection, which has made almost all of us here in this town unhappy, but probably there are a few people back in his district who are running around and revising their aspirations and plans as we speak.

It has been a pleasure to work with Jerry, and I look forward to continuing to do that. He is a real gentleman and has the best interest certainly of the country and the aviation industry and transportation at heart and has contributed a very great deal in many areas, including that which we are discussing today, through a lot of roundtable discussions and efforts to focus the executive branch on moving NextGen forward more rapidly and efficiently.

So anyway, it has been a pleasure serving with you. And I have a longer statement which I guess I better read. The program known as NextGen touches every aspect of the agency's mission. NextGen is an ambitious project currently costing roughly $1 billion per year.

From the beginning, the case for NextGen has centered on the FAA's ability to deliver operational benefits to airspace users, to increase efficiency, decrease user and agency costs, decrease environmental impacts and, most importantly, improve safety. NextGen is also considered a job creator, allowing for continued growth in this important industry.

Today's hearing will focus on the benefits the FAA has delivered over the last year or so and the specific operational benefits that they will deliver over the next 2 years. In addition, we expect the FAA to present their long-term milestones and targets for NextGen benefits. Key to the realization of NextGen benefits is the planned

transition from the 1950s radar-based surveillance of aircraft to a modernized satellite-based surveillance system dependent on GPS avionics. As such, NextGen is capital-intensive and reliant on industry investments into avionics.

Today's hearing is an opportunity for the FAA to present a proper accounting of NextGen benefits, including when such benefits will be realized in the near, mid and long terms. It is also an opportunity to build confidence among users who will need to invest substantial sums of money to realize the NextGen benefits promised by this new system and among Members of Congress who oversee and provide Federal money.

The subcommittee will also hear testimony from representatives of the user committee on the benefits that are of particular importance to them. Under the NextGen moniker, this program has been underway for nearly 5 years, but airspace modernization has its roots in the second term of the Reagan administration. The idea of implementing dramatic improvements to the safety and efficiency of the national airspace system is not new. As efforts to produce these benefits have evolved, it has always remained critical to demonstrate real progress year over year. That includes delivery of benefits in the near term, as well as making the policy decisions to guide the long-term efforts.

In 2008, the NextGen program was pulled off the GAO's high-risk list, a compilation of risky Government programs. From today's second panel of witnesses, Members will hear an update on FAA's current stewardship of the NextGen program and the degree to which benefits are being realized.

I believe the testimony of these witnesses will be critical to the NextGen authorization and funding decisions Congress will make in the tight budgetary times.

Before we turn to Mr. Costello and witnesses for their statements, I would ask unanimous consent that all Members have 5 legislative days to revise and extend their remarks and include extraneous material for the record of this hearing.

Without objection, so ordered.

Now, I recognize my esteemed colleague, Mr. Costello, for his opening.

Mr. COSTELLO. Mr. Chairman, thank you.

And let me first thank you for your kind remarks. You are correct; I announced over the weekend, actually yesterday officially, that I would not seek re-election in the 2012 election. I said back in 1988, when I ran for my first term, that I didn't intend to stay in Congress forever and that I had other interests and other things that I wanted to pursue while I was still healthy and could in fact pursue those interests.

So I decided to do that. It was not an easy decision, after working here on the Hill for over 23 years with you and other colleagues. It has been a great relationship working with the chairman. I am going to be around for another 14 months until the end of my term. So we will be working closely together.

And you are right, there are people back in my district that, namely eight grandchildren, who are very happy with my decision. And one of my granddaughters told me on the phone last night that, you know, maybe next year, you will be able to make grand-

parents' day at my school, which I haven't been able to do in several years.

So I am looking forward to—not retiring—but looking forward to turning the next page and spending time with my grandchildren and also trying to make a contribution in other areas other than elective office.

So, thank you, Mr. Chairman. And I look forward to continuing to work with you over the next 14 months.

I also thank you for holding this hearing today, investing in NextGen now will create a legacy of savings for the next generation. The Government will save money by providing services more efficiently. And the aviation industry users and the flying public will be the beneficiaries of billions of dollars in operating cost savings.

In the 111th Congress, we held four NextGen oversight hearings. We examined NextGen midterm capabilities, discussed area navigations and required navigation performance procedures, reviewed the RTCA midterm implementation task force report and analyzed the long-term planning and interagency cooperation needed in order to keep NextGen on track.

Clearly, everyone in this room wants NextGen to succeed. And I commend the FAA under the leadership of Randy Babbitt and others for making progress in several key areas of NextGen, such as efficiently using FAA resources to streamline procedural approval process, which yields significant fuel savings. Further important NextGen-related infrastructure programs, such as ADS–B, are moving forward relatively on schedule and within the FAA's budget requirements so far.

However, because many of the NextGen programs are dependent on one or more systems, delays in one program mean delays in other programs. For example, a holdup with the En Route Automation Modernization program could have a domino effect on the other key NextGen systems. Including ADS–B, data communications and a systemwide application known as SWIM. My concern is, what happens when we add severe budget constraints on top of logistical program delays? If we are committed to our shared goal of spending taxpayer dollars wisely and efficiently, I am concerned that significantly cutting funding levels for NextGen will move implementation dates back even further and will result in increased costs and reduced benefits for aviation users.

When this subcommittee held two hearings on the FAA reauthorization bill in February, we had the opportunity to hear from both the aviation stakeholders and the FAA. Our witness panel concluded that cutting the agency's budget to fiscal year 2008 levels, as proposed in the long-term reauthorization bill that passed by a partisan vote in April, that it would likely trigger drastic and dramatic budget cuts and cutbacks and cancellations of core NextGen programs.

I want to be clear that simply providing more funding is not the entire solution to successful NextGen implementation. And in fact there are many factors that must come together in order for NextGen to be successful now and in the future. But when we are trying to implement the largest and most important aviation modernization project of our time in a safe and cost-effective manner,

at what point is doing more with less just adding to the problem and making it even more difficult for it to succeed on time and on budget? Going forward, I believe that it is important for us to have an open dialogue with labor and industry stakeholders as well as the FAA and other Federal agencies, such as NASA, the GAO and the Department of Transportation IG, to ensure everyone is on the same page. There needs to be realistic timelines, performance metrics and a candid discussion of cost requirements to make sure NextGen systems are not significantly delayed and end up costing the taxpayers more in the long run.

I commend you, Mr. Chairman, for having this hearing to delve into these details. And as a strong proponent of NextGen, I want this modernization program to continue to make progress and ultimately deliver the benefits that we have long discussed for all of our users, operators and the economy. And because the aviation industry supports millions of jobs and keeps our economy moving, enactment of a comprehensive FAA reauthorization bill that includes adequate funding levels for NextGen, as well as a fiscal year 2012 appropriations measure that makes investments in NextGen a priority, will create jobs and improve aviation safety. It will also position us to create a lasting transportation infrastructure investment for our country.

Again, Mr. Chairman, I thank you and I look forward to hearing from our witnesses today.

Mr. PETRI. Thank you.

Mr. Mica.

Mr. MICA. Well, thank you for recognizing me, Mr. Chairman.

And let me just divert for a second to extend my very best wishes to Jerry and to Georgia.

I was really shocked the other day because I was looking for Mr. Costello, and usually I can find him pretty quickly. And we have a great rapport, incredible working relationship over the entire time I have been in Congress, 19 years, and he preceded me. He served as ranking and chair and back and forth together and worked to bring the Nation's aviation system back to some sense of normalcy after 9/11 and to ensure the safety and security of the flying public. I couldn't ask for a better partner and better friends than both Jerry and Georgia. So we will miss him.

But I knew there was something wrong when I couldn't get a hold of him the other day. I was quite shocked, like everyone else, to learn that he was going to hang it up. But we wish you well.

I always thought you were at least as old as me, Jerry. I looked it up, and I will be damned if you are not a lot younger. So you have a chance for a full additional productive career and spend time with your wonderful family.

So I know all of us on this side wish you well and thank you for a working relationship. It has been great, but we will miss you, and all of us at some time are going to have to join Jerry, either willingly or unwillingly. So we will be with you.

And if you are like my brother, he is a big Democrat like you, there is lots of money after Congress. So good luck. He will hate me for saying that. But he just retired a third retirement I think, so there is lots of potential out there at your young age. But we wish you well.

Mr. COSTELLO. Thank you, Mr. Chairman.

Mr. MICA. And I thank you both for convening this hearing on the progress of NextGen. We have got two panels, and we will hear the benefits, both short- and long-term, and they are many. We can't continue to have an aviation system that relies on 1950s and 1960s, even 1970s, technology, and we have got to do a better job at making certain that our skies are, first of all, safe and secondly that our system is efficient as possible. And you can only do that with using next-generation technology. So we have worked together as strong advocates to move forward. We have made some progress.

Now, today, I don't particularly want to be critical with FAA, but obviously, if you read the IG's report or GAO report, you will see very specific criticism. The IG really strikes at some of the management failures. Some of the RTC recommendations from 2009 still have not been implemented. Only a few have been addressed. FAA has succeeded somewhat in trying to focus on some of the metroplexes and some of our congested airspace areas. But unfortunately, the very basis of putting NextGen in places, as far as programs and technology, ERAM is 4 to 6 years behind, according to the report. Some estimates are it could be as much as half a billion dollars over budget.

We still have problems in developing our technology and Next-Generation approach to tracking aircraft. And we see problems with software programs and management programs in what FAA has taken on to move Next Generation forward. And this again is not my assessment. This is what the IG has said. And this isn't necessarily a failure of money.

And I share Mr. Costello and others' concern that we adequately fund our FAA operations. But this is not a question of money. This is a question of failure of management and getting a better handle on setting a timeframe, keeping these programs, again, moving forward in some logical sequence and you have to build on successes to get to where we want to be.

And unfortunately, there has been too many failures. The IG also cited failure to use onboard equipment, come up with solutions there. We are behind in that. It looks like also we are sort of forced into a full-blown NEPA environmental study. I question the need for that. Anyone with any commonsense or logic that couldn't determine that this has to be vastly more favorable to the environment, more direct routing, less emissions, more efficient use of airspace, I am not sure where they are coming from.

But again, we don't need rocket science or continued extensive full-blown red tape, dotting I's and crossing T's when even commonsense would tell us the environmental positive impacts of Next-Generation technology and protocols. One of the things that concern me, and I am a strong investigate of having the private sector involved in this development and having witnessed, oh, back before I became chairman and sitting in this very room, and we would have hearings on bringing forth new technology, and FAA was doing the developmental programs is that they would go on and on. They just asked for another $1 billion or $2 billion, and they say that our success is right around the corner. Well, we are seeing some of that, unfortunately, repeated again. And also what concerns me is now with the failure of making progress and also the

milestones that aren't met or properly identified, even baselines that are missing, and FAA has not identified, that the private sector is now running scared for participation and also not as willing to come forward and provide some of the solutions.

So I am very concerned about our progress with the program. We have got some good proposals in our pending legislation. I hope to move forward with that in the next few weeks and certainly in the next couple of months to finalize our FAA reauthorization. We include provisions to set some standards, some metrics, some baselines, some milestones and timeframes. So, hopefully, that will encourage the private sector also to become re-engaged. But we have got to get FAA off dead center and get a handle on this very important project.

So, again, with my compliments to our Member who we are going to lose next year and with the concern for the future of NextGen, I will yield back.

Mr. PETRI. Thank you.

Ms. Hirono.

Ms. HIRONO. Thank you very much, Mr. Chairman.

And I do add my thanks to our Ranking Member Costello, and of course, when he chaired this Aviation Subcommittee and the leadership he provided and all of the issues confronting us, including of course the many hearings we had on NextGen. And I want to thank Chair Petri for convening this session to bring us up to date on what is happening with NextGen. I am also glad that Mr. Costello mentioned the importance of FAA working with other partners, such as NASA, GAO and, in my view, particularly with the labor unions, who are going to be very much impacted by what we do with NextGen. And I will have a few questions for our witnesses along those lines.

Thank you very much, Mr. Chair.

Mr. PETRI. Thank you.

Mr. Coble.

Mr. COBLE. Thank you, Mr. Chairman.

No opening statement, per se. I just want to reiterate what you and Chairman Mica, your words, generous words, directed to the distinguished gentleman from Illinois. He will indeed be sorely missed on Capitol Hill, and I look forward to the hearing today as well.

Thank you, Mr. Chairman. I yield back.

Mr. PETRI. Thank you.

Mr. Boswell, did you want to——

Mr. BOSWELL. Thank you.

I would like to join with everybody else, Jerry, in my—well, I am just going to say it like it is—my disappointment because you have made a great contribution here, and I know you will in the next 14 months. So we are really going to lean on you a little bit. But, yeah. A lot has been said and more will be said as we go along and you have done a great job. And you will continue to do so, whatever you do. You are a patriot, a great American and somebodywhose friendship I value very much.

Back to the business at hand, Mr. Chairman. I appreciate you having this hearing.

I think there has been a little amnesia around here. But setting that aside, we have got some real challenges across the board. I know aviation has put a lot of jobs out there for years, growing. And I hear this word uncertainty thrown around, and I think we ought to stop and think, who is creating the uncertainty, and be honest about it.

And I would hope that, for example, Mr. Bolen and some of the rest of you, would tell us what that means, willingness to take risks, whether it is in Wichita or wherever it might be, as we think about general aviation and what it contributes to our economy and the need. We keep throwing barriers in front of them for different things and, you know, trying to make them disclose where they are going to do business and so on, which is wrong. And then to be willing to invest in risk and so on and not knowing what is going to happen to NextGen.

And, Mr. Mica, you made excellent remarks, and I certainly agree with those. It seems like we ought to move off center and get to going. Some things are an investment with a known return, and I think we are thinking about it. I think we have just been thinking about it a long, long time, and we ought to get off center.

So I appreciate what is happening here today. We have had a number of hearings on the issue, and we ought to be moving forward. Airlines and their willingness to—new equipment, new avionics. Avionics costs so much money. General aviation. Avionics costs so much money. And those of us who use the system a little bit around here can have an appreciation for it, but we all ought to appreciate it because we all use the system one way or another, whether we are flying back and forth to a district or going where we go or those of us that have the privilege to participate in general aviation.

It is my hope that we can move forward and to pick up the pace a little bit and realize that this will enhance the economy. It is needed. We need to move forward into Next Generation. That is a pretty good term. But it is here. It is not over the hill. It is here now, and we ought to be into it. And those of us who have gone up to the laboratory and done other things realize there is lots that can be done to make it safer, expedite, get manufacturers to invest and those users to invest and do a lot of things. So I appreciate it, and I hope we do actually move forward with a little bit expediency and get it done now. Thank you very much.

I yield back.

Mr. PETRI. Thank you.

Mr. LoBiondo.

Mr. LOBIONDO. Thank you, Mr. Chairman.

I join with my colleagues in thanking you for calling a hearing on this most important topic and also with my colleagues on their comments about Mr. Costello.

Jerry, you are what this place should be about. I have tremendously enjoyed your counsel, working with you. Almost everybody knows or they should know that you are not a show horse; you are a workhorse. You are about getting it done, you are about getting results. This place needs more people like you. So we thank you.

And, Mr. Chairman, on the topic of NextGen, I am a huge, huge proponent of the program. It is no secret that the Federal Aviation

Administration Technical Center, which is in my district and I believe the premiere facility in the Nation, if not the world, in this particular area, has done extraordinary work.

I want to start by saluting the leadership of Secretary LaHood and Administrator Babbitt, and Michael to you and your whole team, for what you are doing. This is incredibly complicated and incredibly difficult.

But I also want to make a word of comment. I have been into the tech center on numerous occasions, and the men and women of the tech center have a dedication to excellence and a passion for success that makes it much more than a job for them. They understand they are a part of history. They are putting their heart and soul into this every day. And I think this is going to yield great benefits as we move forward.

We have heard a little bit about the certainty or uncertainty. I think one of the biggest things that we can do to provide certainty is provide a long-term FAA bill. The FAA itself needs to be able to plan. I cannot imagine how you can plan 6 months at a time and have to spend so much time and resources worrying about shutting down or not shutting down.

I was out at the conference, which is ongoing now, on Monday. Most every private sector company that I talked to mentioned the certainty and stability, which we don't have right now, which is absolutely critical to our moving forward. This partnership between the Government and the private sector requires us to have a known quantity of what we are doing and how we are doing it. We can't do that on these extensions, and I hope we can get by it at this time.

I also believe that one of the things I have heard repeatedly as the contracts—and we have had about $7.3 billion worth of contracts under the structure known as SE2020 that have been a big help on how we are moving forward. But I certainly am concerned that this is not flowing as quickly as it could be. I would like to see more task orders and more funds being allocated on a faster basis than has been so far.

I think it would certainly send a very important message to those who are paying attention. And with the big issues here in Washington and the debt limit commission and continuing resolutions, this is so important to the safety of our flying public, to the dollars that we can benefit from with our economy. It is one of the programs that we know is going to produce results.

And I am thrilled we have the opportunity, Mr. Chairman, to listen to our panel and to find ways we can be a force multiplier for the group that is here, and I thank you very much.

Mr. PETRI. Representative Johnson.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

And let me associate myself with the remarks that have been made in relationship to Mr. Costello. It was very disappointing information to learn.

But I would like to thank both of you for this hearing today to review the cost-benefits, progress and management of FAA's NextGen program. I might add that no where I have been talking about transportation has there not been emphasis on NextGen and how important it is for the future of our aviation industry. And

coming from a congressional district that is a major air transportation hub, that encompasses Dallas and the Dallas Love Field airport that is very adjacent to the Dallas/Fort Worth International Airport, the safety of our air traffic system is of paramount importance.

And currently the Nation's transportation system supports more than 74,000 flights every day and 730 million passengers every year, with the FAA forecasting an increase of 53 percent to 1.1 billion passengers per year by 2025. So we are very concerned. We are a trade hub. Our airport is the economic engine for the area. General aviation is expected to increase to over 85,000 flights every day over the same period. So, clearly, the demands placed on our national air traffic safety programs will be far greater as time moves forward, and we must prepare for the future.

While the most critical purpose of NextGen is to improve public safety, there are also significant cost savings and efficiencies to be derived from the proper implementation of the program that will benefit airlines, airports and air travelers. The FAA estimates that NextGen air traffic management improvements will reduce delays in flight and on the tarmac by approximately 35 percent by 2018, as compared to doing nothing. That 35 percent improvement in efficiency will equate to $23 billion in savings to aircraft operators, air travelers and FAA over 8 years.

These cost savings and public safety improvements are far too important for this Congress or this committee to ignore. And I look forward to hearing the witnesses' testimony regarding the different programs of the NextGen system: the Automatic Dependent Surveillance-Broadcast, or the ADS–B; En Route Automation Modernization, or the ERAM; the data communications, or DataComm; or System Wide Information Management, or SWIM; the NAS Voice Switch; NextGen Network Enabled Weather, the NNEW; Collaborative Air Traffic Management Technologies, the CATMT, and other expert opinions on what must be done to modernize our air traffic transportation system.

And I thank you for sharing my passion for safe and efficient national airspace and the recognition that the Federal Government must play a partnering role in this effort. I think the future is too important for us to play partisan politics here and for us to talk about how much we have to save and not spend. There are some things that we must spend on to keep us on the world stage and in safety. I think this is one of them.

Thank you, Mr. Chairman. I yield back.

Mr. PETRI. Thank you.

Representative Cravaack.

Mr. CRAVAACK. Thank you, Mr. Chairman and Ranking Member Costello, for holding these important meetings.

And I am sorry that the ranking member is not here right now.

Unfortunately, I haven't been able to know—there he is. I have just been able to get to know Representative Costello somewhat well. But it being a freshman Congressman opposed to a more senior Congressman, we haven't been able to run in the same circles. But what I can tell you is that in dealing with Representative Costello and now paying him the highest of compliments is that he is a statesman, with that being the highest compliment I think I

could give to another fellow Representative. So I am sorry for your departure, but—and your wisdom for this great panel. So thank you very much, sir.

NextGen modernization is critically important in our national airspace system and can meet the transportation capacity for the 21st century. Moreover, implementing NextGen technology will lead to improved aviation and a driver for future airline productivity.

While I do not support the President's bill entirely, I was glad to see the importance the President placed on NextGen funding. I encourage President Obama and his administration to think seriously about working together in both Houses of Congress to enact NextGen-related legislation. I think this is a commonsense issue that transcends the usual partisan divisions, and the positive effects of implementing NextGen technologies will benefit all Americans.

I would like to welcome the witnesses to our panel today and thank you for advance for your testimony. I look forward to hearing from you about ways to ensure the timely implementation of NextGen, as well as eliminating the administrative barriers preventing NextGen's progress. Quite frankly, I am ready to kick the tires and light the fires on implementing NextGen.

As in the first Aviation Subcommittee hearing this year, I will be specifically interested in hearing how the FAA's contract management is impacting NextGen modernization. Again, thank you for being here today, and I look forward to your testimony.

And I yield back.

Mr. PETRI. Thank you. Thank you all.

And Representative Norton.

Ms. NORTON. Thank you very much, Mr. Chairman.

I have to begin by saying what a stunning disappointment it was for me to learn that we would be losing Jerry Costello, for many, many reasons. First for professional reasons, his unusually deep knowledge of this area will be hard to replicate. He knows it backwards and forwards, shares it with all of us, is hardly replaceable as we move by seniority in this body.

His wonderful friendship and collegiality will be missed by all of us. He is a model for how to serve the People of the United States and this Congress.

Mr. Chairman, this is an important hearing to have before the end of the fiscal year. One is left to wonder where we would be with NextGen if there had not been 22—or is it 23; I have almost stopped counting—extensions of the FAA bill. It is impossible to believe that the failure to pass this bill has had no effect on NextGen. We are not only talking about billions of dollars for those of us who want to see more money in the economy and more savings in our budget; we are talking about something even more important, And that is the safety of our system. If we do not meet these deadlines, given the increasing pressure on air traffic, I don't think any of us with a straight face could say that the skies are safe.

I have no idea what cuts have had on this very critical effort. But I believe we must find out where we are, how far behind we are and whether there are enough funds for us to continue to move ahead on this very critical long-term effort.

And I thank you very much, again, for this hearing, Mr. Chairman.

Mr. PETRI. Thank you.

And we turn now to our first panel. And it consists of the Honorable Michael Huerta, Deputy Administrator of the FAA; Captain Lee Moak, president of the Air Line Pilots Association, International; Ed Bolen, president and CEO of the National Business Aviation Association; and Mr. Tom Captain, who is the vice chairman and principal, Aerospace and Defense Sector Leader at Deloitte, a leading accounting and consulting firm globally, I believe.

We will begin with the administrator, Mr. Huerta.

TESTIMONY OF THE HONORABLE MICHAEL P. HUERTA, DEPUTY ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION; CAPTAIN LEE MOAK, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL; EDWARD M. BOLEN, PRESIDENT AND CEO, NATIONAL BUSINESS AVIATION ASSOCIATION; AND TOM CAPTAIN, VICE CHAIRMAN, PRINCIPAL, AEROSPACE AND DEFENSE SECTOR LEADER, DELOITTE LLP

Mr. HUERTA. Good morning, Chairman Petri, Congressman Costello, members of the subcommittee. Thank you for this opportunity to discuss the benefits of NextGen, and I am very pleased to appear before you for the first time.

NextGen is a comprehensive overhaul of our aviation system to make air travel more efficient and dependable while keeping you safe in the skies. It is a continuous rollout of new procedures and technology that will save fuel, reduce noise and cut pollution.

NextGen is a better way of doing business, for the FAA, for the airlines, for airports and for the traveling public. Civil aviation contributes $1.3 trillion to our economy and generates more than 10 million jobs. NextGen is vital to protecting these contributions. The current systems simply cannot accommodate anticipated growth.

President Obama recognizes the economic importance of NextGen; the American Jobs Act includes $1 billion to continue our research and development to advance this transformation. The act also proposes $2 billion for airport improvements for runways, taxiways, and terminals.

The United States has invested nearly $3 billion in NextGen. Why? Because our latest estimates show that NextGen will reduce delays by about 35 percent in the next 7 years. It will bring $23 billion in cumulative benefits. We will save about 1.4 billion gallons of jet fuel and cut carbon dioxide emissions by 14 million tons.

Let me highlight some examples where NextGen is already improving safety, helping the environment, and adding to the bottom line. Helicopters equipped with GPS-based technology in the Gulf of Mexico now have improved safety where there was no radar coverage before. They are saving flight time and fuel.

In Colorado, NextGen enables controllers to track aircraft through mountains that block radar, thereby enhancing safety.

Airlines are benefitting from NextGen routes and approaches that allow for more direct flights. Southwest Airlines says it could save $25 for every mile cut by using a shorter route. By using precise NextGen procedures in Juneau, Alaska Airlines estimates it

avoided cancelling more than 700 flights last year due to bad weather. And UPS estimates it will save as much as 30 percent on fuel during the arrival phase of flights into its Louisville hub.

Environmental benefits are clear: Burning less fuel produces less carbon dioxide and other harmful emissions. Through the Greener Skies Over Seattle Initiative, airlines using NextGen procedures will save several millions of dollars per year. Aircraft will emit about 22,000 metric tons less carbon dioxide per year, the equivalent of taking more than 4,000 cars off the streets.

A true transformation takes planning, and it takes time. So let me now describe some of the longer range benefits. NextGen will make our aviation system safer. It will increase controllers' and pilots' abilities to avoid potential danger. Equipped aircraft will receive information about traffic, weather, and flight restricted areas. On the ground, advances in tracking will make runways safer. We are working in a focused way to relieve congestion and tarmac delays in major metropolitan areas, including right here in Washington, Houston, Atlanta, Charlotte, North Texas and California.

To fully achieve these benefits, we must do two things: First, we need to make sure that the FAA is able to properly manage the NextGen transformation. And second, we need to continue working with our partners in the aviation community.

We appreciate congressional approval for the reprogramming request we submitted this summer. A streamlined NextGen office that reports to me in addition to other organizational changes that improve efficiency will help the FAA meet the needs of our Nation's air transportation system.

NextGen will only be successful if we work closely with the aviation community. We established a broadbased panel, the NextGen Advisory Committee, to provide guidance and recommendations. We need their help to forge industry consensus on how to equip for NextGen and how to measure our success.

There is a chicken-and-egg nature to the decisions that will influence the extent and timing of NextGen benefits. The future depends upon stakeholders' willingness to invest in equipment, staffing, and training. NextGen is happening now.

If we delay investment, the long-term costs to our Nation, to our passengers and to our environment will far exceed the cost of going forward together at this time.

Mr. Chairman, that concludes my prepared remarks. I would be happy to answer any questions that you and the members of the subcommittee may have.

Mr. PETRI. Thank you.

Captain Moak.

Mr. MOAK. Good morning, Mr. Chairman, Ranking Member Costello, and members of the subcommittee. I am Captain Lee Moak. I am the president of the Air Line Pilots Association, representing over 53,000 pilots who fly for 39 airlines and all cargo carriers in the United States and Canada.

On behalf of our members, I want to thank you for the opportunity to provide our perspectives on NextGen.

A few weeks ago, I was the captain of an aircraft operating in the Reagan National Airport, an approach that all of you are familiar with, and you probably experienced the rapid altitude decline

over the Potomac in the last few minutes of a flight when you are arriving here from the South and the DCA, a necessary drop because air traffic controllers keep airplanes high, the air traffic high in the Reagan until the last few minutes to avoid Andrews to the east and Dulles to the north and west. Now, we are kept high to avoid the other traffic because, as a Nation, we are operating our air traffic control system largely with the same outdated and imprecise equipment and, I stress, procedures that were used during the 1950s.

NextGen will bring precision approach capability to locations and runways where precision approaches do not currently exist, like at Reagan and some of the runways at Chicago Midway, Boston Logan and Minneapolis. NextGen technology gives pilots and controllers precise aircraft location and altitude information relative to the landing runway, improving safety and capacity, especially when operating in adverse weather conditions.

There is no question, NextGen brings with it enhanced safety and also increases airspace capacity and efficiency.

Now, what is it going to cost? The cost for NextGen, as estimated by GAO, has been somewhere around $40 billion initially and as high as $160 billion in some scenarios. However, there is little debate over the urgent need to modernize the system, but industry agrees; with a price tag this high, we must get NextGen right the first time.

With a project of this magnitude and complexity, as well as a well coordinated fully integrated plan known to and agreed upon by all stakeholders, along with supporting equipment standards is critical. Today we do not have a way forward on NextGen. There is no coordinated plan.

Now, some of you know I am new to DC here, and I can give you a couple of great examples of that in just a moment. But I will give you an example of the point that aircraft manufacturers are delivering aircraft that possess capabilities that cannot be utilized either because of the current infrastructure, the infrastructure not being prepared to use the technology, or the operational procedures necessary have not been approved.

In addition, Government has required the installation of NextGen equipment, including ADS–B, that does not meet the end state standard necessary to achieve the desired long-term goals. The Government must step forward with greater financial commitment and show real aviation leadership.

ALPA was pleased to see the President's inclusion of $1 billion for NextGen projects in the jobs package, and it is our hope that it becomes law, and the $1 billion NextGen investment will serve as the tipping point for investment in industry and Government to move forward on the critical initiatives that we are engaged in.

But again, on the total cost of NextGen, what will $1 billion get you? Being new, it is like putting a quarter into a parking meter up here on Capitol Hill and expect to get 2 hours in that meter. It is not going to happen. A quarter only has gotten me 7.5 minutes, and if you don't plan it out quite right, you are going to get a ticket or, worse yet, you are going to get towed. And that is a penalty for a lack of investment and an industry and consumers

are being penalized for not having an investment in NextGen with higher costs that sacrifice safety.

You know, when we move forward on NextGen and we try to motivate the industry to invest, it is only going to happen if we see a path forward and return to—and a return on the investment, and the Government needs to show that financial leadership and make decisions moving forward on NextGen. In Chicago, in 1945—1944, the International Civil Aviation Conference was held in Chicago at that time, and they decided that the U.S. was the leadership in the world, and they made a fundamental decision to make English the language of aviation. And right now, we need to move forward with NextGen so that we don't lose that leadership role.

Now, I know I have gone over my 5 minutes, and I will leave my other comments for the Q&A period. But NextGen is important for our members. Our pilots are trained. There is equipment out there. We need to figure out a way to work together to get this timeline sped up.

Thank you, sir.

Mr. PETRI. Thank you.

Mr. Bolen.

Mr. BOLEN. Thank you, Chairman Petri.

Thank you for convening this important hearing and thank you for opening today's hearing by recognizing Mr. Costello. On behalf of the business aviation community and all of the general aviation community, we certainly appreciate the effort that the Congressman has made to understand our industry and to recognize the benefits and importance of general aviation to our country and to be a leading advocate on the value of allowing us to use per-gallon charges to fund the system, rather than devastating per-flight fees. So I want to thank Mr. Costello for all that he has done during his service in the Congress.

This is an important hearing and an exciting one because I think NextGen, as you will hear from all of us, is something that we fully embrace. What we are trying to do is transition from a ground-based, radar-based system to a satellite-based, airplane-centric system of air traffic control.

The benefits are clear. We do believe we can reduce our environmental footprint. We do believe we can enhance safety. We are convinced we can reduce delays and increase capacity. And for the business aviation community, it is the ability to increase system capacity that is really exciting to us. What we have seen over a period of years, is that as airports become congested, general aviation gets pushed out. We are forced to go to secondary airports. Some of you will recall back when Chicago Midway was a great general aviation airport. Manchester, Fort Lauderdale, San Jose, the list goes on and on. But as those airports saw growth in scheduled commercial operations, we began to get pushed from secondary airports to tertiary airports. We need to expand the capacity of the system to allow more safe, efficient operations out of all of our Nation's airports and all of our airspace.

So business aviation and the entire general aviation community has been very supportive of our move to NextGen. I think over the course of the past several years, we have seen reason to be excited about some of the things that are going on. We see that Joint Plan-

ning and Development Office has put forward a vision. We have seen the community come together in Task Force 5 to work on implementation, and currently, we are working very closely with the FAA and the NextGen Advisory Council to develop ways that we can move forward in a coherent, coordinated way and make some of the benefits a reality today.

I think the important thing about NextGen is that we all understand NextGen is not just about technology. There are important technology programs. But NextGen is also about procedures and policies and a culture. And I think we can do more. Part of the Task Force 5 recommendations and the early NAC comments suggest that we have a lot of onboard technology today that we are not using to the fullest extent possible. We can do more with regard to satellite-based approaches and WAAS-based approaches throughout the United States that can yield some immediate benefits.

When people want to know how we move forward with NextGen faster, we see room for improvement in these areas. That means getting more approaches done and not just overlaying just the approaches that we have in place today. Let's create new approaches that provide real benefits. That does bring some environmental challenges, but we think where there is a commitment to working together, we can overcome those. So getting more of those approaches out there, making sure that they deliver benefits and streamlining the approval process so that business aviation can participate in that is a fundamental way that we can all work together to move forward.

Business aviation and the entire general aviation community is committed to NextGen. We have never wavered in that commitment. We participate in all of the advisory groups so that we can have input into building a system that doesn't just improve transportation for business aviation but for the entire aviation community as well.

We appreciate the leadership that we have seen from this committee and the commitment to work together with the aviation community.

We are frustrated by recent proposals that distract us and force us to spend time and effort on Capitol Hill working on these funding proposals rather than on the important communication and coordination that is necessary to make NextGen a reality. We are grateful that this committee has understood the need to move forward and kept our feet to the fire. Thank you.

Mr. PETRI. Thank you. Mr. Captain.

Mr. CAPTAIN. Chairman Petri, Ranking Member Costello, and members of the subcommittee, thank you for the invitation today to testify, to provide input on the benefits of NextGen.

Deloitte published an extensive study this past May on the business case, based on best commercial practices, for the global implementation of air transportation system transformation efforts, with particular attention to the U.S. NextGen program. My name is Tom Captain. I am the lead author of the study.

That study was funded and performed independently by Deloitte and was intended to provide input to the ongoing industry dialogue regarding the quantification of benefits and costs, funding, scope,

timing and potential merits of these transformation and modernization initiatives. It also identified the risks and the challenges associated with this very complex undertaking, as has been mentioned before.

In our business case, we found that conversion to satellite-based positioning, navigation and timing systems enables better pilot situational awareness, point-to-point and closely spaced aircraft operations, continuous descent procedures, and all-weather air traffic operations, resulting in significant reduction in weather and congestion related delays as well as reduced flight times.

We found that the successful implementation of NextGen by 2025, using reasonably conservative assumptions about future demand for travel, price increases in oil and other factors, results in an estimated net present value of $281.3 billion and an internal rate of return of 44.8 percent. By 2026, the first year of full implementation, the study found $29 billion of first year net benefits, which only would increase each year there after, as the price of oil and air travel demand increases. This is made up of 830 million gallons of jet fuel savings per year again; 900,000 hours of time saved; and 6.8 million metric tons of carbon emissions avoided.

It should be noted that these did not include several upside benefits potentially that could make this business case more positive, including potentially inclusion of NextGen for general aviation and for military aircraft operations, nor did the scope contemplate potential consolidation, again, potential, of the national airspace operation, more efficient air traffic control procedures or reduction of legacy ground radar systems, for example.

To provide additional insight about the business case, we examined three NextGen schedule scenarios, number one implementing as planned in 2025, acceleration to 2020, and then delay by 5 years to 2030. We found that acceleration resulted in an additional $19.8 billion of net present value and increased that high internal rate of return by another 21.7 percent. Alternatively, delayed implementation still has a positive business case of that $281 billion, but it would result in a net present value reduction of about $47.6 billion and reduces that internal rate of return by 13½ percent. Additionally, the business case found that the net benefits would accrue to constituents as follows: 35 percent to airlines, 59 percent to passengers, 5 percent to Government and airports, and 19 percent to the general economy. These savings are not only in fuel costs, people's time, and emissions, but in less airplane maintenance and labor costs, insurance, reduction in noise, increased airspace capacity, and overall economic benefit from a much more efficient air traffic system.

As outlined in our study, to achieve these benefits, there are a number of challenges and risks that must be addressed to successfully meet these implementation timetables. These include, but are not limited to, funding, technology and program risk, workforce transformation, regulatory reform, legal, air traffic control procedures, technical and certification standards and harmonization, and so forth. In addition, the program continues to be impacted by program management challenges of cost overruns and schedule delays due to technical complexity, requirements creep and uncertainty, as well as system verification and integration challenges.

Due to the integrated nature of these elements, success will be highly dependent on the ability to manage requirements, cost and schedule in a coordinated manner as a program. A key lag in one of these elements could impact the ability of the entire program to be on schedule, as has been mentioned before, and a focus on interdependencies would necessarily be required.

Our study highlights considerations targeted at addressing a number of these concerns, which include assessments of potential funding to address NextGen equipage to close the gap, to close the business case for airlines, as well as program management to include oversight and governance programs to better ensure overall programmatic performance and accountability, as has been mentioned by the Administrator early year this week.

In summary, the business case demonstrates that the return on investment is significant for all scenarios considered. It looks like it is an open-and-shut business case. As we have said earlier, it is all about execution.

Mr. Chairman, that concludes my statement. I would be happy to answer your questions.

Mr. PETRI. Thank you.

I was going to ask you, just to build on your concluding statement, if you do a—your firm does a lot of consulting for the multinationals of this world, and assume for a minute that we are not talking about a Government, but we are talking about, say, Exxon Mobil, which does billion-dollar projects all the time all over the world. And if they could borrow at the Government's costs—we are borrowing at 2 to 3 percent now—and get a 65 percent return on their investment if they moved things up a little bit faster—I think you indicated 44 percent on the current timetable, and if we cut 5 years off it, we would get 21 percent more—would you say that that is the kind of thing that we would be yelling that they are robbing someone because they are making such a huge profit, or is this a no-brainer, or what—could you bring it to life a little bit for us what we are talking about?

Mr. CAPTAIN. Yes, Mr. Chairman. I think if you look at most investment cases for property, plant, and equipment, most companies would say that a return on investment of 44 percent would be outstanding, and that is why we say this is an open-and-shut business case. It is not about the investment return, it is about how you do it and manage the risk.

Mr. PETRI. Thank you.

And, Mr. Huerta, you are kind of in charge of managing the risks or helping to get this thing done. It is a big assignment, and it is in a way out of the ordinary for the FAA in that normally the FAA is a line agency that is trying to put out fires every day and managing the—has responsibility for managing the safe and efficient flow of air traffic, among other things, in the United States. This is a different type of an operation. It is managing a transformative process to reconfigure the way it is doing business. Could you discuss that a little bit, and the magnitude of the problem, and how we can help you to do as effective and efficient a job as possible?

Mr. HUERTA. Thank you, Mr. Chairman, and I think you provided an excellent summary of the challenge that the FAA faces. The FAA is, first and foremost, an operating agency with a safety

focus, and we never want to do anything that is going to get in the way of our ability to maintain a safe system that operates as efficiently as possible. And you are correct in pointing out that our transformation to NextGen represents a very significant difference in the way that we do business.

One of the things that Administrator Babbitt identified early on when he came to the FAA was the importance of separating the program management functions associated with NextGen from the day-to-day operational functions of the FAA, and that was with a very deliberate intent, to ensure that we had the appropriate level of focus and oversight on delivering NextGen programs as effectively as possible, and at the same time not allowing people that are delivering those programs to be distracted by the day-to-day operation that is always there.

We appreciate the support that has been shown by the Congress in reorganizing the functions of the FAA to create a new program management office and to elevate the profile of the NextGen organization, and we are very focused on putting the tools in place to ensure that we are able to deliver these programs so that we can maximize the benefit.

We also recognize the need to accelerate, and make very visible to everyone, the benefits from delivering NextGen. You have heard from the other witnesses the importance of advanced navigation procedures, and you have also heard that, in fact, most aircraft are equipped to take advantage of those procedures today. That has become an area of very significant focus for us, and in the year ahead what we really want to do is focus on how can we improve the quality of these procedures, how can we accelerate their deployment, and how can we see the very real benefits associated with reduced fuel consumption, reduced time, and corresponding environmental benefits as well. But it starts with how we manage and how we oversee the programs, and we put changes in place in the last few months that I think maximize our ability to do that.

Mr. PETRI. Thank you.

Mr. Costello.

Mr. COSTELLO. Thank you, Mr. Chairman.

Mr. Huerta, let me ask a question, but before I do, I think we all recognize that everyone in the room, both on this subcommittee and everyone here today, supports NextGen and wants to see it successfully implemented. We also, all of us, as Members of Congress, and you as taxpayers, want to see us do the responsible thing in reining in spending, trying to balance the Federal budget, and that is a challenge, trying to make investments that, in fact, pay off in the end, while at the same time trying to figure out in the Federal budget what can be reduced, what can be cut.

What I am trying to do here is to get a handle on how cuts will affect the implementation of NextGen. So my question is, your people at the FAA, surely they have done an analysis concerning the various proposals in Congress. There are proposals in Congress that would cut FAA anywhere from 5 to 10 percent in the capital and operating budgets, including accounts for NextGen. So regardless of where we are and how much should be cut and how much shouldn't be cut, I think we have a responsibility and the agency

has a responsibility to tell us how various proposals will affect the implementation of NextGen.

I said in my opening statement that throwing money at this issue or any issue is not the only answer, that there are other things that have to be done in order to make sure that it is—NextGen is implemented in an efficient, effective way, but obviously you have to have the funding to move forward.

So my question to you is there are proposals in the Congress now to reduce your operating budget, which will, in fact, affect NextGen. Have you done an analysis from a budgetary standpoint as to what a 1-percent, what a 5-percent, what a 10-percent cut would do as far as the progress that the agency is making with the implementation of NextGen?

Mr. HUERTA. Thank you, Mr. Costello.

President Obama has put forward in his budget for fiscal year 2012 the Administration's view on what we think are the resources that are necessary to keep the program on track and to ensure that the benefits that we would like to achieve are there.

The question that you are also raising, which is in tight budgetary times, what can we do to maximize the investments that we make, and how do we ensure that we keep NextGen on track. I think, first and foremost, what the President has put forward is what we believe to be the appropriate balance of maintaining the operation and ensuring that we are able to deliver the goals of NextGen. If we are looking at less than that, first and foremost, what we need to be concerned about is maintaining a safe system, and that puts us in the position of needing to consider are there future investments that we would need to delay? If we delay the investment, we delay the realization of the benefit, and the challenge of that is that the aviation industry continues to grow, and a lot of what we are investing in is to enable us to manage that ever-increasing share of traffic.

We have done an analysis, and we have been engaging in discussions with industry of how we should look at it, and I think the tension that we have in a reduced funding scenario is: do we cut everything across the board—what is called the famous peanut butter spread—or do we really focus on a couple of key programs and try to maximize their benefit? And we don't have an answer to that because we want to consult with industry in terms of where do they want to see the maximum benefit. You have heard from them that in the near term, the focus needs to be on advanced procedures.

I would also like to point out that the investment we have made as of today, about half of that has been in the deployment of the ADS–B ground stations throughout the country, and we need to remain on track to deliver that by 2013 because that is a foundational program that enables us to build on the rest of the NextGen technologies.

To keep the program to meet our timetables that industry has asked for, Task Force 5 has laid out a series of things they would like to see us accomplish between now and 2018. To be able to meet that, though, the President's budget really provides the template to get us there.

Mr. COSTELLO. One more question regarding funding. I asked Administrator Babbitt when he testified before the subcommittee a similar question, and I asked him what effect the proposed cuts at the time would have on the implementation of NextGen, and he said—I have a transcript of his testimony here, and he said that, So I don't think that we should be penny wise and pound foolish. Yes, we could save the penny, but in the end it is going to cost more money over time to delay a lot of what we are proposing.

And what I am trying to do is get a handle on what that means. So I hear you say that, you know, we would take a couple of programs and prioritize, but, you know, I think for those of us who are making decisions on the budget and funding levels for the agency, it would be good for us to know that if you rollback to 2008 or 2009 funding levels, that that is going to delay the implementation by a year, 2 or 3 years, 4 years, whatever it may be, so that when we are making these decisions to vote on budget levels, we know exactly what the effect of that vote will be, that we know that we are delaying NextGen by a specific amount of time. And I don't think I have heard that from the agency yet, and I think it would be helpful for everyone to know that.

Mr. HUERTA. There is no question that civil aviation is a major economic contributor, and, yes, any delay would result in delays in benefits to that industry and would significantly impact the job potential of that industry.

In terms of if we cut here, if we reduce by this, what does it translate to in years? I think it is dependent on a number of factors, paramount among them which is, how does it affect various funding categories within the FAA? But there is no question that reduced funding will result in delays, and delays will cost us more in the future in lost benefit as well as the cost of deploying the program.

Mr. COSTELLO. Thank you.

Thank you, Mr. Chairman.

Mr. PETRI. Mr. Coble.

Mr. COBLE. Thank you, Mr. Chairman. Good to have the panelists with us today. Mr. Chairman, I have to go to another meeting, but I want to put a question to Mr. Huerta, if I may.

Mr. Huerta, very elementary definition, tell us what ERAM is, and more specifically why is the program $500 million, I am told, over budget and 3 to 5 years delayed? Is there a plan to get it back on track? And let me put a two-part question to you to tie on to that.

In your testimony you say that ERAM delays are attributable to not having enough stockholder inclusion. If you would, sir, elaborate in more detail, is that to say that there were no air traffic controllers involved in the development of ERAM? And if you will respond to that, I would appreciate it.

Mr. HUERTA. Thank you, Mr. Coble.

ERAM represents the new platform for handling high-altitude traffic at air traffic control centers all across the country, and it is a foundational program to NextGen. The original contract was awarded to our primary contractor, Lockheed Martin, in July of 2003.

The challenges that we encountered in the deployment of ERAM related to what you pointed out as stakeholder or shareholder involvement, and that is the air traffic controllers that actually have to use this program to safely separate aircraft every day. What we found a couple of years ago was as we started to roll the system out into our first test sites, that there were difficulties in the human interface, the controllers' ability to work with the program as compared with the program that they were migrating off of, an older system known as HOST. And so we elected at that time, a couple of years ago, to stop where we were and really focus on how could we address the controllers' concerns and to ensure that challenges and difficulties we were seeing in the software could be addressed such that the controllers would feel confident that they would be able to operate on this program.

That has been very successful, and we now have the program up and running at two of our air traffic control centers, Salt Lake Center and Seattle Center. On October 19th, we will pass the 1-year mark when we will be operating on ERAM at Salt Lake Center, and later in the year we will pass the 1-year mark at Seattle. And we are very confident that we are going to roll out ERAM and operate traffic-operating capability at another six sites between now and the end of this calendar year.

The delaying challenges have resulted in a rebaselining of the program, though, in terms of its schedule for rollout. I indicated that we expect to be at a total of seven sites by the end of this year, and the next 2 years it is our expectation that we will complete the rollout of ERAM at the remaining sites throughout the country.

There are a lot of lessons learned associated with ERAM, and the one that you pointed out is really the key: the importance of the involvement of the operators of the system early on in the development. And that is something that we have really focused on as we have looked at standing up the program management operation within the FAA: How do we adopt those best practices and ensure that, as we develop further technology programs, that we have the right connection between the operators and the users of the system with those that are developing it?

Mr. COBLE. Thank you, sir.

Mr. Chairman and Ranking Member, I am still having difficulty in embracing the delay and the monetary, the budgetary problem, but I will try to do better as I plow through it.

Thank you all for being with us.

Thank you, Mr. Chairman.

Mr. PETRI. Thank you.

Ms. Hirono.

Ms. HIRONO. Thank you, Mr. Chairman.

As I noted in my brief opening comments, and you mentioned the importance of involving the operators of the system early on, and so you said in your testimony that there will be a new committee to address the various issues that confront FAA as we seek to implement the NextGen. And so I wanted to know, this committee that you referred to, the coordinating committee, who is on it? Are the air traffic controllers sitting at the table with you? Because

they are the ones who are going to have to really move to, you know, implement and be a part of this whole system.

Mr. HUERTA. The NextGen Advisory Committee was created by the Administrator about a year ago, and it is a broad-based committee of industry representatives, all the users of the system, and the question put before them is really how do we look at the business of NextGen, how do we advance the benefits and ensure that NextGen is responding to the needs of the aviation industry?

The members include, yes, labor as well as air carriers. It involves all segments of the industry. In fact, two of my fellow witnesses on this panel are members of the NextGen Advisory Committee. The committee itself meets quarterly, and there are a series of working groups that deal with very specific taskings and questions that are provided to them by the FAA. Examples of recent taskings that we provided to the NextGen Advisory Committee are to do some work so that we could reach industry agreement on what are appropriate metrics for measuring benefits, and then how do we ensure that we are able to actually realize those benefits on a timely fashion. We have asked for input from them on questions such as "how do we address equipage of the fleet?"

The aviation industry has always been founded as a partnership between Government and industry, and in creating the NextGen Advisory Committee, it is really to further that partnership for this very important initiative to transform our——

Ms. HIRONO. Who are the two other people on the panel? Raise your hands.

Thank you very much.

To go on, one of the testifiers talked about how important it is to get the airlines on board, because they are going to need to put forth the funds to make sure that their planes have the proper equipment, and I believe, Mr. Huerta, you said that most—maybe I heard this wrong—that most of them are already equipped to be able to use the NextGen procedures. That seemed to be at variance with some of the other testimony that we need to figure out a way to incentivize and have the aviation, the airlines have the confidence that FAA is actually going to be able to move forward with NextGen. Would you like to comment?

Mr. HUERTA. Yeah, thank you.

There are two distinct levels of equipage. Many aircraft are currently equipped to handle advanced navigation procedures known as area navigation or required navigation performance, RNAV and RNP, respectively. That is a type of approach to airports that enables you to operate with reduced fuel burn and operate shorter distances coming into airports, and so that is one level of equipage.

Longer term, there will be other benefits associated with other equipage; for example, advanced data-communications technologies that will minimize opportunities that might exist in the system for error associated with radio transmissions. Instead, by providing secured data transmissions, you have a higher level of confidence that there wouldn't be errors in the system.

What the industry is telling us is many of them are equipped for RNAV and RNP, and they would like to maximize the benefits of those things, and they want to ensure that the FAA is doing what it needs to do to enable them to maximize those benefits, and they

are right. That is an important confidence-building step that is needed in order for them to have the confidence to do investments in the future.

Ms. HIRONO. So for any of the other testifiers, do you think that things are moving along; for the equipment that the airlines already have, that you have the confidence that FAA will be able to allow the airlines to use, utilize those equipments currently?

Mr. BOLEN. Well, I think at this point it is closer to a "trust but verify" type situation. As the Deputy Administrator stated, and I thought it was a very accurate portrayal of where we are today. A number of groups in the aviation community, not just the airlines, but also general aviation and even the military, have put GPS equipment on board their airplane at their own cost. We have also worked to be trained to use this, so investment in NextGen has already been made by the private sector.

Our frustration at this point is that we don't feel we are freely, consistently, and ubiquitously operating with those types of approaches, thus I earlier spoke about the need to get more approaches, have them be beneficial approaches, and make sure that we are using them to the greatest extent possible. We are committed, we are investing in it today, and when we do get to that second level of equipage, whether it is ultimately purchased by the Government or by industry, there will be additional costs. Not just in buying the box, but installation costs, training costs, the keeping everybody current and proficient on the system. These will be significant for industry, but we shall bear those costs, just as we did with RVSM and GPS.

Ms. HIRONO. Thank you. My time is up, but I do—I will submit one question to you, Mr. Huerta, that has to do with FAA's plans for the NextGen upgrades in Hawaii, which has a vast area to cover, our Honolulu air traffic control system.

Thank you, Mr. Chairman.

Mr. PETRI. Thank you.

Mr. LoBiondo.

Mr. LOBIONDO. Thank you, Mr. Chairman.

Mr. Huerta, I have expressed some concerns about the SE2020 pipeline not flowing as quickly as it could be. I have got a couple parts of the question surrounding SE2020. I have heard and I would like you to comment on whether right now it is not new work that is being assigned, but existing work that is simply being brought under SE2020 from other contracts, and can you shed some light on when we can expect more dollars and tasks to be flowing through the pipeline? Any reasons for the slow start, and what you are doing to help address this?

Mr. HUERTA. Thank you, Mr. LoBiondo.

Yes, as you know, SE2020 is a contract vehicle that enables the FAA to contract with the private sector on specific task orders associated with the deployment and delivery of NextGen. Over the past year, since the award of SE2020, we have processed about 144 task orders, and that totals close to $400 million in investment that has been run through that task vehicle. That is about half of our fiscal year 2011 enacted capital budget, and as I talked about in my testimony, this partnership with the private sector is very important. I think that we would all like to maximize the level of private par-

ticipation in the development of this because it is a force multiplier for us. It enables us to move things as quickly as we possibly can.

I think that there is concern that is expressed on the part of some contractors that we need to be doing more, that there are important things that can be done. I think it is important to balance that, though, against the overall challenge that we have to ensure that all of the work is fully integrated as we are developing various parts of an extremely complex system, and what we are doing is ensuring that that level of integration is there so as to maximize the benefit and to ensure that we don't have disconnects as programs get developed by different contractors. Would we like to do more, and would we like to do it more quickly? Absolutely. But our overriding challenge is to ensure that we do it right.

Mr. LOBIONDO. OK. You mentioned that the FAA just accomplished the realignment, which is supposed to help NextGen along. Could you elaborate a little bit on how specifically these changes will help the FAA deliver NextGen?

Mr. HUERTA. Two major things that we did associated with our realignment relate to the NextGen program office itself, and then the second relates to a program management function, how we deliver complex technology programs.

Taking first the NextGen program office. Previously, it was housed within the Air Traffic Organization, which reflects the fact that fundamentally what we are redeveloping is an air traffic system. But, concern had been expressed by members and industry, and, in fact, by this committee, that that organizational relationship did not fully reflect the transformational nature of NextGen. It is more than developing a computer system; it is also how procedures get certified, it is how we integrate procedures into airports. It involves the full scope of all aspects of the FAA, and there are interagency components. You and others have touched on the importance of relationships with the Department of Defense, with NASA, and a host of other external stakeholders.

What we have done as part of our restructuring is to elevate the NextGen program office into a new Assistant Administrator for NextGen that reports directly to me, and I am pleased to be joined by my colleague, Vicki Cox, who is the Assistant Administrator for NextGen. She has broader agencywide responsibility that we think will be very effective in leveraging the full Resource of the FAA against this agencywide transformation. That is the first thing.

The second thing is program management. Under our old structure, new programs such as ERAM were housed within the operating unit that they were ultimately going to support. So in the case of ERAM, it was housed in our En Route Organization within Air Traffic. The En Route Organization is fundamentally an operating organization, and it is very difficult to ensure consistency across all programs if they are managed by distinct operational units in the FAA. And the second thing is operating units are consumed with operations. Deployment of a new program is a long-term management program that must be kept on track, and we felt it was important to elevate the profile of the programs to give them dedicated oversight and ensure that they are appropriately linked to the operation to keep them on track. And so the two elements were elevating the NextGen program itself and then creating with-

in the ATO a program management office to oversee large technology development programs.

Mr. LOBIONDO. Once again, thank you and your team for what you are doing.

Mr. Chairman, thank you.

Mr. PETRI. Thank you. Mr. Boswell.

Mr. BOSWELL. Thank you, Mr. Chairman.

My time is running out, but I want to compliment all four of you. This has been a great panel. You have said the things we need to hear. Some of it we have heard before. Just keep saying it.

I especially want to associate myself with Captain Moak and Mr. Bolen. Thanks for hanging in there. You have said it clearly, Captain Moak, you are going to be OK on Capitol Hill, you did a good job, so thanks for making yourself available to do what you are doing because we appreciate it very much.

It is investment with a known return, Mr. Chairman. This is investment, and I think for our—call it fiduciary responsibility, whatever. If we know this is an investment with known return, and also it adds all of the capabilities to safety and so on, let us get on with it. Let us get on with it.

I have to go, so I would like to yield the remainder of my time to my good friend and colleague—and I think we are on the same frequency—Mr. Graves.

Mr. GRAVES. Thank you. I appreciate it, Leonard, I really do.

I actually have a couple of different questions. I don't even know where to start. The first one is—and I am going to direct it to Mr. Huerta, and we touched just briefly on the budget, and you said that the President's bill provides us with the tools to get there. And I think we are all concerned about implementation of NextGen and getting there, but what I worry about is—and the administration has proposed a $100 user fee on commercial and general aviation operations in controlled airspace, and I worry about that hampering us considerably when it comes to implementation of NextGen, and for that matter even the general aviation industry altogether. But out of curiosity, are you all worried about that proposal?

Mr. HUERTA. Clearly, we are in a time of significant fiscal challenge in the country, and I think what the President has put forward is a proposal to try to attempt to address that challenge that we have. Establishment of the fee would address what are regarded as current inequities in the cost of operating the air traffic control system. And we recognize that the GA community currently pays a fuel tax, but these revenues are far less than the cost of the air traffic control services that are provided to that community of users. It is a relatively small cost in relation to the total operating cost of a flight, and I think that what we heard from the President is that everyone needs to do their part to address the fiscal challenges that we face as a country.

Mr. GRAVES. Does the FAA support the $100 fee?

Mr. HUERTA. I support the President.

Mr. GRAVES. Do you support the $100 fee?

Mr. HUERTA. Yes.

Mr. GRAVES. Mr. Moak, do you want to——

Mr. MOAK. I would like to comment on the $100 fee is clearly a tax. The Air Line Pilots Association is against that tax. That is a job killer for our members, for the airlines. You put another tax on the airlines, you couple that with the tripling of the TSA tax, and you are going to have a capacity reduction in the system. It is a fact that airline tickets are market based. You put those taxes on there, we won't need to have NextGen hearings because you won't need to modernize the system because there won't be enough people flying. Enough is enough on these fees that are taxes in disguise. That is how we feel about it.

Mr. GRAVES. Mr. Bolen?

Mr. BOLEN. Congressman, the $100-per-flight fee proposal is at best a distraction at a time when our industry cannot afford to be distracted, and at worst it is a very destructive force.

A couple of comments. First of all, the idea of a per-flight charge is not a new idea. It is an idea that this committee and several other committees on Capitol Hill have thoroughly studied, analyzed. It has been the subject of numerous hearings and a great deal of input, and after 4 years of considering this question at the deepest level, on both sides of this Hill, in four different committees, a decision was made to reject a per-flight fee. It is not in the House reauthorization bill, it is not in the Senate reauthorization bill. A per-flight fee is just a bad idea. Congress has rejected it in the past, and it needs to reject it again.

Let me add a couple of other points. Deputy Administrator Huerta talked about cost allocation. As we know from previous hearings, the last time the FAA did a cost allocation study, it was a flawed study. It did not use sound economic principles. The last time the FAA did a cost allocation study that relied on proven and established economic principles, it found that general aviation imposes maybe 7 to 9 percent of the cost of operating the system. Our contribution is currently 8.6 percent to the system. We are paying our fair share. That does not mean we have not been willing to work with the committee to find ways to fund and support NextGen. In fact, we have. But we have been very clear. A per-flight fee is not just a tax, it is the most destructive tax possible, and not only would it create administrative burdens for the general aviation industry, but it would distract the FAA from its core focus.

We want the FAA to be focused on promoting safety and making NextGen a reality. We don't want the FAA to become the Sky IRS, a collection bureaucracy that is focused on billing agents, collection agents, and auditors. It is time to move forward on NextGen. Serious proposals are on the table. This approach is destructive, and it should be rejected.

Mr. GRAVES. Mr. Chairman, I would like to claim my time. I think I have got 4 minutes left.

Real quick, and I apologize, Mr. Huerta, if I mispronounce your name, but you said that the $100 fee is going to be used to pay for inequities in the air traffic control system. I thought it was going to be used to pay for the Jobs Act. Which is the case?

Mr. HUERTA. Right now the current funding profile of the FAA is about half and half user fees associated with fuel taxes and other fees that go into the Aviation Trust Fund and General Funds. I

think what the President is proposing is a larger share of the latter would be based on fees.

Mr. GRAVES. All right. We will move on.

When it comes to NextGen, and my question is—and I am going to have a hearing on this issue in my own committee, the Small Business Committee, coming up here pretty quick—but being as NextGen is a GPS-based system, and we have got the LightSquared issue that is out there—and I would like to direct the question to Mr. Moak and Mr. Bolen. Please elaborate. Give me your concerns, because I am concerned about it, the bleed-over, and particularly when we have got this elaborate system going into place, and all of a sudden, you know, we have got equipment that maybe may not even work under the new system.

Mr. MOAK. So the bottom line on equipage in an aircraft as we go into NextGen and the money that has been spent since early 2000, it depends on GPS. So if GPS has any erosion in capability, all this will be for naught. We are against that LightSquared issue. We spoke publicly on it, we have been up on the Hill on it. The bottom line is we need to protect GPS as a fundamental tenet of the future of the national airspace, and so I would be happy to attend your hearing on that, by the way.

Mr. GRAVES. Mr. Bolen?

Mr. BOLEN. Well, the GPS satellite system was obviously created by the military, but provided to the civilian community, and the benefits to our country have been immeasurable. Whether it is agriculture, transportation, or commerce, it has just been tremendous. And for aviation it has not just been the technology that has helped make us safer and made so much of today's avionics advancements possible, but as Captain Moak just said, it is the cornerstone of where we want to go, and it is incomprehensible that we are at a point where we are talking about interference with the GPS signal. The military is against it, the Department of Transportation is against it, the aviation community is against it.

This is about safe navigation. It is about the transportation system that is so fundamental to our economy, to our jobs, to our way of life. I am not sure how we got here, but we need to make sure that going forward the GPS signal is clear and reliable. We are all depending on it, and in the general aviation community we have invested heavily in its equipment.

Mr. GRAVES. Mr. Chairman, I would like to go back, and I appreciate everybody being here today. I think this is a good hearing. But I do want to associate myself with the comments of Captain Moak and Mr. Bolen when it comes to the $100 fee and how I think it is going to affect the implementation of NextGen, and particularly what Captain Moak had to say, I don't know if there will be any GA left after a $100 fee is imposed, and then I would like to invite everybody to my hearing on LightSquared. But this user fee is something that concerns me in a big way, and I think it is going to hinder us, hinder us considerably.

And with that I will yield back, and I appreciate very much Mr. Boswell yielding me his time.

Mr. PETRI. Thank you.

Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman.

Chairman Petri, Ranking Member Costello, I want to thank you for holding this hearing, and very briefly, Jerry, I want to echo my colleagues' comments about how much we will miss you here on the committee and in Congress, but most importantly I want to congratulate you on making—everything that you have done and making this decision. I always think about the fact that my predecessor, my father, who retired from here 7 years ago, people still say today that he looks younger now than he did 7 years ago when he was still here, so you have that to look forward to certainly.

We all know that NextGen is vital for the future of aviation in our Nation, and I want to commend the chairman and ranking member's efforts to ensure that we see some real near-term benefits from the program. For northeastern Illinois, realizing these near-term benefits is especially important because our airports lie at the heart of the regional, national, and international aviation system. Midway and O'Hare handle over 40 million passengers every year. That number is expected to jump by almost 20 percent within the next 5 years, 15 percent for each 5 years after that. So given the large increase that is expected to happen in the near term, it is clear we need to emphasize the results today.

I am happy that we are taking a look at that, while at the same time working to invest in more long-term efforts, like equipping aircraft with ADS–B out. In particular, I am proud to have worked with the chairman and ranking member to include language in the draft FAA reauthorization that aims to boost NextGen equipage like ADS–B out with the use of public-private partnerships.

So I want to start my questioning with Mr. Huerta. Several Federal Aviation commissions recommended that the Federal Government consider a variety of financial and operational incentives to commercial and GA operators for NextGen equipage. Can you explain what types of incentives, if any, are currently under consideration by the FAA, and do you think that operators will be able to meet the 2020 mandates based on where we stand today?

Mr. HUERTA. Thank you, Mr. Lipinski.

One of the things we have heard loud and clear in our discussions with industry about any level of incentive is that there needs to be a clear linkage between equipage and benefit, and that there need to be mechanisms that would ensure that benefits are delivered, and that the FAA actually signs up for doing its part so that people are able to take advantage associated with equipage.

We asked the NextGen Advisory Committee to provide us a framework to look at future equipage incentives. I think Mr. Bolen led that activity, but I think that I can share with you on a summary level that they looked across the whole scope of the industry and suggested that if you are looking at incentives, while they would like to see some direct Federal support, they feel that there is a great deal of promise through credit programs that would enable them to take advantage of lower cost of borrowing, but those credit programs would need to be linked to specific performance targets that the FAA would need to hit.

They also go on to say that they think we need to look across the whole scope of the industry, and that is not only air carrier, but also general aviation, because we operate in a mixed environment that everyone uses.

Getting back to the point of linking together any sort of a credit program with commitments on the part of the FAA, I think that is entirely fair. I think it is appropriate that the FAA be required to step up for delivery of benefits because it is consistent with the philosophy I talked about before. Our whole aviation system is founded on partnership, and if we are depending on the private sector to make certain investments, they need to be assured that the benefits will be there.

Mr. LIPINSKI. Captain Moak, briefly?

Mr. MOAK. If you don't mind, I want to just give you a little more on that view on the why. The why behind this problem that we are talking about here is that in the airlines they have invested in equipage that is on the airplane right now, they have trained the crews to use the equipment that they have, and they are not currently able to use it because of the process and procedures of the FAA. So that is why this incentive discussion continues and continues, because we have that equipment there, we are not able to use it, and they are not believing that they will be able to deliver when you don't have a work plan and a timeline-based project management delivered, with a deliverable at the end. And that is why they are going with the idea in the airline business that we have already invested in training the pilots, we have bought equipment that we can't use, and we don't know when the FAA will ever be up to speed so we can use it. So they are making the argument on a return on investment, and it is because of the past.

So, again, pilots are ready, and we are trained on RNP, on RNAV, on CPDLC, which we can't currently use in the continental U.S. We have to use CPDLC over the North Atlantic when we leave the continental U.S. So that is what the argument is about.

Mr. LIPINSKI. If the chairman will indulge me for 30 seconds, I am going to submit for the record some questions on performance-based navigation as something that I think we need to expedite the implementation of that, and I am interested in what is going on, what the FAA is currently doing on that, but I will leave that for the question for the record. Thank you, Mr. Chairman.

Mr. PETRI. Thank you.

Mr. Cravaack.

Mr. CRAVAACK. Thank you, Mr. Chairman.

Thank you to the distinguished panel for being here today. Lots of questions, little time.

The first question of Mr. Huerta. Reading the most recent IG report, we keep on hearing the term "investment," we have got to keep on investing in this, but how can we invest in something when the report of the IG says the FAA has not approved total cost, schedule or performance baselines for any of NextGen's transformational programs nor developed an integrated master schedule for managing and executing NextGen? How can we invest in something, sir, we don't even know what the parameters are?

Mr. HUERTA. I think a couple of things on that. First of all, what the FAA has adopted as a philosophy is: in order to minimize program risk is break the program into short and longer term investment decisions, and what we would like to see is that there is a pairing of costs and benefits with shorter term investments so that we minimize the risk, for example, of investing over many, many

years and waiting for some big payoff at the end. We are trying to match costs and benefits over a consistent period of time.

The IG had also suggested that there were certain aspects of the program, two in particular, where they identified that the FAA has not established baselines for even the first phase. We are expecting that in 2012, the next year, that we will be at a point where we will have the initial stage for one program in terms of baselining, and that we will have a contract award for the other, and so we are moving forward to identify program baselines.

On your question related to integration, we have, over the last couple of years, developed two guiding frameworks that I think go a long way toward addressing that question. The first is the NextGen Implementation Plan, which we publish annually. We will be publishing again next spring, and in which we make every effort to match up specific investments with things that have come out of industry in terms of specific proposals that they would like to see the FAA adopt against specific timetables.

Within that and on a more detailed level, we have developed the NextGen Segment Implementation Plan that then deals with the first segment of those and the highly detailed project decision to identify dependencies among the programs and to ensure that they are fully synchronized.

I think that what we have tried—it has certainly been my mission since I joined the FAA a year and a half ago—to focus on much better integration, much better program management, and I think that we have made significant progress in that area.

Mr. CRAVAACK. I appreciate that comment, sir, but in the end that doesn't really help us trying to put a price tag on this overall and when we are actually going to have it implemented. So I appreciate it, and hopefully it will be more clear in the future.

Captain Moak, I read your testimony, and I found something interesting in your testimony, your written testimony, is that in regards to unmanned aircraft systems. I found that to be kind of intriguing, international airspace. In your written testimony you actually mentioned that there has been no extensive study to the potential hazards, and the ways to mitigate those hazards must be undertaken before we can really implement this program.

What a lot of people aren't aware is that we have a lot of DOD missions that actually originate here in the United States, flying CONUS, continental airspace, and head on out to overseas missions. How much work do you know has been done thus far about the Federal Government in studying these potential hazards?

Mr. MOAK. We have been interacting and identifying to the FAA, they have been very cooperative on this matter, but currently there is no transparency and there is no clarity on linkage problems, certification of pilots. And I believe until we have those type of studies where we are working together, it would be tough to integrate them into the national airspace, especially in close proximity to passenger or cargo aircraft.

Mr. CRAVAACK. That is something that definitely we have to look forward in the future, because as UAVs become more prevalent, we are going to definitely be having them in the same airspace as we have passengers and cargo.

Mr. Bolen, real quickly, I have got 50 seconds, in regards to LightSquared, Representative Graves brought that up as well, what would be the cost to the GA community on having to implement any type of equipage that would have to try to make sure that they were able to maintain the proper signal?

Mr. BOLEN. Well, first of all, right now we don't know that a filter is possible. Tests have been run. I think what we are sensing from the manufacturers of GPS equipment is they are not comfortable that a filter can be effective.

Certainly having gone to the effort of investing in GPS, having gone to the effort at making that the cornerstone going forward, to try to do a retrofit is going to be enormously costly, and it comes in a backdrop when our industry is struggling. Over the last 3 years we have seen employment at some of our companies drop by 50 percent. Aircraft operations are down, the inventory of used airplanes are up, the prices for some models have fallen 30, 40, 50 percent.

So this is a tough time for us, and the idea that we are going to simply go buy new GPS equipment or a new filter for GPS equipment because somehow we have given away spectrum that was vital to the future of GPS is just incomprehensible. I urge this Congress to do all it can to preserve the integrity of GPS. We have all invested in it, and its benefits are enjoyed by all Americans.

Mr. CRAVAACK. Thank you, sir. Indulgence for 30 seconds.

Mr. Chairman, I agree that a user tax would be absolutely detrimental to our community. As a pilot I have been laid off before for 2 years because of the tenuous operations, what the dollar value is in the aviation community. I have gone through a bankruptcy with my company as well because of the troubling effects what has happened in our economy. I think adding this is just—as Captain Moak said, we are not going to need this because there won't be any need for it because our skies will be clear.

So thank you very much, sir, and I yield back.

Mr. PETRI. Ms. Norton.

Ms. NORTON. Thank you, Mr. Chairman.

Mr. Huerta, Captain Moak raised a kind of "emperor has no clothes on" issue, although I want to focus on safety, not funds. He in his own way, ever respectful way, mocked the billion dollars, I guess it is, in the President's budget, calling it like a quarter in a meter, and it will get you, you know, 7 minutes. I think that was fair. I don't know about you, but I think that was fair, and I understand that we are under tremendous pressure, so I am not asking this question out of criticism. I just think that it was an important point to raise because there is a big elephant in this room.

The elephant is that we are sitting here as if this is going to happen. You can ask, are we on track? Let me tell you something, we are on track if we are going at the slowest possible pace, and we are on track if we are trying to meet some deadline, so on track tells us nothing. And whether or not we are on track matters to me for one critical reason, and that is the increase in air traffic.

Captain Moak spoke about Reagan, which is right here, where for years they have to use special procedures just to get into the airport closest to the Nation's Capital. These safety concerns are, for me, paramount.

Now, you are going to have a situation where, according to all the figures we have, by 2025 you will have a 53 percent increase in passengers riding planes. Well, I will tell you what, in this country what you are going to do is you are going to keep airplanes going, you know. The airlines are going to keep it happening, and nobody is going to say we are grounding airplanes because we haven't finished our GPS, and everybody is going to say it is safe to fly.

So let me ask you questions that are very specific. On the surveillance broadcast aspect, that is supposed to be done by 2015—2013; on the data communication segment of it should be done between 2015 and 2018; on the systemwide information that we are all depending upon, well, segment 2 has not been baselined, and I think segment 1 was baselined in 2009.

I have got to ask you, Mr. Huerta, in terms of the safety of the skies, if GPS stays on—I am sorry—if— yes, if GPS stays on the track it is going, are we prepared to limit air travel in the United States because we cannot guarantee its safety, or do you think we will be able to guarantee the safety going at this pace with a 3-percent—53-percent increase in air travel in just a few years, by 2025?

Mr. HUERTA. Thank you, Mrs. Norton.

The FAA will never do anything that would compromise the safety of the system.

Ms. NORTON. Please don't give me your stock answer.

Mr. HUERTA. No, but to respect your question, you have asked are we on track for the delivery of the benefits.

Ms. NORTON. Or the systems that I have just named.

Mr. HUERTA. Let me talk first about ADS–B, surveillance broadcast, by 2013. The FAA is very confident that we will meet our deadline for delivery of the ground infrastructure for ADS–B by 2013. And as I said, we have made significant progress in that deployment, and we have——

Ms. NORTON. OK, go on to Data—I have limited time.

Mr. HUERTA. DataComm, we are expecting to receive proposals from bidders in the next few days, and based on what we see from proposals, I will have a better sense of where we will look relative to 2015, 2018. But we have identified those deliveries as required under the procurement, and I am looking forward to seeing what we get there.

System Wide Information Management, yes, you are correct that on the first segment of that, I think that that was baselined back in 2009. There are some benefits that we have seen associated with SWIM. That program is one that we continue to focus on in order to improve its overall delivery.

Overall, managing these programs in a very complex and synchronized fashion is our highest priority, but I think, I am confident that we will be able to meet our timetables.

Ms. NORTON. One further question for you, Mr. Huerta, and for Captain Moak. Assuming experienced personnel and the kinds of regulations that helicopters use all over the country, do you think helicopters should be able to come back and forth into the Nation's Capital 10 years after 9/11?

Mr. MOAK. I will speak to that. I believe they can. I was out at Potomac TRACON on Monday in anticipating this hearing, and they have an excellent system set up out there that is probably better talked about privately. But I think they are running a great operation out there, the FAA does, with their DIN network, so I believe it is very safe.

Ms. NORTON. Mr. Bolen.

Mr. BOLEN. Congresswoman Norton, the idea of simply closing down airspace or closing down airports is really an inadequate and inappropriate response to our Nation's security needs, and you have been a terrific advocate. The reality is we need to find a way to facilitate mobility in the United States and do it in a secure manner, and that takes attention, it takes commitment, but it has to be done. The idea that we resolve aviation security issues by not allowing any aviation is self-defeating. We have got to find a way——

Ms. NORTON. Of course, this is the only place where you say "not have any aviation." In New York, which was the main, the major part of our country hit on 9/11, helicopters were up within a few days. Helicopters are up all over the United States of America. It is a terrible comment on the aviation system in this country, even as it now stands, that even in the Capital of the United States, you cannot fly back and forth.

Mr. Huerta, do you think that given the requisites I indicated, the tightest kind of regulations, experienced personnel, helicopters should be able to fly into the Nation's Capital the way they fly into cities with skyscrapers like Chicago and New York?

Mr. HUERTA. There are two dimensions to that. From an operational standpoint, yes, we can certainly find a way to accommodate helicopter traffic, but the security aspect of that, which is, of course, of great interest to other agencies and the executive branch, is also something that we need to coordinate as well, and I can't really speak on their behalf.

Ms. NORTON. Could I ask you to do this, Mr. Huerta? This was not done in this administration, it was done before, and, of course, there were some reasons why it was done before. Could I ask you when you return to take it upon yourself to sit down with the other agencies involved to see if some revision of this policy is not in order a decade after 9/11?

Mr. HUERTA. Certainly.

Ms. NORTON. Thank you very much.

Mr. PETRI. Thank you.

I would like to thank the full panel for the statements that you submitted and for your testimony, your answering questions. The committee, as you have heard from Mr. Costello and myself and other Members, is very interested and supportive of trying to help any way we can to advance the date when we will recognize the benefits of the transformation of our air traffic space, and as Mr. Captain testified, based on his study, the returns are so enormous of this investment that even if the Government lags in doing it, we are seeing increasing signs of individuals in general aviation and other aspects of air travel in other countries moving forward more rapidly on this new technology. And so it behooves us to not linger unnecessarily because the world is going to go on, and we are going

to be left behind if we don't get our Government sector up as efficiently as possible accommodating growth in the private sector with all the advantages that this new technology offers.

So thank you again, and we will continue to work with you in monitoring this situation and hopefully do our part through a reauthorization of giving you more tools and greater focus going forward. Thank you.

Mr. PETRI. The second panel consists of the Honorable Calvin Scovel, who is the inspector general of the U.S. Department of Transportation; Gerald Dillingham, Director of Physical Infrastructure Issues of the GAO, Government Accountability Office, both of whom have been before this Congress and committee on many occasions; and Mr. Thomas L. Hendricks, who is senior vice president for safety, security, and operations of the Air Transport Association of America.

We thank all of you for your patience and for being here today, and we will begin with Calvin Scovel.

TESTIMONY OF HON. CALVIN L. SCOVEL III, INSPECTOR GENERAL, U.S. DEPARTMENT OF TRANSPORTATION; GERALD L. DILLINGHAM, PH.D., DIRECTOR, PHYSICAL INFRASTRUCTURE ISSUES, GOVERNMENT ACCOUNTABILITY OFFICE; AND THOMAS L. HENDRICKS, SENIOR VICE PRESIDENT FOR SAFETY, SECURITY, AND OPERATIONS, AIR TRANSPORT ASSOCIATION OF AMERICA, INC.

Mr. SCOVEL. Chairman Petri, Ranking Member Costello, members of the subcommittee, thank you for inviting me to testify on FAA's progress in implementing NextGen.

NextGen is FAA's most complex effort to date and requires multibillion-dollar investments from both Government and airspace users to overhaul the national airspace system. Since the effort began, we have reported on cost and schedule risks as well as challenges FAA must resolve to successfully transition to NextGen. FAA has taken action to adjust its NextGen plans and budgets in response to our concerns as well as RTCA's September 2009 recommendations.

Pressing challenges remain, however. Today I will highlight three challenges that significantly impact FAA's ability to manage NextGen's implementation and realize benefits.

The first challenge concerns FAA's Metroplex Initiative, a 7-year effort intended to reduce delays at congested airports in 21 major metropolitan areas. Initial studies at 5 of the 21 metroplex locations have been completed, and 2 more are underway; however, FAA has not established key milestones or capitalized on more advanced procedures, as RTCA recommended, raising concerns among airspace users about the pace, execution, and viability of the effort.

The Metroplex Initiative depends on the timely deployment of more efficient flight procedures. However, as we have previously reported, FAA's new procedures are mostly overlays of existing routes, which provide few benefits to users. While FAA completed a study that identified initiatives for streamlining the process for deploying new flight procedures, it may take as long as 5 years to implement them.

The second challenge involves ERAM, a $2.1 billion system for processing flight data. Testing revealed significant software problems with ERAM's core capabilities for safely managing and separating aircraft. To compensate for ERAM's deficiencies, controllers at the key sites have had to rely on cumbersome workarounds. For sites with complex and congested airspace, such as Chicago and Los Angeles, risks will increase.

ERAM's problems are the direct result of poor program and contract management. For example, FAA and its contractor were overly optimistic that ERAM could be fielded within 1 year and ignored early warning signs of trouble during initial site deployment. FAA did not begin to detect and mitigate significant risks until almost 3 years after software problems surfaced at Salt Lake Center, a key implementation site. Despite ERAM software deficiencies and cost and schedule overruns, FAA continues to pay incentives to the contractor.

Given that FAA and its contractor continue to add new capabilities while attempting to resolve problems, challenges are likely to remain and will add to costs and delays. A MITRE study and our analysis estimate that total cost growth could be as much as $500 million, with potential delays stretching to 2016, 6 years beyond FAA's planned date for implementing ERAM.

Prolonged problems with ERAM will affect FAA's capital budget and could crowd out other critical programs. For example, delays in fielding ERAM have required FAA to maintain aging systems longer, reprogram funds from other projects, and retrain controllers and maintenance technicians, who must operate and maintain two different systems.

Despite the significant program risks and unresolved issues associated with ERAM, FAA has not conducted a detailed assessment of ERAM's interdependencies or impact on other programs, costs, and schedules. To date, FAA plans to allocate nearly $600 million to integrate and align NextGen transformational systems with ERAM.

The third challenge FAA must address concerns the costs, schedules, and benefits of its transformational systems. FAA plans to spend almost $2 billion over the next 5 years on three transformational systems, but it remains uncertain what the programs will deliver and how much they will cost. For example, FAA has already delayed plans to deploy key capabilities of DataComm, a wireless system for sharing data between controllers and pilots, from 2016 to 2018. Total program costs for DataComm are uncertain, but FAA estimates that they could be as much as $3 billion. Like DataComm, ADS–B, a satellite-based surveillance technology, must integrate with multiple FAA automation systems, but FAA has not fully addressed requirements and system risks for ADS–B.

Unstable requirements for SWIM, a system expected to provide a secure network for NextGen, have already added $100 million to SWIM's first of three segments and delayed completion by at least 2 years. A lack of clear lines of accountability for overseeing SWIM's development and management largely underlies SWIM's problems.

Finally, FAA has yet to develop an integrated master schedule to manage NextGen. FAA's approach of baselining smaller seg-

ments of larger programs, such as DataComm, ADS–B, and SWIM, may reduce some risks in the short term; however, as requirements continue to evolve, programs are left with no clear end state, and decisionmakers in the Congress and Department lack sufficient information to assess progress. Moreover, delays with one program can significantly slow another, since the programs have complex interdependencies with each other and with FAA's existing automation and communication systems.

While FAA recognizes the need for an integrated master schedule to manage the implementation of these NextGen capabilities, it has not yet developed one. Without a master schedule, FAA cannot fully mitigate operational, technical, and programmatic risks and prioritize trade-offs among its NextGen programs. Much work remains for FAA to implement RTCA's recommendations and achieve promised near-term benefits.

Regardless of the funding levels Congress provides for NextGen, FAA must focus on establishing NextGen budget priorities, detailed milestones, and performance goals and metrics; it must focus on resolving program management and contract problems with ERAM; and it must focus on developing an integrated master schedule for all NextGen programs. FAA needs to take these actions now to advance NextGen and protect taxpayers' interests.

Mr. Chairman, this concludes my prepared statement. I would be happy to address any questions you or other members of the subcommittee may have.

Mr. PETRI. Thank you.

Mr. Dillingham.

Mr. DILLINGHAM. Thank you, Mr. Chairman, Ranking Minority Member Costello, and members of the subcommittee.

You have heard a lot about the benefits of NextGen from the previous panel, and we are all aware of those benefits. I would like to take my time this morning and identify with my colleague, the DOT IG, and focus on some of the challenges that FAA faces going forward.

The first and arguably the most important challenge for FAA is to establish and maintain credibility with NextGen stakeholders. This is especially true for airlines, since several NextGen benefits depend on having a critical mass of properly equipped aircraft flying in the NAS. Program cancellations, cost overruns, and schedule breaches in prior ATC modernization programs have given stakeholders cause for concern about whether FAA can and will deliver desired NextGen capabilities on time and on budget.

According to the airline representatives with whom we spoke, two developments would give them the type of reassurances that they are seeking. The first is the opportunity to make greater use of aircraft technology that is currently available in the fleet, such as you have heard earlier, RNAV and RNP. The second is on-time delivery of NextGen systems with defined benefits and an acceptable return on investment. We are optimistic that the recent reorganization at FAA, which is partly intended to provide greater and more focused accountability for NextGen implementation, will also raise the stakeholders' confidence.

A second challenge for FAA is to deliver NextGen capabilities on time and on budget. Delays in implementing key programs can

have significant implications, given the integrated nature of NextGen. For example, the scheduled delays associated with the ERAM program affect the delivery of several other systems, including ADS–B, SWIM, and DataComm, each of which requires the use of some ERAM functions. Additionally, program delays could have a negative impact on the plans for harmonization with Europe's ATC modernization effort as well as the U.S. avionics industry. Thus the implementation of NextGen, both in the midterm and the long term, will depend on how well FAA manages program implementation and program interdependencies.

A third challenge for FAA is to integrate human factors research into NextGen system development and training for those who will be responsible for operating and operating within the system. FAA and its partners will have to identify and develop training for controllers and pilots to carry out their changing role and have this training in place before NextGen can be fully implemented. Meeting these training requirements may be particularly difficult during the transition period when some aircraft will be equipped with NextGen systems, and others will not.

A fourth challenge for FAA is to expedite environmental reviews and develop strategies to address the environmental impacts of NextGen. With the changes in aircraft flight paths that will accompany NextGen efforts, some communities that were previously unaffected or minimally affected by aircraft noise and emissions could be exposed to increased levels of both. Obtaining the environmental clearances, including community buy-in, can sometimes take several years.

The last challenge is to manage NextGen implementation and current operations with potentially constrained resources. Largely because of governmentwide budget constraints, and perhaps project implementation delays, FAA has reduced its capital budget by a total of $2.8 billion, or 20 percent, for fiscal year 2012 through 2015. This proposed reduction could affect NextGen and NextGen-related spending. We note that significant reduction in FAA's program funding or its operations budgets could contribute to delays in establishing NextGen capabilities, increase total cost for implementation, and postpone benefits. In the final analysis, FAA would have to balance its priorities to keep NextGen implementation on course, while also sustaining the current system's infrastructure, level of safety, and operational efficiency.

Thank you, Mr. Chairman.

Mr. PETRI. Thank you.

Mr. Hendricks.

Mr. HENDRICKS. Thank you, Chairman Petri, and Ranking Member Costello and other members of the subcommittee. Good afternoon. My name is Tom Hendricks. I am the senior vice president of safety, security, and operations for the Air Transport Association. We are committed to evolving the national airspace system into the Next Generation Air Transportation System, or NextGen. To enable this evolution, we believe that Congress and the administration should be guided by a national airline policy that recognizes America's airlines as the global businesses they are and enables them to operate as such. An indispensable element of such

a policy is NextGen. We appreciate the opportunity to express our views today about the progress of that modernization.

Airlines understand the importance of NextGen. They are deeply engaged in it. Airlines also recognize that we cannot wait for what is over the horizon. Improvements are within our reach and are needed now. We believe that tangible, near-term benefits that improve customer satisfaction, with better on-time performance and that save fuel and reduce emissions can be achieved. The FAA should therefore focus on ensuring that needed policies, procedures, and training are implemented to ensure that the benefits of existing navigation technologies are maximized without delay.

Our priorities for this modernization are to accelerate the development and approval process of performance-based navigation procedures, the RNAV and RNP approaches that were previously referred to; streamline the National Environmental Policy Act review process to expedite the development and implementation of PBN and other NextGen procedures; and to develop metrics that gauge the performance of NextGen.

We appreciate that each of these objectives was addressed in the FAA Reauthorization and Reform Act of 2011, H.R. 658, which this committee and the full House approved earlier this year. We also commend the House and Senate for resisting any increases in commercial aviation taxes in their respective FAA bills. Airlines and passengers are already subject to 17 Federal taxes and fees which totaled nearly $17 billion last year in our industry. As a result, Federal taxes now constitute $61 of every $300 domestic round-trip ticket, putting commercial aviation at a higher Federal tax rate than so-called sin taxes on alcohol, tobacco, and firearms.

We urge House and Senate transportation leaders to resolve their differences and send a final multiyear FAA bill to the President's desk as soon as possible. We also ask that Congress reject aviation taxes included in the White House's debt reduction plan, a new $100-per-flight departure tax, and a tripling of the passenger security tax from $2.50 to $7.50. These taxes would cost passengers and airlines an additional $3½ billion annually, a 21-percent increase in our annual Federal tax bill, the results of which would be devastating to our industry, our passengers, and the U.S. economy.

U.S. airlines have lost $55 billion and cut 160,000 jobs since 2001. The new taxes would result in another 10,000 airline job cuts next year and permanent reductions in service to less profitable small and medium-sized communities.

In addition to holding the line on the tax burden of our passengers and airlines, enactment of a long-term FAA bill will help advance NextGen. NextGen offers the potential to further improve aviation safety and deliver substantial efficiency and environmental improvements.

The national airspace system, despite being the most complex aviation system in the world, is extraordinarily safe. That remarkable safety record reflects the determined efforts of the FAA, airlines and its employees, as well as other stakeholders, and we appreciate the support and oversight provided by this committee, which has played a key role in helping shape that success. How-

ever, as the committee knows all too well, the national airspace system relies on safe but outdated technology.

An FAA-commissioned study published last November estimated that the total cost of U.S. air transportation delays was over $31 billion in 2007. Without significant modernization of the system, congestion and delays will worsen as traffic increases, thereby undermining not only the viability and global competitiveness of U.S. aviation industry, but the economy as a whole.

Concern about the future of airspace management, as these data show, is not a parochial consideration. Aviation is one of the principal drivers of the U.S. economy. Commercial aviation drives $1.3 trillion in annual economic activity, or 5 percent of U.S. gross domestic product, and 10 million good-paying jobs. In this context, the need to improve airspace management is immediate and pressing. We cannot wait for all the pieces of NextGen to come together. We must get the most out of the technology investments already made in our aircraft. This means that the FAA should focus resources on expediting the introduction of the most cost-beneficial elements of NextGen that are available, most notably PBN procedures. These will pay immediate dividends for all stakeholders, including passengers and shippers, by reducing delays, lowering fuel burn, and decreasing emissions.

We commend the FAA for launching its so-called NAV Lean program to expedite the deployment of PBN procedures. Unfortunately implementation is scheduled to occur over 5 years. We need a leaner NAV Lean program, and we need it now. Airline fuel costs have spiked by nearly one-third this year, which will cost the industry an additional $15 billion. U.S. airlines have already invested billions of dollars in new equipment, infrastructure, and technology to maximize fuel efficiency. We are doing our part, and we want to work with the FAA to ensure that procedures, policy, and training are updated so that we realize the benefits from this investment.

I will be happy to take any questions from the subcommittee. Thank you.

Mr. PETRI. Thank you.

Thank you all for your testimony.

One thing that I think has been done more formally in the last year was the appointment of a fairly senior stakeholder, if you wish, or industry and other involved people, advisory group, to work with the FAA to try to help move NextGen forward more efficiently. Is that process working, Mr. Scovel, or is there—are there ways we could strengthen that? And I guess also I wonder if—it is a complex process, and it involves decisions by the private sector, but the Government sector is in the catbird seat, at least in the short run, because if they don't provide the infrastructure, the industry has stranded investment, and that is a great deterrent if they don't—if the Government doesn't meet its guidelines, or the FAA, with NextGen.

So you talk about trying to set better benchmarks or ways not just for Congress, or other, or your agency, but for the private sector to calculate their own lead times and investments they need to make. How can we strengthen that process? Is that committee helping with that and doing it effectively?

Mr. SCOVEL. Thank you, Mr. Petri.

Let me preface my answer to your question by noting that despite the hard-hitting nature of our testimony this morning, my staff and I are firm believers in the concept of NextGen. We should not be mistaken as being naysayers before the committee today. We are certainly not.

The benefits are indisputable, and, as Mr. Captain testified from the first panel, the business case is open and shut. It is all about execution, and that is where our office comes into play.

Our statutory mission, of course, as you well know, is to keep the Congress fully and currently informed on the efficiency, economy, and effectiveness of the Department's programs, and that is what brings us to NextGen. We have been looking at it now for a number of years, and I would be remiss in my duties if I did not point out areas where the Department has been successful as well as those areas where its efforts at execution have been less than fully successful. So that is what our objective has been with this testimony and every other appearance of my office before the committee.

Your specific question goes to our views of the effectiveness of what is now called the NextGen Advisory Committee. I would relate our assessment of that back to the RTCA Task Force 5, which met in 2009 and made 32 recommendations across a number of cross-cutting areas, including one that FAA has chosen to focus on first as being most beneficial to users and, therefore, to the American flying public; that is, the Metroplex Initiative. FAA adopted, recognized, and approved those recommendations in January 2010 and has been proceeding with Metroplex ever since. To its great credit, the agency recognized that it needed a vehicle primarily in order to continue to solicit input from the industry, but also to provide labor and other stakeholders with a voice in the development process. So it established the NextGen Advisory Committee.

We have not examined the Advisory Committee in great detail, but our preliminary assessment is that it has been helpful to the agency in driving the process forward. The agency has referred specific questions to the NextGen Advisory Committee, hoping to get more detailed input so that the agency can formulate its approach.

You asked, Mr. Chairman, specifically about metrics. That has been a matter of great dispute, frankly, between FAA and the industry. As a case study, we can use what has been discussed at length this morning: the development of required navigation procedures, RNAV and RNP procedures. FAA has worked on RNAV and RNP procedures, but only to the extent of trying to develop quantity over quality, in the views of the industry. It has developed RNP procedures to overlay existing routes; however, those aren't the routes that the industry assesses as most valuable to their needs. The industry has repeatedly asked FAA not to simply shoot for a quota, but to consider metrics such as were cited in a statement by a senior industry official last week where he spoke of the percent of an airline's total operations that could be governed by RNP, the number of approaches, and the clearance rate by air traffic controllers. And that brings into play the need for FAA to train its air traffic controllers in handling aircraft that have RNP and aircraft that don't have RNP, in the mixed equipage environment, so that they can safely maintain separation and accommodate the industry's needs as well.

That is the kind of detailed discussion that has to take place now between industry and FAA as far as developing a common language on metrics so that they can together act to bring NextGen to reality, and it is going to take both, as we have heard this morning, with significant investments and effort from both Government and the industry.

Mr. PETRI. Thank you.

I just would be remiss if I didn't follow up with Mr. Hendricks on one. You have been here before, and I think the last time you were before this committee, we were talking about kind of a cloud out there having to do with all this depends on—a lot of it depends on communication and using part of the spectrum, and we were looking at the impacts that the aspirations of LightSquared would be on GPS-based communications. They have come out with a—and they at the testimony indicated that they were thinking about using only a part of the spectrum, and then they have come out with now some proposals about reequipage or whatever. Do you have any evaluation of how realistic any of that is or——

Mr. HENDRICKS. Sure. Thank you, Mr. Chairman.

I am happy to report that the laws of physics have not changed since my last testimony in June. LightSquared's proposals have been studied very carefully by a special committee of the RTCA. As you recall from the testimony, there are two 10-megahertz bands both above and below the current GPS spectrum that are affected by this. LightSquared has stipulated they will not utilize the upper 10-megahertz band.

The lower band still causes some concern to the industry, and that was validated in the RTCA special committee report. We currently believe that the upper 5 megahertz of that lower band causes problems for aviation GPS users and precision GPS users like farmers. The lower 10-megahertz band may be available to us, but these so-called filters that LightSquared is referring to have not been certified; to my knowledge, they have not been manufactured, and the certification standards to put any avionics system on an aircraft are extremely high. That is one of the reasons we have an incredibly safe system in the United States.

So while theoretically there may be solutions out there, we know from experience that the path to those solutions is very rigorous, and we need to maintain the highest levels of safety possible as we transform to NextGen. So unless we can guarantee that, we see very little opportunity for the current proposal to be successful.

Mr. PETRI. Thank you.

Mr. Costello.

Mr. COSTELLO. Thank you, Mr. Chairman.

Dr. Dillingham, I wonder if you might give us a brief assessment as to the progress that the FAA is making concerning NextGen.

Mr. DILLINGHAM. That is a big question, Mr. Costello.

Mr. COSTELLO. It is.

Mr. DILLINGHAM. I think in the first few years there was a lot of starts and stops and false starts. Over the last couple of years—and some of this is understandable. This is one of the most complicated undertakings that we have done across the U.S. Government.

I think we are beginning to turn the corner. We are at least guardedly optimistic, and it is because what you have heard this morning, that, for example, the RTCA Task Force 5, which brought together for the first time all the players, even the industry, and everybody agreed if you do these kinds of things, then everybody is on board. Another first for the FAA is the NAC, which is a—to help them implement the recommendations.

So, I mean, again, we are guardedly optimistic, but, you know, it is the implementation where it all falls down, and we are watching this for the committee, this committee and other committees.

Mr. COSTELLO. One of the problems that, I think, everyone identified in the past was that the FAA had a tendency not to include all of the stakeholders, not only labor, but also the private sector and so on, bringing them to the table to get their benefit of their knowledge and their input on a system that they will all be using and benefit by. It appears to me that that is in the past, and the cooperation now is working pretty well; is that correct?

Mr. DILLINGHAM. I would agree with that, Mr. Costello, and it is because of the work of this committee and the willingness to cooperate between the two parties.

Mr. COSTELLO. Well—and I appreciate that, and I appreciate your comments, because Chairman Petri and I, when I was chairman and now since I am ranking member and he is chair, I think we both agree that it was the responsibility of this committee to continue to hold the FAA responsible, and that the more pressure that we put on them, the more they would respond. And hopefully that is one of the reasons why we are seeing some progress as well as a number of other things.

Final question. You heard me ask—I believe you were in the room—you heard me ask earlier, we all know that we have a budget problem, we all know that all of us want to address the deficit spending issue and get to a balanced budget at some time. We also know that there is things that should be cut maybe deeper than others, and we also know that some of the money that we invest, in fact, will reap benefits, and NextGen obviously is one of those investments.

My concern is trying to figure out, both in talking informally and at hearings, as we go forward, and there are cuts that are proposed, some 5 percent, some 10 percent, operation maintenance, also in NextGen, how that is going to affect NextGen. As you heard me say earlier, it is not all about money. There is a lot of other things that have to come about, but you have to have the money in order to bring the private sector and the private contractors in.

What is your assessment of where we are from a fiscal standpoint, I mean, as far as the budget is concerned and what, for instance, a 5-percent cut would do as far as delaying NextGen as to where we are now?

Mr. DILLINGHAM. Thank you, Mr. Costello.

We did some preliminary look when the discussion was taking place about moving back to 20O6 and 2008 and 2011 and that kind of thing. Basically I think everyone would agree a shortage of funding almost automatically means a delay in the implementation of the programs, and as delays increase, so do costs for various and sundry reasons. We have seen it in the past, and we are seeing it

now. You heard the discussion of ERAM and the $300 million and $10 million a month to maintain the old system.

So delays are costly, and I guess as important as delays is confidence. As we said, the credibility for FAA is beginning to rise, but when you see situations, it brings back the thought that maybe they can't do this.

Mr. COSTELLO. Thank you very much, Dr. Dillingham, and, General Scovel, thank you for your testimony.

Mr. PETRI. Mr. Cravaack.

Mr. CRAVAACK. Thank you, Mr. Chairman.

Thank you again for being here today and all the information you are providing us, and in particular I would like to thank Mr. Scovel. I thank you very much, you and your team, for all the work that you do. The information you gave us today was very thorough, very informative, and I just want to thank you and your team for all that you do.

One of the things I could ask you, sir, if you don't mind, is the NextGen has never really suffered a lack of funding; would that be a correct statement?

Mr. SCOVEL. Historically, sir, the Congress has taken good care of NextGen.

Mr. CRAVAACK. OK.

Mr. SCOVEL. We have looked at the Congress' funding of FAA programs across the board for many years now, dating all the way back to the ground-based radars. The Congress has been generous, and appropriately so, in taking care of FAA and its capital needs.

Mr. CRAVAACK. OK, thank you.

So is it a funding insufficiency, or is it management issues that are basically leading to the delay of NextGen's implementation?

Mr. SCOVEL. As it currently stands, sir, to date—and I am not looking ahead to whatever budget cuts for FAA may lie in the future, but I am looking at the agency's posture today fiscalwise and executionwise—I would have to say that it relates to the Department's inabilities along three lines, if you will. First, when it comes down to program execution, it is unstable requirements, or requirements that change along the way during the development process, that increase costs and incur delays. Second, poor program and contracting management and decisionmaking also contribute to delays.

The third area that I would have to cite would be the inability of FAA to bring to bear all of the sources of information that it may need in order to make proper decisions along the line. Whether that is industry, stakeholders, or labor, all of those voices need to be heard for FAA to make the proper decisions.

Mr. CRAVAACK. Thank you for that. It is interesting you bring that up. Because in your written testimony you spoke of the FAA continued contract management problems. Could you elaborate on that a little bit?

Mr. SCOVEL. Yes, I could. Let me use ERAM as a case study, because ERAM was referred to by a senior FAA official last week as the chassis on which all NextGen functionalities must be bolted, and that is an arresting image. I would say that the vehicle, that chassis, is not right now up on blocks, but it is certainly not running. It is at idle. It may be at park, in fact.

FAA has recognized problems, and it has been attempting at great speed to try to fix those, but as we dug deeper into ERAM over the last couple of years, we had to come to the conclusion that this was a program that was hobbled from the start. It never had a clean start out of the gate.

We looked at the contract structure, and we saw undefinitized contract elements, and that means that basically FAA was going to be billed down the line for work that it couldn't identify that it had required in the first place.

We also saw that this is essentially an IT contract, sir, and best practices for IT contracts call for rather small segmented divisions so that the agency letting the contract can quickly identify where problems may arise and direct the contractor to make corrections. With ERAM, however, FAA contracted in very large segments so that when the problems ultimately did arise later, FAA had to engage in very lengthy troubleshooting in order to try to pin down the sources.

The testing process is another one that is mentioned in our written testimony today. FAA sent ERAM to the tech center in Mr. LoBiondo's district—and it is a state-of-the-art facility—but the contractor sent an incomplete software package. It turned out that the tech center's capabilities were not up to testing this offering along all the functions that would be required to replicate the field. But the program was approved, it was accepted by the Government, and it was sent to the 20 en route centers, and that is when the problems began to be identified as they arose as the controllers began to work with the new system.

That testing process needs to be fixed. FAA cannot go ahead with another program along the lines of ERAM, send it to the tech center, whether it is an incomplete version of the package or that may require capabilities that are simply not resident in the tech center, and expect the tech center to do its level best on the mission, because that can't happen.

Once ERAM got out to the field, sir, the controllers identified problems. They identified workarounds that they needed to take. Those were able to be made at the Seattle and Salt Lake Centers, but as the project rolls out to far more complex en route centers, and I am thinking now of Chicago and L.A., which are supposed to pick up the ERAM program in the next several months, as Mr. Huerta testified, those very busy centers where the sectors are quite small and the traffic is quite dense, controllers are not going to be able to engage the same workarounds that they used successfully at Salt Lake.

For all of those reasons, this was a very troubled program from the beginning, and it dates all the way back to the contract structure and management decisions along the line.

Mr. CRAVAACK. Thank you, sir. I appreciate all that.

If I could just have a little bit of indulgence. First off, outstanding controllers that we have, the boots on the ground that actually make this stuff work, our hats have to be off to those controllers that do an exceptional job on a daily basis. None of us know the challenges that they go through on a daily basis.

With that said, Mr. Hendricks, you kind of commented early in your written testimony and also the testimony you brought out

today that we actually have capabilities within a lot of the aircraft already to go ahead and execute RNAV and RNP; is that correct?

Mr. HENDRICKS. Yes, both in our flight management systems and with the navigation capability on the aircraft itself.So about 45 percent of the U.S. fleet is capable of RNP approaches right now, about 90-plus percent can do area navigation, and most of the aircraft have advanced flight management computers that allow very optimized cruise altitude and descent planning, as you are well aware, and we are not able to take advantage of that, and that technology has been around for a couple of decades.

I have flown RNP approaches myself. One of the ones we have gained great benefit from is in Quito, Ecuador, where we improved the safety and the reliability of the operation in Quito. We need to do the same thing at Chicago Midway, where we could fly an RNP approach to runway 22 after flying straight in to runway 31. These are things that we can do now. We need to streamline our processes for environmental reviews, we need to put the internal FAA processes that give us approvals to do these on steroids and crank out some of the benefit to the industry. We will all benefit.

Mr. CRAVAACK. Thank you for that. That is the point I wanted to bring out.

Mr. Chairman, as a pilot, I know, I have aircraft that I have flown that have the capability of doing the exact same things that we are talking about, that have the capability of having the efficiencies already in there, and yet because of rules, regulations and restrictions, we are not able to capitalize on that. As Mr. Hendricks said, that is something we need to streamline, because we have the capability of doing that right now.

So I thank you, Mr. Chairman, for your indulgence, and I yield back.

Mr. PETRI. Thank you.

Mr. Costello.

Mr. COSTELLO. Mr. Chairman, I have no further questions. I do want to clarify a point that my friend asked the questions, I think, to Mr. Scovel, and you said that based upon where we are now, that it is not budget issues or funding issues, it is management issues and going forward. And I just wanted to point out for the record, because I asked that question at a previous hearing, and it was addressed in a GAO report. Actually it is—GAO report is "FAA Has Made Progress But Continues to Face Challenges in Acquiring Major Air Traffic Control Systems." It is GAO Report 05–331 in June of 2005 at our request.

And then the GAO said some key factors cited by the Government Accountability Office as contributing to cost scheduling and performance shortfalls include, and the number one thing that was listed was budget cuts led to cost overruns and schedule delays. Now, that was a 2005 report that the GAO—so I just wanted to put that on the record. And again, you know, money is not the only issue here. There are other issues. There are management issues and monitoring contracts, and I understand that.

What I want to do is just get out in the open and on the record for Members and the stakeholders to understand, as we go forward to making decisions about budget issues, the decisions that we make, how it will affect NextGen. And if you came in here and

said, hey, for the next 2 years it is not a money issue, it is a management issue, then that is fine; but if you said that, you know, if you cut 1 percent or 5 percent, it is going to delay it 2 or 3 years, then we just need to know that upfront so that when we cast our vote and when we make decisions, we know what the consequences are going to be.

So that is the only point that I wanted to make for the record, and with that, Mr. Chairman, I thank our witnesses for being here, and I thank you for holding our hearing.

Mr. PETRI. I join in thanking you, and we look forward to continue working with you as we do our best to oversee and to accelerate this vital national program.

This hearing is adjourned.

[Whereupon, at 12:45 p.m., the subcommittee was adjourned.]

STATEMENT OF
THE HONORABLE JERRY F. COSTELLO
SUBCOMMITTEE ON AVIATION
HEARING ON
"A COMPREHENSIVE REVIEW OF FAA'S NEXTGEN PROGRAM:
COSTS, BENEFITS, PROGRESS, AND MANAGEMENT"
OCTOBER 5, 2011

- Thank you, Chairman Petri, for holding this hearing to discuss the costs, benefits, progress, and management of the FAA's NextGen program.

- Investing in NextGen **now** will create a legacy of savings for the next generation. The government will save money by providing services more efficiently, and the aviation industry, users, and the flying public will be the beneficiaries of billions of dollars in operating cost savings.

- In the 111th Congress, we held four NextGen oversight hearings. We examined NextGen mid-term capabilities, discussed Area Navigation (RNAV) and Required Navigation

Performance (RNP) procedures, reviewed the RTCA Mid-Term Implementation Task Force report, and analyzed the long-term planning and interagency cooperation needed in order to keep NextGen on track.

- Clearly, everyone in this room wants NextGen to succeed, and I commend the FAA under the leadership of Administrator Randy Babbitt and Deputy Administrator Michael Huerta and others for making progress in several key areas of NextGen, such as efficiently using FAA resources to streamline procedure approval processes, which yields significant fuel savings. Further, important NextGen-related infrastructure programs, such as ADS-B, are moving forward *relatively* on schedule and within the FAA's budget requirements, so far.

- However, because many NextGen programs are dependent on one or more systems, delays in one program mean delays in others. For example, a holdup with the En Route Automation Modernization (ERAM) program could have a domino effect on other key NextGen systems, including ADS-B, Data Communications, and a system-wide application known as SWIM. My concern is: What happens when we add severe budget constraints on top of logistical program delays?

- If we are committed to our shared goal of spending taxpayer dollars wisely and efficiently, I am concerned that significantly cutting funding levels for NextGen will move implementation dates back even further and will result in increased costs and reduced benefits for aviation users.

- When this subcommittee held two hearings on the FAA reauthorization in February, we had the opportunity to hear from both aviation stakeholders and the FAA. Our witness panels concluded that cutting the agency's budget to Fiscal Year 2008 levels, as proposed in the long-term reauthorization bill that passed by a partisan vote in April, would likely trigger drastic cutbacks and cancellations of core NextGen programs.

- I want to be clear that simply providing more funding is not **the entire solution** to successful NextGen implementation. In fact, there are many factors that must come together in order for NextGen to be successful now and in the future. But when we are trying to implement the largest and most important aviation modernization project of our time in a safe and cost-effective manner, at what point is *"doing more with less"* just adding to the

problem and making it even more difficult for it to succeed on time and on budget?

- Going forward, I believe it is important for us to have an open dialogue with labor and industry stakeholders, as well as the FAA, and other Federal agencies such as NASA, the GAO and the DOT IG to ensure everyone is on the same page. There need to be realistic timelines, performance metrics, and candid discussions of costs requirements to make sure NextGen systems are not significantly delayed and end up costing the taxpayer more in the long run. I commend Chairman Petri for having this hearing to delve into these details.

- I am a strong proponent of NextGen, and I want this modernization program to continue to make progress and ultimately deliver the benefits we have long discussed for all

aviation users, operators, and our economy. And because the aviation industry supports millions of jobs and keeps our economy moving, enactment of a comprehensive FAA reauthorization bill that includes adequate funding levels for NextGen, as well as a FY12 appropriations measure that makes investments in NextGen a priority, will create jobs and improve aviation safety. It will also position us to create a lasting transportation infrastructure investment for our country.

- Thank you, Chairman Petri. I look forward to hearing from our witnesses.

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Opening Statement of Congresswoman Eddie Bernice Johnson

T&I Subcommittee on Aviation Hearing on:

"Comprehensive Review of FAA's NextGen Program: Costs, Benefits, Progress, and Management"

October 5, 2011

Chairman Petri, Ranking Member Costello, I would like to thank you for holding today's hearing to review the costs, benefits, progress, and management of the FAA's NextGen Program.

As a senior member of this Committee and someone who represents a congressional district that is a major air transportation hub that encompasses the city of Dallas, Dallas Love Field Airport, and adjacent to Dallas-Fort Worth Airport, the safety of our air traffic system is of paramount importance to me.

Currently, the nation's air transportation system supports more than 74,000 flights every day and 730 million passengers every year with the FAA forecasting an

increase of 53% to 1.1 billion passengers per year by 2025. General aviation is expected to increase to over 85,000 flights every day over the same time period.

Clearly the demands placed on our national air traffic safety programs will be far greater as time moves forward and we must prepare for the future.

While the most critical purpose of NextGen is to improve public safety, there are also significant cost savings and efficiencies to be derived from the proper implementation of the program that will benefit airlines, airports, and air travelers. The FAA estimates that NextGen air traffic management improvements will reduce delays in flight and on the tarmac by approximately 35% by 2018 as compared to doing nothing. That 35 percent improvement in efficiency would equate to $23 billion in savings to aircraft operators, air travelers, and the FAA over eight years.

These cost savings and public safety improvements are far too important for this Congress or this Committee to ignore.

I look forward to hearing the witness' testimony regarding the different programs of the NextGen System – Automatic Dependent Surveillance-Broadcast (ADS-B), En Route Automation Modernization (ERAM), Data Communication (DataComm), System Wide Information Management (SWIM), NAS Voice Switch (NVS), NextGen Network Enabled Weather (NNEW), Collaborative Air Traffic Management Technologies (CATMT) – and other expert opinions on what must be done to modernize our air transportation system.

Thank you for sharing my passion for a safe and efficient national airspace and the recognition that the federal government must play a partnering role in that effort.

The future and safety of our air passengers is too important to have the drag of partisan politics placed upon it and I am confident that we can work together on this issue.

Thank you.

STATEMENT OF ED BOLEN

PRESIDENT AND CEO

NATIONAL BUSINESS AVIATION ASSOCIATION

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION
AND
INFRASTRUCTURE

U.S. HOUSE OF REPRESENTATIVES

OCTOBER 5, 2011

Chairman Petri, Ranking Member Costello, members of the Subcommittee, on behalf of the National Business Aviation Association, I am pleased to have the opportunity to provide our views on the future of our national air transportation system.

We commend the Subcommittee for your commitment to improve our nation's aviation system and on-going efforts to foster economic growth and job creation during these challenging economic times. NBAA strongly supports these efforts and believes that the importance of a robust aviation system cannot be overemphasized.

Aviation, including business aviation, is a vital link in our transportation system and powerful engine for job creation and economic growth.

NBAA was founded 67 years ago to represent companies that utilize general aviation aircraft as a tool for meeting some of their transportation challenges. NBAA and our members are committed to working with the government to transform and modernize the nation's aviation system. Likewise, we are committed to policies that support the continued growth of each aviation segment, including general aviation, which plays a critical role in driving economic growth, jobs and investment across the U.S.

General aviation is an essential economic generator, contributing more than $150 billion to annual U.S. economic output, and directly or indirectly employing more than one million people. Most general aviation aircraft operating around the world are manufactured and/or completed in the U.S., and our industry is continuing to build a strong American manufacturing and employment base that contributes positively to our national balance of trade.

FACTS ABOUT BUSINESS AVIATION

Business aviation is an FAA-defined term. According to the FAA, business aviation is the use of any general aviation aircraft – piston or turbine – for a business purpose.

From creating growth opportunities and global connectivity for America's small towns and rural areas to supporting the nation's productivity, business aviation is an important economic engine, creating jobs and investment, while contributing to the world's leading aviation system. Simply put, business aviation is a vital part of the nation's economy and transportation system.

As the Subcommittee knows, the U.S. aviation system is fully integrated. Each player is critical to the success, strength and growth of our economy. As you know, the system is made up of three segments:

- Scheduled operations, including passenger airlines;
- Military, and;
- General aviation.

General aviation includes diverse operations, with business uses that range from agriculture, to law enforcement, to fire and rescue services, to varied government, educational, nonprofit and business organizations. Servicing and supporting these organizations are FBO's, maintenance technicians, suppliers and service providers.

The business aviation fleet is dominated by pistons and turboprops, with over 80 percent of the 15,000 registered business aircraft in the U.S. having cabins about the size of an SUV, and flying on average less than 1,000 miles. The vast majority of these GA operators use small aircraft that seat no more than eight people.

A Vital Lifeline for Main Street

In small towns and rural areas across America, business aviation is an essential tool that enables businesses to thrive, grow and create jobs in their hometowns. That's because in many instances, there are no other transportation options that meet their needs.

Many small and mid-size businesses are located in areas without scheduled airline service. Businesses of all sizes require in-person travel for such operations as sales, technical support and other types of customer service. Such trips may call for multiple stops in a short period or travel to remote locations. Often, the distances are too long to drive or airline service is not available.

A 2009 survey of business aviation pilots and passengers, conducted for NBAA and GAMA by Harris Interactive, concludes that managers and other mid-level employees are the typical passengers on business aircraft – not senior executives.

A Lifeline in Disaster and Emergency

The business aviation community is not only an economic lifeline for thousands of our nation's communities; it also supports people and communities in times of crisis.

General aviation has snapped into action when there's a need to confront floods in the Midwest, fires in the West, or a whole host of other natural disasters. The business aviation community – working mostly on a volunteer basis – has always been quick to help assess damage, rescue those affected by these disasters, and carry in lifesaving support and supplies to the affected regions.

In addition, hundreds of GA operators carried thousands of passengers and over a million pounds of supplies to and from Haiti after the devastating earthquake there. In fact, Congress passed a resolution commending business aviation for its response to the crisis.

The people who rely on a general aviation aircraft for business are also dedicated to helping provide lifesaving flights to the communities in which they live and work. Operations like the Corporate Angel Network arrange free air transportation for cancer patients traveling to treatment using the empty seats aboard business airplanes. Angel Flight America's seven member organizations and 7,200 volunteer pilots arrange flights to carry patients to medical facilities.

Veterans Airlift Command uses business airplanes and unused hours of fractional aircraft ownership programs to provide free flights for medical and other purposes for wounded service members, veterans and their families.

Veterans Airlift finds volunteers in the business aviation community to fly missions on request and contribute the full cost of their aircraft and fuel for the missions flown.

ECONOMIC CHALLENGES FACING GENERAL AVIATION

Unfortunately, the people and businesses in general aviation, like other industries, are weathering one of the worst economic storms anyone has ever seen. The impact of the flagging economy on the companies and communities that rely on general aviation is visible in all parts of the country.

Over the past few years, we saw business aviation flying decrease by as much as 35 percent in some locations. The inventory of used airplanes available for sale reached an all-time high, with close to one in five airplanes for sale. Prices for business airplanes declined by 40 percent, and employment at leading general aviation companies fell by as much as 50 percent. While we have seen some uptick in flight activity in recent months, activity is still below the 2008 levels and experts agree that the recovery will be slow and gradual over the next several years.

NEXT GENERATION AIR TRAFFIC CONTROL TECHNOLOGY

While much has changed for the industry I represent as a result of the recession, one thing has remained constant – our continued support for modernization of the nation's air traffic control system. We commend the Subcommittee for conducting a thorough examination of all of the issues related to system modernization.

Accelerating the transition to the Next Generation air transportation system will advance important national objectives including: further reducing the industry's environmental footprint, reducing long-term costs at the FAA, enhancing safety, expanding system capacity and reducing delays.

General aviation has long been at the forefront of the modernization effort. We were early adopters of GPS navigation systems. We helped initiate the ADS-B test program in Alaska – a test program that is now the cornerstone technology of the modernization effort. We also participated in the ADS-B experiments at the Atlanta Olympics in 1996. In 2005, we supported our nation's transition to Reduced Vertical Separation Minima (RVSM) which effectively doubled our en route airspace capacity.

So, while general aviation has never been nor is it projected to be a major cause of system delays, we have a strong record of working tirelessly to expand system capacity and improve system efficiency. Thus, it should come as no surprise that general aviation has been a leading proponent of NextGen.

In order to expedite the transition to NextGen, it has been suggested that government investment in aircraft equipage is an important infrastructure investment that will streamline the system and further reduce aviation's already small environmental footprint. As the Subcommittee reviews these questions, we urge you to be sure that any program developed is equally available to all operators in the system.

NEAR TERM PROGRESS ON NEXTGEN

As we look forward to areas where measurable progress can be made in the near term, NBAA believes that one area that would be most beneficial for our members would be in the continued development and expansion of new satellite navigation approaches into small, medium and large-sized airports where we operate.

Among the benefits of satellite-based approaches is that they permit more fuel-efficient descents. For example, at airports like Albuquerque (ABQ), Las Vegas (LAS), El Paso (ELP) and Reno (RNO), FAA and air carriers have developed RNAV Visual Flight Procedures that provide smooth, fuel efficient, low emission descents that reduce ATC communications and enhance safety during periods of good weather conditions.

Unfortunately, FAA has no current plans nor approval processes to permit properly equipped business aircraft to fly these RNAV Visual procedures--even though the majority of our crews fly highly advanced aircraft and participate in regular simulator training sessions.

Other NextGen procedures, such as WAAS/LPV approaches, provide predictable access in periods of poor weather and support reliable business aviation access to the communities served by business aviation. In some cases in larger metropolitan or mountainous areas, Required Navigation

Performance/Authorization Required, or RNP/AR procedures are the Satnav approaches that work best.

RNP/AR approaches are more technically advanced and require a very laborious and highly customized FAA design and approval plan to implement. This results in obtaining a costly set of approvals for each operator which currently has a very limited benefit for the general aviation community today. We need the FAA to streamline and standardize these approvals and make them available at hundreds of field offices -- not just through a slow centralized process at headquarters.

Additionally, we need FAA to provide the operational infrastructure to support ADS-B as a replacement for radar surveillance and aircraft separation. There is a broad range of certification standards for avionics, advisory circular guidance and operational approvals as well as specific procedural items that are needed before this equipment can be manufactured, purchased and installed in general aviation aircraft.

Finally, we need FAA to continue their efforts in the ADS-B research and development areas. This includes implementing specific operational trials and demonstrations that prove the benefits of ADS-B. All of these "action items" are contained in the ADS-B IN ARC report that was delivered to FAA on Sept 30th.

As I have stated, NBAA supports our nation's transition to NextGen. We are prepared to do our part to help our country realize the benefits of NextGen including a smaller environmental footprint, enhanced safety, expanded capacity and reduced delays. Please understand, however, that our ability to support NextGen is currently at risk because of the proposed $100 per flight fee that is threatening our industry.

Today, general aviation covers the incremental costs it imposes on the air transportation system through a per-gallon user charge. It is the best possible method for generating revenue from out industry. Per-gallon user charges are inexpensive for the government to collect and impossible for users to avoid. They are easy to understand and impose no administrative burden on operators. Per-gallon user charges directly correlate to one's use of the system and provide an incentive for environmentally friendly flying. They are also progressive in nature.

The benefits of per-gallon fuel charges stand in stark contrast to the per-flight taxes which would require our government to stand up new collection bureaucracy--a "Sky-R-S" branch of the FAA. The per-flight fee would also impose a huge administrative burden on small operators and establish a regressive tax scheme that unfairly penalizes smaller operators flying shorter routes.

Mr. Chairman and Ranking Member Costello, the general aviation community is grateful for the tremendous leadership and oversight this subcommittee has provided as we collectively work to develop, implement and fund NextGen. We look forward to continuing to work with you to make NextGen a reality sooner rather than later. And we thank you for consistently recognizing that per-gallon fuel charges work but per-flight taxes destroy.

Thank you.

STATEMENT OF TOM CAPTAIN, VICE CHAIRMAN AND PRINCIPAL, AEROSPACE & DEFENSE SECTOR LEADER, DELOITTE LLP: A COMPREHENSIVE REVIEW OF FAA'S NEXTGEN PROGRAMS: COSTS, BENEFITS, PROGRESS, AND MANAGEMENT, BEFORE THE HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, OCTOBER 5, 2011.

Chairman Petri, ranking member Costello and members of the subcommittee:

Thank you for the invitation to testify today to provide input on the benefits of NextGen implementation. Deloitte published an extensive study this past May on the business case for global implementation of Air Transportation System (ATS) transformation initiatives, with particular attention to the U.S. NextGen program. My name is Tom Captain and I am the lead author of the study. That study was funded and performed independently by Deloitte and was intended to provide input to the ongoing industry dialogue regarding quantification of benefits and costs, funding, scope, timing and potential merits of these transformation and modernization initiatives. It also identifies risks and challenges associated with this complex undertaking.

In our business case, we found that conversion to a satellite based positioning, navigation and timing (PNT) system enables better pilot situational awareness, point to point and closely spaced aircraft operations, continuous descent procedures and all weather air traffic operations, resulting in significant reduction in weather and congestion related delays as well as reduced flight times. We found that successful implementation of NextGen by 2025, using reasonably conservative assumptions about future demand for travel, price increases of oil, and other factors, results in an estimated net present value (NPV) of $281.3 billion and an internal rate of return of 44.8%. By 2026, the study found $29 billion of 1st year net benefits, which only increases each year thereafter. This is made up of 830 million of gallons of jet fuel savings, 900 thousand hours of time saved, and 6.8 million metric tons of carbon emissions avoided.

It should be noted that we did not include several upside benefits that could make this business case potentially more positive, such as including general aviation and military aircraft operations. Nor did the scope contemplate potential consolidation of National Air Space (NAS) operations, more efficient air traffic control procedures, or reduction of legacy ground radar systems, for example.

To provide additional insights about the business case, we examined three NextGen schedule scenarios: (1) implementing as planned by 2025, (2) accelerating implementation by five years to 2020, and (3) delaying implementation by 5 years until 2030. We found that acceleration would result in an additional $19.8 billion in NPV, and increases the IRR by 21.7%. Alternatively, delayed implementation still has a positive business case, but results in an NPV reduction of $47.6 billion and reduces the IRR by 13.5%. Additionally, the business case found these net benefits would accrue to constituents as follows: 35.2% to airlines, 58.5% for passengers, 5.2% to the government and 19.1% to the general economy. These savings are not only in fuel costs, people's time and emissions, but in less airplane maintenance and labor costs, insurance, reduction in noise, increased airspace capacity and overall economic benefit from a much more efficient air transportation system.

As outlined in our study, to achieve these benefits there are a number of challenges and risks that must be addressed to successfully meet the implementation timetables. These include, but are not limited to funding, technology and program risk, regulatory reform, legal, air traffic control procedures, technical and certification standards and harmonization, and workforce transformation. In addition, the program continues to be impacted by program management challenges of cost overruns and schedule delays due to technical complexity, requirements creep and uncertainty as well as system verification and integration challenges. Due to the integrated

nature of these elements, success will be highly dependent on the ability to manage requirements, cost and schedule in a coordinated manner as a program. A lag in only one of these elements, could impact the ability to implement the whole program on schedule, thus the focus on interdependencies is required.

Our study highlights considerations targeted at addressing a number of these concerns, which include assessments on potential funding mechanisms to address NextGen equipage costs to close the business case for airlines, as well as improved program management to include an oversight or governance program to better ensure overall programmatic performance and accountability.

In summary, this business case study demonstrates that the return on investment for NextGen is significant for all scenarios considered. While we found there is significant financial value in accelerating NextGen, it is recognized that there are a number of challenges to realizing these benefits and that our national focus should be on solving the issues that threaten achieving any one of the implementation timetables. As we have stated publically, the business case appears to be an open and shut case. The real challenge is in its execution.

Mr. Chairman, that concludes my statement. I will be happy to answer your questions at this time.

United States Government Accountability Office

GAO

Testimony
Before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

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NEXT GENERATION AIR TRANSPORTATION SYSTEM

FAA Has Made Some Progress in Implementation, but Delays Threaten to Impact Costs and Benefits

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

Chairman Petri, Ranking Member Costello, and Members of the Subcommittee:

I appreciate the opportunity to testify before you today on the current progress toward implementing the Next Generation Air Transportation System (NextGen). NextGen will impact nearly every aspect of air transportation and will transform the way in which the air transportation system operates today. It will do so, in part, by

- using satellite-based surveillance as opposed to ground-based radars,
- using performance-based navigation[1] instead of cumbersome step-by-step procedures,
- replacing routine voice communications with data transmissions, and
- organizing and merging the disjointed data that pilots, controllers, airports, airlines, and others currently rely on to operate the system.

The Federal Aviation Administration (FAA) has been planning and developing NextGen since 2003, and is now implementing near-term (through 2012) and mid-term (through 2018) capabilities. Over the years, concerns have been raised by the Congress and other stakeholders that despite years of effort and billions of dollars spent, FAA has not made sufficient progress in deploying systems and producing benefits. In past reports, we have made a number of recommendations to FAA to address delays in development and acquisitions, improve its processes, and focus on accountability and performance. Others have also made recommendations to FAA to improve its implementation of NextGen. For example, the Department of Transportation's Office of the Inspector General recently made recommendations regarding specific NextGen programs, and the NextGen Midterm Implementation Task Force—whose creation was requested by FAA—resulted in consensus recommendations from industry on specific capabilities FAA should

[1]Performance-based navigation includes such things as Area Navigation (RNAV), which enables aircraft to fly on any path within coverage of ground- or space-based navigation aids, permitting more access and flexibility for point-to-point operations; and Required Navigation Performance (RNP), which, like RNAV, enables aircraft to fly on any path within coverage of ground- or space-based navigation aids, but also includes an onboard performance monitoring capability. RNP also enables closer en route spacing without intervention by air traffic control and permits more precise and consistent arrivals and departures.

prioritize.[2] Over the last 2 years, FAA has taken several steps and instituted many changes to address several of these issues.

My statement today discusses (1) the results of NextGen programs and improvements to date and (2) ongoing issues that will affect NextGen implementation. This statement today is based on our NextGen-related reports and testimonies over the last 2 years;[3] ongoing work for this subcommittee that includes our analysis of selected NextGen acquisitions and our analysis of FAA's efforts to harmonize NextGen with air traffic control modernization efforts in Europe; our review of FAA's 2025 Strategic Plan, 2011 NextGen Implementation Plan, 2012 Budget Submission, and other documents; and selected program updates from FAA officials. The GAO reports cited in this statement contain more detailed explanations of the methods used to conduct our work. We performed our work in accordance with generally accepted government auditing standards.

In summary, FAA has improved its efforts to implement NextGen and is continuing its work to address critical issues that we, stakeholders, and others have identified over the years. In some areas, FAA has implemented NextGen capabilities that have demonstrated measurable benefits for system users, such as fuel savings. FAA has also made

[2]The Task Force included representation from the four major operating communities—airlines, business aviation, general aviation, and the military—as well as participation from controllers, airports, avionics and aircraft manufacturers, and other key stakeholders. The Task Force issued its report on September 9, 2009.

[3]GAO, *NextGen Air Transportation System: Mechanisms for Collaboration and Technology Transfer Could be Enhanced to More Fully Leverage Partner Agency and Industry Resources*, GAO-11-604 (Washington, D.C.: June 30, 2011); *Integration of Current Implementation Efforts with Long-term Planning for the Next Generation Air Transportation System*, GAO-11-132R (Washington, D.C. Nov. 22, 2010); *Aviation and the Environment: Systematically Addressing Environmental Impacts and Community Concerns Can Help Airports Reduce Project Delays*, GAO-10-50 (Washington, D.C.: Sept. 13, 2010); *Next Generation Air Transportation System: FAA and NASA Have Improved Human Factors Research Coordination, but Stronger Leadership Needed*, GAO-10-824 (Washington, D.C.: Aug. 6, 2010); *NextGen Air Transportation System: FAA's Metrics Can Be Used to Report on Status of Individual Programs, but Not of Overall NextGen Implementation or Outcomes*, GAO-10-629, (Washington, D.C.: July 27, 2010); *Next Generation Air Transportation System: Challenges with Partner Agency and FAA Coordination Continue, and Efforts to Integrate Near-, Mid-, and Long-term Activities are Ongoing*, GAO-10-649T (Washington, D.C.: Apr. 21, 2010); *Next Generation Air Transportation System: FAA Faces Challenges in Responding to Task Force Recommendations*, GAO-10-188T (Washington, D.C.: Oct. 28, 2009).

progress in streamlining its processes, improving its capacity to develop new flight procedures, and focusing its efforts on specific procedures that are needed in key metropolitan areas. Furthermore, we found that several NextGen-related acquisitions are generally on time and on budget. However, some acquisitions have been delayed, which has impacted the timelines of other dependent systems, and the potential exists for other acquisitions to also encounter delays. These delays have resulted in increased costs and reduced benefits. Going forward, FAA must focus on delivering systems and capabilities in a timely fashion to maintain its credibility with industry stakeholders, whose adoption of key technologies is crucial to NextGen's success. FAA must also continue to monitor how delays will affect international harmonization issues, focus on human factors issues,[4] streamline environmental approvals, mitigate environmental impacts, and focus on improving management and governance.

FAA Has Implemented Aspects of NextGen That Have Produced Measurable Benefits, but Delays Threaten to Increase Costs and Impact Overall Implementation

FAA has made progress in several areas to improve its implementation of NextGen. FAA has set performance goals for NextGen through 2018, including goals to improve the throughput of air traffic at key airports by 12 percent over 2009 levels, reduce delays by 27 percent from 2009 levels, and achieve a 5 percent reduction in average taxi-time at key airports. The setting of NextGen performance goals is a positive step, but much work remains in identifying measurable and reasonable performance metrics and targets for specific NextGen activities.[5]

FAA has undertaken a number of NextGen initiatives to improve system efficiency. For example, FAA has begun work to streamline its procedure approval processes—including its environmental reviews of new procedures—and has expanded its capacity to develop new performance-based navigation routes and procedures. In 2010, FAA produced over 200 performance-based navigation routes and procedures, exceeding its goal of 112. FAA reports thousands of gallons of fuel savings from the performance-based navigation routes in operation at Atlanta and the continuous descents being used into Los Angeles and San Francisco. However, aircraft operators have complained that FAA has not produced

[4]Human factors is the study of how humans interact with the design of the equipment they use, environments in which they function, and jobs they perform.

[5]GAO-10-629.

the most useful or beneficial routes and procedures to date. To address these concerns, FAA has undertaken thorough reviews in a number of areas. FAA has completed initial work to identify improvements needed in the airspace in Washington, D.C.; North Texas; Charlotte, North Carolina; Northern California; and Houston, Texas—focusing on routes and procedures that will produce benefits for operators. While the specific benefits from this work are not yet fully known, FAA expects to achieve measurable reductions in miles flown, fuel burn, and emissions from these actions. In addition, airport surface management capabilities—such as shared surface surveillance data and new techniques to manage the movement of aircraft on the ground—installed in Boston and New York have saved thousands of gallons of fuel and thousands of hours of taxi-out time, according to FAA.

With respect to the continuing implementation of NextGen systems and capabilities, our ongoing work has preliminarily found that some key NextGen-related programs are generally proceeding on time and on budget (see table 1).

Table 1: Selected Baselined NextGen and Related Programs Cost and Schedule Performance

Dollars in millions

Program	Description	Start date	Original Completion date	Projected completion date	Difference between original and projected completion dates (in months)	Original cost	Projected cost as of Aug. 2011	Difference between original and projected cost
Automatic Dependent Surveillance Broadcast (ADS-B)	A satellite-based information broadcasting system to enable more precise control of aircraft	Aug. 2007	Sept. 2014	Sept. 2014	0	$1,682	$1,726	$45
Collaborative Air Traffic Management (CATM)- includes work packages 1-3	Encompasses the development of systems to manage airspace and flight information	Aug. 2005	Dec. 2015	Dec. 2015	0	561	561	0
System Wide Information Management (SWIM)-segment 1[a]	The information management architecture for the national airspace system	July 2009	Sept. 2015	Sept. 2015	0	310	310	0

Dollars in millions

Program	Description	Start date	Original Completion date	Projected completion date	Difference between original and projected completion dates (in months)	Original cost	Projected cost as of Aug. 2011	Difference between original and projected cost
Time-Based Flow Management (TBFM)	Modernizes the Traffic Management Advisor (TMA) system aimed at integration of airport and air traffic control information	April 2010	Nov. 2014	Nov. 2014	0	115	115	0
En Route Automation Modernization (ERAM)	A new enroute air traffic control system for high altitude traffic	June 2003	Dec. 2010	Aug. 2014	44	2,155	2,485	330

Source: GAO analysis of FAA data.

[a]Schedule and cost for SWIM is subject to change due to rebaselining that will occur in 2011 or later.

Some key acquisitions may soon encounter delays, which can increase overall acquisition costs, as well as costs to maintain current systems. For example, delays in implementing the ERAM program is projected to increase costs by $330 million, as well as an estimated $7 to $10 million per month in additional costs to continue maintaining the system that ERAM was meant to replace. Moreover, due to the integrated nature of NextGen, many of its component systems are mutually dependent on one or more other systems. For example, ERAM is critical to the delivery of ADS-B because ADS-B requires the use of some ERAM functions. ERAM is also pivotal to the on-time implementation of two other key NextGen acquisitions—Data Communications and SWIM. In part due to ERAM's delay, FAA pushed the Data Communications program's start date from September 2011 to February 2012, plans to revise the original SWIM-segment 1 cost and schedule plan, and delayed the SWIM-segment 2 start date from 2010 to December 2012. The long-term result of this decision is not yet known but it could delay certain SWIM capabilities and hinder the progress of other capabilities that depend, in turn, on the system integration that SWIM is intended to provide. Thus, looking more broadly, the implementation of NextGen—both in the midterm (through 2018) and in the long term (beyond 2018)—will be affected by how well FAA manages program interdependencies.

Delays in program implementation, as described above, and budget constraints have also affected FAA's capital budget planning. The

Administration has proposed reducing FAA's capital budget by a total of $2.8 billion, or 20 percent, for fiscal years 2012 through 2015 largely due to governmentwide budget constraints. Most of this proposed reduction is on NextGen and NextGen-related spending, as reflected in FAA's revised 5-year Capital Investment Plan for fiscal years 2012 through 2016. Congress has not completed FAA's appropriation for fiscal year 2012, but current House and Senate appropriation bills propose to fund the agency near or above 2011 levels. FAA will have to balance its priorities to ensure that NextGen implementation stays on course while also sustaining the current infrastructure—which is needed to prevent failures and maintain the reliability and efficiency of current operations.

FAA Faces Several Ongoing Issues That Will Affect NextGen Implementation

To maintain credibility with aircraft operators that NextGen will be implemented, FAA must deliver systems and capabilities on time so that operators have incentives to invest in the avionics that will enable NextGen to operate as planned. As we have previously reported, a past FAA program's cancellation contributed to skepticism about FAA's commitment to follow through with its plans. That industry skepticism, which we have found lingers today, could delay the time when significant NextGen benefits—such as increased capacity and more direct, fuel-saving routing—are realized. A number of NextGen benefits depend upon having a critical mass of properly equipped aircraft. Reaching that critical mass is a significant challenge because the first aircraft operators to equip will not obtain a return on their investment until many other operators also equip.

Stakeholders have proposed various equipage incentives. For example, one such proposal is for a private equity fund, backed by federal guarantees, to provide loans or other financial assistance to operators to help them equip, with payback of the loans dependent on FAA meeting its schedule commitments to implement capabilities that will produce benefits for operators. In addition, the NextGen Advisory Committee[6] has begun to identify the specific avionics requirements for particular NextGen

[6]The NextGen Advisory Committee is comprised of aviation stakeholders from the government and industry. The committee works to develop a common understanding of NextGen priorities in the context of overall NextGen capabilities and implementation constraints, with an emphasis on the near term and midterm. The committee primarily focuses on implementation issues, including prioritization criteria at a national level, joint investment priorities, and location and timing of capability implementation.

capabilities through the midterm, as well as identifying who—in terms of which parts of the fleet operating in which regions—should be targeted for additional incentives to equip.

Our past and ongoing work examining aspects of NextGen have highlighted several other challenges facing FAA in achieving timely and successful implementation. For this statement, we would like to highlight a few specific areas: the potential effect of program delays on international harmonization efforts, the need for FAA to ensure that it addresses human factors and workforce training issues to successfully transition to a new air transportation system, the need for FAA to continue to address potential environmental impacts, and the need for FAA to improve the management and governance of NextGen.

- **Effect of delays on FAA's ability to collaborate with Europe.** Delays to NextGen programs, and potential reductions in the budget for NextGen activities, could delay the schedule for harmonization with Europe's air traffic management modernization efforts and the realization of these benefits. FAA officials indicated that the need to address funding reductions takes precedence over previously agreed upon schedules, including those previously coordinated with Europe. For example, FAA officials responsible for navigation systems told us that FAA is restructuring plans for its ground-based augmentation system (GBAS) because of potential funding reductions.[7] While final investment decisions concerning GBAS have yet to be made, these officials said that FAA might have to stop its work on GBAS while Europe continues its GBAS development, with the result that Europe may have an operational GBAS, while FAA does not.[8] A delay in implementing GBAS would require FAA to continue using the current instrument landing system which does not provide the benefits of GBAS, according to these officials. Such a situation could again fuel stakeholder skepticism about whether FAA will follow through with its commitment to implementing NextGen, and in turn, increase airlines' hesitancy to equip with NextGen technologies.

[7]GBAS is designed to supplement satellites in providing aircraft positioning data to pilots and air traffic controllers as aircraft approach runways prior to landing.

[8]GBAS is currently in the research and development phase. At the completion of this phase, FAA will decide whether it will be the system to replace instrument landing systems and move it into its acquisition system.

- **Need to address human factors and training issues**. Under NextGen, pilots and air traffic controllers will rely to a greater extent on automation, which will change their roles and responsibilities in ways that will necessitate an understanding of the human factors issues involved and require that training be provided on the new automated systems. FAA and the National Aeronautics and Space Administration (NASA)—the primary agencies responsible for integrating human factors issues into NextGen—must ensure that human factors issues are addressed so that controllers, pilots, and others will operate NextGen components in a safe and efficient manner. Failure to do so could delay implementation of NextGen. We recently reported that FAA has not fully integrated human factors into the development of some aviation systems.[9] For example, we noted that controllers involved in the initial operations capabilities tests of ERAM at an air traffic control center in Salt Lake City found using the system cumbersome, confusing, and difficult to navigate, thus indicating that FAA did not adequately involve controllers who operate the system in the system's early development. In response to our recommendations in that report, FAA has created a cross-agency coordination plan in cooperation with NASA that establishes focus areas for human factors research, inventories existing facilities for research, and capitalizes on past and current research of all NextGen issues. In addition to integrating human factors research into NextGen systems, FAA and NASA will have to identify and develop the training necessary to address controllers' and pilots' changing roles, and have this training in place before NextGen is fully realized (when some aircraft will be equipped with NextGen systems and others will not).

- **Need to address environmental impacts of NextGen**. Another challenge to implementing NextGen is expediting environmental reviews and developing strategies to address the environmental impacts of NextGen. As we stated in our recent report on environmental impacts at airports, with the changes in aircraft flight paths that will accompany NextGen efforts, some communities that were previously unaffected or minimally affected by aircraft noise will be exposed to increased noise levels.[10] These levels could trigger the need for environmental reviews, as well as raise community concerns. Our report found that addressing environmental impacts can delay the

[9]GAO-10-824.

[10]GAO-10-50.

implementation of operational changes, and indicated that a systematic approach to addressing these impacts and the resulting community concerns may help reduce such delays. To its credit, FAA has been working to develop procedures for streamlining environmental review processes that affect NextGen activities.

- **Need to improve management and governance**. FAA has embarked on an initiative to restructure a number of organizations within the agency. We have previously reported on problems with FAA's management and oversight of NextGen acquisitions and implementation.[11] Specifically, FAA plans to abolish and merge a number of committees to improve decision making and reduce time requirements of senior FAA executives. It also plans to make the NextGen organization the responsibility of the Deputy Administrator and to create a new head of program management for NextGen-related programs to ensure improved oversight of NextGen implementation. Further, the Air Traffic Organization will be divided into two branches: operations and NextGen program management. Operations will focus on the day-to-day management of the national air space and the program management branch will be responsible for developing and implementing programs while working with operations to ensure proper integration. While elimination of duplicative committees and focus on accountability for NextGen implementation is a positive step, it remains to be seen whether this latest reorganization will produce the desired results.

Chairman Petri, Ranking Member Costello, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to answer any questions that you may have at this time.

[11]GAO-10-629 and GAO, *Next Generation Air Transportation System: Status of Systems Acquisition and the Transition to the Next Generation Air Transportation System*, GAO-08-1078 (Washington, D.C.: Sept. 11, 2008).

GAO Contact and Staff Acknowledgments

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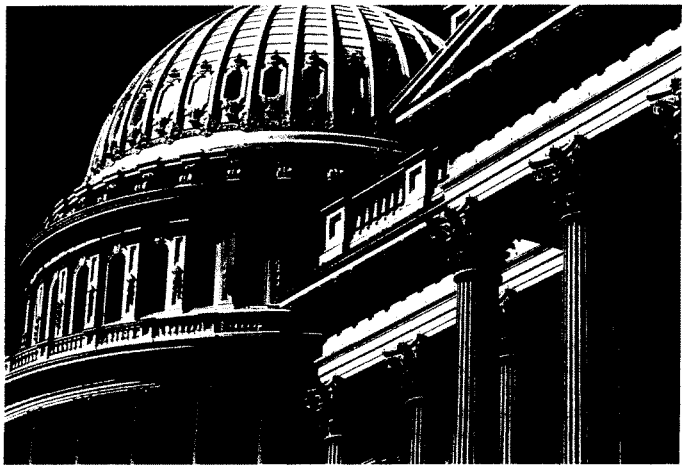
ATA TESTIMONY

A Comprehensive Review of FAA's NextGen Program: Costs, Benefits, Progress, and Management



Statement of Tom Hendricks
Senior Vice President, Safety, Security and Operations
Air Transport Association of America, Inc. (ATA)
before the
Subcommittee on Aviation
of the
House Transportation and Infrastructure Committee

October 5, 2011

AIR TRANSPORT ASSOCIATION

ATA members believe that Congress and the Administration should be guided by a National Airline Policy that will treat America's airlines like the global businesses they are and enable them to operate as such. An indispensable element of such a policy is the modernization of the U.S. air traffic management system, the Next Generation Air Transportation System (NextGen). We therefore appreciate the opportunity to express our views about the progress of this critical national infrastructure program.

Carriers understand the importance of NextGen and are passionate about it. We believe that tangible, near-term results that improve schedule reliability and customer satisfaction, reduce delays, save fuel and reduce emissions can be achieved. Today's NextGen technologies and current equipage can deliver greater efficiencies. In order to achieve these near-term benefits, the FAA should focus on ensuring that the needed policies, procedures and training are in effect to enable realization of the benefits.

Our priorities for that modernization are to:

- accelerate the development and approval process of performance-based navigation (PBN) procedures;
- streamline the National Environmental Policy Act (NEPA) review process to expedite the development and implementation of PBN and other environmentally beneficial NextGen procedures; and
- develop metrics to gauge the actual performance of NextGen.

Each of these objectives is achievable, will enhance airspace utilization and will benefit all who depend on air transportation.

I. Overview: Why NextGen Matters Impact on the Economy and Passengers

NextGen is designed to transform the current air traffic management system that which relies on ground-based navigation and positioning signals from ground-based facilities into a modern system using satellite-based Global Positioning System (GPS) signals for navigation and surveillance, which will provide dramatic efficiency and environmental improvements. The successful implementation of NextGen is critical to the viability and global competitiveness of civil aviation in the United States. Airlines, their employees, the communities that they serve and the U.S. economy all have an important stake in that success.

The current National Airspace System (NAS), despite being the most complex aviation system in the world, is extraordinarily safe. That remarkable safety record reflects the determined efforts of the Federal Aviation Administration (FAA) and its employees, as well as aviation stakeholders, including airlines and their employees. We are grateful for the support and oversight provided by this subcommittee, which also has played a key role in helping shape this success.

As the subcommittee knows all too well, however, the system has been showing its age for some time. That reflects two basic realities: increases in demand over the years and the technological constraints of current radar, navigation, and communications systems. Although these systems have been repeatedly upgraded, they have inherent limitations. For example, at busy airports, congested air traffic control communications is a recurrent problem. That is a limitation that will not go away: Only one person can speak at a time on a radio. NextGen's planned use of digital data communications will alleviate that problem.

Reliance on these legacy systems is costly because they cannot meet current demands in important areas of the NAS, most notably in the New York area. An FAA-commissioned study published last November

estimated that the total cost of U.S. air transportation delays in 2007 was $31.2 billion.[1] Passengers, according to the study, suffered estimated losses of $16.7 billion because of schedule buffers, delayed flights, flight cancellations and missed connections. Costs to airlines were estimated at $8.3 billion, attributable to increased fuel, crew and maintenance expenses. The study concluded that air transportation delays decreased the U.S. gross domestic product by $4 billion.

These costs paint a picture of a system that cannot handle projected demand. Without significant modernization of the system, we will experience the inexorable spread of airspace congestion, which will constrict air travel and multiply those costs. Not only will users suffer from that ever worsening burden, so will the national economy.

The implications of this situation are profound because of aviation's importance to the economy. In August 2011, the FAA Air Traffic Organization (ATO) published "The Economic Impact of Civil Aviation on the U.S. Economy," finding that commercial aviation was ultimately responsible for 5.2 percent of U.S. gross domestic product, helping generate $1.3 trillion in annual economic activity, $394 billion in annual personal earnings and 10.2 million jobs.[2]

Concern about the future of airspace management, therefore, is not a parochial consideration. This is not "inside baseball." Aviation is one of the principal drivers of the U.S. economy. Future constraints to aviation will thwart economic activity and our international competitiveness. It also will disadvantage airline employees.

While the importance of NextGen is clear, its implementation has been complicated and significant issues remain unresolved. It is not a turnkey operation. Instead, NextGen is an intricate, long-term undertaking. That has important implications for mapping out implementation policies as we go forward.

II. NEXTGEN CAPABILITIES

NextGen is estimated to cost $40 billion. NextGen will transform today's ground-based air traffic navigation and surveillance system to a state-of-the-art satellite-based system.

Today's ground-based systems add flight time because they cannot consistently route aircraft in a direct, linear fashion. Because current technology does not pinpoint an aircraft's position in space as precisely as a satellite-based system, a greater amount of time and separation must be factored in spacing flights. In contrast, utilizing satellite-based systems, the FAA and airlines will be able to route flights more precisely, directly and efficiently. This will reduce miles flown, flight times, congestion and delays. Less aircraft time in the air and on the ground means less congestion and lower fuel consumption and greenhouse gas emissions.

Projections of fuel consumption and greenhouse gas (GHG) emissions reductions from full NextGen implementation are impressive. They range from 6 percent to 15 percent.

[1] The National Center of Excellence for Aviation Operations Research ("NEXTOR"), "Total Delay Impact Study: A Comprehensive Assessment of the Costs and Impacts of Flight Delays in the United States – Revised Final Report," November 2010, p. vii.
[2] Federal Aviation Administration, "The Economic Impact of Civil Aviation on the U.S. Economy," August 2011, p. 20.

A. Elements of NextGen that are currently being deployed or undergoing testing and refinement by commercial airlines

Airlines, recognizing the benefits of exploiting existing and anticipated technologies, have committed resources to using available technologies and evaluating the effectiveness of emerging technologies. Examples of these industry initiatives include:

- **Automatic Dependent Surveillance-Broadcast (ADS-B) –** provides surveillance using GPS signals to fix aircraft location more precisely than today's ground-based radar. ADS-B will provide radarlike coverage in areas where no coverage exists today (e.g., Gulf of Mexico and mountainous areas). Ideally, ADS-B will permit reduced separation between aircraft due to improved accuracy by enabling FAA ATC to utilize shared precision location information between controllers and pilots;
- **Required Area Navigation (RNAV) –** enables aircraft to fly on any path within coverage of ground- or space-based navigation aids, permitting more access and flexibility for point-to-point operations;
- **Required Navigation Performance (RNP) procedures (RNAV with enhanced onboard technology) –** monitors aircraft performance and enables closer en route spacing without intervention by ATC and permits more precise and consistent departures/arrivals;
- **Optimized Profile Descents (OPD) –** allow aircraft to fly continuous descent airport approaches rather than traditional "step downs," which conserves fuel, though efforts should be made to ensure their use does not negatively impact efficiency gains made elsewhere;
- **Tailored Arrivals –** allow aircraft to fly an approach that is optimized for the conditions; guidance is developed by ATC based on all known constraints and uplinked to aircraft before top-of-descent;
- **Ground-Based Augmentation System (GBAS) –** technology used to support precision landings in low visibility, poor weather conditions; will supplement current instrument landing systems (ILS) and provide precision approach guidance where ILS systems cannot be installed. Over time, it likely will replace ILS systems as well; and
- **Precision Runway Monitor-Alternate (PRM-A) –** leverages Airport Surface Detection Equipment (multilateration) to provide Closely Spaced Parallel Approach capabilities at airports, which allows aircraft to land more efficiently, increasing runway capacity.

B. Accelerating NextGen

However, we cannot wait for all of the pieces of NextGen to come together. We must get the most out of existing technology.

This means that the FAA should focus resources on expediting introduction of the most cost-beneficial elements of NextGen that are available, most notably performance-based navigation procedures. These will pay immediate dividends for all stakeholders, including passengers and shippers, by increasing system capacity, reducing fuel burn and decreasing emissions. We strongly support section 213 of the *FAA Reauthorization and Reform Act of 2011* (H.R. 658), which directs the FAA to expedite the deployment of PBN procedures, and focus deployment at the top 35 busiest U.S. airports (i.e.,Operational Evolution Partnership (OEP) airports).

We are pleased that sections 213 and 214 of H.R. 658 require the FAA to establish, based on stakeholder input, NextGen performance goals and metrics, which is a crucial step to ensuring its successful and timely implementation. While the March 2011 FAA NextGen Implementation Plan maintains that NextGen could reduce flight delays by as much as 35 percent, the U.S. Government Accountability Office

(GAO) noted in December 2010 that the agency has not yet outlined specific goals or identified how it plans to achieve those outcomes. We also support provisions in section 214 that direct FAA to establish performance metrics for the development of PBN procedures that would show, among other things, how such procedures will reduce flight times and save fuel. FAA currently measures its performance by the number of flight routes it creates annually, which does not necessarily benefit airlines and other stakeholders.

White House Chief Technology Officer Initiative

Air carriers are pleased that the White House Chief Technology Officer (CTO), Aneesh Chopra, has initiated a project to drive benefits in the near term of performance-based procedures such as RNP, RNAV and Optimized Profile Descents (OPDs). Last month in Dallas, several airline CEOs met with Mr. Chopra, DOT Deputy Secretary John Porcari and FAA Deputy Administrator Michael Huerta to discuss how we can act collectively to move NextGen forward.

As a result of that meeting, carriers have identified the high-value procedures they view as priorities for development, and procedures that have been developed but for some reason are not being utilized. In addition, carriers have identified FAA policies that need to be addressed in order to achieve real, near-term benefits from procedures. The CTO is creating a Dashboard to measure progress toward making the needed changes in policies, as well as progress in the actual implementation of efficient procedures. Part of the purpose of this work will be to further identify the impediments to the timely implementation of PBN procedures.

Streamline the Environmental Review Process

One issue that has been identified as a bottleneck is the environmental approval process. By definition, developing a useful flight path requires a change in the airspace around an airport, and any material change is generally subject to some level of *National Environmental Policy Act* (NEPA) review, even in those cases where the new flight path will result in environmental improvements. ATA believes that more RNP/RNAV procedures should be subject to a Categorical Exclusion (CATEX), (i.e., do not have a significant effect on the environment and therefore, neither an environmental assessment nor an environmental impact statement are required). We are pleased that section 213 of H.R. 658 directs the FAA to conduct expedited environmental reviews to accelerate the implementation of PBN procedures, and that certified PBN procedures are presumed to be covered by a CATEX, especially in those instances where environmental improvement can be demonstrated.

NAV Lean

FAA has recognized the need to streamline its processes and we commend the FAA for launching the "NAV Lean" program to expedite the deployment of PBN procedures. Unfortunately, implementation of NAV Lean is scheduled to occur over five years. That is unrealistic; we cannot wait that long. Airline average fuel costs in July were up more than 32 percent year over year. U.S. airline fuel costs for the first seven months of this year were up more than $7.4 billion over the comparable period in 2010. The Department of Energy's U.S. Energy Information Administration last month forecast that average jet-fuel prices this year will be $3.05 per gallon for the entire year; this compares with $2.15 per gallon for calendar year 2010.

U.S. airlines have invested billions of dollars in new equipment, infrastructure and technology to maximize fuel efficiency. We are doing our part but we cannot afford to wait years for the introduction of air-navigation procedures that are based on technology that exists today.

III. NextGen Challenges

While the foregoing technological and procedural advancements are essential for achieving future efficiencies, the FAA, in coordination with the aviation community, should quickly and clearly design the future ATC system by identifying achievable near-term, mid-term and long-term:

- milestones for NextGen implementation;
- appropriate training for controllers to implement needed changes to the controllers' handbook;
- performance metrics for NextGen technologies and procedures; and
- revised separation standards.

Moreover, labor and management at the FAA must fully partner to move forward uniformly with implementation and use of the new systems. Modernizing the airspace infrastructure requires comprehensive structural design, and technology development and integration. It also needs workforce acceptance.

As attractive as NextGen is, a word of caution is in order. NextGen is a very complicated undertaking. This means as GAO has stated, "[w]ithout specific goals and metrics for the performance of NextGen as a whole, together with a timeline and action plan for implementation, it is not clear whether NextGen technologies, systems, and capabilities will achieve desired outcomes and be completed within the planned time frames."[3]

This concern is evident with respect to the development of ADS-B In, which is intended to enable aircraft to receive, process and display other aircrafts' ADS-B transmissions. Our view is that although many of the ADS-B In applications show much promise, additional development and analysis are necessary before investment or implementation decisions can be justified. We recently expressed this view in the FAA ADS-B In Aviation Rulemaking Committee, which I co-chair with Mr. Steve Brown from the National Business Aviation Association (NBAA). We urge continuation and expansion of ADS-B In research and development. Our conclusion, however, is that for many of the applications examined, the existing levels of progress in the areas of benefits, technologies, systems and policy development exhibit risks that many airlines are unwilling to bear. Thus, at this time, achieving a convincing business case for ADS-B In is very difficult for most NAS users.

We believe that the lesson of the ADS-B In ARC is that technology investment and deployment decisions require thorough, disciplined evaluations, including real-world validations of the proposed initiative.

Conclusion

NextGen is a vital component to the future success of the airline industry and its employees, and an important means of reducing flight delays and the industry's carbon footprint. The swift implementation of NextGen must be a national priority. Fortunately, many of the technological and procedural advancements listed above are already available and a sizable portion of today's commercial aircraft is equipped to use them.

[3] Government Accountability Office, "NextGen Air Transportation System: FAA's Metrics Can Be Used to Report on Status of Individual Programs, but Not of Overall NextGen Implementation or Outcomes," GAO-10-629, July 27, 2010, p. 2.

FAA leadership is the difference between success and failure in realizing the benefits of NextGen for all stakeholders. Accelerating the deployment of NextGen technologies; designing new routes; and implementing new airspace and procedures will produce material improvements in the operational performance and fuel efficiency of aircraft using those procedures.

As noted previously, H.R. 658 includes several important provisions that will help accelerate the most cost-beneficial elements of NextGen. We are grateful that both the House and Senate multiyear FAA reauthorization legislation (S. 223) acknowledge the importance of NextGen, including the deployment of PBN procedures, and urge House and Senate transportation leaders to resolve their differences and approve a final bill as soon as possible.

We also would like to extend our gratitude to Congress for resisting any increases in commercial aviation taxes. Our carriers and passengers are already subject to 17 federal taxes and fees totaling more than $16 billion annually. To put this into perspective, the federal aviation tax burden on a typical $300 domestic round-trip ticket has tripled – from $22 in 1972 to $61 today. As a result, commercial aviation is now taxed at a higher rate than alcohol, beer, cigarettes and guns – items taxed at high rates to discourage use. The federal aviation tax burden was cited by DOT Secretary Ray LaHood's Future of Aviation Advisory Committee (FAAC) as a threat to the industry's viability and global competitiveness, as well as by President Clinton's airline industry commission, the National Commission to Ensure a Strong Competitive Airline Industry, which concluded 18 years ago that "tax policies often have had a major and adverse effect on the industry. We are of the opinion that changes must be made to relieve the airline industry's unfair tax burden."

Against this backdrop, we urge Congress to reject the aviation taxes included in the White House debt-reduction proposal, including a new $100 per flight departure tax on passenger and cargo airlines, and a tripling of the passenger security tax, from $2.50 per enplanement to $7.50 per on-way flight by 2017. Over the next decade, these taxes would cost passengers and airlines $3.5 billion annually – a 21 percent increase in the federal aviation tax burden. The economic firm of Oliver Wyman estimates that just in 2012, these taxes will result in almost 10,000 direct passenger and cargo airline job losses, with total job losses to the entire economy of 181,000. The taxes would be devastating not only to the U.S. airline industry, which has lost $55 billion and cut 160,000 jobs since 2001, but also to the nation's economic recovery.

In addition to completing a multiyear FAA reauthorization bill and rejecting the White House proposed aviation taxes, we need Congress to help drive:

- commitment to NextGen, which will help build industry confidence in delivering benefits;
- a fair and predictable funding stream;
- continued industry partnership and an aggressive approach to seeking public input through the rulemaking process;
- adoption of consensus-based metrics to measure NextGen implementation progress; and
- consistent, deliberate evolution of the current safe system to NextGen.

Congress must help the U.S. aviation community avoid the compression of these contemplated systemic changes into an artificially brief period of time. The evolution should be planned carefully to enable the continued improvement in what already is the world's safest system. Delaying NextGen until the current infrastructure is truly unsustainable will inject risk unnecessarily into the current system. We simply cannot wait until we are in a crisis management mode to impart these needed changes. A steady metering of constant evolutionary change is what's needed to evolve this very complex system into NextGen.

STATEMENT OF THE HONORABLE MICHAEL P. HUERTA, DEPUTY ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON THE BENEFITS OF THE NEXT GENERATION AIR TRANSPORTATION SYSTEM, OCTOBER 5, 2011.

Chairman Petri, Congressman Costello, Members of the Subcommittee:

Thank you for the opportunity to appear before you today to discuss the benefits of the Next Generation Air Transportation System, or NextGen. This is my first appearance before this Committee since starting at the Federal Aviation Administration (FAA), and I am pleased to have the opportunity to get to know you all.

We recognize that we need to change the FAA internally to best serve the future needs of our nation's air transportation system. This means realigning some functions in order to better handle the enormous transformation to NextGen. Congress approved the reprogramming request we submitted this summer to change our reporting structure and implement other organizational changes. This is a critical step in moving forward with the changes that will lay the foundation for our success as an agency in the next 15 years.

The reprogramming approval allows us to create a NextGen office that will report to me. It also allows us to create an Assistant Administrator for NextGen. I'm very pleased that Vicki Cox is serving in this position. Together, we are setting the strategic direction for NextGen and continuing to raise NextGen's profile within the FAA and within the aviation community. While much of NextGen involves the air traffic control function, it also involves much more than that and needs the involvement and focus of every FAA office going forward.

We have also established the NextGen Advisory Committee (NAC), a broad-based, senior-level advisory panel to which we turn for expertise and guidance. One of the first actions we requested of this new committee is to form a working group to develop recommendations on outcome-based performance metrics for NextGen. We look forward to the NAC's involvement in bringing all of the stakeholders together.

NextGen Defined

NextGen is a comprehensive overhaul of our National Airspace System (NAS) to make air travel more convenient and dependable, while ensuring your flight is as safe and efficient as possible. In a continuous roll-out of improvements and upgrades, the FAA is building the capability to guide and track air traffic more precisely and efficiently to save fuel and reduce noise and pollution. NextGen is a better way of doing business – for the FAA, the airlines, the airports, and the traveling public. It's better for our environment, better for efficiency and flexibility, better for safety, and better for the economy and the traveling public.

As recently as 2009, civil aviation contributed $1.3 trillion annually to the national economy, and constituted 5.2 percent of the gross domestic product according to FAA's recent report on the economic impact of civil aviation. It generated more than 10 million jobs, with earnings of $397 billion. NextGen is vital to protecting those contributions. The current system simply cannot accommodate anticipated growth in the aviation industry. Congestion continues to increase at many of our nation's busiest hub airports, a problem that will only be exacerbated now that traffic levels are starting to rebound from the impact of the economic recession.

Between 2007 and 2011, approximately $2.8 billion has been appropriated for NextGen. We estimate the development of NextGen will require between $20 and $27 billion in FAA funding from 2012 to 2025. And just last month, the President requested $1 billion in the American Jobs Act for Next Gen to support applied research, advance development, and implementation of engineering solutions for NextGen technologies, applications and procedures.

What are we getting for our money? Our latest estimates show that by 2018, we will recoup our investment and NextGen air traffic management improvements will reduce total delays, in flight and on the ground, about 35 percent, compared with what would happen if we did nothing. The delay reduction will provide $23 billion in cumulative benefits through 2018 to aircraft operators, the traveling public, and the FAA. We will save about 1.4 billion gallons of aviation fuel during this period, cutting carbon dioxide emissions by 14 million tons.

Let me highlight some examples of where NextGen is already improving safety and adding real dollars to the bottom line:

- Using Automatic Dependent Surveillance-Broadcast (ADS-B), a GPS-based technology, aircraft are able to fly more safely and efficiently in previously challenging areas. ADS-B equipped helicopters flying over the Gulf of Mexico are benefiting from radar-like air traffic services for the first time. ADS-B radio stations deployed along the shoreline and on oil platforms blanket the area with air traffic surveillance, increasing the safety of all operations. This same surveillance improves efficiency in the Gulf through more direct routing of ADS-B equipped helicopters, reducing both their operating cost and environmental impact. In Colorado, new surveillance technologies are enabling controllers to track aircraft flying through challenging mountainous terrain. Currently, over half of the ADS-B ground infrastructure has been deployed.

- Southwest Airlines started using GPS-based Required Navigation Performance (RNP) approaches at a dozen airports this year. The airline says that it could save $25 for each mile they save by using a shorter route.
- Alaska Airlines has been a leader in using RNP approach procedures at Juneau International Airport. They can fly precisely through mountainous terrain in low visibility conditions thanks to the higher navigational accuracy of GPS. The airline estimates it would have cancelled 729 flights last year into Juneau alone due to bad weather if it were not for the GPS-based RNP approaches.
- In Atlanta, Delta Airlines reports saving 60 gallons of fuel per flight by using more efficient descent procedures we have designed under NextGen. Aircraft descend continually to the runway with engines idle, as opposed to descending in a stair-step fashion and using the engines and burning fuel to power up at each level-off point.
- UPS, with the help of the FAA, is equipping its fleet with NextGen technology to help save time and money as pilots transport goods in and out of their hub. UPS estimates that it will save between 25% and 30% in fuel burn on arrival.
- We have conducted Initial Tailored Arrival (ITA) flight demonstrations, at San Francisco, Los Angeles, and Miami. ITAs are pre-negotiated arrival path through airspace of multiple air traffic control facilities; they limit vectoring and minimize the time the aircraft spends maintaining level flight during its descent. ITAs differ from other types of Optimized Profile Descents (OPDs) in that they are assigned by controllers to specific approaches and tailored to the characteristics of a limited number of FANS-equipped aircraft types – 747s, 777s, A330s, A340s and A380s. We estimate that the 747s saved an average of 176 gallons of fuel per arrival in ITAs and 78 gallons per flight in partial ITAs, compared with conventional approaches. For 777s, the corresponding savings were 99 gallons in full ITAs and 43 gallons in partial ITAs.

We anticipate seeing other benefits shortly. The "Greener Skies over Seattle" initiative should save literally millions of gallons of fuel annually, cut noise and decrease greenhouse gas emissions. The FAA estimates that airlines using RNP procedures at Seattle Tacoma International Airport will save several millions of dollars per year at today's fuel prices. And that number is only going to get larger as more airlines equip. With the "Greener Skies over Seattle" initiative, aircraft will emit less carbon dioxide – about 22,000 metric tons less per year. That's like taking more than 4,000 cars off the streets of the Seattle region.

These are just a few of the benefits that we are seeing already from our investments. But, we cannot afford to be short-sighted. A true transformation in the way we deliver air traffic services takes planning and time. Let me now turn to a discussion of some of he longer-range benefits.

NextGen Benefits: Safety

NextGen operational capabilities will make the NAS safer. ADS-B improvements in situational awareness – on the ground and in aircraft – will increase controllers' and pilots' individual and combined ability to avoid potential danger. Among other benefits, this could provide valuable time savings in search and rescue efforts. Appropriately equipped aircraft will be able to receive information displayed directly to the flight deck information about nearby traffic, weather, and flight-restricted areas.

More precise tracking and information-sharing will improve the situational awareness of pilots, enabling them to plan and carry out safe operations in ways they cannot do today. Air traffic controllers will become more effective guardians of safety through automation and simplification of their most routine tasks, coupled with better awareness of conditions in the airspace they control. Additionally, NextGen will facilitate the implementation of Safety Management System processes for the air traffic controllers' use.

Advances in tracking and managing operations on airport surfaces will make runway incursions less likely. Fusing surface radar coverage from Airport Surface Detection Equipment-Model X (ASDE-X) with ADS-B surveillance of aircraft and ground vehicles will increase situational awareness, particularly when linked with runway status lights.

Collaborative decision making will increase everyone's understanding of what others are doing.

Starting with pre-takeoff advisories, departure instructions and reroutes for pilots, we will use data messages increasingly instead of voice communications between pilots and controllers, reducing opportunities for error or misunderstanding. Voice channels will be preserved for the most critical information exchange.

NextGen Benefits: Environmental

As with safety, our work to enhance aviation's influence on the environment also benefits – and is a beneficiary of – NextGen. The operational improvements that reduce noise, carbon dioxide and other greenhouse-gas emissions from aircraft are the tip of the FAA's environmental iceberg. Equally important are the other four-fifths of the agency's environmental approach – aircraft and engine technology advances, sustainable fuels, policy initiatives and advances in science and modeling.

Environmental benefits of operational improvements are simple and direct. When we improve efficiency in the NAS, most of the time we save time and fuel. Burning less fuel produces less carbon dioxide and other harmful emissions. Some of our NextGen improvements, notably landing approaches in which aircraft spend less time maintaining level flight and thus can operate with engines at idle, reduce ground noise too. But operational benefits go only so far; their net system-wide effect can be offset by growth of the aviation system.

To accommodate system growth, we are supporting development of aircraft, engine and fuel technology. In 2009, we established the Continuous Lower Energy, Emissions and Noise program to bring promising new airframe and engine technologies to maturity, ready to be applied to commercial designs, within five to eight years. Similarly, we are part of a government-industry initiative, the Commercial Aviation Alternative Fuels Initiative, to develop sustainable low-emission alternative fuels and bring them to market.

We have developed and are using the NextGen Environmental Management System (EMS) to integrate environmental protection objectives into NextGen planning and operations. The EMS provides a structured approach for managing our responsibilities to improve environmental performance and stewardship. We also are analyzing the effect on aviation environmental policy and standards, and of market-based measures, including cap-and-trade proposals.

NextGen Benefits: Airports

Many airports will benefit from substantial improvements in efficiency, access, surveillance, environment and safety. Surveillance, situational awareness and safety will improve at airports with air traffic control radar services as we deploy ADS-B ground stations across the NAS and update our automation systems, and as operators equip their aircraft for it. The FAA also plans to publish Wide Area Augmentation System Localizer Performance with Vertical Guidance approach procedures for all suitable runway ends by 2016.

We are making important progress on a number of efforts to show how better situational awareness and pacing on the ground will give operators and the traveling public more reliability and save them time, while also managing environmental impacts. We can cut fuel consumption and emissions by reducing the time and number of aircraft idling on taxiways waiting for takeoff, or for open gate slots upon arrival. Also, we can reduce equipment wear – stop-and-go accelerations are hard on engines and other parts, and they also emit significant additional amounts of carbon dioxide into the atmosphere.

A major success in 2010 was the minimal disruption that occurred during a four-month runway resurfacing and widening project in one of the nation's busiest airspaces. The longest runway at New York John F. Kennedy International Airport (JFK) had to be expanded to accommodate new, larger aircraft. The project also included taxiway improvements and construction of holding pads. To minimize disruption during construction, JFK's operators turned to a collaborative effort using departure queue metering, in which each departing aircraft from JFK's many airlines was allocated a precise departure slot and waited for it at the gate rather than congesting taxiways. The procedure limited delays so well, it was extended after the runway work was completed.

NextGen Benefits: Flight Operations

All aircraft operators in the NAS will benefit from two major categories of improvements – efficiency and capacity, and access. Much of the time, efficiency and capacity go together. When we reduce the distance needed for the safe separation of aircraft, reduce delays from weather and other disruptions, and increase flight-path and procedures options for controllers as they maintain the flow of traffic, we improve capacity as well.

Surface initiatives make important contributions across the board – they improve situational awareness and safety, they reduce fuel consumption and carbon dioxide emissions and they reduce tarmac delays. By improving the efficiency of surface operations, they increase capacity.

Access issues center on runways at major airports, affecting mainly airlines, and airports and airspace that lack radar coverage, a problem for general aviation. NextGen will improve efficiency in operations that involve closely spaced parallel runways and converging and intersecting runways. Area Navigation and Required Navigation Performance (RNAV/RNP) will improve efficiency and capacity in departures and approaches. For general aviation, ADS-B will enable controllers to track properly equipped aircraft in non-radar areas covered by ADS-B ground stations. General aviation operators equipped for ADS-B In will receive traffic and weather information directly in the flight deck, providing them with greater situational awareness. Wide Area Augmentation System Localizer Performance with Vertical Guidance approach procedures will give properly equipped aircraft Instrument Landing System (ILS)-like capability at non-ILS airports. Through our new NAV-Lean process, we are streamlining the development and implementation for new procedures to ensure that users can take advantage of new navigational procedures and their benefits as quickly as possible. We hope to accelerate design and implementation of RNAV/RNP procedures and optimized descents to achieve their benefits sooner rather than later.

Optimization of Airspace and Procedures in the Metroplex (OAPM) is a systematic, integrated and expedited approach to implementing Performance Based Navigation

(PBN) procedures and associated airspace changes, which was developed in direct response to RTCA Task Force 5 recommendations on the quality, timeliness, and scope of metroplex solutions. OAPM focuses on a geographic area, rather than a single airport. It considers multiple airports and the airspace surrounding a metropolitan area, including all types of operations (air carrier, general aviation, military, etc.), as well as connectivity with other metroplexes.

The OAPM process uses two types of collaborative teams including FAA and industry partners. Study Teams recommend conceptual airspace and procedure solutions, and then Design and Implementation (D&I) Teams design, refine, review, and implement those recommendations within a near-term three-year timeframe. To date, 21 Metroplex sites have been identified and prioritized with input from FAA and industry. Five sites have completed Study Team activities and potential benefits ranging from $6M to $26M per year have been identified at each site. The Washington, DC and North Texas sites have initiated D&I activities, and D&I activities have been approved for two additional sites (Charlotte and Northern California). Two additional Study Teams are currently active in Atlanta, and Southern California, and expect to release their findings and recommendations shortly.

NextGen Benefits: Next Steps

In order to achieve these benefits, we know that we need to continue working with our partners in the aviation community. Making sure that we are all on the same page about our expectations, our obligations, and our capabilities is essential to the successful planning, development, and execution of NextGen.

The FAA continues to expand its work on demonstrations, trials and initial deployment of NextGen systems and procedures. NAS operators and users – particularly participants in the demonstrations and trials – are benefiting from them. But there is a chicken-and-egg nature to the economic and policy decisions that will have the most influence over the extent and timing of future benefits.

On the one hand, achieving NextGen's benefits depends heavily on aircraft operators and other stakeholders investing in the avionics, ground equipment, staffing, training and procedures they will need to take advantage of the infrastructure that the FAA puts in place to transform the aviation system in the coming decade and beyond. On the other hand, the willingness of operators and other stakeholders to make these investments depends critically on the business case for them – analyses of how valuable these benefits will be, and that they have confidence that the FAA can deliver the infrastructure in the time frames and manner required for those benefits to be realized.

When costs are clear but benefits are even a little bit cloudy, there is an information gap that the FAA must help fill. We try to do this in two ways. First, we conduct broad, system-level analyses, estimating how integrated NextGen benefits will develop and grow over a period of years. This work draws on modeling and simulations of how NAS operations will change and what effects the changes will have. The FAA must continue to work closely with the aviation community to ensure these benefits are well understood by those who need to invest in NextGen.

Second, we conduct a wide range of demonstrations and operational trials of specific NextGen systems and procedures. These demonstrations, conducted in real-world settings by operations and development personnel using prototype equipment, are invaluable. They provide all of the stakeholders with the opportunity to see the very real benefits that NextGen can bring. They mitigate program risks and show us whether we are on the right track in our technical approaches. They provide valuable insight into how equipment should be designed for operability, maintainability and a sound human-automation interface. And they are instrumental in advancing our understanding of the benefits to be gained from the capabilities being demonstrated.

Information from the demonstrations also helps us refine our models of NAS operations and how these operations will change, and thus our overall estimates of NextGen benefits. Further, it provides direct measurements of the ways specific NextGen capabilities can benefit NAS stakeholders and the public, enabling stakeholders to improve their own estimates of the benefits and costs of buying equipment for NextGen, and to be more confident of their analyses.

In an interconnected world, one aviation system cannot succeed on its own. Each system is a function of the next. All of the major systems need to work in harmony. In March 2011, the FAA finalized an historic collaborative agreement with Europe to ensure that our future systems—NextGen and SESAR—are fully harmonized. We have five working groups and more than two dozen specific harmonization programs to ensure that all the small pieces work together. This collaboration has begun in earnest and will continue until the job is done.

We are closely aligning the work we do on NextGen and SESAR with International Civil Aviation Organization's (ICAO) Block Upgrade Initiative. The goal is to identify suites of technology and procedural changes that can be packaged in such a way as to be accessible world wide for improvements in air traffic safety, efficiency and decreased environmental impact.

The FAA is working towards greater harmonization of airspace through efforts like the Aviation Cooperation Program for the Mid-Americas and Caribbean. Our hope is to use private and public resources to enhance aviation safety and efficiency across 21 countries.

Latin America has invested in modern navigational equipment and it has improved safety and efficiency. Some of the items we are talking about include upgrading low level and en route radar and enhancing weather radar. We also need to incorporate new technology for airports, such as runway status lights. We envision ADS-B from the Yucatan Peninsula to the northern region of South America. We want to use a system of data communications to cut down on misunderstandings on the radio.

Finally, in Asia, harmonization is moving forward through efforts like ICAO's recent Seamless Air Traffic Management Symposium in Bangkok. Participants brainstormed about ways to remove international barriers that exist today in order to make a truly seamless airspace across Asia and the Pacific.

As you can see, we are working steadily and carefully to bring NextGen to fruition. We have mapped out our course and we are moving towards our goals, and we look forward to your continued guidance and oversight as we go forward.

Mr. Chairman, this concludes my prepared remarks. I would be happy to answer any questions you and the Members of the Subcommittee might have.

RESPONSES TO
QUESTIONS FOR THE RECORD FROM
REPRESENTATIVE MAZIE K. HIRONO TO
THE HONORABLE MICHAEL P. HUERTA,
DEPUTY ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION

Q1. Can you provide a list of the people, trade associations, labor organizations, and other stakeholders that will comprise the new NextGen Advisory Committee (NAC)?

A1. The FAA recognizes the need to continue to work collaboratively with the aviation community to successfully deploy NextGen. As a result, the FAA directed RTCA to create a new advisory committee, the NextGen Advisory Committee (NAC), to provide recommendations that can be used by the FAA to inform policy, program, and regulatory decisions. The NAC includes senior industry participants who speak for safety, airport, environmental, global harmonization, and air traffic interests. The table below provides the current leadership and membership of the NAC.

Domain	Member
Designated Federal Official	• Michael Huerta, Deputy Administrator, FAA
Chair	• Dave Barger, President and Chief Executive Officer, JetBlue Airways
Federal Aviation Administration	• Vicki Cox, Assistant Administrator for NextGen • Christa Fornarotto, Associate Administrator for Airports • Peggy Gilligan, Associate Administrator for Aviation Safety • David Grizzle, Chief Operating Officer Air Traffic Organization • Julie Oettinger, Assistant Administrator of Aviation Policy, Planning and Environment
Department of Homeland Security	• TBD
Operators	• Ed Bolen, President & CEO, National Business Aviation Association (NBAA) • Craig Fuller, President & CEO, Aircraft Owners & Pilots Association (AOPA) • Dave Barger, President and Chief Executive Officer, JetBlue Airways • Jim Rankin, President & CEO, Air Wisconsin (Regional Airline Association – Chairman) • Bob Gray, Vice President of Flight Operations, ABX Air, (Cargo Airline Association – Chairman)
International	• Patrick Ky, Executive Director, SESAR Joint Undertaking • David McMillan, Director General, Eurocontrol

Domain	Member
Airports	• Sue Baer, Director of Aviation Department, Port Authority NY&NJ • Kim Day, Manager of Aviation, Denver International Airport
Department of Defense	• Brett Williams, Major General, United States Air Force
Federally Funded Research and Development Center (FFRDC)	• Agam Sinha, Sr. Vice President & General Manager, The MITRE Corporation
RTCA	• Margaret Jenny, President, RTCA
Labor	• Lee Moak, President, Air Line Pilots Association (ALPA) • Paul Rinaldi, President, National Air Traffic Controllers Association (NATCA) • Tom Brantley, President, Professional Aviation Safety Specialists (PASS)
Aircraft Manufacturer	• Sherry Carbary, Vice President of Flight Services, Boeing Commercial Airplanes, The Boeing Company • Eric Stefanello, Sr. Vice President of Air Traffic Management , Airbus • GA Aircraft Manufacturer rep – TBD
Air Traffic Control Automation Provider	• John Mengucci, President, Lockheed Martin IS&GS • John Harris, President, Raytheon Technical Services Company
Avionics	• Carl Esposito, Vice President, Honeywell Aerospace
Environment	• Arlene Mulder, Mayor, Village of Arlington Heights

Q2. As you know, Honolulu Air Traffic Control has a state-of-the-art facility that was dedicated in 2002. That facility, and the people that work there, have tremendous responsibility for the safety of air traffic, and air travelers, throughout the Pacific. I've been told that there are plans to implement ADS-B by approximately 2014-2015. Can you provide a more detailed overview of what the FAA's plans for implementing NextGen in Hawaii will be in the coming years?

A2. ADS-B is one of the most important, underlying technologies in the FAA's plan to transform aviation from the current radar-based system to a satellite-based system. ADS-B is bringing the precision and reliability of satellite surveillance to the nation's skies, including Hawaii.

The FAA plans to provide ADS-B infrastructure in Hawaii as part of the national ADS-B deployment. The ADS-B radio station installations are scheduled for 2013 with pilot advisory services (traffic and weather information provided to properly equipped aircraft) and air traffic services available by April 2014. An approximate implementation schedule for Hawaii is illustrated below.

Name	Planned Radio Station Installation	Testing	Pilot Advisory Services	ATC Separation Services
Honolulu Enroute	Apr-2013	Feb-2014	Mar-2014	Apr-2014
Hilo Terminal	Apr-2013	Jan-2014	Mar-2014	Apr-2014
Lihue (Kauai) Terminal	Apr-2013	Jan-2014	Mar-2014	Apr-2014
Kahului Terminal	Apr-2013	Jan-2014	Mar-2014	Apr-2014
Honolulu Terminal	Apr-2013	Jan-2014	Mar-2014	Apr-2014
Honolulu Surface	May-2013	Jan-2014	Mar-2014	Apr-2014

In addition, NextGen is also impacting Hawaii positively in the form of Performance Based Navigation (PBN) and surface data sharing. The FAA has published five Optimized Profile Descent (OPD) arrival procedures into Honolulu. The procedures, called "STARs" for Standard Terminal Arrival, connect to the existing Instrument Landing System (ILS) and also to new Required Navigation Performance (RNP) approach procedures to allow a seamless, continuous descent to the runway from over two-hundred miles away from Honolulu. These environmentally friendly advanced navigation procedures allow for a near-idle descent to the airport, reducing noise, CO2 emissions and fuel use. New Standard Instrument Departure (SID) procedures have also been developed for Honolulu. New arrival and departure procedures are under development for Kahului and Kona.

The FAA has plans to install a Data Distribution Unit (DDU) to the existing surface movement radar, called Advanced Surface Detection Equipment – Model X (ASDE-X), that would allow surface data to be made available to all operators requesting the information. The sharing of surface data is a safety enhancement to alert air traffic

controllers to potential runway incursions but also allows airlines to make better operational decisions through improved situational awareness at the airport.

RESPONSES TO
QUESTIONS FOR THE RECORD FROM
CONGRESSMAN LIPINSKI TO:
THE HONORABLE MICHAEL HUERTA
DEPUTY ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION

The American Jobs Act

The President's jobs plan contains $1 billion for NextGen. What components of NextGen would be advanced under the President's plan? What measurable, near to midterm benefits can we expect with this investment? How far would $1 billion bring us in the effort to implement NextGen? What is the current estimate of investment necessary to implement the various components of NextGen?

The Administration is focusing on an integrated series of infrastructure projects to support safe, efficient, and green aviation for the $1B marked for NextGen. Our considerations include performance navigation initiatives that will benefit the most from additional investment, create jobs from that investment, and can accelerate the development and implementation of NextGen overall.

Performance Based Navigation (PBN) may be the key to unlocking the congestion that is hampering the growth and flexibility of our nation's airspace. By optimizing the airspace and de-conflicting flight paths in and around major US cities the FAA will reopen the skies for the aviation industry. New procedures that are made precise by satellite navigation will result in fewer miles flown and reduced fuel burn and greenhouse gas emissions. The development of high performance aviation navigation includes using both new and existing technology to improve the safety, efficiency and environmental impacts on the national airspace system and linking advances in airport and air traffic controller operations to air space improvements. By placing our focus on these satellite-based routes we can create a more predictable system that will reduce delays, fuel burn and carbon emissions.

Improvements to the air transportation infrastructure resulting from these efforts can stimulate the economy in a myriad of ways not directly related to aviation. Improvements to the air transportation infrastructure will also lower operating costs and provide a better passenger experience, which support airline growth with the accompanying increase in airline jobs.

Performance Based Navigation

PBN will allow for more efficient use of airspace in terms of route placement, fuel efficiency, and noise abatement around airports. How many airports currently utilize PBN? What challenges does FAA face in implementing PBN? What is the FAA currently doing to facilitate and expedite the implementation of PBN?

How many airports currently utilize PBN?

A variety of PBN instrument flight procedures (IFPs) are currently published for hundreds of airports across the NAS. Utilization rates for some combinations of these IFPs can routinely approach 100 percent (e.g., Area Navigation (RNAV) Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARS) at large metroplex airports), but actual utilization of others may vary widely due to implementation considerations.

Type IFP	Type PBN	Airport Count
APPROACH	RNAV	809
APPROACH	RNP	90
SID	RNAV	85
STAR	RNAV	85

What challenges does FAA face in implementing PBN?

- Environmental evaluations and public controversy with new flight tracks
- Integrating PBN procedures within existing airspace constraints and system complexities
- Aircraft mixed equipage capabilities and operational approvals for PBN
- Aircraft performance differences and their accommodation in public use PBN procedure design guidance
- Development of new ATC merging and spacing tools, separation standards, associated procedures and phraseology for full implementation of PBN operational concepts
- Pilot and Controller Training

What is the FAA currently doing to facilitate and expedite the implementation of PBN?

- FAA has implemented RNAV and RNP procedures in some of the most complex airspaces in the nation, resulting in significant benefits such as increases in efficiency, reduction of delays, and reduction of fuel burn and emissions. These implementations have been in close collaboration with the aviation community, as well as between the FAA's air traffic and flight standards organizations.

- The FAA's Optimization of Airspace and Procedures in a Metroplex (OAPM) process is an expedited approach for Integrated Airspace and Procedures efforts. The framework of OAPM takes a systems approach to PBN initiatives and the design of airspace providing a geographic focus to problem solving. Developed from the RTCA's Task Force 5 report, the FAA, with stakeholder input, created a prioritization of sites for Airspace Optimization. Beginning with the first quarter

of 2010, the FAA began study efforts at two prototype sites and since then a total of seven study teams have been completed. The FAA recently began Design and Implementation efforts at the Washington D.C. and North Texas metroplexes, with Design and Implementation efforts scheduled in 2012 for Houston, Charlotte, Atlanta, and Northern California. Southern California is presently scheduled for the first quarter of 2013. A typical OAPM project can take from thirty to forty-five months from beginning to end. The OAPM team, using Houston as a prototype for expedited efforts, is attempting to reduce the total time of the Design and Implementation phase to twenty-four months.

- FAA recently completed a multi-year project to approve the use of PBN approach procedures (RNAV and RNP) in any combination with simultaneous ILS operations to parallel runways. When these new ATC procedures are operationally implemented (either later this year or early next year), utilization rates of existing PBN approaches are expected to rise significantly at affected airports. Additionally, this new capability lays the groundwork for even more beneficial PBN applications for parallel runways, including reduced runway spacing and aircraft separation standards.

- The current FAA project, Greener Skies Over Seattle, intends to provide both near-term benefits to SeaTac International Airport arrivals with new PBN procedures and longer-term benefits to many airports across the NAS once the specific PBN procedure designs can be fully implemented. Greener Skies primarily intends to prove the "RNP established" concept, as proposed by the Performance Based Aviation Rulemaking Committee (PARC). The PARC concept would enable shorter and more environmentally responsible RNP approach procedure designs to parallel runways, but requires establishment of new ATC separation standards before routine utilization can be allowed.

- In addition, the FAA initiated a cross-agency Navigation Procedures project to streamline policies and processes used to implement instrument flight procedures in the National Airspace System. This initiative, headed by the Office of Aviation Safety (AVS) and the Air Traffic Organization (ATO) used the "Lean Management Process" to identify potential improvements and to develop a set of detailed recommendations to improve and streamline the processes used for developing and implementing IFPs. In June 2011, an implementation plan was approved, with funding needs currently being identified.

STATEMENT OF

CAPTAIN LEE MOAK

PRESIDENT

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, DC

October 5, 2011

A COMPREHENSIVE REVIEW OF THE FAA'S NEXTGEN PROGRAM: COSTS, BENEFITS, PROGRESS, AND MANAGEMENT

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STATEMENT OF
CAPTAIN LEE MOAK
PRESIDENT
AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
BEFORE THE
SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
UNITED STATES HOUSE OF REPRESENTATIVES
ON
A COMPREHENSIVE REVIEW OF THE FAA'S NEXTGEN PROGRAM: COSTS, BENEFITS, PROGRESS, AND MANAGEMENT
OCTOBER 5, 2011

Good morning, Mr. Chairman and members of the Subcommittee. I am Captain Lee Moak, president of the Air Line Pilots Association, International (ALPA). ALPA represents over 53,000 pilots who fly for 39 passenger and all-cargo airlines in the United States and Canada. On behalf of our members, I want to thank you for the opportunity to provide our perspectives on the issues that are of great importance as the FAA, as the Air Traffic Service provider, and the pilots and operators who use the system, work collaboratively to modernize the National Airspace System (NAS) into the Next Generation Air Transportation System (NextGen).

The Economic Benefits of NextGen

As the budget debate rages in Washington, everyone, from our President to the most liberal and conservative members of Congress, should agree that we need to cut programs that are not providing an acceptable return on our investment and support the ones that bring back more than we put in—those that grow the economy and create jobs. These are decisions that businessmen and women make in companies large and small every day. It's fundamental to long-term success.

This basic measure of smart business spending—return on investment—should be the same in government and industry. The challenge often lies in determining where the waste is and what will bring a good return.

There is no serious disagreement on the smart investment in NextGen—it's plain that funding NextGen will bring enormous returns to the U.S. economy for years to come and equally clear that funding should commence immediately.

We need to get our economy moving again. The civil aviation industry has a critical role to play. Civil aviation, directly and indirectly, contributes more than $1.3 trillion to the

U.S. economy each year—or 5.2 percent of gross domestic product. The value of air travel—leisure and business—is a critical pillar of the economy. Hotels and resorts, conference centers, rental car companies, tourist attractions, and just-in-time deliveries are not viable without reliable, efficient, affordable air travel. In today's economy—and even more so in tomorrow's—millions of jobs depend on keeping the air travel system healthy. NextGen will increase capacity and efficiency while generating growth in our nation's airlines, aviation companies, and suppliers. This will lead to job growth at a time when our nation needs it the most.

The Safety Benefits of NextGen

Aviation safety is vital to our country and air traffic control (ATC) system modernization and NextGen is vital to the future of aviation safety.

Today's U.S. air transportation system is the safest in the world. You are about 40 times safer in an airliner than on the safest highway system in the world. But we are at a crossroads. Our ATC system is getting older and there are many systems on our aircraft that are not used to their fullest capabilities. Infrastructure is woefully outdated, the equipment's capabilities are limited, facilities are crumbling, efficiency is decreasing, and capacity is limited. These shortcomings, left unchecked, eventually have the potential to decrease efficiency and even erode safety margins, because our air traffic system and infrastructure have not been kept up to date.

Despite all that, it is a tribute to the dedication and professionalism of our pilots, controllers, and air traffic services employees that the system continues to operate safely, albeit at a slower tempo during periods of radar outages, poor weather, and mass congestion. The system we are given to work with, however, cannot keep going indefinitely.

In 1931, ALPA's founders chose the motto "Schedule with Safety." That era saw accident rates many times higher than those of today. In fact, over half the founding members of ALPA died in aircraft accidents. ALPA is keenly aware of the continuing need to improve the safety of the air transportation system. Over the past 80 years, NAS has changed greatly. Communications evolved from light signals and burning oil cans to lightweight and reliable radios to where we are now, using a data link technology akin to texting to track aircraft.

The ATC system in the contiguous United States has moved from separating flights using radio position reports to positive control using radar that extends from coast to coast.

With the introduction of the Global Positioning System (GPS), a system originally designed by the Department of Defense as a precision method to attack targets and adapted by the aviation industry, aircraft navigation is moving from a ground-based navigation system to a satellite-based navigation system and at the same time achieving unprecedented levels of positioning accuracy. GPS technology allows all types of aircraft, both large and small, to fly approaches around the world in all types of weather using purely satellite-based navigation systems.

All of these changes have two things in common. They have made air travel safer, and they were successfully accomplished when there was a collaborative relationship between the government and the private sector.

In each example, the private sector and government worked together to develop system and equipment specifications, new controller and pilot procedures, training requirements, and the development and implementation of ground and airborne infrastructure. ALPA is working actively with industry, the FAA, and the JPDO to ensure that NextGen is yet another example of a successful collaboration leading to fundamental change to the NAS.

We have a lot of work to do. It is almost unbelievable, but despite improvements in technology, a large percentage of the approximately 50,000 flights a day in the United States are controlled much the same as they were in 1960—by World War II–era ground radar stations. NextGen will completely replace our World War II–era analog, ground radar-based air traffic control infrastructure with a 21st-century, all digital, satellite-based system.

NextGen provides precision surveillance and navigation capability that will give pilots and controllers more accurate and detailed real-time information about aircraft location than is currently possible, increasing situational awareness and making the system safer. NextGen will bring precision-approach capability to locations and runways where precision approaches do not currently exist. A full list of these runways is attached at the end of this statement, but what this means is that in locations and runways like Reagan National 19, Chicago Midway 4L–22L–31C, Boston 4R–9–22R–32, and Minneapolis 4–17–22 to name a few, pilots will be given precise aircraft location and altitude information relative to the landing runway, improving safety and capacity when operating in adverse weather conditions.

Without the improved navigation accuracy possible through NextGen, we are seeing the implementation of nonstandard procedures in some locations in an attempt to gain capacity and efficiency improvements. While we have worked hard to ensure an

adequate level of safety, moving forward on NextGen implementation would mitigate the need for these nonstandard, location-specific applications. Our current system is capacity limited. Without the improved navigation accuracy possible through NextGen, we risk reducing the current safety margin for that system capacity.

The 793 ground transceivers that comprise the NextGen surveillance system will be in place by 2013, but NextGen cannot work unless the commercial airlines and private aircraft install avionics systems designed to send and receive NextGen data. This equipment, however, isn't required until 2020, a seven-year gap that could cost our economy $35 billion in reduced benefits.

Funding NextGen

The cost for NextGen, among the most significant efforts ever undertaken to upgrade the air traffic management infrastructure, has been estimated at over $40 billion initially and as high as $160 billion in some scenarios. There is little debate over the need to modernize. Industry agrees that with a price tag this high, we must get this right the first time. This is a global issue and demands a high priority.

ALPA was pleased to see the President's inclusion of $3 billion for aviation-related projects in the American Jobs Act that was presented to Congress. The bill provides $2 billion for airport-development grants plus an additional $1 billion specifically for NextGen projects. In addition, the American Infrastructure Financing Authority (AIFA), or infrastructure bank, which is established in the bill, would allow a portion of the $10 billion allocated to the AIFA to be used to support loans and loan guarantees for private financing of airports and ATC systems.

It is our hope that, if it becomes law, the $1 billion NextGen investment will serve as the tipping point for others in industry and government to move forward on this critical initiative in a serious way. But, against the total cost of NextGen what will $1 billion get you? It is like putting a quarter into a parking meter on Capitol Hill and expecting to get two hours of parking. It is not going to happen, a quarter only gets you 7.5 minutes. You are going to get a ticket or be towed—a penalty for lack of investment—and industry and consumers are penalized for not investing in NextGen with higher costs and sacrificed safety.

Another analogy, look at the home mortgage crisis in this country which is as a result, in part, of homes that were purchased with an insufficient down payment by people who ultimately could not afford their mortgage, but banks were willing to lend them money with no money down. NextGen is going to collapse, and the United States is going to be bypassed by our aviation competitors around the globe if we continue with

an insufficient down payment—the system cannot sustain itself without a committed buy-in from the government and a promise of return on investment for industry.

One billion dollars is simply not enough against the estimated price tag for NextGen. The government must step forward with a greater financial commitment and show of support for aviation here in the United States.

In 1997, while a member of Congress, former Secretary of Transportation Norm Mineta chaired the National Civil Aviation Review Committee (NCARC). The NCARC recommended that the FAA's funding and financing system receive a federal budget treatment that ensured revenues from aviation users and spending on aviation services were directly linked and shielded from discretionary budget caps. This would ensure that FAA expenditures would be driven by aviation demand. While some movement has been made on this issue, this recommendation has not been fully implemented.

With the movement toward NextGen, the issue of a sustained funding stream is even more urgent. This is best illustrated by the fact that the FAA is currently operating under the 22nd continuing resolution.

The safety of our air transportation system and the companies and workers who rely on it for their livelihood demand that Congress put a stop to the repeated short-term patchwork fixes and get an adequately funded bill passed. Operating from continuing resolution to continuing resolution does not provide the FAA with the ability to allocate money for needed ATC system improvements in a timely manner.

We urge Congress to pass a fully financed, multiyear FAA reauthorization bill, which would allow the FAA to move forward with implementing NextGen on a faster timetable. Twenty-two continuing resolutions over the past four years is simply unacceptable. The fact that partisan politics led to the FAA curtailing projects, furloughing employees, and the loss of hundreds of millions of dollars in tax revenue is unacceptable and must not be repeated.

Sustained long-term funding of the nation's airspace and air traffic control infrastructure is essential. ALPA feels that funding must be composed of a combination of federal funds and fees that require all airspace users to pay "their fair share" because all users will benefit from modernization. NextGen is simply a project that cannot be killed in midstream.

Right now our commercial airlines, through aviation taxes, pay the majority of the cost to operate and maintain this country's ATC system and infrastructure. Our airlines

cannot afford to pay the cost of operating and maintaining our current system and for the additional expense to purchase avionics equipment that may not realize its full benefit for many years. The congressional plan must pay for both operating the existing ATC system and modernizing the NAS without driving our airlines out of business. As such, ALPA opposes any new commercial aviation user taxes, disguised as fees, and calls on Congress to level the playing field for airline taxes.

And beyond funding, we need a comprehensive NextGen strategy, driven by the government. Funding from industry will not come without a clear path forward.

For example, aircraft manufacturers are currently delivering aircraft off the production line that possess capabilities that cannot be utilized either because the current infrastructure is not prepared to use the technology or the necessary operational procedures have not been approved. In addition, the government has required the installation of NextGen equipment that does not meet the end-state standard necessary to achieve the desired goal. This is irresponsible.

With a project of this magnitude and complexity, a well-coordinated, fully integrated plan, known to and agreed upon by all stakeholders, along with supporting equipment standards, is critical. Safety initiatives, as well as hardware and software projects by a wide variety of aerospace companies and the FAA are the component parts of NextGen. They must be developed in a tightly coordinated manner on specific time lines to support critical interrelationships with a variety of U.S. and international efforts.

Pilots sit literally at the intersection of new technology, operational measures, air traffic control procedures, and varying aircraft capabilities. This gives us a unique vantage point to see and experience firsthand what can happen if well-intended, but unrealistic operational procedures are instituted. Without thorough study and stakeholder involvement, complexity can increase, efficiency can decrease, and, in some cases, safety margins are eroded.

NextGen requires a new way of thinking about the NAS. No longer can we tolerate a NAS composed of a number of independent ATC systems and tools. NextGen must be an integrated blend of future technologies, procedures, and public policy reform designed to enhance system safety, increase throughput, and decrease emissions through the use of collaborative decision making and more precise and efficient flight routings and separation standards.

For the past 10 years, ALPA, during congressional testimony, speeches, press conferences, and releases has pressed for the long-term funding of the NAS and ATC

infrastructure. Every day we delay we fall further behind other regions of the world that have moved ahead without us and our airlines and their employees suffer in the global marketplace.

Transforming the NAS has been likened to changing the tire on a truck while it is underway at 70 MPH. It can be done, but it must be well thought out and it will take new technologies to make it happen. ALPA is working with the FAA and industry stakeholders to ensure that the airline pilot voice, the major operator, is a part of all discussions regarding the transition from the current ATC system to NextGen. This transition must be made without affecting the excellent NAS safety record.

Airport Surface

Since 2000, government and industry have been working together to implement a series of programs to reduce delays. These programs have had some effect in reducing delays, but more work is needed. Air traffic congestion in flight and on the ground remains a major issue, indeed the crux of the problem. There are physical limits in time and space of capacity, and a major impediment is the ground infrastructure, e.g., concrete runways, taxiways, aprons, and buildings. Each new runway takes over 10 years on average to design and build and costs billions of dollars. The impacts of noise and pollution regulations are forcing the cost even higher.

Airlines have been forced to increase the scheduled time between departing the gate and arriving at the destination gate. The flight of a propeller-driven Douglas DC-7 in the 1950s between Dallas and Atlanta had a shorter *scheduled* time than does a flight today in a Boeing 757. The extra time is necessary to navigate on the ground to and from the runway.

At some airports, airlines routinely allocate over 70 minutes just to get from the departure gate to the runway. Increased airport surface congestion increases the chances of runway incursions and possible collisions. Ground delays cost more than just the extra time. Time delays due to congestion adds costs for fuel, wear and tear on aircraft, follow-on schedule disruptions for crews and aircraft, and so forth that collectively amount to billions of nonproductive dollars lost annually due to sitting in traffic.

A 2010 research report by five universities, which was funded by the FAA, found that flight delays cost the United States $32.9 billion a year. The research also found that delays in the aviation system also create a significant drag on the economy. Delays reduced the gross domestic product by $4 billion in 2007. They also cost the airlines $8.3 billion.

Industry and government must collaborate on a series of efforts to reduce the challenges of airport surface management, including the use of ADS-B for increased surface situational awareness for both pilots and controllers. The collaborative use of flight data such as departure time of a flight from the gate and the estimated time before a flight will touchdown can be used by the airport, air traffic control, and airline managers to more effectively and dynamically manage the surface traffic of aircraft and ground vehicles.

The potential benefits of more effective surface management are tremendous. With the rising cost of fuel, less fuel will be consumed while taxiing, resulting in immediate savings. Reduced taxi time also translates into less noise and emissions. Better knowledge of exactly where the aircraft is on the surface translates into more efficient gate management and will allow the air traffic controller to arrange departures into a more efficient departure stream.

The RTCA's NextGen Mid-Term Implementation Task Force recommended that the FAA take steps to improve aircraft surface traffic management at airports. The intent would be to reduce tarmac delays and enhance safety, efficiency, and situational awareness by defining and standardizing requirements, and implementing the capture and dissemination of surface operations data to controllers, ramp towers, and user operations centers.

The FAA is in the process of addressing aircraft surface management as the Task Force recommends. They recently accelerated the ASDE-X schedule. ASDE-X enables air traffic controllers to detect potential runway conflicts by providing detailed coverage of movement on runways and taxiways. By collecting data from a variety of sources, ASDE-X is able to track aircraft ground support equipment, maintenance vehicles, and aircraft in the airport movement area and obtain identification information from aircraft transponders.

Metroplex Optimization

The Task Force also recommended that the FAA focus on relieving congestion and tarmac delays at major metropolitan area airports by reducing inefficiencies at satellite airports and surrounding airspace. This would be accomplished by instituting joint government and industry teams that focus on quality of implementation at each location and eliminating airspace conflicts with adjacent airports.

The Task Force recommended using core capabilities of RNAV, with RNP where needed; optimized vertical profiles using vertical navigation; and use of three nautical mile and terminal separation rules in more airspace.

The FAA has been working with industry towards addressing the complexities of the airspace of these metroplexes. Tiger Teams have been established to develop redesign and optimize the airspace at the Metroplexes. Over the past year, Tiger Teams completed the initial evaluations at the Potomac–Washington, D.C.; North Texas–Dallas/Ft. Worth; Northern California; Charlotte; and Houston metroplexes. They are currently conducting studies of the Southern California and Atlanta metroplexes.

These teams, composed of government and industry members, work with local air traffic control and airports to optimize use of performance-based procedures and associated separation rules that will improve throughput while also potentially reducing fuel burn, emissions, and noise.

Access to the NAS

The Task Force recommended improving access to, and services provided at, non-OEP airports and to low-altitude, nonradar airspace. They recommend doing this by implementing more precision-based approaches and departures, along with the expansion of surveillance services to areas not currently under radar surveillance. This can be accomplished through RNAV and RNP approach procedures, arrivals, and departures.

RNAV/RNP

Taking advantage of area navigation (RNAV and RNP) offers flexibility in procedure design and improved navigational accuracy available right now in many modern aircraft and can improve efficiency and reduce delays without compromising safety. However, efforts to use this technology to its fullest extent are lagging and must be accelerated.

In April 2002, FAA Administrator Jane Garvey announced the migration away from a ground-based navigation system to a "required navigation performance" (RNP) system. Airlines have long complained of sending aircraft to the bone yard with equipment capable of operating independent of ground-based navigation systems that has never been fully used. This avionics equipment was developed, bought, and installed with the hope that the capabilities could be used. However, this was an example of how the private sector and government did ***not*** work in a collaborative manner.

NextGen must take better advantage of these aircraft capabilities. Area navigation (RNAV) uses onboard avionics that allow an aircraft to fly more direct and precise flight paths, improving efficiency. This enhanced navigation capability allows greater ATC flexibility in assigning routes compared to traditional ground-based procedures. RNAV also allows ATC to put more aircraft in the same airspace safely. Using these improved procedures on departures has led to reduced departure delays, decreased taxi times, and reduced fuel burn and associated emissions. For example, RNAV operations have saved operators $8.5 million annually at Dallas/Ft. Worth International Airport and a total estimated $34 million at Hartsfield-Jackson Atlanta International Airport. Required Navigation Performance (RNP) builds upon RNAV and allows flights to land with lower minima.

Using RNP, in 2006 Alaska Airlines was able to continue 980 approaches that otherwise would have been diverted, largely due to adverse weather conditions. NextGen plans call for continued deployment of RNAV and RNP procedures, and we will begin to couple them with other decision-support tools to maximize their capabilities.

RNAV allows aircraft to fly more fuel efficient arrivals into airports. This has been demonstrated at San Francisco, Atlanta, and other airports. Aircrews receive the arrival path guidance matched to a specific flight by taking into consideration factors including aircraft performance, air traffic, airspace, and weather. In 2009, Boeing reported that the tests carried out at San Francisco International Airport showed the optimized arrivals helped the airlines cut fuel consumption by 1.1 million pounds and cut carbon dioxide emissions by 3.6 million pounds over one year.

One of the advantages of a satellite-based navigation system is the ability to expand capacity of the existing airports through greater-precision instrument approaches to all runways, not just those served by the ground-based workhorse of precision-landing approach guidance, the Instrument Landing System (ILS).

Meeting this goal will require a rethinking of the FAA's instrument procedure production and maintenance capability. Currently the FAA develops and maintains over 18,000 instrument procedures. Approximately 60 percent of these approaches are published as satellite-based procedures, and the number continues to increase. However, a large number of these are in fact, RNAV versions of existing ground-based procedures.

While we applaud this step toward reduction in the need for ground-based infrastructure, these so-called "overlay" procedures do not use the technology to

improve efficiency. The FAA must accelerate the development, testing, and implementation of true RNAV procedures in order to safely improve efficiency. In addition, the FAA is still maintaining over 900 procedures based on nondirectional beacons (NDBs), the oldest navigation technology in the NAS, and as a result, using resources to maintain ground equipment based on navigation methods that are now approaching 100 years old.

Instead of spending resources on older technologies, the resources should be spent on advancing the capabilities of the NAS. No longer can we afford to base the NAS on the lowest common denominator. Users equipped with the newest technologies should benefit instead of being penalized.

ADS-B

Fifty years ago, two airliners collided over the Grand Canyon killing all onboard both aircraft. As a result of this horrific accident, Congress demanded the establishment of an air traffic control radar system requiring commercial aircraft to be under positive radar control, that is, ground surveillance. Once again, government and industry collaborated to quickly establish a radar system across the NAS and at major airports that has evolved into the present system in use today.

In March, 2007, Administrator Blakey announced the surveillance system of the future—Automatic Dependent Surveillance-Broadcast (ADS-B). ADS-B, unlike radar, does not rely on a ground-based surveillance system of emitters and receivers. With ADS-B, each aircraft broadcasts its position along with additional information.

In May, 2010, the FAA issued a regulation requiring ADS-B "Out" equipment on all aircraft operating in certain classes of airspace within the NAS by 2020. ADS-B "Out" refers to the broadcast of the position signal by the aircraft to ground stations. The FAA has not issued a regulation proposing a time frame for the adoption of ADS-B "In," which would allow not only ground facilities, but also other suitably equipped aircraft, to receive the inbound signal.

While a radar uses ground-based signals to calculate the location of the aircraft in their airspace, by receiving better data directly from the source, that is, the aircraft, pilots are freed of many technical constraints and limitations and can make both strategic and tactical decisions on how best to guide the airplane. The new system tracks aircraft with greater accuracy, integrity, and reliability than the current radar-based system. ADS-B targets on controller screens update more frequently than radar and show information including aircraft type, call sign, heading, altitude, and speed. Controllers, and flight

crews with access to the appropriate equipment, will know the real-time position of aircraft on the ground or in the air.

Just like radar increased the air traffic controllers' situational awareness, ADS-B will increase situational awareness for everyone in the system. However, to realize the full benefit of the technology, a plan to facilitate widespread equipage of airline aircraft is essential.

Equipage for NextGen

At the Air Traffic Control Association's 55th Annual Conference, a paper with a provocative proposal to resolve what many have termed the "NextGen equipage paradox" was presented. The "NextGen equipage paradox" refers to the big problem of coordinating the FAA Air Traffic Organization's investments in ATC infrastructure with investments by aircraft operators (airlines, air taxis, fractional providers, business aircraft, etc.) needed to take advantage of the new infrastructure. Most of the benefits promised by NextGen will not be realized until a large fraction of the aircraft fleet is equipped.

Yet, based on previous unsuccessful programs, airspace users lack confidence that the FAA will make its infrastructure investments in a timely manner, making them reluctant to lay out the cash to equip their planes.

This concern is reflected in a 2010 DOT Inspector General report, "FAA Faces Significant Risks in Implementing the ADS-B Program and Realizing Benefits." (AV-2011-002, Oct. 12, 2010). The report points out that, "The greatest risks to successfully implementing ADS-B are airspace users' reluctance to purchase and install new avionics and FAA's ability to define requirements for the more advanced capabilities."

A significant challenge is the development of methodology to incentivize airlines to equip early in the process. This is the paradox. Discussions are ongoing right now on identifying the best way to incentivize early equipage. Without such plans, airlines are unable to close a business case that will allow them to responsibly equip with avionics that are crucial to the realization of systemic benefits of NextGen.

NextGen is the plan—but an architect's plans tend to work out best when the people building the house are actively engaged with the planners. That is the approach that will sustain the forward momentum if we're to achieve success.

A critical decision in all this will revolve around the aircraft capabilities needed for NextGen success. When it comes to looking at equipage, we've got to start with the

airplane. Aircraft capabilities are essential to NextGen. As we've learned from too many of the start-and-stop modernization plans of the past, decisions to implement new avionics-enabled capabilities must be made by industry and government together, and both sides need to be clear on what they're buying into and what return on investment they can achieve. Clarity on proposed aircraft capabilities is especially important and especially challenging. These must be vetted, refined, and matured by the aviation community.

Given the national significance of these challenges, partnership has to be the order of the day and everyone must weigh in. Potential capabilities only turn into system performance when both sides make the required investment. Certainly aircraft operators will play a decisive role in the resolution of these challenges.

The operators must make focused investments in the key aircraft equipment enablers required to deliver operational capabilities that are going to enable NextGen—including the avionics and other aircraft performance requirements. And operators must have some real assurance, not just wishful thinking that the investments they make in new aircraft and avionics will pay off.

We need to define exactly how the NAS could operate in 2018. We need to be able to explain how data link, ADS-B, RNP, and other existing systems will work together to make things better than they are right now. And, most importantly, we need to understand from operators how these systems can translate into business performance. After all, an industry that makes money can invest and upgrade faster than one simply seeking to survive.

An example of this is the new En Route Automation Modernization (ERAM). ERAM is the replacement for the existing host computer for en route centers. ERAM was designed with NextGen in mind. It will support satellite-based systems, such as ADS-B, and data communication technologies. This, in turn, will clear the way for future gains in efficiency and safety. ERAM has begun installations in the 20 air route traffic control centers (ARTCCs).

ERAM includes a fully functional backup system and precludes the need to restrict operations in the event of a primary system failure. The backup system also provides safety alerts and weather information not available on today's backup system. ERAM has increased flexibility in routing around congestion, weather, and other airspace restrictions. Automatic flight coordination increases efficiency and capacity.

A fully developed NextGen could eliminate as much as 15 percent of today's delays, increase safety and capacity, and concurrently reduce emissions. Funding of important research activities, like wake vortex studies, are critical to the full development of NextGen. More information about and understanding of wake vortex patterns around runways will allow spacing of traffic on the runway based on real hazards—a more accurate standard than the currently used mileage separation.

It is critical to continue funding for important infrastructure improvements including runway and taxiway additions and improvements. Poor airport design, including those with intersecting runways, increases taxi time and increases fuel use. Adding high-speed taxiway exits from runways can reduce runway occupancy time, thus increasing airport capacity. Additional runways, like those recently commissioned at Seattle-Tacoma, Chicago O'Hare, and Washington Dulles airports, reduce fuel wasted in holding patterns and long lines of aircraft waiting for takeoff.

Unmanned Aircraft Systems (UAS)

The need to modernize extends beyond simply upgrading today's ground and airborne equipment. New concepts and new technology must be integrated. Among the most dramatic changes in technology is the Unmanned Aircraft Systems (UAS).

The introduction of UAS to the NAS is a challenging enterprise for the FAA and the aviation community. UAS proponents have a growing interest in expediting access to the NAS. There is an increase in the number and scope of UAS flights in an already busy NAS. The design of many UAS makes them difficult to see, and adequate "detect, sense, and avoid" technology is years away.

Decisions being made about UAS airworthiness, pilot qualification and training, and other operational requirements must fully address safety implications of UAS flying in, around, or over the same airspace as manned aircraft, and perhaps more importantly, aircraft with passengers who have come to expect a single level of safety that is the highest in the world.

UAS are aircraft that range in size from as small as a bird to as large as a Boeing 737. They are flown remotely from an operational center or control stations that can be located at the launch and recovery site or thousands of miles away. Some are capable of "autonomous operation," meaning they follow preprogrammed instructions without direct operator control. Their pilots/operators are not currently required to be FAA-licensed pilots or even have a common level of proficiency.

Most of the current designs were developed for the Department of Defense (DOD) for use in combat areas and so are not necessarily designed, built, maintained, or operated in the same manner as other aircraft in the NAS. As a result, today they are typically flown in segregated airspace, i.e., military restricted airspace or equivalent, but have the clear potential to stray into our airspace in the event of a malfunction.

The UAS industry is currently focused on the rapidly growing DOD UAS application but is moving toward adapting current UAS to civil use. There is growing pressure by the UAS industry to gain access to the NAS as for commercial applications. In order to guarantee an "equivalent level of safety" for UAS in the NAS, extensive study of all potential hazards and ways to mitigate those hazards must be undertaken. The pressure for rapid integration into the NAS must not result in incomplete safety analyses prior to any authorization to operate.

The much-publicized success of UAS in combat operations has created a large potential market for the use of these aircraft by commercial enterprises. Many are also in use domestically by government agencies (law enforcement, customs, agriculture, etc.). However, there is currently a lack of transparency in understanding the full operational experience of UAS operated by government agencies. The civil aviation world needs to understand the difficulties, failures, and challenges already experienced in UAS operations in order to develop accurate risk analyses for UAS in the NAS.

As the number of these aircraft increase, and the potential for business use increases, so does pressure to allow their unrestricted operation in the NAS. Currently, they are operated in exclusionary airspace and not in the common areas. Before UAS can be authorized to occupy the same airspace as airlines, or operate in areas where UAS might inadvertently stray into airspace used by commercial flights, there needs to be in place a standard or combination of standards that will ensure the same high level of safety as is currently present in the NAS. We cannot afford to misjudge this issue in the name of profits.

ALPA believes that in all types of aviation, a well-trained and experienced pilot is the most important safety component of the commercial aviation system. The role of the pilot is a major area of concern within the UAS and piloted aircraft communities. These pilots should be trained, qualified, and monitored to the same standards as pilots who operate aircraft from within the aircraft. ALPA will continue to work to protect the safety and integrity of the NAS and ensure the introduction of UAS operations will not compromise the safety of our members, passengers, cargo, or the public at large.

ALPA fully supported the comments of the former FAA Associate Administrator for Aviation Safety, Mr. Nick Sabatini, when he said "that UAS should do no harm," when referring to their potential integration into the NAS. The standards for design, construction, maintenance, and operation of UAS must be developed to the point where they operate with the same high level of safety we all expect of commercial aviation before they are allowed unrestricted access to the NAS.

Summary

NextGen has the potential to revolutionize the NAS and our air transportation system, but only if private industry and government work together. By collaborating, we have made major strides in the almost 108 years since the Wright brothers first flew. However, the next 20 years could see of the most dramatic changes in the history of aviation.

Forecasted increases in air traffic of two to three times today's traffic cannot be met in today's NAS. The changes will be not be cheap or easy and will require much work and effort. Neither industry nor government can afford to attempt, or are capable of completing, this enormous undertaking alone. ALPA looks forward to collaborating with industry, academia, and government to meet these challenges.

Any measures to address NextGen's achievable goals must include the following general areas:

- **Air traffic control (ATC) modernization:** The administration and Congress should work to accelerate the FAA's NextGen plan to modernize our antiquated ATC, communications, navigation, surveillance, and management infrastructure; this is vital to safety and efficiency and can bring significant reductions in greenhouse gas (GHG) emissions.

- **Technology and research:** Industry is driven by customer demand and market forces to develop and deploy improvements to the NAS, aircraft, and engines.

- **Operational measures:** Aviation has vastly increased the efficiency of its operations to minimize GHG emissions; widespread use of GHG-saving navigation procedures such as continuous descent arrivals (CDA) or as they are also known, Optimized Profile Descents (OPD), awaits ATC modernization.

- **Ground infrastructure investment:** More infrastructure investment is required to address shortcomings at our busiest airports and improve operational efficiency.

- **Economic measures:** Positive incentives can add to the industry's efforts, but fees, charges, or taxes, whether direct or indirect, are counterproductive. Should any climate-change measures raise revenues, such revenues must be reinvested into initiatives that reduce aviation's GHG emissions.

We must have a fully funded plan that offers a systematic approach that builds on better science and improved decision support tools, advanced air traffic procedures, enhanced aircraft technology, sustainable alternative fuels, and policies to address environmental challenges. Advances in aircraft technology and renewable fuels are essential if we are to provide solutions for the energy and climate challenges for the U.S. aviation system. The close partner to this sustainable development is livability, the fourth area of this administration's priorities. In aviation, this entails a commitment to the flying public to continue to focus on the safety, convenience, and confidence of the traveling public, with minimal environmental impacts on our communities.

Thank you for the opportunity to present our views.

OEP Airport Runway Ends Without Precision Approach Capability

Airport	ID	Runways Without Precision Approach
Reagan National	DCA	19
Kennedy	JFK	13R
O'Hare	ORD	4L
Midway	MDW	4L/22L/31C
Tampa	TPA	10/28
Ft. Lauderdale	FLL	9R/27C/31
San Francisco	SFO	19R
Dallas/Ft. Worth	DFW	13L/31L
Detroit	DTW	9L/9R
Boston	BOS	4R/9/22R/32
Philadelphia	PHL	35
LaGuardia	LGA	31
Dulles	IAD	30
Minneapolis	MSP	4/17/22
Houston Continental	HOU	15L/33L
Las Vegas	LAS	1R/7L/7R/19L/19R
Phoenix	PHX	25R
San Diego	SAN	27
Orlando	MCO	18L/36L
Baltimore	BWI	4/15L
Dallas-Love	DAL	8/36
Cleveland	CLE	10
Newark	EWR	29

Before the Committee on Transportation and Infrastructure
Subcommittee on Aviation
United States House of Representatives

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Progress and Challenges in Developing and Transitioning to the Next Generation Air Transportation System

Statement of
The Honorable Calvin L. Scovel III
Inspector General
U.S. Department of Transportation

Mr. Chairman and Members of the Subcommittee:

Thank you for inviting me here today to testify on the Federal Aviation Administration's (FAA) progress in developing and transitioning to the Next Generation Air Transportation System (NextGen). As you know, NextGen involves a significant overhaul of the National Airspace System (NAS) to shift from ground- to satellite-based air traffic management. NextGen is FAA's most complex effort to date and will require multibillion-dollar investments from both Government and airspace users. Since the effort began in fiscal year (FY) 2004, we have reported on cost and schedule risks as well as challenges that FAA must resolve to successfully implement NextGen. In September 2009, a government-industry task force—established at FAA's request—made 32 recommendations for accelerating NextGen's deployment[1] (see exhibit A).

In response to the task force recommendations, FAA significantly adjusted its NextGen plans and budgets and established ways to collaborate with industry on planned actions. However, a number of program management challenges remain, including delivering near-term benefits and resolving problems with ongoing projects, all within a constrained budget environment. Today, I will discuss three challenges that will impact FAA's ability to manage NextGen's implementation and realize its benefits: (1) addressing concerns with FAA's timely execution of recommendations in five critical areas, (2) resolving technical and program management problems with the En Route Automation Modernization (ERAM) program, and (3) managing program costs and schedules with NextGen's transformational programs.

IN SUMMARY

The task force recommendations fall across several broad areas intended to enhance airspace capacity and alleviate congestion. To date, FAA has focused its attention in one critical area—improving airspace around major cities—because this effort can provide near term benefits to users by fully using equipment already onboard aircraft. However, industry and users are expressing concerns about the effort's pace and execution since FAA has yet to clarify timelines for improvements at key sites or integrate recommendations from other key areas that are critical to this initiative. Central to realizing benefits from this and other NextGen efforts, however, is the successful implementation of ERAM—a $2.1 billion system for processing flight data. Significant software-related problems have pushed ERAM's schedules well beyond original completion dates and increased costs by hundreds of millions of dollars. These problems have exposed a number of fundamental programmatic and contract management concerns. For example, despite cost and schedule deficiencies, FAA has continued to pay cost incentives to the contractor. In addition, FAA has not approved total cost, schedule, or performance baselines for any of NextGen's

[1] RTCA, "NextGen Mid-Term Implementation Task Force Report," September 9, 2009.

transformational programs nor developed an integrated master schedule for managing and executing NextGen.

BACKGROUND

To accomplish NextGen's long-term goals, Congress mandated in 2003 that FAA establish the Joint Planning and Development Office (JPDO) and create a plan for implementing NextGen by 2025.[2] While FAA's initial planning focused on this timeframe, it has more recently emphasized near- and mid-term initiatives.

To solidify commitments from both Government and industry, FAA asked RTCA[3] to examine the NextGen operational improvements planned for the 2012–2018 timeframe and help develop business cases to support and implement mid-term capabilities. In September 2009, the RTCA task force delivered its final report to FAA, which identified the following key issues:

- Users are willing to support FAA communications, navigation, and surveillance infrastructure programs that require user investments only if those programs provide a clear and unambiguous path to immediate and tangible benefits to the users.

- Focusing on delivering near-term operational benefits, rather than on the entire infrastructure, would help gain operator confidence in FAA plans and encourage users to invest in NextGen. A key element for accomplishing this is obtaining industry and FAA agreement on common metrics to measure benefits.

- Assigning responsibility, accountability, authority, and funding within the Agency is critical to accomplish all associated and necessary non-infrastructure tasks (i.e., development of procedures and policy) and to achieve NextGen benefits.

The task force made 32 recommendations across areas to take advantage of existing technologies and on-aircraft equipment. These recommendations were intended to quickly generate user benefits, support cross-cutting improvements to air traffic management and communications, and encourage operator investment and confidence within the aviation community in FAA's ability to implement new capabilities.

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[2] Vision 100—Century of Aviation Reauthorization Act, Pub. L. No. 108-176 (2003).

[3] Organized in 1935 as the Radio Technical Commission for Aeronautics, RTCA, Inc., is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. It functions as a Federal Advisory Committee.

DELAYS IN ADDRESSING KEY TASK FORCE RECOMMENDATIONS COULD DISCOURAGE INDUSTRY INVESTMENT IN NEXTGEN

FAA has primarily focused its efforts on one of the most critical areas—improving airspace efficiency around major cities. However, it has not defined when users will benefit from the effort. As a result, industry representatives have expressed concerns over FAA's execution with this and related projects—which will ultimately make them reluctant to invest in NextGen equipage and advance NextGen at key locations. Delays with this and other NextGen initiatives are likely to continue since FAA has not made critical, longer term design decisions on NextGen ground and aircraft systems.

FAA Is Responding to Task Force Recommendations but Has Made Only Limited Progress in Key Areas

FAA is addressing the RTCA recommendations, but its efforts are delayed in key areas, such as metroplex initiatives, surface operations, and data communications (see table 1).

Table 1. Status of Efforts To Address RTCA Recommendations in Five Key Areas

Metroplex Airspace - *Improve airspace affecting multiple airports near large metropolitan areas*
FAA has made the most progress in this area. FAA has identified 21 metroplex sites, developed a method to prioritize them, and completed 5 studies. However, a lack of available staffing and development of the metroplex project plan delayed the design and implementation phases for the first two sites.
Airport Surface Operations - *Improve management of airport taxiways, gates, and parking areas*
Surface demonstration studies ongoing but not integrated with FAA's metroplex plans. After 18 months, FAA is just now establishing an office for a single point of responsibility for surface.
Runway Access - *Improve the use of converging or closely spaced runways during low visibility conditions*
Runway studies ongoing. FAA adopted the task force dates and locations for closely spaced parallel operations projects but has not defined locations and dates for key recommendations (e.g., a precision surveillance system for runways and a new automated tool to maximize benefits of routes).
High-Altitude Cruise - *Improve high-altitude flight by better using available airspace to increase capacity and reduce delays*
FAA has not integrated an automated controller tool for managing aircraft with other Traffic Flow Management tools. The task force wants this completed in 2011, but FAA's target date is 2014.
Data Communications (DataComm) - *Enable more efficient use of available or forecast capacity*
FAA has already delayed this capability 2 years from 2016 to 2018. Industry needs assurance that the implementation date for en route services is solid.

Source: FAA and industry officials

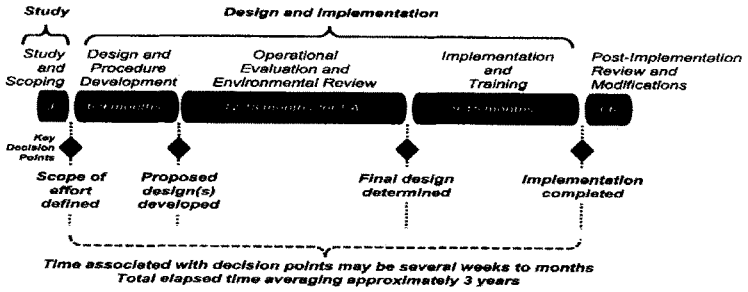
The task force remains concerned with FAA timelines for these projects. For example, the task force stated that if some DataComm capabilities are delayed to 2018, as FAA

has proposed, users will need to revisit their business cases and commitment to advance NextGen. Resolving timeline delays and location differences between FAA's plans and the task force's recommended sites will further slow progress in all of these key areas.

FAA Has Launched Its Metroplex Initiative, but Timelines, Benefits, and Methods To Integrate Key Initiatives Are Uncertain

The task force and FAA identified the metroplex initiative as a key initial area that could provide the most near-term benefits. This 7-year effort is intended to improve the flow of air traffic and reduce delays at congested airports in 21 major metropolitan areas. FAA has completed initial studies at 5 of the 21 metroplex locations and has 2 more sites under way. Work at each site will consist of study and design phases, which will take about 3 years (see figure 1). However, unresolved issues could slow its deployment, increase costs, and delay benefits. Specifically, FAA has not established definitive start dates or detailed milestones. Further, the current metroplex effort is limited and not what the task force recommended in terms of taking advantage of new technologies and more advanced procedures. As a result, airspace users are concerned about both the pace and execution of this effort. Task force and industry representatives want FAA to adopt an approach that integrates recommendations from other key areas, such as better managing surface operations at critical metroplex sites.

Figure 1. Notional Timeline for Each Metroplex Site



Source: FAA

Achieving the goals of the metroplex initiative will also require timely deployment of more efficient flight procedures. However, as we noted in December 2010,[4] FAA's new flight procedures are mostly overlays of existing routes. Airlines advocate that

[4] OIG Report Number AV-2011-025, "FAA Needs To Implement More Efficient Performance-Based Navigation Procedures and Clarify the Role of Third Parties," December 10, 2010. OIG reports and testimonies are available on our Web site at http://www.oig.dot.gov/.

FAA should develop procedures that achieve maximum benefits, such as shorter flight paths and fuel savings. FAA's metroplex initiative focuses primarily on adding area navigation (RNAV)[5] procedures and optimizing climb and descent profiles for existing routes. FAA's plans do not focus on the more advanced required navigation performance (RNP)[6] procedures to take full advantage of equipment already onboard aircraft for curved approaches. To address these concerns, FAA completed a study[7] that identified numerous initiatives for streamlining the process for deploying new procedures; however, FAA estimates it may take as long as 5 years to implement the initiatives.

FAA Has Not Made the Decisions Needed To Move NextGen From Planning to Implementation

Task force industry representatives want FAA to move from NextGen planning and demonstration to actual implementation. However, this will be difficult in terms of making the internal Agency changes required for a new system as well as defining longer term plans for NextGen. First, FAA faces significant organizational, policy, logistical, and training challenges. For example, to successfully complete its planned actions, FAA will have to work across its diverse agency lines of business, but this has been difficult in the past. As we testified in July 2009, organizational barriers and fragmented efforts hindered FAA's process to approve new flight procedures.[8] Second, FAA has not yet addressed critical decisions that affect the cost and schedule of NextGen. These include (1) what new capabilities will reside in the aircraft or in FAA's ground-based automation systems, (2) the level of automation for controllers that can realistically and safely be achieved, and (3) the number and locations of air traffic facilities needed to support NextGen. All of these elements are crucial to the success of NextGen.

ONGOING PROBLEMS WITH ERAM'S IMPLEMENTATION HAVE CAUSED SIGNIFICANT DELAYS THAT IMPACT THE COST AND PACE OF NEXTGEN

FAA's primary goals for NextGen, such as increasing airspace capacity and reducing flight delays, depend on successfully implementing ERAM—a $2.1 billion system for processing flight data. FAA originally planned to complete ERAM by the end of 2010, but ERAM continues to experience software-related problems that have pushed schedules well beyond original completion dates and increased costs by hundreds of millions of dollars. ERAM's problems are the result of a number of fundamental

[5] RNAV is a method of navigation in which aircraft use avionics, such as global positioning systems, to fly any desired flight path without the limitations imposed by ground-based navigation systems.
[6] RNP is a form of RNAV that adds on-board monitoring and alerting capabilities for pilots, thereby allowing aircraft to fly more precise flight paths.
[7] FAA's Navigation (NAV) Lean Instrument Flight Procedures Report, September 2010.
[8] OIG Testimony Number CC-2009-086, "Challenges in Implementing Performance-Based Navigation in the U.S. Air Transportation System," July 29, 2009.

programmatic and contract management concerns, and prolonged problems will directly impact the cost and pace of NextGen.

ERAM Continues To Experience Software-Related Problems, Causing Schedule Delays and Cost Overruns

Although ERAM passed testing at FAA's Technical Center and received Government acceptance,[9] testing at initial sites revealed significant software problems with the system's core capabilities for safely managing and separating aircraft. These problems include errors that display flight data to the wrong aircraft and hand-off problems between controllers at other facilities. FAA now plans to complete ERAM in 2014—a delay of 4 years—and estimates it needs an additional $330 million to complete deployment. However, a MITRE study and our analysis estimate that total cost growth could be as much as $500 million, with potential delays stretching to 2016.

Because of problems with ERAM, controllers at the key sites have been forced to rely on a large number of "procedural workarounds,"[10] such as re-entering flight information for aircraft multiple times, that have increased their workload. These cumbersome workarounds pose the risk of data entry errors and, more importantly, take the controller's focus away from managing and separating aircraft. Problems with ERAM functionality are of particular concern at sites that have complex and congested airspace such as the Chicago and Los Angeles Centers. The airspace at these locations is divided into smaller and more heavily congested sectors that do not allow controllers time to use workarounds to compensate for ERAM's deficiencies.

ERAM's persistent problems have raised concerns about the overall design of the system, especially since we have found similar problems in another critical FAA system. Our work on the Standard Terminal Automation Replacement System (STARS),[11] which shares the same aircraft tracking software (tracker) with ERAM, found similar problems with tracking aircraft and pairing associated flight plan information that ERAM is currently experiencing. After discussing our concerns with FAA, the Agency tasked MITRE with examining the accuracy and performance parameters of the ERAM tracker. MITRE plans to complete its assessment next year.

FAA is taking action to address problems with ERAM. For example, FAA recently appointed a new Director of Program Operations, created a benchmarking process for

[9] Government acceptance of ERAM by the FAA Technical Center requires meeting specific criteria established for the project baseline. These criteria include successfully completing developmental testing activities per the Statement of Work, listing all problem trouble reports, demonstrating that all contractual requirements are satisfied, and completing both functional and physical configuration audits.

[10] A workaround is a method or series of steps used to correct or deal with a deficiency or faulty capability in the ERAM software. It must be executed each time the problem occurs.

[11] STARS is an air traffic control system in use by FAA and DOD air traffic controllers to control traffic in the terminal environment. The terminal environment controls aircraft taxiing, departing from and arriving at airports within the vicinity (up to 50 miles out) of an airport. For more details, see OIG Testimony Number CC-2001-127, "Efforts To Develop and Deploy the Standard Terminal Automation Replacement System," March 14, 2001.

identifying and resolving problems with ERAM, and established user groups of subject matter experts and controllers. Yet, ERAM continues to face substantial risk for cost growth, schedule delays, and performance shortfalls as the program is deployed to more complex sites. These risks will grow as FAA and its contractor continue to add new capabilities while attempting to resolve problems in earlier software versions.

Cost growth with ERAM will also impact FAA's budget for other programs. For example, delays in fielding ERAM required FAA to maintain aging systems longer, reprogram funds from other projects, and retrain controllers and maintenance technicians who must operate and maintain two different systems. In the current fiscally constrained environment, prolonged problems with ERAM and the associated cost escalations will affect FAA's capital budget and could "crowd out" other critical programs.

Problems With ERAM Exposed Fundamental Weaknesses in Program Management and Contract Oversight

Our ongoing work shows that problems with ERAM are directly traceable to weaknesses in program management and contract oversight. Specifically:

Program Management: FAA did not establish effective program management controls during ERAM's planning and deployment stages. As a result, when significant problems occurred, FAA was not well positioned to address them. For example:

- FAA and its contractor significantly underestimated the complexity in fielding ERAM. They were overly optimistic that it could be fielded to all 20 sites within 1 year and ignored early warning signs of trouble during initial site deployment.

- FAA did not effectively manage key site expectations to initially deploy and test the first ERAM software release. FAA could perform only limited software testing at its Technical Center and therefore did not have a full understanding of the maturity and stability of the software prior to deployment. As a result, the software was released to the key sites with significant defects.

- FAA did not implement required program management tools to ensure ERAM would achieve performance and schedule goals. Specifically, the program office did not review the ERAM budget when required, and FAA's risk management process did not begin to detect and mitigate significant risks until almost 3 years after software problems surfaced at Salt Lake Center, the key implementation site.

Contract Oversight: FAA is primarily relying on a cost-plus, incentive fee contract to develop and deploy ERAM, but it is not structured to effectively manage performance and control costs. In fact, FAA's contract management vehicle not only supports but rewards and incentivizes poor program management practices. For example:

- FAA did not structure the ERAM contract into small segments of deliverables. Typically, it is a best practice to divide large-scale information technology acquisitions into smaller segments that deliver requirements incrementally. This adds flexibility for managing schedule and costs. However, the ERAM contract instead called for major deliverables—such as initial software design, development, and testing—over multiple years. Also, the contract currently identifies work to be performed into units so large that FAA cannot track individual factors that are driving ERAM's cost overruns.

- FAA's use of contract incentives did not adequately manage schedule and costs or achieve desired program outcomes. For instance, the ERAM contract pays out a cost incentive if the contractor keeps costs below a targeted ceiling. However, these incentives did not motivate the contractor to manage costs because when requirements grew, FAA simply increased the targeted ceiling for the contractor. At the time of our review, FAA had paid the contractor over $150 million of the total available cost incentives even though ERAM was at least $330 million over budget.

Continued Problems With ERAM Pose Risks to NextGen Initiatives

Despite the significant program risks and unresolved issues associated with ERAM, FAA has not conducted a detailed assessment of ERAM's interdependencies or impact on other programs' costs and schedules. Our work shows that ERAM's continuing problems could also cause significant cost growth and delays with other systems key to FAA's overall NextGen effort. These systems include DataComm, the System Wide Information Management (SWIM), and ADS-B. FAA plans to allocate about $600 million to integrate and align these systems with ERAM. ERAM delays will also affect FAA's ability to develop NextGen-related improvements (e.g., trajectory-based operations[12]) and develop and transition to a common automation platform for terminal and en route operations. In addition, ERAM delays will push back future software enhancements to add new NextGen capabilities, such as flexible and dynamic airspace redesign. These enhancements are estimated to cost over $1 billion.

[12] Trajectory-based operations focus on more precisely managing aircraft from departure to arrival with the benefits of reduced fuel consumption, lower operating costs, and reduced emissions.

COSTS, SCHEDULES, AND BENEFITS ARE UNCERTAIN FOR NEXTGEN'S TRANSFORMATIONAL PROGRAMS

Costs, schedules, and benefits are uncertain for three of the six NextGen transformational programs—ADS-B, SWIM, and DataComm. These programs will provide critical technologies and infrastructure for NextGen and allow for more efficient data sharing among airspace users, a key NextGen goal. FAA plans to spend almost $2 billion between FY 2012 and FY 2016 on these three transformational programs. However, FAA has not yet approved the programs' total cost or schedule baselines nor developed an integrated master schedule to manage and coordinate NextGen's implementation.

FAA Has Not Fully Addressed ADS-B Requirements and System Risks

ADS-B is a satellite-based surveillance technology that combines the use of aircraft avionics and ground-based systems. As we noted in our October 2010 report,[13] to realize the full range of ADS-B benefits FAA must address a number of critical issues. These include: (1) finalizing requirements for capabilities to display traffic information in the cockpit, (2) modifying the systems controllers rely on to manage traffic, (3) addressing broadcast frequency congestion concerns, (4) implementing procedures for separating aircraft, and (5) assessing security vulnerabilities. While FAA is planning to implement ADS-B in four segments, thus far it has only approved funding for the initial 2 segments to deploy the system's ground infrastructure. FAA has deployed 275 of the planned 800 radio ground station and also published a final rule mandating that airspace users equip ADS-B avionics by 2020.

FAA Faces Challenges in Establishing Clear Lines of Accountability for Managing SWIM

SWIM is expected to form the basis for a secure network that manages and shares information more efficiently among the air traffic systems that will comprise NextGen. Key benefits expected from SWIM are streamlined data communications and real-time information that will improve air traffic management, enhance airspace capacity, reduce flight delays, and decrease costs for FAA and aviation users.

As we reported in June,[14] FAA faces significant challenges with SWIM because it has not established clear lines of accountability for overseeing how SWIM is developed and managed. This has made it difficult to implement requirements and control the program's cost and schedule. As a result, FAA has already increased costs for SWIM's first segment by more than $100 million (original estimate was $179 million) and delayed its completion by at least 2 years. Without stable and consistent

[13] OIG Report Number AV-2011-002, "FAA Faces Significant Risks in Implementing Automatic Dependent Surveillance-Broadcast System and Realizing Benefits," October 12, 2010.
[14] OIG Report Number AV-2011-131, "FAA's Approach to SWIM Has Led to Cost and Schedule Uncertainty and No Clear Path for Achieving NextGen Goals," June 15, 2011.

requirements and clearly defined program priorities, FAA will not be able to define how much it will cost or how long it will take to deploy all three SWIM segments and realize expected benefits.

FAA Faces Industry and User Concerns With DataComm Plans

DataComm will provide two-way data communications between controllers and pilots that is similar to wireless e-mail. Developing and implementing DataComm will be a complex, high-risk effort, and industry officials have expressed skepticism about FAA's ability to deliver the program. Like ADS-B, DataComm faces the challenge of integrating with multiple FAA automation systems. FAA has already delayed plans to deploy DataComm's en route capabilities from 2016 to 2018. Total acquisition costs are uncertain, but FAA estimates that they could be as much as $3 billion.

FAA plans to implement DataComm in at least three segments and make a final investment decision for the first segment in FY 2012. Until FAA resolves these issues, however, users are likely to remain skeptical and reluctant to equip since FAA abandoned the similar Controller-Pilot Data Link Communications program in 2005. FAA did so due to concerns about cost growth and schedule delays resulting from unplanned, additional integration requirements that posed a risk to the program as well as concerns over how quickly airlines would equip with the avionics.[15]

FAA Has Yet To Develop an Integrated Master Schedule To Manage NextGen

FAA's approach of baselining smaller segments of larger programs, such as these three transformational programs, may reduce some risks in the short-term. However, as requirements continue to evolve, programs are left with no clear end-state and decision makers lack sufficient information to assess progress. Moreover, delays with one program can significantly slow another, since the programs have complex interdependencies with FAA's existing automation and communications systems. While FAA recognizes the need for an integrated master schedule to manage the implementation of these NextGen capabilities, it has not yet developed one. Without a master schedule, FAA will continue to face the challenges of fully mitigating operational, technical, and programmatic risks, and prioritizing trade-offs among its NextGen programs.

CONCLUSION

FAA's multibillion-dollar effort to enhance the flow of air traffic continues to experience management issues, leaving the costs, schedule, and expected benefits of NextGen initiatives uncertain. The RTCA task force's recommendations are an

[15] OIG Report Number AV-2004-101, "Observations on FAA's Controller-Pilot Data Link Communications Program," September 30, 2004.

important stepping stone to NextGen and a way for FAA to build confidence with users in its ability to deliver much needed benefits. Yet, much work remains for FAA to effectively implement the RTCA's recommendations and achieve promised near-term benefits. Unless FAA can effectively address RTCA's recommendations at already congested airports, resolve problems with ERAM, and address challenges to its transformational programs, the Agency's ability to meet NextGen goals and safeguard taxpayers' investment remains at risk.

Regardless of the funding levels Congress provides for NextGen, FAA must focus its attention on (1) NextGen budget priorities, detailed milestones, and performance goals and metrics; (2) problems with ERAM; and (3) an integrated master schedule for all NextGen programs. FAA needs to take actions now to advance NextGen and protect taxpayers' interests.

That concludes my statement. I would be happy to address any questions that you or the other Members of the Subcommittee may have.

EXHIBIT A. KEY RTCA TASK FORCE RECOMMENDATIONS FOR NEXTGEN'S MID-TERM PHASE

Rec's	Area	Recommended Capability
4	Airport Surface Operations	Improve the management of airport taxiways, gates, and parking areas by revamping systems for sharing information between FAA, airline operations centers and airports. Candidate locations include all major airports beginning with the New York area airports.
5	Runway Access	Improve the use of converging or closely spaced runways during low visibility conditions. Candidate airports include Kennedy, Las Vegas, and Newark.
4	Metroplex Airspace	Improve the capacity of airspace that affects multiple airports near large metropolitan areas, including Chicago, New York/New Jersey, and Southern California.
4	High-Altitude Cruise	Improve high-altitude flights by, among other things, increasing the availability of real-time data on the status of airspace used jointly by civilian and military aircraft. The first candidate location is Minneapolis Center.
2	Access to the National Airspace System	Improve service at smaller airports by implementing more precision approaches and departures and expanding ways to track aircraft in non-radar airspace. Full range of candidate locations is still under development.
	Cross-Cutting	
4	Integrated Air Traffic Management	Create an Integrated Air Traffic Management System that leverages new technologies and collaboration with users and implement solutions to traffic flow problems that are effectively integrated across air traffic control domains to achieve service providers' and users' efficiency goals.
5	Data Communications	Improve cruise and transition operations by using data communications to enable more efficient use of available or forecast capacity in the National Airspace System. Increase the ability to better adapt to changing conditions through improved dissemination of tactical reroutes around weather forecast and congestion.
	Overarching	
1		Achieve existing separation standards.
1		Incentivize equipage.
1		Streamline the operational approval and certification processes for new flight procedures.
1		Establish institutional mechanisms for transparency and collaboration in the planning, implementation, and post-execution assessments.
Total: 32		

Source: OIG