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CAUSES OF DELAYS TO THE FAA'S NEXTGEN PROGRAM

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BEFORE THE

SUBCOMMITTEE ON AVIATION

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

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

Bill Shuster Chairman	Washington, DC 20515	Nick J. Rahall, II Ranking Member
Christopher P. Bertram, Staff Director	July 17, 2013	James H. Zoia, Democrat Staff Director

SUMMARY OF SUBJECT MATTER

TO:	Members, Subcommittee on Aviation
FROM:	Staff, Subcommittee on Aviation
RE:	Subcommittee Hearing on "Causes of Delays to the FAA's NextGen Program"

PURPOSE

The Subcommittee on Aviation will meet on Wednesday, July 17, 2013, at 10:00 a.m. in 2167 Rayburn House Office Building to receive testimony from the Federal Aviation Administration (FAA) and the Department of Transportation Office of Inspector General (DOT IG), regarding the underlying causes of delays to the NextGen program.

BACKGROUND

More than a decade ago, Congress, the federal government, and aviation industry stakeholders began working on a program to transform our World War II-era air traffic control (ATC) system into a modern air traffic management system capable of meeting the future air traffic demands of 2025. Congress recognized that without modernizing our ATC system, the United States would be hard-pressed to remain global leaders in aviation. The concept was simple; create a more efficient, reliable, safer, and environmentally-friendly air transportation system using 21st Century technologies. While FAA has made progress in its efforts to implement NextGen, it has also experienced setbacks, including cost overruns and delays on some major programs. Additionally, several key strategic decisions that will ultimately shape the capabilities, timing, and costs of NextGen have not been made.

Over the years, the DOT IG has conducted several audits and issued numerous reports on the FAA's NextGen program and the agency's efforts to develop and implement this multi-billion dollar endeavor. Given its long history monitoring the FAA's efforts, the DOT IG is uniquely positioned to study and report the status of the implementation of NextGen, as well as evaluate potential causes for delays. In fact, the DOT IG has repeatedly raised concerns with the pace and progress of the NextGen program and has made recommendations intended to assist in keeping the program moving forward.

2010 DOT IG Report – "Timely Actions Needed to Advance the Next Generation Air Transportation System"

In June 2010, the DOT IG published a report (AV-2010-068, Timely Actions Needed to Advance the Next Generation Air Transportation System), which examined the FAA's progress in transitioning to NextGen. The report was critical of the FAA's progress and highlighted a number of improvements needed to move NextGen from planning to implementation. These improvements included (1) establishing firm requirements or reliable costs and schedules for adjustments to existing projects or new NextGen acquisitions, (2) modifying its Acquisition Management System so it can manage initiatives as portfolios, (3) addressing key safety concerns related to increased throughput at congested airports and mixed equipage, (4) assessing the ability to implement multiple capabilities concurrently, and (5) establishing a viable plan to secure the expertise needed to manage a NextGen-driven workforce.

In this same report, the DOT IG also analyzed the efforts of the Joint Planning and Development Office (JPDO), an entity housed within the FAA and established in 2003 to plan for, in coordination with government and industry stakeholders, the transition to NextGen. The report cited concerns related to inadequate budgeting, a lack of coordination in several areas between the FAA and its partner agencies, including leveraging research and development within the Department of Defense, and a failure to clearly define the role of certain industry stakeholders.

In addition to encouraging the FAA to follow through on previous recommendations provided by the DOT IG in testimony before the Subcommittee in March 2009,[1] the DOT IG made five additional recommendations intended to further reduce risk, enhance collaboration with the private sector, and advance NextGen. These recommendations include (1) assessing the risks associated with implementing multiple NextGen capabilities in the mid-term and what can reasonably be accomplished, (2) assessing risks with mixed-equipage operations and mitigation strategies and policies, (3) developing a plan to potentially utilize Department of Defense research and development for NextGen efforts, (4) expanding the NextGen Research Transition Team concept, and (5) reassessing the role and need for the NextGen Institute. Although the FAA concurred with each recommendation, more than three years later four of five recommendations are considered 'open' by the DOT IG.[2]

2013 Draft DOT IG Report – "Underlying Causes of Limited NextGen Progress"

The DOT IG continues to monitor the FAA's progress in implementing NextGen and they are currently updating their 2010 report. They are expected to publish their final report in July 2013.[3] Specifically, the DOT IG is (1) assessing the FAA's progress with meeting key milestones for achieving NextGen capabilities, (2) examining possible underlying causes for the FAA's limited progress with advancing NextGen overall, and (3) reviewing the FAA's recent reorganization and other efforts to improve the management and execution of NextGen

[1] http://www.oig.dot.gov/library-item/4988

[2] Recommendations remain 'open' when the FAA has yet to fully implement proposed actions or to provide the DOT IG with supporting documentation of their implementation."

[3] The DOT IG provided the FAA with a copy of the Exit Conference Draft of the report in early July 2013.

initiatives. The audit was initiated in July 2012. The preliminary findings conclude that while the FAA is making progress with elements of NextGen, and while many initiatives are still in the early stages of development, there are still longstanding problems with cost increases, schedule slips, and performance shortfalls with the FAA's air traffic control projects.

The current audit examines the FAA's progress in making key NextGen-related decisions, including investment, management, planning, and design decisions. It also assesses programmatic and organizational challenges and looks at the FAA's organizational culture. Areas highlighted by the DOT IG as underlying causes of the FAA's lack of progress with NextGen include:

- An overambitious and unrealistic plan for NextGen: The DOT IG points out that the initial plans for NextGen—targeted for 2025 at a cost of $40 billion—was overambitious and unconstrained, and an executable implementation plan linked to Agency budgets has proven elusive.

- NextGen design issues remain unresolved: Examples include a lack of comprehensive facility realignment and consolidation planning, which the DOT IG describes as a critical step in implementing NextGen and replacing the Nation's aging air traffic infrastructure, and insufficient progress in determining the appropriate level of automation to support NextGen efforts.

- Stakeholder skepticism: The FAA has had difficulty formulating the business case for NextGen systems, such as Performance Based Navigation (PBN).[4] The Agency has not been able to clearly define or show the benefits of PBN, and airlines and other airspace users remain reluctant to purchase and install avionics required for PBN.

- Problems with foundational programs: The FAA has had technical issues with modernization projects that are needed to implement NextGen capabilities, including delays in developing and deploying En Route Automation Modernization (ERAM).[5] The DOT IG has raised serious concerns with the status of ERAM, which has experienced extensive software problems that have delayed the effort by almost 4 years, with cost increases that could reach in excess of $500 million.

- FAA's organizational culture: A 2010 internal FAA study found that FAA "lacks a sense of urgency and exudes a 'resistance to change.'" The FAA has also been unable to coordinate across internal lines of business as well as with other agencies.

[4] Performance-Based Navigation (PBN) is comprised of Area Navigation (RNAV) and Required Navigation Performance (RNP) and describes an aircraft's capability to navigate using performance standards.
[5] According to the FAA website, ERAM is vital to the future of air navigation, providing the platform required for the FAA to evolve to NextGen, via programs including System Wide Information Management, Data Communications, and Automatic Dependent Surveillance-Broadcast, which depend on a successful ERAM deployment.

- Changes in leadership and lack of clear lines of accountability and authority: Due to delays in replacing key NextGen leadership positions and an inability to clearly define roles and responsibilities, there has been no consistent FAA mission or vision for NextGen. However, it should be noted that last month FAA appointed a Deputy Administrator who will serve for a 5-year term as Chief NextGen Officer in accordance with section 204 of the FAA Modernization and Reform Act (P.L. 112-95).

The current DOT IG audit also takes a close look at the FAA's reorganization, such as elevating the Director of the JPDO to Associate Administrator and establishing a Chief NextGen Officer. It updates previous work by the DOT IG regarding the FAA's progress in defining clear lines of responsibility, accountability, and authority, and the agency's ability to develop performance metrics (also mandated by the *FAA Modernization and Reform Act*) to measure success and progress, including whether or not the expected outcomes were achieved.

The DOT IG's current audit points to the need for the FAA to provide sustained leadership, identify clear lines of accountability and authority, and set realistic expectations and priorities. The DOT IG's final report will include recommendations to help the FAA provide greater visibility and understanding of critical NextGen decisions and achieve a successful reorganization.

WITNESS LIST

Panel 1

The Honorable Michael Huerta
Administrator
Federal Aviation Administration

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

CAUSES OF DELAYS TO THE FAA'S NEXTGEN PROGRAM

WEDNESDAY, JULY 17, 2013

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. Frank A. LoBiondo (Chairman of the subcommittee) presiding.

Mr. LOBIONDO. Good morning. The subcommittee will come to order. I thank you all for being here.

One of the priorities of the subcommittee is to ensure that the U.S. maintains a modern, safe, and efficient aviation system now and into the future. Our current system simply cannot meet future air traffic demands. Over the last decade the FAA has been developing and more recently implementing a program to meet these demands, generally known as NextGen.

Let me be clear, I completely support the NextGen program. I am very fortunate to represent the FAA Technical Center in my district, which is the Nation's premier aviation research and development, test and evaluation facility, and the primary facility supporting NextGen, as well as many other vital aviation safety initiatives.

I have seen firsthand the development of technologies at the Tech Center that are now being deployed and in use in the National Airspace System. These technologies, many of which contributed to the survival of so many passengers aboard the Asiana flight 214, are improving the safety and efficiency of the civil aviation system. That is why I believe that the validation and testing of NextGen and other critical safety and modernization initiatives should continue to be conducted at the Tech Center.

However, I also know that there are serious concerns regarding the FAA's ability to effectively and efficiently implement NextGen. I have heard that some "transformational" NextGen programs aren't truly transformational, that the FAA will never make the tough decisions required to advance NextGen, and that nobody can really agree what NextGen is today or what it should be in 2025.

These concerns should not be downplayed, ignored, or outright dismissed. Whether or not you agree with them is not relevant. We—and the taxpayers, more importantly, and airspace users—have invested billions of dollars in NextGen, and it is clear that billions more will need to be invested. Every concern should be acknowledged, reviewed, and properly addressed.

I also want to make clear that I am not pointing the finger at any specific person for perceived or actual problems with NextGen. In particular, Administrator Huerta, this is not directed at you. But the NextGen program is a decade old, and there are a lot of people that share the responsibility for what has taken place or what has not taken place, including people within the FAA, the aviation industry, and Congress itself for what we maybe have not done or not done as well as we should have done.

The inspector general is here today to outline a number of problems with advancing NextGen that he and his inspectors and auditors have identified. I look forward to hearing his findings and recommendations. This report provides an opportunity for all of us to hit the reset button and make sure that we are headed in the right direction, in the most efficient and effective way, and with the best outcome. We have to plan appropriately, in particular with the upcoming budget constraints which could have a big impact on all FAA operations.

I expect DOT Secretary Foxx, Administrator Huerta, Deputy Administrator Mike Whitaker, and industry stakeholders to work together to get the program back on track, yielding the benefits that all of us want to see.

Most of you know that by now my door is always open, and if there is anything that I can do, or more importantly we as the committee can do, we hope that you do not hesitate to ask.

I also want to add that I have worked very closely with Congressman Larsen over the years, and especially now with this session of Congress, with this Aviation Subcommittee, I think we are of exactly the same mind with our focus and direction and how we would like to see things move forward.

So with that, Rick, I will now yield to you for your opening statement.

Mr. LARSEN. Thanks, Frank. And I want to thank the chairman for calling today's hearing to review the implementation of NextGen.

Mr. Chairman, you and I have led this subcommittee for only a few months, but I believe we are both committed to making sure that the FAA's NextGen effort succeeds, and this subcommittee must provide the FAA with the authority and resources that it needs to be successful. We also have to provide vigorous oversight to ensure necessary corrections to guarantee NextGen stays on track.

And if you will allow me just to divert briefly from my prepared remarks, in looking at the testimony of both Administrator Huerta and Inspector General Scovel, it reminds me of a term that I think law enforcement uses to describe when two or more people look at the same crime scene or the same crime incident, and conclude two or three or four very different things happening. It is called the Rashomon effect. And reading the testimony from both folks, it seems like two people are looking at the same thing and coming up with two very different conclusions about what happened.

Now, the term "Rashomon" is from the movie by Akira Kurosawa, some might know, called "Rashomon." And it details a very tragic incident that happens and it really gets down—in the

movie it really—it sort of devolves into the cesspool of existentialism about what is the truth and what is the meaning of truth.

I hope we don't get to that point in this hearing about what is NextGen and what are the concerns with it. Otherwise, we may be in a lot of trouble. But I do think that we have to provide some pretty aggressive oversight to get at what are the actual problems and what are the next steps that we do need to take.

The FAA has clearly made some progress in its efforts to implement NextGen. For example, the agency has advanced the ADS–B program that will be the NextGen satellite-based successor to radar for tracking aircraft. FAA has deployed more than 500 ADS–B ground stations and is on track to deploy all 700 ground stations on time in early 2014.

But it has experienced setbacks. According to the inspector general, a $330 million cost overrun and 4-year delay on the ERAM, or En Route Automation Modernization program, has delayed the start of new NextGen programs. And after examining the inspector general's report, I am concerned that without changes, delays in NextGen may force us to rename it LastGen. We have a lot of work to do.

The FAA's approach to implementing NextGen has changed since Congress tasked the FAA with transitioning to NextGen a decade ago. For example, in 2005 the administration at the time requested and received cuts to the FAA's capital account, leading to the termination of some early efforts to achieve NextGen capabilities.

In 2009, FAA shifted its strategic focus to delivering NextGen benefits to airspace users in the midterm 2018 timeframe. The FAA took this action at the urging of industry stakeholders who participated in the RTCA's Midterm Implementation Task Force. Yet, while the FAA has been working to maximize early NextGen benefits, the inspector general will testify this morning that the FAA has not made several key long-term decisions that will ultimately shape the capabilities, timing, and costs of NextGen.

So therefore I look forward to hearing Inspector General Scovel and Administrator Huerta's explanations of the reasons why these long-term decisions have not been made. Additionally, I want to hear how the FAA intends to respond to budgetary pressures that will undoubtedly affect future NextGen implementation. In May, the chairman and I hosted a NextGen listening session where industry participants told us the FAA stood down its NextGen metroplex initiatives due to sequestration.

In response, I wrote to Administrator Huerta asking him to explain that situation and have yet to receive a formal reply. So I do look forward to hearing Administrator Huerta's answer providing the subcommittee with an update on this issue.

And last month, the House Appropriations Committee reported a fiscal year 2014 transportation appropriations bill with historically low capital funding levels for the FAA. H.R. 2610 would provide $2.1 billion for the FAA's facilities and equipment account for 2014. That is 22 percent less than the Administration's request. Moreover, it is a cut below the 2013 post-sequester funding level and the authorized 2014 funding level this committee provided in the FAA reauthorization.

The House transportation appropriations bill would provide the lowest level of capital funding for FAA since the start of the NextGen program and the lowest level since 2000. Clearly, the Administration is expecting budget cuts to have a significant impact on NextGen. Last Friday Administrator Huerta asked the RTCA Advisory Committee, the NextGen Advisory Committee to develop a prioritized list of NextGen activities that will be triaged due to budget cuts and sequestration. And I want to hear the Administrator's explanation why he asked the NAC to undertake this project and how it will influence NextGen strategy.

On a positive note, we now have stable leadership for NextGen that we have not had in the past. Administrator Huerta, who led the NextGen effort for years, was sworn in for a 5-year term as Administrator late last year, and just last month the Obama administration appointed a Deputy Administrator who will serve a 5-year term as the chief NextGen officer, as required by the FAA bill.

Mr. Chairman, NextGen's success will rely on a strong partnership between Government and industry. As an airline industry veteran, Deputy Administrator Whitaker is well positioned to reach out to the industry stakeholders and leverage the collaboration needed to move NextGen forward.

So with that, Mr. Chairman, I want to thank you for the opportunity to provide an opening statement, and look forward to hearing from our witnesses.

Mr. LOBIONDO. Thank you, Rick.

With that, I 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 would like to turn to our panel.

And first, Administrator Huerta, welcome, and we look forward to your statement.

TESTIMONY OF HON. MICHAEL P. HUERTA, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION; AND HON. CALVIN L. SCOVEL III, INSPECTOR GENERAL, U.S. DEPARTMENT OF TRANSPORTATION

Mr. HUERTA. Thank you, Chairman LoBiondo, Ranking Member Larsen, and members of the subcommittee. I appreciate the opportunity to testify before you today on the progress we are making with NextGen.

Mr. Chairman, before I begin my testimony I want to express that our thoughts and prayers are with the passengers and crew of Asiana flight 214 and their families. I am sure the committee appreciates that the ongoing accident investigation is in the early stages, and I am not able to speculate about the cause of the crash. The FAA is fully supporting the investigation of the National Transportation Safety Board and we will continue to do so throughout the process.

We are also fully supporting the NTSB investigation into the crash of an air taxi in Alaska earlier this month. Our thoughts and prayers are with those families as well. And we are participating in the investigation of the fire aboard the Ethiopian Airways Boeing 787 in London last week. The FAA has sent a specialist to

Heathrow Airport in support of the British Government's investigation into that incident.

Safety is our mission at the FAA, and we are working to continuously enhance our policies and procedures. Last week we issued a new rule requiring more hours of experience for first officers who fly for U.S. airlines, and we are also requiring that first officers earn a type rating, which involves additional training and testing specific to the aircraft they fly.

The Next Generation Air Transportation System is helping us to enhance safety and efficiency by transforming our aviation infrastructure. NextGen technologies guide aircraft on more direct routes, they save fuel, and decrease delays. That is not only good for the environment, it saves the airlines money, and it is good for business.

We are delivering the objectives of NextGen as promised. We have consistently met more than 80 percent of our implementation milestones over the last 5 years, which is extraordinary when dealing with a complex technological program. Overall, NextGen is on track, and yes, there have been delays, but we have learned from these and incorporated those lessons in the way we move forward.

We are making all of these improvements in a very dynamic operating environment. We have found that collaboration is the key to success and to providing the best benefit to all stakeholders. We have a detailed plan to implement NextGen, and this plan is integrated into our enterprise architecture for our entire National Airspace System. At the same time, we are flexible enough to adjust our course. This approach is working and we are delivering benefits to our stakeholders now.

A good example is Memphis, where we have increased airport capacity by more than 20 percent since last fall. By working with our partners we were able to revise wake turbulence separation standards. This allows aircraft to safely depart, one behind another, slightly closer together than before.

In Atlanta, we work to safely allow jets to take off on headings that are slightly closer together. This small change has resulted in a 10-percent increase in departures per hour from the world's busiest airport. We estimate customers have saved more than 11,000 hours of waiting in line to take off last year thanks to NextGen.

We expect these improvements will save the airlines $20 million this year in Atlanta alone, and we intend to bring this type of efficiency to other major airports. We have brought together all of our stakeholders—airports, airlines, our air traffic controllers, managers, and other Federal agencies—to decrease congestion in the airspace over busy metropolitan areas nationwide. Through the metroplex initiative we are working in north Texas and Houston, northern and southern California, Atlanta, Charlotte, and right here in Washington, DC. Airlines flying into the DC metro area have started using these NextGen procedures. We estimate they will save $2.3 million in fuel per year and cut greenhouse gas emissions by 7,300 metric tons. And these benefits will increase as we develop more procedures.

Just as industry depends on us to deliver the best benefits now, we depend on industry to share information with us to help us measure the benefits that NextGen provides. As I said earlier, col-

laboration is key. Only by investing the time, dedication, and commitment, will we continue to see the best benefits.

Mr. Chairman, last year Congress reauthorized the FAA for 4 years and laid out a vision with bipartisan consensus to address the future needs of our aviation system. These needs have not gone away. Yet, under the sequester and the current climate of fiscal uncertainty, the FAA needs to make sizeable budget cuts that affect our operations, NextGen, and our future.

This uncertainty undermines the roadmap that the FAA and Congress laid out for NextGen. It was only last year that we all agreed that these goals were extremely important to protect the great contribution that civil aviation makes to our national economy.

We are facing many challenges, but we must stay the course. Our aviation system needs these improvements, and the cost of not doing them is far greater than the cost of moving forward. It is important for us to work together to ensure that the United States continues to lead the world in aviation technology.

Mr. Chairman, this concludes my prepared remarks, and I would be pleased to answer any questions you may have.

Mr. LOBIONDO. Thank you, Administrator Huerta.

Our second witness today is Department of Transportation Inspector General Mr. Calvin Scovel.

Inspector General Scovel, you are recognized for your statement.

Mr. SCOVEL. Chairman LoBiondo, Ranking Member Larsen, members of the committee, thank you for inviting me to testify on FAA's NextGen program.

Transforming our Nation's aging air traffic system is critical to meet the increasingly complex demands on airspace while maintaining the highest levels of safety. While FAA has made progress since it launched the program a decade ago, such as responding to a Government-industry task force, publishing a rule on ADS–B, and establishing a new organizational structure, many NextGen initiatives are still in the early stages of development. My testimony today will focus on three priorities for advancing NextGen: addressing the underlying causes for limited progress, maximizing near-term benefits, and successfully implementing critical automation systems such as ERAM.

A number of weaknesses have contributed to the problems in advancing NextGen. FAA's original plans for NextGen contained in its 2005 progress report to Congress did not establish priorities, fully develop requirements, specify how technologies would be developed or integrated, or address implementation costs. By 2009 both FAA and industry recognized and agreed that FAA's initial goals of completing NextGen by 2025 at a cost of $40 billion would not be possible.

Developing adequate plans with realistic expectations still remains a challenge, largely because FAA has yet to make critical design decisions that will serve as the foundation for NextGen's future. For example, FAA has yet to decide on the level of automation needed to manage air traffic and how much responsibility for separating aircraft should be delegated to pilots and what should remain with air traffic controllers. These decisions will significantly impact NextGen requirements, capabilities, timing, and costs.

Organizational instability and gaps in leadership have impeded implementation and further undermined FAA's advancement of NextGen. Establishing clear lines of accountability and authority will be key to securing progress. FAA's recent reorganization, the third in less than 10 years, is a step forward to improve NextGen's management, but ultimately the key to success will be in FAA's execution.

Securing stakeholder buy-in is another significant roadblock to advancing NextGen. Industry representatives and other stakeholders continue to express skepticism that FAA will be able to deliver planned capabilities. Until FAA clearly defines how NextGen technologies will benefit users, air carriers will remain reluctant to invest in costly NextGen equipment.

A key component to gaining user support for NextGen will be integrating new performance-based navigation routes and procedures at major airports. Navigation procedures, such as RNAV and RNP, can provide significant near-term benefits, including reduced congestion, more direct flight paths, and fuel savings.

FAA has made progress in designing new advanced procedures at busy airports. However, implementing them has been delayed due to obstacles such as a lengthy procedure development process, outdated controller procedures, and limited training for controllers.

Moreover, air carriers are not widely using procedures that have been implemented. For example, at the six large airports in Chicago, New York, and Washington, where FAA has implemented curved runway approaches, only about 3 percent of eligible flights have used them, due in part to a lack of tools to help controllers manage aircraft using varying routes and equipment.

Finally, NextGen's success will depend on effectively implementing automation systems for controllers that will enable key NextGen capabilities, including the use of satellite surveillance and data-link communications. For example, FAA's efforts to modernize automation systems at 11 large terminal facilities may cost much more and take longer than estimated because the agency has not finalized software and hardware requirements.

FAA faces similar challenges in implementing its multibillion-dollar ERAM system, which processes flight data at en route facilities. FAA has worked hard to resolve previous software problems, and controllers are now using ERAM at 16 of 20 sites, at least part-time. However, considerable work remains to complete the effort by 2014 as planned. In addition, the ERAM contract currently costs about $12 million a month, and if this contract burn rate does not decrease significantly, FAA will need additional funds to complete the program.

NextGen is at a critical juncture. Near-term operational benefits are needed to gain industry confidence in FAA's plans and encourage users to invest. Sustained leadership with clear lines of authority and accountability is key to developing an executable plan that is linked to the agency's budget and that resolves underlying causes for delays.

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

Mr. LOBIONDO. Thank you. Thank you, Mr. Scovel.

Administrator Huerta, the FAA Technical Center has been the primary facility for testing and evaluating NextGen technologies. Do you see that role changing for the Tech Center in the future?

Mr. HUERTA. I don't. The Tech Center serves a very important role for the FAA. It is our principal test bed. It is a place where we test deployment of new technology, where we do a lot of human-in-the-loop simulations, and where we run operational tests. I don't see that changing at all.

Mr. LOBIONDO. OK. The FAA is blessed with great talent at many different levels, and I have seen the outstanding work sort of up close and personal and the dedication at the Tech Center. How does the FAA plan to continue to utilize the expertise at the Tech Center to advance NextGen?

Mr. HUERTA. Well, the Tech Center serves for us as our principal test and evaluation platform. And in that capacity, it plays an important role in integrating the deployment of technology into the actual operation that is ultimately going to take advantage of this.

NextGen is more than just a technological platform. It actually has to be workable for the users of the system. And so, in addition to ensuring that the technology will be useful for supporting our needs for air traffic in the future, we also have to understand everything involved in making it operational within the real world environment, and that is where the human-in-the-loop piece comes in. The Tech Center really is the place where all of those things come together, which enables us to make the determinations and the decisions as to how we actually deploy technology in the field.

Mr. LOBIONDO. I hope you can clear something up for me. On a couple of previous occasions we have asked you about the status of the facility's realignment and consolidation plan, which is required under the Modernization and Reform Act. And I believe you indicated that the plan was underway, and that the FAA was looking at the whole country; in other words, to be a very comprehensive plan. In the IG's written testimony, he indicates that the FAA has scaled back its plans and will focus only on an integrated facility in the New York metropolitan area. Could you clarify for us what the FAA is doing in terms of developing a comprehensive plan and how that meets with the mandate?

Mr. HUERTA. Sure. Those are two different things. For years, as you point out, we have looked at the question of how to realign and consolidate aging facilities. And we appreciate the thought and vision that went into the process that was outlined by Congress, and we recognize that you provided us with an important tool.

As I have testified previously, we do have underway a very significant effort where we are looking at the whole country, and what we are doing is that—as you know, we have had difficulty in achieving consolidation of facilities in the past. And so to address the previous shortfalls that we have had in this area for facility consolidation, the FAA has taken a holistic approach, including our workforce and subject matter experts in developing the process and recommendations that will guide realignments of future facilities.

We have a multidisciplinary work group of FAA and workforce representatives, and they are developing a process and recommendation for evaluating our existing terminal air traffic facilities for potential realignments. The draft process and initial rec-

ommendations have been briefed to several industry stakeholders, including the National Academy of Sciences and the National Customer Forum, which includes representatives of the airlines and of general aviation.

Now, I recognize that developing this approach has been slower than what Congress has asked for. It has also taken longer than I would have wished, slowed in part by the management and financial challenges that we have faced. That said, we are creating an approach that has the ability to deliver much more efficient and effective infrastructure for the FAA.

I anticipate that we will work with you here in this committee, in Congress, and with the aviation industry, to evaluate operationally viable scenarios for facility realignments and consolidations, and we look forward to briefing the committee on this.

Mr. LOBIONDO. Thank you. And the last question, Mr. Huerta, which I will ask you to, for the record, to provide the subcommittee in writing with a detailed status, and that is on performance-based navigation, I think we all can agree that is a cornerstone of NextGen. When you testified before this subcommittee earlier this year, you stated that the FAA's two reports on implementing performance-based navigation as required under the Modernization and Reform Act were forthcoming. So if you could provide to us in writing in detail we would appreciate that so we can review where that is.

Mr. HUERTA. Absolutely. [1]

Mr. LOBIONDO. OK.

I have, Mr. Scovel, I have questions for you, but in deference to the other committee members, I will now turn to Mr. Larsen.

Mr. LARSEN. Thank you, Mr. Chairman. I actually will start with Inspector General Scovel.

In my opening statement, I discussed the proposed House transportation appropriations bill to provide $2.1 billion for a facilities and equipment account for FAA. If enacted, that would represent the lowest capital funding level for FAA in the history of the NextGen program. In your view, how would those proposed funding levels continue to affect the implementation challenges that exist in NextGen?

Mr. SCOVEL. Mr. Larsen, we have conferred with FAA on that specific matter, as well as your staff. Our understanding is that at those funding levels the agency would be required to constrain its efforts greatly in regard to NextGen and in fact would have to devote almost all of its attention and much of its funding permitted by Congress to simply sustaining the current system as it exists today.

Mr. LARSEN. Administrator Huerta, could you comment on my question as well?

Mr. HUERTA. As you know, there are various components to our budget. The House bill increases operations funding enough to maintain day-to-day NAS operations, but it does jeopardize both near-term and long-term capital investments that are needed to rebuild the aviation system in the future.

[1] Please refer to Mr. Huerta's status update in response to Hon. LoBiondo's question number 5 on page 48.

In particular, as the inspector general pointed out, the facilities and equipment account is where we have the greatest concern; the House appropriation bill is $623 million below the President's budget request and $439 million below what we have in fiscal year 2013.

The House level would provide the lowest F&E funding level since 2000, as you pointed out in your opening statement. It includes both targeted and undistributed reductions, specifically $259 million of targeted cuts, of which $43.6 million, or 4.7 percent, is from NextGen programs, and $214.9 million, or 11.6 percent, from legacy programs. But there is also $364.3 million of an undistributed reduction, and alternatives for this allocation are being developed by our capital team.

What this forces us to do is to make tradeoffs between continued maintenance of the current infrastructure and NextGen modernization efforts. The focus would need to be that a state of good repair is maintained, and NextGen capabilities supporting information sharing and programs that are nearing completion in fiscal year 2014, which provide near-term improvements, would be taken to completion. However, the NextGen programs just getting underway would likely need to be suspended.

A NextGen slowdown would affect the economy. An Aerospace Industries Association study found that a reduction of 30 percent in the NextGen funding could result in up to $40 billion in lost economic output by 2021. It could cost 700,000 jobs by 2021 and as many as 1.3 million by 2035. I recognize these are difficult tradeoffs, but as I said in my opening statement, it winds up costing far more in the long term if we delay NextGen now.

Mr. LARSEN. And those, the budget numbers are numbers you lay out before the 2014 sequestration numbers kick in?

Mr. HUERTA. Yes, this is based on the House mark. Under a sequester scenario there are different flavors of it, and part of it depends on how the appropriations bills come out for the entire Government and whether they are consistent with the Budget Control Act.

Mr. LARSEN. Yeah.

Mr. HUERTA. Under a scenario where we would start the year on a continuing resolution with no anomalies, in an F&E context we would actually be somewhat better off than this, but far worse off in the operation account.

Mr. LARSEN. Yeah, right. Right. Last Friday you asked the RTCA NextGen Advisory Committee to develop a prioritized list of NextGen activities that would be triaged due to budget cuts and sequestration. Would you explain why you asked NAC to undertake that project and how it will influence FAA's NextGen strategy, Administrator.

Mr. HUERTA. We have had a lot of discussions in our industry consultation through the NAC and through other forums about the general climate of fiscal uncertainty. As you and the chairman and other Members have all mentioned, we are operating under significant fiscal constraints as a country as a whole. The industry has indicated, and we have agreed, that it would be prudent for us to have a clear sense of our key priorities to ensure that we have the

maximum level of focus as we enter this more uncertain fiscal climate.

As a general matter, I think that we all agree that we are in a far better place in a constrained fiscal environment if we are focusing on a state of good repair and perhaps needing to consider doing fewer things but doing them well, and seeing them through to completion, as opposed to an across-the-board reduction which only has the effect of delaying everything and jeopardizing benefits for delivery to the aviation community.

What we are asking the NAC is, as an industry group which represents air carriers, general aviation, suppliers, manufacturers, where do they think the greatest focus needs to be placed in order to minimize the impact of sequestration. As we consider the tradeoffs here, what advice would they offer us on what our highest priorities should be?

Mr. LARSEN. Thank you, Mr. Chairman. And when I get to a second round, to the extent that other Members don't touch on the differences in testimony, I will explore that. Thank you, Mr. Chairman.

Mr. LOBIONDO. Thank you.

We will now turn to Mr. Williams.

Mr. WILLIAMS. Thank you, Mr. Chairman.

I want to thank both of you for being here. Thank you today.

I am from Texas, I am a business guy, and I look at everything like a business. In my district I have got Dallas/Fort Worth Airport and Austin-Bergstrom, among a lot of smaller ones, so I am rooting for you. But I have a question, two questions actually, to you, Administrator. In reading the IG's comments, they mention about organizational culture has been slow to embrace NextGen's vision. And as a business guy, when you don't believe in the product, it is hard to sell it. It is hard to get involved in it. I know about that because I still use this flip phone, and I need to get away from it.

And so what are you doing to have your folks understand that this is the future of where we are heading and to get them embracing it?

Mr. HUERTA. Thank you, sir. I would like to answer your question in two parts. First of all, the question of why is it the way it is, and then what are we doing about it.

I think it is important to recognize that the FAA is governed very much by a safety culture. Everyone is very focused on maintaining the highest levels of safety in our aviation system. And what that leads to is a level of caution against trying things that are different, for a very important reason: Individuals are concerned about messing something up. We have a system that provides the highest levels of safety, and there is a general belief that we want to ensure that in deploying anything new that we are not in any way compromising safety. That is not at all to suggest that things don't need to change. We can always raise the bar on safety, and change is a big part of that.

What we have found is that the best approach is through the collaborative processes that we have implemented in the last couple of years working with industry and working with our own workforce to actually do the very hard work of grinding through, what

we want to deploy, what questions and concerns stakeholders have, and how to respond to them in a real way.

That is the approach that underlies how we got ERAM back on track. We are now operating it in 16 of our air traffic control centers. That is the framework through which we are deploying advanced navigation procedures in north Texas and elsewhere, and we are actually reducing time associated with the delivery of those procedures and directly addressing the point made by the inspector general that publishing a procedure alone is not enough. You actually have to work with the operators to ensure that they have the tools that they need to actually deploy it.

What we are finding is that we need to work with all of the stakeholders. We can't simply publish a new procedure and just issue an order and say make it happen. We really need to work through the full scope of the operation, and we need to be responsive to the questions and concerns that are raised by all the stakeholders in the system.

Mr. WILLIAMS. Well, get them going. I will dump this flip phone if you will get NextGen cranking, OK?

Mr. HUERTA. That is a deal.

Mr. WILLIAMS. All right, second question. I am also concerned as a business guy about what we see and what we call organizational instability, which the IG also talked about, inconsistent leadership surrounding the program. I know that you are filling some administrative areas, but it has been slow in doing that. And can you explain why there has been so many reorganizations and are we moving in a direction where we are going to have a full team?

Mr. HUERTA. I can speak to what has happened over the last couple of years for those that I have been a part of. When I originally joined the agency as Deputy Administrator, it was with the thought that I would oversee the NextGen portfolio. And as you know, I stepped into the Acting Administrator role soon after that.

Since then, FAA reauthorization called on us to appoint a chief NextGen officer. We did bring in a new Deputy Administrator earlier this year, once I was confirmed as Administrator, and we did name Mr. Whitaker as chief NextGen officer. He is now in the process of filling out his team, and we are very close to naming a new Assistant Administrator for NextGen as part of the organizational restructuring that the IG touched upon. We implemented that restructuring a couple of years ago and it was very focused on elevating the profile of NextGen, taking it out of the ATO, and ensuring that it had the specific authority that the IG has mentioned in his testimony to work across all the lines of business of the FAA.

I think that we are actually making very good progress. It has taken longer than I would like. Part of that was driven by the fact that for a long time I was two-hatted, serving both as the Administrator and effectively the chief NextGen officer. But I think that we are well launched to getting to where we need to be organizationally.

Mr. WILLIAMS. That is good to hear. We need nine men on the field of play.

Mr. HUERTA. Absolutely.

Mr. WILLIAMS. Thank you. Appreciate you coming by, appreciate your testimony. I yield back.

Mr. LOBIONDO. Mr. Capuano.

Mr. CAPUANO. Thank you, Mr. Chairman.

Gentlemen, I have been hearing about NextGen since the day I got on this committee, actually a little bit before that, and it sounds great. And I am one of those supporters because pretty much everybody I have talked to looks me in the eye and says, great idea, great program, I am for it.

But I am starting to wonder. I mean, it has taken a really long time to roll that out. Everybody seems to be dragging their feet, not just the FAA, if you want the truth. Everybody is pointing to everyone else about somebody else's responsibility to pay for this or get this done.

And I am starting to wonder to myself, especially now with sequester, if we are not going to be able to do, if we haven't been able to, and we are not likely to be able to do what we had originally wanted to do, why isn't it time to just kind of take a deep breath, not because the proposal is a bad proposal, but the situation has changed. There is obviously more problems.

I mean, I like the idea that change and these kinds of things take second place to safety concerns. I don't have any problem with that concern. But it is obviously not what I had been led to believe 10 years ago, or 6 years ago, or 2 years ago, or 6 months ago.

Is it not time to just kind of take a deep breath and for everybody just to relax, step back, look at where we have been, look at the moneys that we currently have, look at the problems that we have already faced and encountered, and still face and encounter, and say, you know what, maybe we have to make it a little longer, maybe we have to focus in on a few airports first, maybe we need to do something different so that we can actually live up to the expectations that we set forth?

And I don't think that is a bad thing. I don't even think it is an anti-business thing. There isn't a businessman in the world that I know of that hasn't made a change in their investment plans or their business plan because they run into unforeseen obstacles. And I don't personally think that is a criticism of the proposal. I don't think it is a criticism of anybody or anything. It is just simply an acceptance of the reality.

And I am just wondering what you think of that concept, Mr. Administrator, the idea of taking a deep breath, kind of getting everybody back in the room again and say, OK, here we are today, here is where we all want to go, how do we from this point forward, not based on a plan that was put together 10 years ago or 2 years ago, how do we get from where we are to where we want to be with the lessons we have already learned, including the financial restraints that we now face?

Mr. HUERTA. Sure. Thank you, Mr. Capuano.

The plan that the FAA has developed is designed to have an overall architecture, but also to be flexible, to respond to what stakeholder requirements are, and the realities of how the industry is developing. I think that we are actually in a good place based on the investments that we have made over the last 10 years.

Over the first 10 years, a lot of the focus has been on foundational technologies. What does that mean? The basic building blocks and platforms on which we build advanced capabilities

over time. So those are new automation platforms for en route and our terminal environment. We talked about ERAM. We talked about how we had some hiccups on that, but we have addressed those. We are doing the same in our terminal program. We also mentioned ADS–B, which is a foundational technology. That is the GPS-based technology that enables us, that ultimately can replace radar across the country.

Mr. CAPUANO. But, Mr. Administrator, if you have all the technology in the world, but people refuse to use it or won't use it for any good number of reasons——

Mr. HUERTA. But let me come to that point.

Mr. CAPUANO. Because I am running out of time.

Mr. HUERTA. OK. Well, the point is that what that now enables is for us to focus on delivering benefit. And the big focus for the last year has been on performance-based navigation. That for the airlines and the users of the system is a huge benefit because it has reduced fuel burn, reduced cost, and reduced environmental emissions. And that is what our metroplex initiative is all about. Let's take advantage of the investments we have made to date. Let's focus on delivery of benefits while, in parallel, we are looking at the longer term initiatives.

Mr. CAPUANO. Mr. IG, would you agree with that statement? Would you agree with that approach?

Mr. SCOVEL. I would agree with the approach that we are at a critical juncture, and that to some extent a reset is required. My reservation is that if the reset is to extend for an appreciable length of time, industry and the taxpayers will become even more frustrated with the situation that we find ourselves in today.

I think essentially FAA is well positioned under the leadership of this committee and in close collaboration with industry to make just the kind of reassessment that you have suggested, Mr. Capuano. New leadership is coming in. FAA has established pretty good ties, my office believes, with the NextGen Advisory Committee, and the RTCA continues to function with them. The move last week to request priorities from the NAC, we heartily applaud. It is much needed, especially in this fiscal environment.

I would urge the committee to hold FAA's feet to the fire now with the new leadership coming in and to instill, as our statement suggests, a new sense of urgency with NextGen, which has been lacking for much of the past decade. FAA has had the luxury of being able to proceed across a broad front. Now they have to narrow their attack along specific lines, and together with industry they need to identify those priorities——

Mr. CAPUANO. Thank you.

Mr. SCOVEL [continuing]. PBN being the first and foremost.

Mr. CAPUANO. Thank you, Mr. Chairman.

Mr. LOBIONDO. Mr. Meadows.

Mr. MEADOWS. Thank you Mr. Chairman.

Thank you both for being here.

Mr. Huerta, I wanted to follow up on some of your written testimony. I think in your written testimony you said we have been transparent from the very beginning about what we intend to accomplish, and yet here we are some 10 or 11 years later with very little to show for it. You know, in 2004 we talked about the trans-

formation of Americans' airport network. And then in 2006 we talked about an aviation revolution. In 2007, a wide-ranging transformation. In 2008 we talked about another transformation to the 21st-century technologies. In 2009 we talked about being forever redefined. In 2011, a comprehensive overhaul. And wide-ranging transformation in 2012.

Then in 2013 we changed the rhetoric to be an evolution. And really when we talk about evolution, we think of millions of years. And so I get concerned about that.

And then in the IG's report he talks about the 2009 internal FAA study, and it said that you did not specifically address risk-adjusted, realistically reflect the risk-adjusted technology in terms of feasible implementation as promised, your own internal survey. So wouldn't you say, isn't it fair to say that we have been maybe over-ambitious and unconstrained with regards to what we hope that we can accomplish?

Mr. HUERTA. I don't think we have. What we have adopted is a segmented approach to deployment of what is, we all agree, a very complex technological change and operational change in terms of how we move airplanes. And we have really——

Mr. MEADOWS. So you feel like you have accomplished——

Mr. HUERTA. I do.

Mr. MEADOWS [continuing]. What you set out to do 10 years ago?

Mr. HUERTA. I feel like we have made significant progress toward a very significant change in how we manage air traffic. Let me give you a specific example. Fundamentally, the ADS–B technology gives us a much clearer view of what is happening in the National Airspace System. That is very different from radar. A way to think about it is a radar picture is sort of the equivalent of a somewhat fuzzy view of what is going on because it is limited by the sweep of the radar. What ADS–B gives you is sort of the equivalent of HDTV. It is a much clearer and more precise view which enables you to move aircraft closer together. That makes for a much more efficient use of the system.

Mr. MEADOWS. And you shared that in your opening testimony with regards to Atlanta and how we are able to do that.

Mr. HUERTA. Yes.

Mr. MEADOWS. But really, help us understand, because NextGen was supposed to be this, you know, now we are moving aircraft closer together. But from a lot of the stakeholders we are seeing that their concern is that the FAA and many of your employees are not buying in. It is not a buy-in or lack of a buy-in in terms of the stakeholders. It is really a lack of a buy-in in terms of many of the people that work for you, is that not correct?

Mr. HUERTA. It actually goes both ways. Let's talk about what NextGen enables. It enables performance-based navigation. I talked about earlier how, in order to successfully deploy performance-based navigation, we must engage in collaboration. An airline might want a particular PBN procedure that is going to save fuel for them. They can request that we publish it, and in the old days that is what we would have done. We would have published it and then we would have found our operational difficulties with it and it wouldn't have worked.

What we are doing now is we are sitting down with the airline, the airport, the controllers, the military, and adjacent facilities in the metropolitan area to ask the question, OK, these guys would like to have this approach which will reduce track miles flown, reduce their fuel burn—how do we make it happen?

Mr. MEADOWS. All right. So based on these meetings that you have had over the last 10 years, what would you say is the probability of us seeing real transformation, not an evolution, but real transformation and redefining within the next 10 years? Are we going to make our, you know, 2025 deadline? By what I read, I don't see any way that we can do that at this point.

Mr. HUERTA. I don't know exactly what you would consider to be transformation, but I can say this.

Mr. MEADOWS. What would you consider transformation?

Mr. HUERTA. I think we will be in a very different place where we will be handling more traffic, much more efficiently, with a higher level of safety, and reducing fuel——

Mr. MEADOWS. But if we don't know—OK, but if we don't know where we are going, if we are just making good progress, we are still lost.

Mr. HUERTA. No, we do know where we are going. We have an enterprise architecture that has specific building blocks. I talked about the foundational programs that we are building, and we are overlaying additional technological capabilities on top of them. And that is very clearly laid out in the NextGen implementation plan that we publish every year, along with specific milestones and schedules for meeting them.

Mr. MEADOWS. Thank you, Mr. Chairman.

Mr. LOBIONDO. Ms. Johnson.

Ms. JOHNSON. Thank you very much, Mr. Chairman. And let me express my appreciation to Administrator Huerta and Inspector General Scovel for being here.

Of course, I have been listening to the NextGen debate in this committee now for quite a while. And I think I know why quite a bit of it has not been implemented: It is hard to do it without money.

But I do look at the Inspector General's that controller policies and procedures have not been updated and remains an unresolved obstacle, which makes it uncertain when airspace users can expect widespread benefits.

What is causing this delay other than some money, I know, and updating the controller policies? And as an addendum to that question, there is a small airport near Dallas in Mesquite, Texas—and I have had just about every airport around Dallas County now in the last 21 years or more—completed recently a new control tower funded, with the commitment that it would be furnished with air controllers. Now that it is finished, they can't get a commitment or an answer as to whether or not they will get this air controller. Could you comment on that and the previous question?

Mr. HUERTA. Thank you. Let me talk first about the question that you asked with respect to how do we integrate with controllers. One of the things that was identified in working with our industry stakeholders was that we needed to focus on rewriting the

Air Traffic Control Handbook; that that is a very important provision in order to unlock the benefits of NextGen.

In July of last year, we set a goal for this year to make progress in rewriting the controller handbook to keep up with modern air traffic capabilities in the NextGen era. And here is the specific issue we needed to address: what are the rules under which controllers will authorize and ensure that advanced navigation procedures can actually be operationalized, particularly in congested metropolitan areas?

To accomplish this task effectively we have been working with NATCA, with aircraft traffic control management, and the aviation community to identify the most important changes for each of these groups. And we found that the requested changes fell into two categories: current standards that we needed to update as a result of new technology, and cases where changes have been made but the criteria that I was talking about for conducting advanced operations has not been completely established.

We identified a consolidated list of 15 specific changes that would enable us to address these issues. We expect to complete 10 of them by the end of this fiscal year with the following 5 to be completed thereafter.

The revisions to the handbook are things that we have to be very careful about, and we have to do them in accordance with our safety management systems. Safety management systems are a systematic and continuous management process to proactively identify, analyze, and mitigate safety risk. And these 15 changes are just the first step as we continue to work collaboratively with our internal and external stakeholders to write a long-term plan and to address these specific operational problems that you are talking about.

Going to your point about Mesquite, Texas, I will need to check into the specifics of that and we will provide a response to you after the hearing.

Ms. JOHNSON. Thank you very much.

Mr. Scovel, you indicated in your written testimony that the FAA has made little progress in shifting from planning to implementation on NextGen and delivering benefits to the airspace users. Would you please expand on this statement, explain how you are measuring that progress?

Mr. SCOVEL. It is very difficult to measure. And thanks, that was exactly our point. Over the last 10 years, FAA set overly ambitious NextGen goals and what it believed would be achievable in its 2005 progress report to Congress on NextGen. By 2009 those goals and the vision for NextGen had changed rather drastically, from a 2025 completion date to at least 10 years later, and in the view of the JPDO and the contractor who worked with them to complete that report, a final cost figure of two to three times the original $40 billion estimate. This changed the picture drastically but FAA did not communicate this to Congress.

Since then, there have been other problems with FAA's organization of its NextGen effort, and now FAA finds itself confronted with a very difficult fiscal environment. It is time for FAA to look in close consultation with industry at what is most achievable in the short term. And our consultation with industry would lead us to

recommend to FAA performance-based navigation—and we believe they are fully on board with that—as well as continuing their emphasis with the automation platforms, ERAM, and substituting STARS for Common ARTS at their specific TRACON locations, and then confronting the critical design decisions that will be needed to fully maximize potential benefits from ADS–B and DataComm. Specifically, FAA must address level of automation that will be required and also the division of responsibility between cockpit and ground systems for managing aircraft.

Until those design decisions are made, the true benefits of NextGen cannot be realized.

Ms. JOHNSON. Thank you both. I yield back. My time has expired.

Mr. LOBIONDO. Mr. Graves.

Mr. GRAVES. Thank you, Mr. Chairman.

And, Administrator Huerta, I appreciate you coming in, as always, taking the time to come up to the Hill.

My question is a little bit different. It does deal with delays, however, but it is on technology delay, which I was specifically speaking to some of the technology out there on spin, you know, or making aircraft spin resistant, which has been going on forever. And I know ICON has got some new technology out there and they are trying to get an exemption from the weight limit when it comes to light sport, which was kind of arbitrarily set, and I think that should be based on performance and complexity of aircraft. But that is a whole other issue.

Mr. GRAVES. But I was surprised to find out that they applied for an exemption that is 15 months old. And I have got letters here from Senator Inhofe and Congressman Petri and various industry groups asking for some sort of resolution. I have got a letter from the FAA, too, on this saying that they would have a response to their request from you all at the end of last year, 2012. And I know I am kind of hitting you with this, and I don't intend to hit you blind side, I just would like to get an answer, have you get back to me and give me an answer on when they are going to have some resolution, because they can't move this technology forward unless they get an exemption and get an answer to that. So I would appreciate that very much, they need a decision on that.

I am always interested in new technology, and particularly when it comes to Spin Resistance, Aircoupe started this way back in the 1940s, you know, now we have ICON doing and it is fascinating, as a pilot, it is fascinating. And that is one of the things obviously that gets a lot of pilots in trouble is getting into a stall spin situation. So if have you any comment on that, I sure would appreciate it.

Mr. HUERTA. I am not familiar with the status, Congressman Graves, but we will get you a response.

Mr. GRAVES. OK. And I was afraid of that, I didn't mean to hit you blind side and that is the reason I am not going to press it today, but I would like a response right away on that.

Mr. HUERTA. Absolutely.

Mr. GRAVES. I appreciate that, and thank you very much for coming in. I yield back, Mr. Chairman.

Mr. LOBIONDO. Mrs. Titus.

Ms. TITUS. Thank you, Mr. Chairman. Administrator Huerta, thank you for being here. You know, I represent Las Vegas and tourism and air travel are key to our economy. Forty-five percent of the people who come to Las Vegas come through McCarran Airport. I talked to the folks at McCarran before this hearing because I wanted to get some feel for how they are dealing with the problems that we are addressing here and the NextGen. And I am glad to report that they are pretty satisfied with what has happened. They give you good marks for what has happened so far. But like most people in the comments you heard today, they are concerned about when something else is going to happen and they would like to see that sooner rather than later.

Well, it sounds like from listening to you and to the inspector general, that you are pretty aware of what the problems are, we are not telling you anything with these questions. I hear you talk about the identified management problems, the resistant culture, the need for reliable data. You addressed that with a monitor study, a change of personnel, better coordination with other agencies, more involvement with stakeholders. I appreciate all that.

The elephant in the room that nobody wants to really talk about is money, now you have had to deal with a sequester, but if you look at the latest Republican Transportation appropriation bill, that cuts more than half a billion dollars from FAA. So how are you going to make any progress under those kind of circumstances?

Mr. HUERTA. That is a challenge. The House appropriations bill would significantly impact, I would say, devastate our facilities and equipment account, and that is the account through which we fund both the maintenance of our legacy infrastructure as well as the deployment of new capabilities. It is $623 million below the President's request, and $439 million below where we are this year. And so it is a significant challenge. It is for that reason, as I was talking about with Mr. Larsen, that we have asked industry to share with us what they would like to see as priorities if we need to deal with that.

Personally, I believe that it is extremely important for us to stay the course. This is a very complex technological evolution, and it is one in which the United States has very significant leadership. We are working closely with our international stakeholders because air traffic is a global system, and trying to ensure that we have common procedures, common approaches to how we redesign the airspace, not just here in the United States, but internationally. And as a result of being where we are and the commitment that we have all made as a Nation to this, we are in a very significant leadership position, and in a place where we can really drive what the international standards are going to be for the entire aviation system worldwide.

I think that for us to step back from that becomes a very serious thing. Aviation was invented in America and we have always represented the cutting edge of technology and it is important that we continue that.

Ms. TITUS. Thank you, I yield back.

Mr. LOBIONDO. Mr. Ribble.

Mr. RIBBLE. Thank you, Mr. Chairman, and I want to thank both of you for coming back again. It is a little bit like Groundhog Day

to me, it sounds a lot like last year's report that we got. We a got a relatively rosy report from the agency and a relatively negative report from inspector general and this year kind of the same thing.

I guess I will start with you, Mr. Scovel, you have made a lot of recommendations over the period of time, dozens and dozens and dozens of recommendations. How do you feel the FAA has been responding to those?

Mr. SCOVEL. Thank you, Mr. Ribble. Generally, FAA is responsive. Part of our audit process is to confer closely with the agency as we work our way through the audit. We have what is called an exit conference at the end where we present our findings and planned recommendations. FAA always gives us a very thoughtful effort in their assessment of those recommendations, and quite often concurs with those and we are pleased with that. However, an administrative point that worries us as auditors is that not only FAA, but other agencies in the Department take quite a bit of time to get their comments back to us and that raises questions to us about the timeliness and relevance of our work.

I would say our relationship overall with regard to our recommendations with FAA is quite good. We have a number of open recommendations from past reports, specifically regarding NextGen. I could tick off a couple of those that we consider most significant.

By the way, we have briefed FAA on our tentative findings on the current audit that forms the basis for our testimony this morning. We intend to focus our recommendations first on the critical path for NextGen implementation. We will focus as well on FAA's reorganization of its NextGen implementation entities to try to drive at some of the programmatic and organizational challenges that we discuss in our statement regarding leadership, organizational culture and the sense of urgency.

Of our past recommendations from April 2012, the highlight was our recommendation for an integrated master schedule. In fact, we have highlighted before this committee and also before the House Oversight and Government Reform Committee, that this is one of our top five open recommendations across the entire Department of Transportation. The integrated master schedule will form the basis for FAA to make better informed choices regarding priorities, and sequencing, and also the consequences of decisions down range. The key is the ripple effect, if you will—specifically concerning time on many diverse and interdependent programs.

That gets us to delay, and we understand from the users that their principle pain point right now is the perception that there has been a lot of time and undue delay in implementing NextGen capabilities. But we have also recommended to FAA in June 2010 that they document interdependencies between systems and procedures, that they identify critical path issues or decisions in terms of airspace changes, and finally that they assess safety and implementation risks of mixed equipage operations and develop corresponding mitigation strategies and policies.

All those recommendations and those last three remain open from 2010. In fact, we understand FAA has been working to implement them, but until we have further meetings and documentation from the agency, we will not close them because we want to be able

to report to the Congress that FAA has indeed responded fully to the intent as well as to a letter of those recommendations.

Mr. RIBBLE. Thank you. Mr. Huerta. You talk a little bit earlier about the culture of safety at FAA, and I really want to commend FAA, I get an airplane every single weekend, and quite frankly, I never even think about safety. The airline industry and what FAA and NTSB have done over the last several decades has been a stunning achievement, quite frankly, to the point—you fly all over the country and not even be concerned about it to be quite honest with you.

Is it possible, however, and I have seen this in other organizations where a culture of safety, I have seen employees who are so safety-focused that they hop on a parallel path of a culture of fear, where fear now pervades the fear of making any mistake whatsoever, inhibits them from making any change at all whatsoever and it can impede progress. Are you observing any of that? Is there any concern of that?

Mr. HUERTA. That is something that has about a concern of the aviation industry in general for a long time. I think the industry in its totality, and the FAA as a part of this, has really tried to address this issue head on through nonpunitive reporting mechanisms where individuals can identify a problem without fear of retribution. On the carrier side, it is programs such as ASAP where they can identify issues that might represent a safety risk so that they can be dealt with. On the air traffic side our counterpart is ATSAP, where controllers can identify are there procedural issues? Are there challenges?

I think what you are talking about is extremely important. It is something that we are very focused on and that is really the entire underpinning of our collaborative efforts to try to bring all stakeholders together and recognize that air traffic management is a shared responsibility. Everyone wants to see a safe system, an efficient system, and they want it to be adaptable to new technologies and to new operational characteristics. That is a very positive development.

The downside of it is that it takes time, because it requires you to build levels of trust, levels of understanding, and a familiarity and working relationship, which is really critical to ensure that you are able to deliver actual benefits. While it takes longer, I am all for it, because you get a better result. It is a result that sticks, and it is a result that people can actually use and which really delivers benefits.

Mr. RIBBLE. Thank you very much. Mr. Chairman, I yield back.

Mr. LOBIONDO. Thank you. Mr. Scovel, you talk a little bit about the integrated master schedule. Did you say and did I miss what you believe the status of the integrated master schedule is?

Mr. SCOVEL. Thank you, Mr. Chairman. I didn't say and I appreciate the opportunity to clarify that. FAA is working on that recommendation. We are informed that by December of this year, FAA anticipates completing that work. We will have a chance to look at it, and we will assess whether it meets the intent and letter of the recommendation, and perhaps be in a position to close it at that point.

Mr. LOBIONDO. You do believe that is key to how we move forward?

Mr. SCOVEL. It is key and the effort is underway on the part of FAA.

Mr. LOBIONDO. You identified some of the challenges and development and implementation of NextGen, could you tell us what you believe the problems are? I mean, is this funding related? Is it organizationally related? What do you believe is the root of this?

Mr. SCOVEL. Mr. Chairman, we don't believe looking at the past record that funding has been a problem. Congress has been fairly generous with the agency for its NextGen lines of businesses, to the tune of $3.8 billion since 2008. As I mentioned earlier, FAA has had the luxury of being able to try to proceed on a pretty broad front across transformational programs, both longer range as well as trying its hand at some of the near-term improvements that the users have been most eager for.

Now the situation is different with regard to funding and FAA will have to make some very tough priority decisions in consultation with the users. However, there are programmatic and organizational challenges that are outlined in our statement concerning organizational culture, inconsistent leadership, leading to a different messaging of vision and so forth. Programmatic problems have led to some of the technical difficulties that the agency has encountered, specifically with ERAM, which would be the best example of that. We anticipate the agency will also encounter similar challenges as it modernizes its automation platform in the TRACON facilities.

So all of those technical programmatic and organizational challenges persist with NextGen. We would say while funding in the past may not have been a problem, certainly it is, as was mentioned earlier, the elephant in the room for FAA and this committee today.

Mr. LOBIONDO. Do you have any specific recommendations for either Congress in general, or the Transportation Committee or the Aviation Subcommittee of what additionally we can or should do to help move this along?

Mr. SCOVEL. I think Administrator Huerta has laid out a pretty good outline of what he thinks the agency needs in order to advance NextGen, even facing the difficult fiscal challenges that we all know he faces today. I would urge the committee and Congress to hold FAA's feet to the fire, and use our office as your tool to help you do that. We would welcome the opportunity to further work with you and the agency to review FAA's programs and plans, to see whether it has made good on much of what Administrator Huerta has said today regarding prioritization—further collaboration with users and its workforce, the near-term steps with PBN and metroplex improvements, automation platform modernization with ERAM and at the TRACONs, and then confronting the very difficult critical design decisions regarding divisional responsibility between cockpit and ground facilities and the level of automation. Only when those decisions are finally made—and they are difficult policy decisions, not within the purview of my office, but certainly for the agency and the committee—will the long-range benefits of ADS–B and DataComm be put in place. If final benefits are ever

to be felt by the taxpayer, we believe it will be in FAA's ability to consolidate and realign its facilities as ADS–B fully reaches its potential—perhaps to make adjustments to the workforce, certainly to close some of its most aging facilities and to consolidate those. But those are difficult policy decisions for the Administration and for the Congress.

Mr. LOBIONDO. Mr. Huerta, is there anything additional you can think of or suggest that we can do from this end to help you in your efforts to this humongous task?

Mr. HUERTA. I think that it is important that we all recognize that this is a very large and complex program and, as we have talked about, we have built an excellent foundation where we can now add additional capabilities. As you heard from the inspector general, we have been in discussions and have been responsive to many of the recommendations made by the inspector general. In fact, in their most recent review of the ERAM program, the inspector general acknowledged that significant progress had been made in getting that program back on track.

I think that where the committee can be helpful is to go back to where we were with FAA reauthorization and recognize that we had all identified, as a country, that this is an extremely important initiative to enable us to provide support and to maintain leadership for an aviation industry. We all knew then that it was an incredibly complex undertaking, but that the cost of not doing it greatly exceeded the cost of doing it. We need to keep that in mind as we go through this difficult climate in the years ahead.

Mr. LOBIONDO. Mr. Larsen.

Mr. LARSEN. Thank you, Mr. Chair. First off, I would ask unanimous consent to enter some QFRs from Mr. Nolan.

Mr. LOBIONDO. Without objection so ordered.

Mr. LARSEN. Thank you. Inspector General Scovel, getting back to some of the things you noted, you testified initial plans are NextGen targeted 2025 at the cost of $40 billion. And your office said this was overly ambitious and unconstrained, and you talked about some of the specific concepts and capabilities that were part of initial plans for NextGen, and whether FAA is on track to achieve them by 2025. Can you pick, is there a poster child for this?

Mr. SCOVEL. For the failure to meet a 2025 deadline?

Mr. LOBIONDO. Right, yeah.

Mr. SCOVEL. I would say it is a combination, sir, between ADS–B and DataComm at this point. Progress has been made on ADS–B in terms of installing the ground infrastructure, although that has been delayed from 2013 to 2014, so we continue to see friction there. Demonstration projects are in line and underway, such as greater coverage in areas where we don't have radar—Gulf of Mexico and Alaska, for instance—and a few other demonstration projects around the country. But as far as being able to demonstrate to users who will bear the ultimate and quite large bill to equip with ADS–B In—and that will be the game changer for them as well as for FAA—the agency hasn't yet been able to confront those decisions. It may be simply a matter of time and in a couple of years they will be able to do that, but if that slips, 2025 is well off the table.

DataComm is an essential program for NextGen, but it is a program that has had its own fits and starts through the years. You may remember, sir, that it began initially in 2003 after $100 million investment, but was terminated in 2005 for technical difficulties among other problems. It was resurrected last year. It is an expensive program but users have long memories, and they see that some users in the middle part of last decade actually spent to equip and then had, in their view, the rug pulled out from under them when the FAA had to terminate the program in 2005. They are very reluctant to repeat what they view as a mistake and so they want to see FAA make solid, consistent and prolonged progress on DataComm before they spend more money on it. If ADS–B and DataComm continue to lag in their view, there is no chance of 2025.

Mr. LARSEN. Thanks. Before I asked Mr. Huerta to comment, I just never thought I would be here long enough to have anybody say you might remember back in 2003, it is getting to be here a little long.

Administrator Huerta, you testified though in your written testimony FAA's delivering NextGen on time and on target. Here are a couple of examples where there are obvious concerns. Can you address that?

Mr. HUERTA. Yes, the premise that as a result of individual delays causing the whole program to be delayed I think is fundamentally not correct, because what NextGen is is a series of interrelated programs, and admittedly, we have experienced delays with some of them. But the approach is also based very much on showing that we have the flexibility to recover from them and to ensure that we can reorder delivery of things so that we can meet the overall objective, which is delivery of the benefits that we have always talked about.

I would like to address the two things that the inspector general has talked about, ADS–B and DataComm as illustrative examples. ADS–B capability is truly foundational. We are delivering the ground stations, and that will complete that aspect of the project. What the inspector general talked about was how we ensure equipage for ADS–B In. Well, one of the things that we thought important was we need to consult with industry to understand the dynamics associated with that and what they want to see. So we convened an aviation rulemaking committee to provide advice to us and to raise issues that they want to make sure that we take account of before we were to issue a mandate. That is something that we are carefully evaluating.

As I talked about earlier, these are necessary consultative steps; it takes time but gets us to a better outcome. Because what I don't want to have on the back end is a big fight about whether we have got it right. We want to get it right the first time. And that ultimately enables us to ensure expeditious deployment when the time comes.

On DataComm, this is one that is at a very critical point. There are three factors that affect it. One is the capabilities that will be deployed as a result of DataComm. The second is ensuring that we have the highest level of coordination with our European counterparts who are looking to deploy a similar technology. We want to

ensure interoperability and consistency across the Atlantic. Working with them on standards and on calendars is extremely important.

And the final point is funding. DataComm is a program that is just getting underway. And as the inspector general pointed out, it is a game changer, it is one that really does cause significant operational benefit, but given where it is in its planning cycle and our funding choices, that is one that does very much concern me in terms of its voidability.

Mr. LARSEN. Thank you. I have further questions, I will wait for the third round, I see some other Members have returned.

Mr. LOBIONDO. Mr. Meadows.

Mr. MEADOWS. Thank you, Mr. Chairman. I wanted to follow up a little bit. Mr. Huerta, when we were talking about successes earlier, you brought up the ADS system and it being a success of NextGen. And yet when I look at your testimony, where you highlight it, you talk about UPS being able to save some fuel, you talk about Jet Blue being able to save 100 miles, it doesn't sound like a great success story. In fact, when I talk to many of the people in the industry, their comment is that ADS, for all practical reasons, is not being used. How would you comment on that?

Mr. HUERTA. Well, what it enables is the use of performance-based navigation.

Mr. MEADOWS. I know it enables that, but is it being used?

Mr. HUERTA. That is what they want and that is what the metroplex program is focused on delivering.

Mr. MEADOWS. I understand that is what it is focused on. Is it being used?

Mr. HUERTA. It is.

Mr. MEADOWS. Across the industry. So I went out to all the stakeholders, the majority of them would say, this is a great success, this is—we are spending $40 billion worth to implement it and use it, is it being used that way?

Mr. HUERTA. I think if we worked through particular metropolitan areas they would acknowledge that they are seeing benefit. I talked about Atlanta, how we are able to increase departure rates at Atlanta, I talked about north Texas, how we are able to deconflict——

Mr. MEADOWS. But that wasn't in your testimony, but you are saying that is a direct success of ADS.

Mr. HUERTA. Yes, yes.

Mr. MEADOWS. OK. So if I called the Uniteds and all of them, they would agree with you that Delta, that this is a great success and they would be applauding you on this.

Mr. HUERTA. They would agree that what we have been able to deliver as a result of technology is more performance-based navigation procedures. Now they still want more, and they are not completing where they want to be, but they would say that yes, they do benefit in particular programs.

Mr. MEADOWS. So how do we measure success? I am all about results and not spending this. And earlier we talked about success, the IG has been very detailed and perhaps some would say critical in terms of where we have been with this. At what matrix do we look at, since most of the stakeholders are saying that we haven't

really adopted ADS, you have put in—it gets back to what Mr. Williams said, he is using a flip phone. I can use a Smartphone if all I am doing is making phone calls, it doesn't do me any good, and that is what it sounds like, we have a lot of technology out there that is not really being implemented across your agency or used fully, would you agree with that?

Mr. HUERTA. I would agree with the point that as you deploy technology, there is a period of time where utilization needs to catch up with it; that is true for any technological revolution.

Mr. MEADOWS. Sure.

Mr. HUERTA. And that our focus needs to be on how to ensure that users are taking advantage of technology that is already deployed.

Mr. MEADOWS. So how do you ensure that, because to date, we haven't really assured that, so how would you——

Mr. HUERTA. We are. That is entirely what our focus on performance-based navigation is all about. Now we have put on our Web site, and we have made available specific metrics that measure how we actually meet the business objectives that the users have associated with the deployment of these.

Mr. MEADOWS. So who puts forth the grade? I mean, you put it on a Web site, how are we meeting it, who grades you out?

Mr. HUERTA. Ultimately it only works if it is delivery and benefit to the users and I understand that. And I understand that we have to continue to focus on what it is that they require for the delivery of the capabilities that they want, we get that. Last summer there was a lot of discussion around a particular runway configuration in Chicago, so we focused in on what we could do to eliminate conflicts through the use of PBN, and we have been successful in doing that. Before that, there was a lot of concern about what could be done to increase capacity in Atlanta. That is what led to that 10-percent increase in departures. We need to be responsive.

Mr. MEADOWS. I am running out of time, so if you can answer this last question for me, out of the industry, out of the stakeholders, what percentage of the stakeholders are you using ADS and really seeing a significant advantage out of that, what percentage of the stakeholders are using it?

Mr. HUERTA. I think a better way for us to respond to that is what percentage of time or procedures actually being used in particular metropolitan areas, and we can get you some information on that.

Mr. MEADOWS. Well, I would like the answer to the other question I asked you too, what percentage of stakeholders? And with that, I thank the chairman and I yield back.

Mr. LOBIONDO. Ms. Johnson.

Ms. JOHNSON. Thank you very much. I would just like to ask if I can depend on your department to have a briefing with my office as it relates to Mesquite Airport.

Mr. HUERTA. Yes, absolutely.

Ms. JOHNSON. Thank you very much.

Mr. LOBIONDO. Mr. Scovel, do you think that ADS–B is being widely used now?

Mr. SCOVEL. No, I don't think it is being widely used now. In some locations, sure, such as over the Gulf of Mexico, Alaska,

Philadelphia, and Memphis areas where demonstration projects are in place. Elsewhere, it is not widely used. And as far as being an enabler requirement for using PBN, performance-based navigation in specific metropolitan areas, our review of the FAA data shows that it is not either.

For instance, our statement notes that in three major metropolitan areas where certain RNP procedures are in place, Chicago, New York, and right here in Washington, only 3 percent of the eligible flights are able to use those RNP procedures. The sticking block in most instances is not with the controllers themselves or their outlook but their training and their ability to manage those advanced procedures.

They don't have the tools, they don't have the revised handbook, they don't have the new policies, and they haven't had the necessary training. It is entirely understandable and proper that they should decline to grant authorization to aircraft that request to use RNP under those circumstances. But if we don't have the ultimate enablers for the controllers at this point and their level of training, then they won't get that user and that aircraft across the goal line.

Mr. LOBIONDO. Do you want to comment?

Mr. HUERTA. What I would add is which why we are so focused on dealing with how we make this operational in focusing on the controller handbook, focusing on working with all of the stakeholders, and ensuring that a procedure is not published. I mean, as we—when we deploy a new procedure, what we have to focus on in very granular terms is who wants to use it, who is able to use it, and how does it mix with other traffic in that area. And we can only do that, not in a big global training session, but by working with specific work groups, in specific metropolitan areas to really focus on very precise procedures, and how do we ensure that they get used. That is what the metroplex initiative is all about.

And while people may be critical that it doesn't take time, I think it is important not to lose sight of the fact that we have invested significantly in trying to tackle that specific problem, and we are seeing benefit as a result of it.

Mr. LOBIONDO. Really, I think this has been very good and very helpful for us to sort of understand a little bit better. Trying to be fair, from a timeframe, do you think we would have additional positive news 3 months, 6 months a year? I mean, what do you think it will take to get to another level here, Mr. Huerta?

Mr. HUERTA. The thing that I am most concerned about is the fiscal uncertainty between now and going into the next fiscal year. Here is why. We have spent a lot of time talking about delivering benefits and ensuring users have that. And you have heard from me that the way we ensure that we are able to deliver benefit is through very intensive, collaborative processes with industry, with controllers and with the agency in very granular terms about ensuring that we are able to take advantage of the technology that we are deploying.

That costs money, and that is something that is—has been for me—a very high priority with how we use or operate and our F&E resources. As we look at an uncertain fiscal climate, it presents us with a choice that we don't like which is, do we retreat to a base operation and not try to do new things, or do we continue to stay

the course on deploying of these new advanced technologies so we can deliver the very benefits that we all say that we want to deliver? And as I look at where we are in the balance of this fiscal year and the uncertainty we face going into next year, we do have to resolve that question.

Mr. LOBIONDO. Thank you. Mr. Larsen.

Mr. LARSEN. Thank you. Inspector General Scovel, in your written testimony, you stated the FAA hadn't yet made a key design decision regarding how much responsibility for tracking aircraft will be delegated to pilots versus the duties that would remain for air traffic controllers. Could you explain why that is a key decision?

Mr. SCOVEL. Thank you, Mr. Larsen. Yes, it is a key decision because heretofore, pilots haven't had that type of responsibility. It has rested with controllers on the ground. For pilots to undertake that, of course their employers will have to agree, they will have to be trained, the aircraft will have to be equipped, controllers will have to change their outlook from one of air traffic control to air traffic management. That really is a revolutionary step.

Right now it appears to us that until ADS–B is mandated, and those requirements specified, it is very much an open question as to whether that delegation of responsibility to the cockpit is going to take place.

Mr. LARSEN. Administrator Huerta, do you care to respond? Do you still see this happening?

Mr. HUERTA. I do see it happening but I differ with the inspector general that there is a magic day where a decision is made and everything changes. The way I would characterize it is that as we deploy technology, we need to work through respective responsibilities of users of the system in terms of what they actually mean.

NextGen, by definition, is a transformation from a command and control environment, as the inspector general pointed out, to a shared responsibility for air traffic management. But how we deploy that is what we need to discuss. And that is something that is not a black and white, we decide that one day and move forward; that is an operational discussion of actually how do we make that real in specific congested airspace.

Mr. LARSEN. Inspector General Scovel, with regards to the design decision on the number and locations of air traffic facilities needed to support NextGen as a key decision, can you layout why the IG says that is a key decision?

Mr. SCOVEL. Number and design of facilities?

Mr. LARSEN. Yes.

Mr. SCOVEL. It is a key decision because if the full potential of all of NextGen's programs are to be realized, it might be possible for the current configuration of the NAS to be very radically different from today in terms of the number of facilities, their location and the workforce that is required to staff them.

As the Administrator has pointed out, that is a continuing discussion that needs to take place. Both the agency and the committee, the full Congress, need to understand what the possibilities are in that area, and then make a difficult policy decision as to whether to embark in that direction. After all, in the final analysis it is jobs, and we are also talking about Federal presence in areas across the entire country, north, south, east, west. The will of the

Congress will be paramount in that area, but it is not a decision that can rest exclusively with the agency or with the industry. We acknowledge that difficult policy matter and continuing discussions have to take place.

Mr. LARSEN. Administrator Huerta, any additional comment on that.

Mr. HUERTA. I agree.

Mr. LARSEN. I have a question from a member not on the committee, I want to ask it, for Administrator Huerta, it does deal, if the chairman will indulge me with Asiana flight 214 about testing of employees of foreign carriers and whether or not they should be required to undergo mandatory drug and alcohol testing following a crash in the U.S., we require that for domestic pilots or domestic carriers, but are not able apparently to require of foreign pilots of foreign carriers. Does the FAA have a position on changing that?

Mr. HUERTA. Sure, as you know the FAA does require U.S. operators to conduct drug testing of pilots following accidents. And you also pointed out that FAA regulations do not apply to foreign pilots or foreign airlines. In order to do that, we would need to undertake a rulemaking, but I want to step back for a minute and talk about the broader global context in which this operates.

Changes to international standards on post accident drug and alcohol testing are most likely to occur if there is multilateral support for many countries. And the forum through which that is done is the International Civil Aviation Organization. ICAO standards do not presently require that member States establish biochemical testing programs to detect or to deter inappropriate drug or actual use. However, what they have is something called a recommended practice. And the recommended practice states that ICAO member States shall ensure as far as practicable that all license holders who engage in any kind of problematic use of substances are identified and removed from their safety critical functions.

We, the U.S. Government, believe that the global aviation community would greatly benefit from the development of clearer ICAO standards in that regard and would be supportive of those efforts. And we believe that it is appropriate to work that in a multilateral context. I would caution against unilateral regulatory action on the part of the U.S., because we have to consider the implication of other States taking unilateral actions that would affect our crews and our carriers in their respective countries. So we would push to deal with this in the international setting through ICAO.

Mr. LARSEN. I understand. And finally, my last question is I had asked in my opening statement about the letter I sent to you all about metroplex—sending out metroplex initiatives because of sequestration and was looking forward to a formal response.

Mr. HUERTA. I will be providing you a formal response shortly in writing, but I'd like to highlight some of the things I will be talking about in that. The collaborative part of the metroplex program was stood down in mid-April as a result of sequestration. These are the collaborative report groups we have for air traffic controllers. We anticipated needing to return controllers to their home facilities in order to move air traffic as a result of reduced hours.

We approved the restart of these projects after we received the one-time authority to enable us to cancel the furlough. We have

designated funding operations facilities engineering activities in the affected en routes in terminal air traffic control facilities in order to enable these projects to move forward.

We are still assessing what the long-term impact of that is on schedule because of necessity. We need now to reassemble teams, get caught up in terms of work that was underway in order to enable us to take this high-priority program and get it back to where it needs to be, but yes, we did have to reduce those activities as a result of the sequester.

Mr. LARSEN. Under a CR environment, I assume that we continue under a, what I would put long odds on, under regular order environment where we actually pass all the bills, appropriations bills by October 1st that would continue, but under a sequestration environment, you would have to return to make a decision on whether to continue those?

Mr. HUERTA. Absolutely. Because under a CR environment with sequester we would see a very significant reduction to our operating budget, and that is how we fund this.

Mr. LARSEN. And that is how you fund that. Yeah, good, all right. Thank you very much, thank you.

Mr. LOBIONDO. Mr. Huerta, Mr. Scovel, we thank you very much. This has been very helpful. I hope we can continue to work together to try to see future progress and with that the hearing is adjourned.

[Whereupon, at 11:45 a.m., the subcommittee was adjourned.]

STATEMENT OF MICHAEL P. HUERTA, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION, BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON CAUSES OF DELAYS TO FAA'S NEXTGEN PROGRAM, JULY 17, 2013.

Chairman LoBiondo, Congressman Larsen, Members of the Subcommittee:

Thank you for the opportunity to testify today before the subcommittee on the progress the Federal Aviation Administration (FAA) has made on the Next Generation Air Transportation System (NextGen). NextGen is the largest single aviation infrastructure project in history. This fundamental transition allows us to best utilize new and existing technology, including satellite-based and digital technology, to ensure that we meet the future demands for safe and efficient air travel.

As demand for our nation's increasingly congested airspace continues to grow, NextGen improvements are enabling the FAA to guide and track aircraft more precisely on more direct routes. This allows us to cut flight miles and reduce fuel burn, making air travel more convenient, predictable, and environmentally friendly.

Our goal as an agency is to manage our national airspace in the safest and most efficient way possible, and NextGen plays a central role in this effort. We are delivering concrete benefits to users of the national airspace through NextGen. As of this very moment, air carriers that take advantage of precision routing get into and out of airports more quickly and efficiently, which reduces fuel use, saves money, and decreases aircraft exhaust emissions. Airlines flying into Dulles International and Reagan National have started using NextGen procedures and we estimate they will save $2.3 million in fuel per year and cut greenhouse gas emissions by 7,300

metric tons. In Atlanta, the precision of NextGen navigation means we can safely allow jets to take off on headings that are slightly closer together. This small change has resulted in an increase of 8 to 12 planes departing per hour, saving valuable time. It is also better for the environment because those jets spend less time on the ground with their engines running. This expected initial benefit of the new procedure is $20 million in Atlanta this year alone. We expect to bring this type of efficiency to other major airports as well.

General aviation pilots and other small-aircraft operators are also seeing benefits under NextGen, which allows them greater access to more airports nationwide, particularly in poor weather conditions, thanks to enhanced satellite navigation capabilities. Air traffic controllers now have a wider array of tools at their disposal to help them make the critical decisions necessary to bring about more efficiency in the world's busiest airspace system. The flying public is enjoying shorter flight times and fewer delays. We are realizing these benefits because of NextGen.

Michael Whitaker, who assumed the role of Deputy Administrator on June 3, 2013, will serve as Chief NextGen Officer. This is a role of great importance. Effectively leading the agency through the next phases of NextGen implementation will require working with many organizational components within the FAA, collaborating with industry and labor, and understanding the complexities of the NextGen program. Mr. Whitaker is a seasoned aviation executive with extensive business, regulatory, legal, and international experience. He is well-versed in general aviation, as well as commercial aviation, and has led collaborative efforts and joint ventures to promote aviation safety and enhance performance and profitability. In his

career he has fostered alliances and improved corporate governance. I am confident that NextGen will flourish under his leadership.

NextGen would not be as successful as it is without collaboration and investment by a wide range of participants and the support of Congress. We are listening to the aviation community, including operators, bargaining unit representatives, and international colleagues, and we have adjusted our plans accordingly to create benefits for the maximum number of stakeholders. We carefully consider the audits, reports, and recommendations from the DOT Office of the Inspector General and the Government Accountability Office when evaluating our programs and we consistently review our own progress to measure success and identify areas where we can improve.

Collaboration is Key to the Success of NextGen

The FAA has a long history of engaging with industry to develop consensus around policy, programs, and regulatory decisions. NextGen is arguably the best example of that collaboration. We have worked closely with industry partners, built consensus, and incorporated important recommendations from industry in our NextGen planning. We are working with our partners through the NextGen Advisory Committee, NextGen Institute, RTCA, and the Joint Planning and Development Office.

Our primary vehicle for industry collaboration is the NextGen Advisory Committee (NAC). Its advisory role includes facilitating industry participation in NextGen, providing recommendations, and reviewing performance objectives. The NAC's involvement is intended to

ensure a positive business case for those who must invest in NextGen, and to provide a venue for tracking progress and sustaining joint commitments.

We believe the NAC has been successful in providing guidance and input into the current plans for the development and implementation of NextGen. For example, we consulted extensively with the NAC to establish metrics that focus on post-implementation operations at locations where the agency has deployed NextGen systems and capabilities. They are reported on the FAA's new NextGen Performance Snapshots website.[1]

One of our most successful collaborations with the NAC was on a recommendation involving city pairs. The NAC was instrumental in identifying sets of city pairs that can help measure the progress made by NextGen technologies once implemented. Specifically, we track fuel burn, average distance flown and actual versus filed flight times between key city pairs. In selecting city pairs, the NAC and the FAA took into consideration airports that were slated to receive various NextGen improvements, for example new PBN procedures or new surface management capabilities. These city pairs reflect a variety of important factors for the airline industry, such as passenger volume and traffic mix, among others.

We have, however, faced some challenges to achieving consensus via the NAC. For example, in order to evaluate fuel efficiency gains under NextGen in accordance with Section 214 of the reauthorization, we discussed fuel burn with our industry partners participating in the NAC. Some of our industry partners expressed reluctance about providing fuel burn data out of a concern that releasing this information would provide proprietary data to the public and their

[1] NextGen Performance Snapshots are available online at http://www.faa.gov/nextgen/snapshots/

competitors. The activity underscored for us and for our partners on the NAC the true complexities that we deal with in trying to gather the information necessary to implement this interdependent set of initiatives in an airspace that operates 24 hours a day, seven days a week. Furthermore, this challenges our ability to establish a reliable baseline measure from which improvements can be assessed over time. While collaboration is vital, true consensus among all stakeholders isn't always possible. To gather the necessary information, the FAA and the NAC are moving forward in partnership with a number of operators who are interested in sharing fuel use data.

Despite these challenges, continued collaboration is a critical component of NextGen development. Even if it takes more time, developments that take into account the needs and contributions of industry will allow us to better serve all those who use the national airspace. Through NextGen, we are transforming an entire system, even as it continues to operate. We must continuously evaluate our progress and collaborate with industry to ensure that operations run smoothly as we proceed. We are building this system one step at a time and our partnerships with industry are vital to its success.

Our partnerships with labor are just as crucial. The FAA has learned the lesson that you must involve the system operators on the front end, and the earlier the better, because they are the subject matter experts on our airspace and air traffic management system. The success of NextGen depends on the collaboration of talented experts working together to build it, which includes engineers, scientists, mathematicians, technicians, and air traffic controllers.

Because of our relationship with labor, these subject matter experts are an integral part of our major NextGen initiatives. To date, we have more than 600 NATCA representatives, and 90 front-line managers, participating in 90 discrete events. The controllers are not just collaborating, they are shaping NextGen. They are at the heart of what we are doing, and they are embracing NextGen implementation.

While we have a well-constructed enterprise architecture and implementation plan for NextGen, it is critical that we maintain a level of flexibility, scalability, and responsiveness that allows us to evaluate each stage of implementation and adjust our plans to accommodate new technology and economic changes. The FAA employs an integrated approach to track NextGen program costs, schedules, and performance milestones. This includes a framework of several complementary tools that, together, address these issues and detail the planning, development, and delivery of NextGen. The FAA continues to work on an Integrated Master-Schedule (IMS) to strengthen its enterprise-level management tool. This tool is being designed to show how changes in programs' schedules will impact the delivery of NextGen capabilities. The IMS will draw upon the information contained in the roadmaps of the NAS Enterprise Architecture and captures key program activity and milestones for operational improvements. The NAS enterprise architecture is a strategic planning tool that depicts the evolution of the NAS architecture over time. The NAS enterprise architecture is a set of working documents that provide significant detailed planning information to implementing offices. The FAA publishes an executive level overview of the agency's progress annually in the NextGen Implementation Plan.

The 2013 NextGen Implementation Plan

I am proud to announce the recent release of the 2013 NextGen Implementation Plan. The plan provides an updated roadmap of the FAA's ongoing transition to NextGen. It also provides a wealth of information on the current state of NextGen programs.[2]

We have been transparent, from the beginning, about what we intend to accomplish with NextGen. The Implementation Plan describes what success looks like in our operational vision. We are publicly holding ourselves accountable, and we are proud of the progress we have made.

Successes and Benefits of NextGen

We report regularly on our success in achieving the milestones established in our Implementation Plans.

We have met a majority of the milestones identified in the previous edition of the Plan, having completed 82 percent of the site-specific implementations we promised in 2012. We are on track and fully committed to these programs and the capabilities they bring. That's on top of meeting an equally high percentage of the 340 implementation and work activity commitments we made in the 2009-11 editions of the Plan. We are delivering NextGen on time and on target. We continue to make consistent progress in the following key areas:

[2] In accordance with the Administration's directive to reduce printing costs, and capitalize on advances in mobile technology, the Plan is as an electronic document available for download on the FAA's NextGen website in e-book and PDF formats, www.faa.gov/nextgen .

- Automatic Dependent Surveillance–Broadcast (ADS-B) – To date, the FAA had installed more than 500 ADS-B ground stations, 445 of which were operational. This system changes the nation's air traffic control system from one that relies on radar technology to one that uses global satellites, which can provide more precise location data. ADS-B ground stations provide traffic and weather information to more than 1,400 properly equipped aircraft and supporting air traffic control separation services at eight En Route and 37 Terminal facilities.

    - United Parcel Service (UPS) in Louisville has been an early adopter of ADS-B technology; they have equipped aircraft with ADS-B and have seen both increased efficiency and lower fuel burn in their operations.

    - JetBlue has equipped 35 aircraft with ADS-B Out avionics. In June 2013, the airline was re-routed across the Gulf of Mexico to avoid weather-related delays. This shaved off about 100 miles from the flight's initial path and resulted in hundreds of gallons of fuel savings.

    - Helicopters equipped with ADS-B have been able to increase flight hours during periods of low visibility from 1,500 to almost 20,000 in the Gulf of Mexico.

    - To date with ADS-B, more than 500 operational radios are providing traffic and weather information to more than 1,400 properly equipped aircraft on the East Coast, West Coast, and in Alaska, with supporting air traffic control separation services at 8 En Route and 37 terminal facilities and supporting surface advisory services at 24 airports.

- The optimization of airspace and procedures in the Metroplex program has seven active teams in various phases of development. Additional sites were expected to complete their design and implementation in 2013, but may be delayed due to budget sequestration.

- Equipage Incentives – The FAA is considering operational and financial incentives to influence owners and operators to equip their aircraft to use NextGen capabilities and gain NextGen benefits and has engaged in a number of public meetings to engage industry and gain their input. Under the program name AirPASS (the Aircraft Priority Access Selection Sequence), the agency is developing plans for operations designed to benefit owners and operators who complete NextGen equipage early to implement "best-equipped, best served" strategies that are under consideration.

- The FAA has awarded the Data Comm Integrated Services contract, which will provide for data communications between airport towers and appropriately equipped aircraft in 2016. Operational Data Comm trials are underway in Memphis and Newark with FedEx and United Airlines.

- Over the last two years, System Wide Information Management (SWIM) infrastructure investments have enabled significant advancement in the access and distribution of airport surface movement information. The surface movement data from 27 major airports is now available through a single portal to a broad range of external consumers. Today there are 19 external consumers, including many cargo and passenger airlines, vendors, and aviation research institutions, receiving surface movement data through this single portal. This allows operators to make better-informed decisions that improve their efficiency.

- During a Collaborative Departure Queue Management demonstration, FedEx saved several hundred minutes of taxi time during each bank of departures from Memphis International Airport. FedEx at Memphis has seen a 20 percent increase in departure runway throughput capacity, which has eliminated their departure gate holds and departure queues that were always present for their early morning departure rush - resulting in fuel savings, and being able to have additional minutes, if needed, in their package sort. Called arrival and departure rates have been raised from about 77 per hour to 99 per hour. Louisville, San Francisco, Houston, Miami and Philadelphia are scheduled to implement this change through the end of this calendar year and early next year.

- Performance Based Navigation (PBN) - which facilitates more efficient design of airspace and procedures which collectively result in improved access, capacity, predictability, operational efficiency, and environment - is providing greater operational flexibility. Some examples of PBN success are:

    - US Air reduces its carbon footprint by 51,000 tons per year by flying Optimized Profile Descents into Phoenix Sky Harbor International Airport.

    - As early as 2008, flights at Hartsfield-Jackson Atlanta International Airport were saving up to 60 gallons of fuel per flight by using more efficient Optimized Profile Descent procedures. That also equates to a 380 kg reduction in CO2 emissions.

    - Flights at Las Vegas and Henderson that used RNAV area navigation routes spent about 10 fewer minutes in the airspace within 200 miles of the airport. There were 14 percent fewer interactions between McCarran traffic and Henderson arrivals.

    - At Dallas-Fort Worth, RNAV departure procedures enabled additional diverging departures from the same runway yielding capacity increases of between 11-20 additional operations per hour resulting in approximately $8.5 million to $12.9 million in delay savings per year.

- The use of Required Navigational Performance (RNP) AR approaches at Chicago Midway allows aircraft landing RY13C to de-conflict with aircraft simultaneously departing Chicago O'Hare RY22L. Previously a one-in, one-out method was used to separate these operations.

- There are other examples of advantageous RNP AR use, such as approaches to Bishop, CA, that avoid terrain and provide access that previously didn't exist and approaches into Ronald Reagan Washington National Airport that use precise paths to avoid prohibited areas.

We work very hard to calculate and report the benefits that we accrue. We are projecting that NextGen will reduce overall delays by 41 percent by 2020, compared with what would happen if we did not implement any additional NextGen improvements.[3] These delay reductions will provide an estimated $38 billion in cumulative benefits through 2020. We estimate 16 million metric tons in cumulative reductions of carbon dioxide emissions through 2020, and 1.6 billion gallons in cumulative reductions of fuel use.

We have expanded our public reporting of NextGen performance through success stories and performance snapshots on our website. The FAA publishes NextGen-specific metrics at the local level in order to isolate and identify NextGen improvements at site-specific locations. Core airports, key city pairs, distance/time/fuel reduction, runway safety, the implementation and use of NextGen technology and procedures will continue to be important to understanding the value and benefits of modernization. Taken together, these metrics reveal the nationwide impact of NextGen development, which has already been shown to provide tremendous benefits to efficiency and the environment.

[3] In order to assess the full cost of delay, the Department of Transportation (DOT) considers the value of air travelers' time. From 2003 to 2011, this was estimated by DOT at $28.60 per hour. In the Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis, DOT increased that value for 2012 to $43.50 per hour.

Challenges

A key limitation to measuring NextGen improvements is data availability. The FAA is working diligently on closing internal and external data gaps. In May 2013, the FAA launched the PBN Dashboard, a web-based tool that provides deployment and usage data on RNAV and RNP airport procedure in the NAS. This dashboard details procedure availability usage by runway and airport. The information collected and published on the Dashboard will support current and future analysis.

Another, more significant challenge we face is the uncertainty brought about by sequestration. The FAA reauthorization laid out a vision to address the future needs of our nation's aviation system. These needs have not gone away. It is important for us to work together to protect the great contribution that civil aviation makes to our economy.

The sequester and future funding unpredictability requires the FAA to make sizeable budget cuts that affect our operations and our future. While we are grateful that Congress passed budgetary flexibility for FAA to provide for a temporary solution to the FAA furloughs, this stop-gap measure does not end the ongoing challenges the sequester presents. We will not enjoy the benefits or the stability that reauthorization was intended to provide until we end the sequester and its fiscal consequences and find a sensible long-term funding solution. Without a predictable funding source, our ability to confidently develop long-range plans is compromised. I sincerely hope that we can work together to ensure that America continues to lead the world in the

development and implementation of aviation technology and operates the safest and most efficient aviation system in the world.

Mr. Chairman, this concludes my prepared remarks. I would be pleased to answer any questions you may have.

LoBiondo-1

QUESTION:

Performance Based Navigation (PBN) has great potential, including more direct flight paths, greater fuel savings, and reduced aircraft noise and emissions. Yet, utilization rates of PBN procedures remain low. Can you describe what the FAA is doing to both improve the implementation and utilization of PBN procedures?

ANSWER:

The FAA has a number of initiatives underway to address utilization rates of PBN procedures. Last year, the FAA produced a report on Obstacles to PBN Implementation, which collected information from the controller perspective, and more recently, FAA requested and received a report from the RTCA NextGen Advisory Committee (NAC) on recommendations for increased utilization, which collected the industry perspective. These reports made recommendations regarding automation improvements, the design process, environmental streamlining, regulatory changes, and training improvements, and FAA is pursuing many of these actions in collaboration with our labor organizations, industry stakeholders, and other organizations such as the Performance Based Operations Aviation Rulemaking Committee (PARC). The FAA is actively addressing the various recommendations. A key to success is a program management structure that we are establishing to integrate all of the requirements associated with implementation.

In addition to addressing the recommendations from industry and other stakeholders, the FAA has undertaken a systematic, integrated and expedited approach to implement PBN procedures and associated airspace changes in key metropolitan areas around the country. The Metroplex Program (or Optimization of Airspace and Procedures in the Metroxplex [OAPM]) was developed in direct response to the recommendations from RTCA's Task Force 5 Final Report on Mid-Term NextGen Implementation on the quality, timeliness, and scope of Metroplex solutions. There are active teams in various phases of development at seven sites across the country. While implementation to date has been limited, early implementation of independent utility procedures in the Washington DC Metroplex showed promising results, including utilization rates up to 80 percent on some of the procedures.

At non-Metroplex locations progress is also being made in PBN implementation and utilization. We have seen more than 50 percent utilization of Denver's RNAV STARs in the month following implementation. These procedures are reaping rewards for both the air carriers and the environment, and similar procedures are being designed and implemented around the country. The use of PBN capability on departure has also proven to be a value added. As a case in point, utilizing the more accurate navigation capability PBN provides, Atlanta has been able to create more departure routes, resulting in more takeoffs per hour, saving an estimated $20 million dollars for the air carriers and saving time for the travelling public. However, challenges remain as we rollout NextGen procedures. To help us understand and solve the issue, we have implemented a metrics utilization tool, called the PBN Dashboard, to better see which procedures are being used and which are not.

QUESTION: **In order for NextGen to be successful, do you believe industry stakeholders must have confidence in the FAA's ability to implement NextGen? If so, do you believe industry stakeholders have confidence in the FAA's ability to implement NextGen?**

ANSWER:

The FAA strongly agrees that NextGen success depends on industry stakeholders having confidence in the agency's ability to implement NextGen. FAA collaboration with stakeholders is the key to success of NextGen. The FAA can meet the needs of stakeholders if they are identified early in the NextGen effort by aircraft operators, airports and communities.

The FAA has a long history of engaging with industry and the agency has worked closely with stakeholders from the earliest stages of NextGen development to facilitate contributions towards the development of new systems, policies and procedures to transform the National Airspace System. Stakeholders have to make long-range investment decisions on new equipment and training to fully benefit from NextGen capabilities. The FAA is working closely with them as they develop business cases to justify their investments in terms of benefits that will be captured.

The FAA believes it has been making progress in building confidence among stakeholders and overcoming the memories of difficulties in several collaboration efforts in the decades before NextGen. Stakeholder confidence is essential to NextGen success if the necessary private sector investments are to be made, but these participants in the modernization process will only be satisfied if the FAA delivers on its promises.

Here are several examples of how the FAA has been responsive to stakeholder input in its NextGen efforts:

Metroplex: The FAA's rapidly progressing Metroplex effort is coming to fruition as a response to recommendations by the RTCA NextGen Mid-Term Implementation Task Force (Task Force 5). The FAA requested the formation of Task Force 5 in early in 2009 to advise the agency on NextGen developments. The group, composed of a broad spectrum of representatives from commercial airlines, general aviation, the Department of Defense, original equipment manufacturers and airports, reached consensus with its recommendations in 2009. Following a suggestion in the final Task Force report, the FAA set a high priority on Metroplex work. A Metroplex, in FAA parlance, is a metropolitan area with airspace encompassing several airports including one with multiple runways.

Performance Based Navigation: As a result of FAA work since 2009, new networks of performance based navigation (PBN) procedures are starting to go operational at major Metroplexes including Washington, D.C. The success of the Metroplex effort thus far is helping build confidence among airports, airlines and other aircraft operators that NextGen can produce benefits that are going to justify their investments.

Ahead of the Task Force 5 recommendations, the FAA was already collaborating with stakeholders at some Metroplexes to add PBN procedures. One example is the Denver metroplex where 49 new PBN procedures (21 arrivals, 16 departures and 12 approaches) have gone operational in the second and third quarter of FY 2013. These 49 new PBN procedures serve the needs of a variety of operators flying into six airports in the Denver area. Data is not yet available on the benefits to stakeholders but early feedback to the FAA is positive.

In the United States, the total number of PBN procedures published as of June 27 (not just those in Metroplexes) includes 175 routes, 446 departures, 243 arrivals, 367 approaches (Required Navigation Performance) and 159 area navigation approaches with GPS. This is based on the periodically updated instrument flight procedures (IFP) inventory summary that can be found at this link: http://tinyurl.com/d9ue3pv.

Data Communications: Another example of work that is building stakeholder confidence is the FAA's testing of Data Communications at Newark Liberty and Memphis International. This text-message-like system should reduce the time and effort needed for pre-departure communications between controllers and pilots, boosting airport efficiency and safety. Several airlines are participating in the trials, learning firsthand how this technology can contribute to increased efficiency and reduced delays.

In summary, the success of NextGen is dependent on the long-term confidence of stakeholders. This confidence will continue to rise with ongoing collaboration and the achievement of NextGen goals. It won't, however, always be easy to motivate stakeholders to action in equipping their aircraft for NextGen considering the diversity of interests, the shifting priorities of various stakeholders, the need for clear cut business cases tailored to the needs of a particular airline, and the competition for resources in a corporation that may lead to a cabin makeover instead of an air navigation improvement.

LoBiondo-3

QUESTION: **The FAA is making progress on measuring and reporting on metrics that reflect the performance of the national airspace system. At the same time however, criteria for success remain elusive. What are the specific near-term performance improvements NextGen will deliver to justify the significant investment we continue to make in its deployment?**

ANSWER:

NextGen has already begun implementing near-term improvements, and has a waterfall of others that are scheduled for deployment between now and 2015. These near-term performance improvements include:

- Reduced aircraft separation and increased safety over the Gulf of Mexico, as a result of new ADS-B surveillance;
- Increased situational awareness for pilots, achieved by delivering flight and weather data directly to the cockpit;
- Enhanced surface surveillance for ground vehicles using ADS-B, reducing the risk of runway incursions;
- Time and fuel savings resulting from new Performance Based Navigation (PBN) procedures in the enroute and terminal airspace;
- Time and fuel savings achieved through improved metering of traffic arriving to busy airports;
- New procedures to safely allow additional approaches on closely spaced parallel runways; and
- More efficient oceanic flight trajectories, enabled by increased equipage with FANS and ADS-C.

These and other improvements are either being delivered now, or are on-track for delivery by 2015. Our modeling indicates that the cumulative benefits of these improvements will be $5.7 billion between now and 2015. However, these improvements will continue to yield benefits throughout their life. Assuming continued accrual of benefits at the 2015 rate of $2.6 billion per year, we estimate that near-term improvements will yield $45 billion in lifecycle benefits between now and 2030.

In comparison, NextGen's expenditures from 2007 through 2015 will be less than $7 billion.

LoBiondo-4

QUESTION:

Since 2010, when Optimization of Airspace and Procedures in the Metroplex was started, what sites have been completed, approximately how much does this effort cost, and what benefits are being observed and measured today?

ANSWER:

The typical Metroplex project takes approximately three years from initiation to implementation. The prototype Study Teams for Washington DC and North Texas were initiated in the fall of 2010. Since then, Metroplex teams have initiated work in Atlanta, Charlotte, Houston, Northern California, Southern California, South/Central Florida, and Phoenix. Full implementation at the first sites was not expected to be completed until the end of 2013, but there have been some delays due to budget and staffing constraints, sequestration, facility training requirements, and other demands on facility personnel. Nevertheless, the Houston Metroplex procedures are expected to be fully implemented in May 2014; implementation in DC and North Texas is expected by the end of 2014; and Charlotte, Atlanta, and Northern California should be fully implemented by mid-2015.

Metroplex Study Teams have predicted per site fuel burn savings ranging from $90 to $214 million per year for the nine sites examined to date ($10 to $24 million annually per site on average). In comparison, while costs vary considerably by Metroplex due to varying scopes and levels of complexity, the current average cost per site is estimated at $5 million dollars total over the approximately 3 year life of the project.

To date, Metroplex implementation of PBN procedures has been limited to independent utility procedures implemented by the Washington DC Metroplex Team in August 2012 and updated in June 2013. The FRDMM and TRUPS RNAV STARs to Washington Reagan National Airport and the GIBBZ RNAV STAR to Washington Dulles International Airport offer more direct flight paths and Optimized Profile Descents (OPDs) to eliminate interim level segments. These improvements were designed to reduce fuel consumption and emissions, and the Washington DC Metroplex Study Team predicted these OPDs would save over two million dollars in annual fuel burn for the operators serving these airports. Preliminary post-implementation analysis of radar track data estimates $2.3 million in annual fuel savings, and anecdotal feedback from air carriers has been very positive.

LoBiondo-5

QUESTION:

Can you please provide the subcommittee with a detailed status update of the implementation of section 213(a)-(c) of the FAA Modernization and Reform Act?

ANSWER:

The Report to Congress on Section 213 has been completed and is currently in coordination within the Agency and the Department of Transportation before publication.

As part of the process for developing the reports required by 213 (a) and (b), a comprehensive review of airports was completed and resulted in the focus of accelerated PBN efforts at 30 core (formerly titled Operational Evolution Partnership airports, or OEP) and 35 non-OEP airports. The results of the review, by airport, have been provided to all stakeholders via the FAA public website. As we move forward, stakeholder participation is paramount to success of PBN development and will be a vital part of procedure development. This information can be found on FAA's public website:
https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/reports/

Before and since enactment of the FAA Modernization and Reform Act, the FAA has been actively collaborating with the parties listed in Section 213 about the acceleration of NextGen technologies. In addition, representatives of these stakeholders are an integral part of several working groups and initiatives designed to accelerate NextGen implementation. Airport industry groups, Airlines for America (A4A), and air carriers are members of the NextGen Advisory Council (NAC) and the RTCA Operational Capabilities Working Group (OCWG). Aircraft and avionics manufacturers are also part of the NAC. Qualified third party vendors and the Aircraft Owners and Pilots' Association (AOPA) and National Business Aircraft Association (NBAA) belong to the RTCA Airspace and Procedures Working Group. In addition, air carriers and aircraft and avionics manufacturers are part of the Performance-Based Operations Aviation Rulemaking Committee (PARC).

LoBiondo-6

QUESTION: **NextGen has long been described as a transformation of the air traffic control system from ground-based radars to satellite-based GPS. At what point will the federal government achieve true cost savings by shutting down the existing ground radars? If there are no plans to shut down the ground radars, then what cost benefits or savings will be achieved for taxpayers (as opposed to the flying public and the airspace users) as a result of the NextGen transformation?**

ANSWER:

With the implementation of the Automatic Dependent Surveillance – Broadcast (ADS-B) capability, the FAA will be able to significantly reduce the Secondary Surveillance Radar (SSR) infrastructure that supports Air Traffic Control (ATC) operations today. To mitigate outages of the GPS positioning source that enables ADS-B, the agency will maintain all SSRs in the en route domain along with approximately 42 SSRs in high density terminal locations, resulting in the decommissioning of 50% of the SSR inventory (or approximately 200 terminal radars).

In addition, the FAA will decommission 44 surface surveillance radars (ASDE-3 and the SMR portion of ASDE-X). These radars will no longer be necessary with aircraft and airport surface vehicles equipped with ADS-B. The FAA estimates that this will save the agency approximately $371M (2022 through 2035).

The main objective of NextGen is to improve the safety and efficiency of the National Airspace System. Most of the benefits take the form of reduced delays, more efficient flight paths, and reduced fuel consumption – all relative to what is forecast to occur without NextGen, and all while maintaining or enhancing the safety of the system. Increased system efficiency means that our current workforce will be able to handle more traffic per controller. While this implies that there will be cost avoidance, in most cases we do not directly quantify this benefit. We do anticipate significant cost savings after the NextGen transition from ground-based to space-based navigation. The FAA has already begun decommissioning Non-Directional Beacons (NDB), and we anticipate decommissioning VHF Omni-Range (VOR) stations in the future. Additionally, we expect some cost savings from programs that provide supporting infrastructure to NextGen. Programs such as System Wide Information Management, Time Based Flow Management, Data Communications and NAS Voice System are projecting over $1.25 Billion in cost avoidance through 2030.

LoBiondo-7

QUESTION: **Based upon both written statements, the FAA has convened a number of NextGen working groups, task forces, committees, and advisory boards since 2004, resulting in a large number of recommendations. Unfortunately, it seems that those recommendations have largely gone unaddressed. Why do you think the FAA has had such a hard time following through on recommendations that the agency itself sought and concurred with?**

ANSWER:

The FAA has a long tradition of seeking input from and collaborating with our many aviation community stakeholders. The planning and implementation of NextGen capabilities exemplifies that tradition. One of the best examples is the Metroplex initiative, which grew out of recommendations by the government-industry RTCA NextGen Mid-Term Implementation Task Force and continues to be refined through recommendations by the NextGen Advisory Committee (NAC). NextGen implementation will occur over several years, and recommendations are incorporated as capabilities are developed over time. While not all recommendations can be accommodated within FAA plans and fiscal realities, the agency values the aviation community's input and collaboration and works to refine its NextGen plans accordingly.

In January 2010, the FAA responded to the RTCA Task Force's recommendations on prioritizing NextGen capabilities for implementation. The FAA outlined its process for integrating the recommendations into its planning and is reporting progress against those recommendations in Appendix B of the annual updates to the FAA's NextGen Implementation Plan (NGIP).

Since the NAC was established in September 2010, the FAA has tasked the committee with making recommendations on a variety of NextGen implementation-related issues. The FAA has accepted and has included in its planning several NAC recommendations. The progress of NextGen capabilities related to these recommendations is tracked in Appendix B of the NGIP. Following is the FAA's progress toward addressing and acting on specific NAC recommendations:

Metroplex prioritization and regional airspace projects and priorities: FAA accepted these recommendations on prioritized NextGen capabilities for a key set of Metroplexes and is using this valuable input for near-term program and budget planning. Work at several Metroplex sites, which includes collaboration between the FAA and local stakeholders, is ongoing, but some work has been delayed due to sequestration.

Trajectory Operations: FAA accepted the NAC's recommendations pertaining to operational concepts and scenarios and included them in the NextGen Mid-Term Concept of Operations.

Special Activity Airspace: The FAA is using these recommendations to inform strategic planning with the goal to provide real-time information on the availability of Special Activity Airspace for non-military use, improving efficiency of aircraft operations.

NextGen Metrics: The NAC recommended that the FAA utilize Key Performance Indicators (KPI), as defined by the International Civil Aviation Organization, to measure NextGen progress. The NAC also defined a NextGen measurement methodology and recommended operational metrics and next steps. The FAA launched the NextGen Performance Snapshots (NPS) website in March 2012. Updated quarterly, the NPS measures performance at locations where NextGen capabilities have been implemented. Additional NAC-recommended metrics are included as data become available, including:

- City pairs for measuring NextGen performance: the NAC recommended key city pairs and the FAA has included metrics for those city pairs on the NPS website; and
- Actual fuel data: the NAC has not yet provided final recommendations on data sources for measuring NextGen fuel impact. A number of commercial operators are collaborating to provide meaningful data and the agency plans to evaluate this activity in FY 2014.

Equipage Incentives: The FAA used the NAC's broad recommendations to plan and hold several public meetings to seek input from interested stakeholders about program design and implementation of both financial and operational NextGen equipage incentives programs for commercial aircraft and general aviation. The agency continues to actively engage with industry to assess options that could attract additional investment in NextGen technologies and training.

Data Communications Roadmap: The FAA is using the NAC roadmap for Data Communications as input in developing the longer-term vision for operational capabilities supported by Data Comm. A more formal FAA response is planned for September 2013.

LoBiondo-8

QUESTION 8:

What initiatives will the FAA undertake to effectively lay out the business case for ADS-B In to ensure sufficient buy-in from the airline and general aviation community?

ANSWER:

The national deployment of ADS-B is steadily progressing and the FAA continues work on ADS-B procedures and applications for both Air Transport and General Aviation users that that will bring further near-term improvements to the NAS. To date, more than 560 radio stations have been installed throughout the NAS, of which 525 are currently operational. The operational radios are:

- Providing traffic and weather information to more than 1,700 properly equipped aircraft in an area covering roughly two thirds of the United States (ADS-B In)
- Supporting ATC separation services at 8 en route sites and 38 terminal sites (ADS-B Out)
- Supporting surface advisory services at 24 sites (ADS-B Out)

National deployment of the ADS-B ground infrastructure will complete in FY2014.

Air Transport Initiatives:
The FAA is using Other Transaction Agreements (OTAs) to help expedite early adoption of ADS-B by air carriers. Through OTAs with industry partners, the agency is able to demonstrate real benefits of advanced ADS-B In applications and procedures while allowing the FAA to share costs and risks with the participants. The use of ADS-B In applications will give the agency and airlines detailed cost and benefit data, and encourage other airlines and operators to equip early to capitalize on ADS-B benefits.

Any ADS-B-In application operational benefits validation activity requires at least one fleet operator to be willing to take the risk of being the "early adopter" to adequately exercise the application. Based on FAA's experience, this typically requires the Government to provide financial and operational incentives via FAA funding of the Non-Recurring Engineering to develop and certify the initial ADS-B-In avionics and some number of these systems to reduce the operator's financial exposure.
One example is the agency's partnership with United Airlines to demonstrate an ADS-B In-Trail Procedures application in the Oakland Oceanic Flight Information Region. An operational evaluation of this capability is ongoing. In May 2012, the FAA made the decision to fund the integration of In Trail Procedures into the automation system for use by air traffic controllers, which will be operational in 2017.

In addition, the agency plans to continue the evaluation and business case development of additional ADS-B In applications that were previously recommended by the user community through the ADS-B-In Aviation Rulemaking Committee (ARC). Based on ADS-B-In application research and feedback from the ARC, the major near-term benefits from ADS-B-In will be generated by Interval Management applications.

Current FAA plans call for Initial Investment Decisions for changes to the automation systems to support Interval Management to occur by the end of FY14, with Final Investment Decisions to occur by mid-FY16. If these investment decisions are made on this schedule, then FAA would expect to be able to commence support of Interval Management operations by 2019-2020. Interval Management avionics should be available in the 2016-2019 timeframe.

General Aviation Initiatives:
For the general aviation community, an agreement was signed in 2007 with Alaska Aviation Organizations and Alaska Aircraft Operators for safety enhancements, aircraft equipage, and airport improvement in the State of Alaska. As an extension of this agreement, the FAA recently awarded a contract to FreeFlight Systems to upgrade the aircraft previously equipped (ADS-B Out and In) under the legacy Capstone program with rule-compliant DO-282B avionics. In addition, the FAA is working with the University of North Dakota through the Center for Excellence for General Aviation Research (CGAR) to develop and certify an ADS-B In Portable Electronic Device (PED) for use in helicopters.

Lastly, the FAA has been investing in the development of standards and prototype avionics for an ADS-B In application known as Traffic Situational Awareness with Alerts (TSAA). This application provides pilots of non-TCAS II equipped aircraft with enhanced traffic situation awareness in all classes and domains of airspace by providing timely alerts of qualified airborne traffic operating in their vicinity (alerts using voice annunciations and visual attention cues). The avionics standards for this application are scheduled to be completed in late 2013.

RICHARD M. NOLAN
8TH DISTRICT, MINNESOTA

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Questions for the July 17, 2013 House Aviation Subcommittee Hearing Record

Submitted by Congressman Rick Nolan

Administrator Huerta:

Over four years ago, the MITRE Corporation developed an Automatic Dependent Surveillance-Broadcast (ADS-B) transceiver prototype using low cost commercial Global Positioning System (GPS) chip sets designed for cell phone and car navigation systems. By using commercially available components the total parts cost for this prototype was under $400.

This prototype is a fully functional ADS-B IN and OUT compliant device, which was successfully tested in gliders and other General Aviation aircraft in a series of flights cosponsored by MITRE, the FAA, AOPA and the Soaring Society of America (SSA) in 2010. To encourage the commercialization of this technology MITRE has made the designs and firmware for this device available to the commercial market on a non-exclusive basis for a nominal licensing cost.

As a result of these efforts, we are currently we seeing a proliferation of low cost ADS-B IN receivers in the General Aviation market which permit GA pilots to see both weather and traffic on low cost display devices, such as iPADs and iPhones. Unfortunately, we have not seen any low cost ADS-B OUT transmitters for the GA market, due to the FAA's insistence that these devices incorporate aviation certified GPS components which are prohibitively expensive for this application. The high cost of existing FAA compliant ADS-B OUT transmitters has discouraged the vast majority of GA users from deploying this technology.

In a futile attempt to encourage users to install ADS-B OUT transmitters in their aircraft, the FAA has decided to upload traffic data from its network of ADS-B ground stations only when an ADS-B OUT equipped aircraft is in the area, artificially limiting the ability of low cost ADS-B IN receivers from displaying traffic data that could significantly enhance the pilot's situational awareness and reduce the chance of mid air collisions, not only between GA aircraft, but also with airliners that may be in the vicinity.

QUESTIONS

1. The FARs exempt gliders, balloons, parachutists, and other aircraft without electrical systems from being equipped with transponders or ADS-B out devices. As a result these aircraft are

invisible to Air Traffic Control and TCAS collision avoidance systems installed on turbine aircraft. What is the downside of permitting the use of commercial grade GPS components for low cost ADS-B Out transmitters in these applications so that these aircraft become visible to the ATC system?

2. Why doesn't the FAA upload all traffic data from its ADS-B ground stations, without requiring an aircraft to be ADS-B OUT equipped, so that GA aircraft can fully take advantage of the collision avoidance technology provided by currently available low cost ADS-B IN receivers.
3. What are the FAAs plans to provide an alternative low cost certification scheme for General Aviation Avionics so that the latest technologies that are commonplace in the automotive and consumer electronic markets become available to the General Aviation community in a timely and cost effective manner?

Thank you.

Richard Nolan
Member of Congress
Minnesota 8th District

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

QUESTION: The FARs exempt gliders, balloons, parachutists, and other aircraft without electrical systems from being equipped with transponders or ADS-B out devices. As a result these aircraft are invisible to Air Traffic Control and TCAS collision avoidance systems installed on turbine aircraft. What is the downside of permitting the use of commercial grade GPS components for low cost ADS-B Out transmitters in these applications so that these aircraft become visible to the ATC system?

ANSWER:

The risk for any GPS receiver, commercial or those certified for aviation, when used to support separation services is how far the position measurement can be in error without detection. If the error in position gets large enough, air traffic control could induce a collision (or near miss) by issuing vectors based on invalid position information. FAA and our international peers conducted an analysis prior to publishing the final ADS-B rule to determine what this error detection bound should be. The final ADS-B rule performance requirements are based on this safety analysis.

Certified aviation grade GPS sensors use an internal algorithm to compare GPS satellite measurements against each other. When a satellite signal error becomes large enough to detect, the receiver will reject that signal. The integrity performance specified in the ADS-B rule is the practical application of this error detection technique. It ensures the safety of using ADS-B position based on GPS measurements.

By comparison, commercial grade GPS are designed to minimize time to first fix and to mitigate the multipath problems with using a GPS in an urban canyon. These sensors assume that GPS is working properly and do not attempt to detect errors in the satellite measurements. As such, when presented with an erroneous measurement, they will continue to calculate an erroneous position. This was proven to be an unsafe condition by the safety analysis. Therefore, ADS-B

position based on these sensors was prohibited from being used to support air traffic separation services.

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

QUESTION: Why doesn't the FAA upload all traffic data from its ADS-B ground stations, without requiring an aircraft to be ADS-B OUT equipped, so that GA aircraft can fully take advantage of the collision avoidance technology provided by currently available low cost ADS-B IN receivers?

ANSWER:

For the ADS-B program, the FAA approved the provision of services that supported a baseline set of ADS-B In applications. The traffic applications for ADS-B In provide for situational awareness and traffic alerts to operators. However, collision avoidance applications, such as that provided by the Traffic Collision Avoidance System (TCAS), are not part of the approved ADS-B baseline.

The FAA considered multiple approaches to providing traffic services with ADS-B. The baseline ADS-B In traffic applications have a defined set of performance criteria developed through RTCA to support their intended function. The service requirements included these performance criteria to ensure that these applications could be conducted by end users such as aircraft operators.

In addition, the FAA considered that a collision avoidance application with ADS-B was a potential future need which would have more stringent requirements than today's existing traffic applications due to the safety criticality of such an application. The FAA analyzed multiple options to meet application performance criteria and determined that it was necessary for aircraft to have both ADS-B Out and ADS-B In equipage to support these applications. The selection of the defined functionality for the provision of traffic services to ADS-B Out/In equipped aircraft was based primarily on the following factors:

- This option provides a guaranteed level of service to operators that are equipped such that all performance requirements are met throughout all ADS-B service volumes.

- Provision of traffic to ADS-B Out and In aircraft ensures that operators receive the services that fully support the SBS Program's approved baseline applications
- Excessive traffic that would be provided with a broadcast everything option would overload avionics processing systems rendering them unusable in many traffic environments. The approach implemented by the FAA minimizes processing requirements for avionics by providing only relevant traffic to equipped aircraft.
- This solution resolves issues with service boundary conditions such that aircraft with ADS-B Out and In equipage receive a full traffic picture. This resolves issues with traffic that may not be seen from some radios stations due to coverage holes caused by line of site limitations or terrain obstructions.
- The FAA's traffic service provides a positive indication to aircraft having ADS-B Out and In capability such that they are informed as to the completeness of the traffic picture being uplinked to the operator.
- The FAA is required to manage the aviation spectrum for all NAS users. The FAA's traffic service solution ensures that ATC operations are not affected because it optimizes spectrum use when transmitting traffic to ADS-B equipped aircraft.

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AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

QUESTION: What are the FAA's plans to provide an alternative low cost certification scheme for General Aviation Avionics so that the latest technologies that are commonplace in the automotive and consumer electronic markets become available to the General Aviation community in a timely and cost effective manner?

ANSWER:

The FAA is proposing a new low-cost standard for a combined ADS-B and transponder device. The position source part of this standard is in development between FAA and several GPS manufacturers. The goal of this standard will be to establish the absolute minimum performance allowed for safe display of traffic air-to-air. FAA and industry are exploring what safeguards would need to be established in order to make use of commercial grade GPS sensors in support of this application. Our desire is to publish this standard this calendar year to create a market for voluntary equipage of ADS-B technology for those who are currently exempt from the ADS-B rule.

Before the Committee on Transportation and Infrastructure
Subcommittee on Aviation
United States House of Representatives

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FAA's Progress and Challenges in Advancing 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 the Next Generation Air Transportation System (NextGen)—a system that is expected to provide safer and more efficient air traffic management. As you know, NextGen is an important and necessary transportation infrastructure project to modernize our nation's aging air traffic system. It is also FAA's most complex effort to date and will require multibillion-dollar investments from both the Federal Government and airspace users.

Since the effort began in fiscal year 2004, we have reported on cost increases and delays as well as challenges that FAA must address to successfully transition from legacy air traffic systems to NextGen. In September 2009, a Federal Government-industry task force—established at FAA's request—recommended several strategies for accelerating NextGen's benefits in the near term. While FAA has taken important steps to improve NextGen's management, such as establishing a new program management office, the Agency has made little progress in shifting from planning to implementation and delivering benefits to airspace users.

Today, I will focus on three priorities the Agency must address to realize NextGen's benefits: (1) addressing underlying causes for difficulties in advancing NextGen, (2) maximizing near-term benefits of new performance-based navigation routes and procedures, and (3) keeping the implementation of critical automation systems on track.

IN SUMMARY

FAA's difficulties in advancing NextGen and transforming the National Airspace System (NAS) stem from a number of underlying causes, including the lack of an executable plan and unresolved critical design decisions. For example, FAA's initial plans for NextGen did not address implementation costs or how technologies would be developed or integrated. Also key to NextGen's success is integrating new performance-based navigation (PBN) routes and procedures at key airports in order to maximize near-term benefits and gain user support. Yet, FAA's lengthy procedure development process has delayed the implementation of new routes, and unresolved obstacles, such as the lack of updated controller policies and procedures, make it uncertain when airspace users can expect widespread benefits. Advancing NextGen also depends on successfully deploying new automation systems that controllers use to manage air traffic. However, FAA continues to face technical, cost, and schedule risks with its efforts to modernize or replace automation systems at terminal facilities because the Agency has not identified and finalized all needed software and hardware requirements. Furthermore, despite recent progress with the En Route Automation Modernization System (ERAM)—a multibillion dollar program for processing flight data—considerable work remains to complete the effort in 2014 as currently planned.

BACKGROUND

NextGen involves a significant and much needed overhaul of the NAS to shift from outdated ground-based air traffic management systems to more effective satellite-based systems. This effort includes several components, such as:

- redesigning airspace and deploying new performance-based flight procedures,
- developing systems to help controllers better manage air traffic, and
- providing critical technologies and infrastructure for NextGen.

To accomplish NextGen's long-term goals, Congress mandated in 2003 that FAA create a plan to implement NextGen by 2025. While FAA's initial planning focused on this timeframe, the Agency more recently emphasized near- and mid-term initiatives. The following table highlights FAA's NextGen initiatives and modernization programs underway and their expected benefits.

Table. Examples of Key NextGen-Related Initiatives and Programs

Initiative/Program	Expected Benefits
Metroplex Airspace	Improve the efficiency of airspace that affects multiple airports near large metropolitan areas.
Airport Surface Operations	Improve the management of airport taxiways, gates, and parking areas.
Data Communications (DataComm)	Provide two-way data communication between controllers and flight crews for improved cruise and transition operations to enable more efficient use of available or forecast NAS capacity.
ERAM	Replace and significantly enhance existing software at the 20 FAA Centers that manage high-altitude air traffic. ERAM is FAA's key platform for NextGen to process NAS flight data.
Automatic Dependent Surveillance-Broadcast (ADS-B)	Enhance information about aircraft location for pilots and air traffic controllers using satellite-based surveillance technology.
System Wide Information Management (SWIM)	Provide a more agile exchange of information through a secure, NAS-wide information web that will connect FAA systems with other agencies and airspace users.

Source: OIG analysis.

To solidify Government and industry commitments, FAA asked RTCA[1] to examine NextGen operational improvements planned for the 2012 to 2018 timeframe, help develop plans to maximize NextGen benefits, and justify investment in mid-term

[1] 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 system issues. It functions as a Federal advisory committee.

capabilities. The task force made 32 recommendations and stated that focusing on delivering near-term operational benefits, rather than major infrastructure programs, would help gain industry confidence in FAA's plans and encourage users to invest in NextGen.

LACK OF AN EXECUTABLE PLAN, UNRESOLVED CRITICAL DESIGN DECISIONS, AND ORGANIZATIONAL CHALLENGES HAVE HINDERED NEXTGEN PROGRESS

To date, FAA's progress in implementing NextGen has not met the expectations of Congress and industry stakeholders largely due to several underlying programmatic and organizational weaknesses: (1) the lack of an executable plan given unstable requirements, (2) unresolved critical design decisions, (3) organizational culture and frequent turnover in NextGen leadership, and (4) undefined benefits. These weaknesses have contributed to stakeholder skepticism about NextGen's feasibility and reluctance to invest in NextGen.

FAA Continues To Lack an Executable NextGen Plan

FAA's NextGen plans—which initially targeted completion for 2025 at a cost of $40 billion—have lacked realistic strategies for achieving a system that could handle three times more air traffic while reducing FAA's operating costs. Weaknesses in FAA's plans were demonstrated early with the Agency's 2005 progress report to Congress.[2] Specifically, the report did not address implementation costs, establish priorities, specify sequencing for specific airports and airspace, or detail how needed technologies would be developed or integrated. Instead, the report focused on eight strategies for transforming the NAS, such as how to use weather information to improve on-time performance.

Throughout FAA's initial planning efforts, the Agency did not validate whether planned programs would provide needed capabilities, were technically feasible, and would be affordable for FAA or airspace users. In 2009, an internal FAA study[3] found that the Agency's NextGen plans were not risk-adjusted to realistically reflect what was technologically feasible and therefore could not be implemented as promised. The study concluded that implementing NextGen would cost significantly more than the initial $40 billion estimate and take as much as 10 years longer than originally planned.

FAA has been unable to set realistic plans, budgets, and expectations for key NextGen programs, largely due to a lack of firm requirements for NextGen's most critical capabilities. As we reported in April 2012,[4] requirements continue to evolve for major

[2] FAA, "2005 Progress Report to the Next Generation Air Transportation System Integrated Plan," March 2006.
[3] Joint Planning and Development Organization (JPDO), "Portfolio Analysis Report," 2009—also referred to as the "Trade Space Analysis." The JPDO commissioned the report for FAA to meet Federal requirements to develop a business case for its 2011 NextGen budget request.
[4] *Status of Transformational Programs and Risks to Achieving NextGen Goals* (OIG Report No. AV-2012-094), Apr. 23, 2012. OIG reports and testimonies are available on our Web site at http://www.oig.dot.gov.

transformational programs[5] such as ADS-B and DataComm. Therefore, decisionmakers and stakeholders lack sufficient information—including reliable cost and schedule estimates for achieving NextGen's goals of enhancing capacity and reducing delays—to assess progress and risk.

FAA Has Not Resolved Key Design Decisions That Will Shape NextGen Requirements, Timing, and Costs

FAA will continue to face difficulties with setting firm requirements for NextGen capabilities because several critical design decisions are still unresolved. Without a clear vision of needed capabilities, NextGen's benefits, timing, and costs—as well as its integration into the NAS—remain uncertain.

Key unresolved design decisions that will determine NextGen capabilities, timing, and costs include the following:

Air/Ground Division of Responsibility. FAA has not decided how much responsibility for tracking aircraft will be delegated to pilots in the cockpit versus what duties will remain with air traffic controllers and ground systems.

- **Level of Automation.** FAA has not decided on the degree of human involvement in air traffic management and separating aircraft, which is key to establishing technical requirements for NextGen. Possible options range from today's largely manual flight management to a mostly automated system centered on machine-to-machine exchanges with little controller involvement.

- **Facility Requirements.** FAA has not decided on the number and locations of air traffic facilities needed to support NextGen. In July 2012,[6] we recommended that FAA develop comprehensive and regularly updated cost estimates for its effort to realign and consolidate the Nation's network of air traffic control facilities into centralized locations. FAA concurred with our recommendation but has since scaled back its plans and will focus only on an integrated facility in the New York metropolitan area.

FAA's Organizational Culture and Frequent Changes in Leadership Contribute to Difficulties in Advancing NextGen

FAA's difficulties in advancing NextGen technologies also stem from underlying organizational and management challenges, including an organizational culture that has been slow to embrace NextGen's transformational vision. For example, a 2010–2011

[5] FAA has identified six "transformational programs," which are to provide the foundational technologies and infrastructure needed for NextGen. These programs are Automatic Dependent Surveillance Broadcast (ADS-B), System Wide Information Management (SWIM), Data Communications (DataComm), NextGen Network Enabled Weather (NNEW), NAS Voice System (NVS), and Collaborative Air Traffic Management Technologies (CATM-T).

[6] *The Success of FAA's Long-Term Plan for Air Traffic Facility Realignments and Consolidations Depends on Addressing Key Technical, Financial, and Workforce Challenges* (OIG Report No. AV-2012-151), July 17, 2012.

study conducted at FAA's request,[7] referred to as the Monitor Study, found that the Agency's culture was resistant to the type of significant change needed to achieve NextGen and lacked a sense of urgency. Similarly, officials we spoke with cited a resistance to change as a stumbling block to advancing NextGen.

Both the Monitor Study and our interviews suggest that FAA's highly operational, tactical, and safety-oriented culture can lead to a risk-averse outlook that is slow to embrace change, resulting in an organization that prioritizes day-to-day operations over more strategic and policy-driven change over time. Moreover, as we have previously reported in 2010,[8] FAA's culture is reluctant to embrace outside technologies and has historically not leveraged the work of other departments—such as the U.S. Department of Defense's research and development related to surveillance and security of aircraft.

Organizational instability and inconsistent leadership have also undermined FAA's efforts to establish a culture that could effectively advance NextGen. Since 2003, FAA has had five Administrators, and was without a confirmed Administrator from December 2011 until January 2013. In addition, FAA's current Deputy Administrator was only recently appointed after about a 4-month vacancy, and FAA has yet to permanently fill the Assistant Administrator for NextGen position, which has been vacant since December 2012. Stakeholders we interviewed expressed that frequent turnover in senior leadership has hindered a consistent message and a shared vision for NextGen, along with limiting accountability for NextGen problems and lack of progress.

Since the NextGen effort began in 2004, FAA has undergone several reorganizations intended to assign responsibility, accountability, and authority for NextGen.[9] FAA announced its most recent major reorganization in 2011, which included establishing a new Program Management Office to bridge the gap between NextGen's strategic requirements and program implementation. While such actions could better position NextGen for success, it is too early to assess the overall effectiveness of this change, and it remains unclear how these changes will ultimately advance NextGen.

We are currently conducting an audit further examining FAA's reorganization and the underlying causes for FAA's delays in implementing NextGen, and expect to issue our report later in 2013.

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[7] Between July 2010 and June 2011, the Monitor Group studied FAA's governance, processes, capabilities, and culture.

[8] *Timely Actions Needed To Advance the Next Generation Air Transportation System* (OIG Report No. AV-2010-068), June 16, 2010.

[9] For example, in May 2008, FAA announced a reorganization of its NextGen efforts, which included establishing a Senior Vice President for NextGen and Operations Planning within the ATO and an office for NextGen Integration and Implementation to support the Senior Vice President. Similar to the 2011 reorganization, FAA believed the change would help move NextGen closer to implementation.

Undefined NextGen Benefits Have Led to Industry Skepticism and Reluctance To Invest in NextGen Systems

NextGen's success depends in part on obtaining buy-in from key stakeholders—particularly airspace users, who elect to purchase and install costly NextGen avionics in their aircraft to achieve NextGen capabilities. Without widespread equipage, such as advanced avionics that will be required for ADS-B and DataComm, FAA will be unable to markedly increase capacity or save fuel through NextGen systems.

FAA recognizes the importance of industry participation and engages stakeholders through various forums, such as RTCA and the NextGen Advisory Committee (NAC),[10] as it works to establish near- and mid-term objectives for NextGen. Despite these efforts, consensus on NextGen priorities beyond the near-term has not been reached, and questions remain between FAA and industry regarding what benefits will be achieved and when. Moreover, as we have previously reported and testified, FAA has not clearly defined the benefits of key NextGen initiatives for enhancing capacity, reducing delays, and reducing operating costs. As a result, airspace users are skeptical about FAA's ability to deliver the technologies and related benefits and remain reluctant to equip with costly NextGen technologies.

Breakdowns in past FAA efforts have also fueled airspace users' reluctance to invest in new technologies—especially if the technologies may later be discarded. For example, FAA abandoned a much smaller but similar effort to implement a controller-pilot data link communications program[11] that was expected to play an important role in enhancing air capacity and reducing flight delays. FAA and industry jointly invested in the program and began using data linking on a limited basis. However, FAA terminated the program in 2005 because of cost growth and technical issues. User concerns and a lack of clearly defined benefits with NextGen technologies have triggered debate among FAA and industry about the need for equipage incentives, such as Government-backed grants or loan guarantees.

In response to these and other concerns, FAA convened a joint FAA-industry RTCA task force in 2009 to identify the major obstacles to user NextGen acceptance.[12] The task force framed several overarching issues for guiding FAA and industry investments and made a series of recommendations to the Agency to address them. For example, the task force emphasized that assigning responsibility, accountability, authority, and funding within FAA is critical to accomplish all associated tasks and achieve NextGen benefits.

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[10] The NAC is a Federal advisory committee that will develop recommendations for NextGen portfolios with an emphasis on the midterm (through 2018). The NAC includes representation from affected user groups, including operators, manufacturers, air traffic management, aviation safety, airports, and environmental experts.

[11] The controller-pilot data link communications program represented a new way for controllers and pilots to communicate that was analogous to wireless email. The program was planned for use at en route centers that manage high-altitude air traffic. Implementing this program—and obtaining expected benefits—required joint investments by FAA and airspace users.

[12] RTCA, "NextGen Mid-Term Implementation Task Force Report," September 9, 2009.

In 2012, we reported[13] that while FAA quickly endorsed the task force's recommendations by incorporating them into its NextGen strategic plans and budgets and establishing a mechanism for continued industry collaboration, the Agency has made limited progress in implementing them. Continued uncertainty about FAA's efforts to resolve the safety, policy, training, and organizational issues addressed by the task force could further deter industry's commitment to invest in NextGen technology.

OBSTACLES FACING IMPLEMENTATION OF NEW PERFORMANCE-BASED NAVIGATION ROUTES UNDERMINE EFFORTS TO MAXIMIZE NEAR-TERM BENEFITS AND ENSURE USER SUPPORT

Introducing new performance-based navigation (PBN) procedures, such as Area Navigation (RNAV) and Required Navigation Performance (RNP),[14] is critical to achieving near-term NextGen benefits, including more direct flight paths, improved on-time aircraft arrival rates, greater fuel savings, and reduced aircraft noise. However, use of PBN procedures has been limited due to unresolved obstacles, such as the lack of updated controller policies and procedures for using PBN and the lengthy flight procedure development process. Although FAA has important PBN efforts underway, these obstacles make it uncertain when airspace users can expect widespread benefits.

Use of PBN Procedures Is Limited

Although FAA has implemented over 100 RNP procedures to date at large airports, the benefits of these procedures remain unrealized because air carriers and airports are not widely using them. In 2012, FAA tasked MITRE[15] to obtain and analyze data to measure the use of PBN procedures and quantify their benefits. According to our analyses of MITRE's preliminary data, RNP use is high at some small- to medium-sized airports, such as Oakland, CA, but overall RNP use is low, particularly at busy airports, such as those in the New York City area. Notably, at the six large airports[16] where FAA has implemented advanced PBN procedures with curved approaches to runways,[17] only about 3 percent of eligible airline flights[18] actually used them.

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[13] *Challenges With Implementing Near-Term NextGen Capabilities at Congested Airports Could Delay Benefits* (OIG Report No. AV-2012-167), August 1, 2012.

[14] 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. 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.

[15] MITRE Corporation manages a research and development center for FAA, the Center for Advanced Aviation System Development.

[16] The six large airports are: Reagan National, Dulles International, Chicago Midway International, LaGuardia International, Newark Liberty International, and John F. Kennedy International.

[17] Curved approaches to runways improve the use of airspace by allowing aircraft to avoid critical areas of terrain or conflicting airspace, thus increasing capacity.

[18] An eligible flight is one in which (1) the aircraft was authorized to fly the RNAV/RNP procedure and (2) the flight was in a position to join the procedure.

Several obstacles have undermined FAA's efforts to increase use of PBN procedures. For example, according to a March 2012 FAA internal study and a June 2013 NAC report,[19] a key obstacle at busy metroplex locations is the lack of controller tools to manage mixed operations—that is, merging aircraft using straight-in approaches with those on curved paths.[20] Other reported obstacles include the lack of clear procedure design objectives, outdated controller procedures, and the lack of standard training for pilots and controllers. Recognizing the importance of addressing these obstacles, FAA tasked a team with developing an action plan, but it remains unclear as to when they will issue a report on the team's plan.[21]

FAA is also working to streamline its process for implementing new procedures in response to improvements from an internal FAA review—the NAV Lean project.[22] In September 2010, FAA reported numerous problems with the process, such as the lack of an expedited method for approving procedures that have only minor revisions, inconsistent interpretation of environmental policies and guidance, and inconsistencies in data. To address these problems, FAA made 21 recommendations for streamlining the process for deploying new procedures. In June 2011, FAA issued its plan for executing the 21 recommendations and to date has implemented 4. However, FAA does not expect to complete the entire NAV Lean initiative until September 2015. We plan to issue a report on FAA's NAV Lean progress later this year.

Key PBN Projects Are Underway, but Benefits Remain Uncertain

In 2010, FAA launched its metroplex initiative—a 7-year effort to improve the flow of traffic and efficiency at congested airports in 13 major metropolitan areas.[23] The metroplex project is a step in the right direction to achieving the near-term benefits of reduced congestion, as it involves introducing new PBN procedures. While FAA has completed initial studies or begun design work at 9 of 13 metroplex locations, it has only begun the implementation phase for one location—Houston, TX. According to FAA, airline procedure design and other issues have caused delays at the first two sites (Washington, DC and North Texas), and some metroplex activities were recently halted or delayed due to sequestration.

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[19] NAC (in response to tasking from FAA), "Recommendation for Increased Utilization of Performance Based Navigation (PBN) in the National Airspace System (NAS)," June 2013.

[20] According to MITRE, other causal factors, such as weather or operational conditions that do not necessitate the use of PBN instrument approaches, can also affect RNP use.

[21] The PBN Action Team was formed to develop mitigations to obstacles impacting the implementation and operational use of PBN procedures. Three NATCA representatives and three FAA management representatives identified 31 obstacles with corresponding action plans for mitigations; however, the plans have not yet been approved by FAA management.

[22] NAV Lean was a cross-agency project to streamline policies and processes used to implement instrument flight procedures in response to a 2009 joint FAA-industry task force report recommendation. FAA used the "Lean Management Process" to identify areas of waste.

[23] The 13 metroplex locations are: Atlanta, Charlotte, Chicago, Houston, Memphis, Northern California, North Texas, Phoenix, Southern California, Washington, DC, Cleveland/Detroit, and South/Central Florida.

Additionally, in March of this year, after 4 years of planning and development, FAA began publishing new PBN procedures as part of its Greener Skies[24] project in Seattle. According to FAA, the Agency found errors with some of the new procedures and has ongoing efforts to fully implement them. However, controllers will not be able to optimize the use of these procedures until FAA completes critical safety studies—due this September—and deploys new controller automation decision support tools. As a result, it is uncertain when users will see widespread benefits and whether this model can be applied NAS-wide.

As we reported in August 2012,[25] industry representatives have expressed concerns that FAA has not yet integrated efforts from other related initiatives, such as better managing airport surface operations.[26] In addition, many airspace users that are equipped with advanced avionics would like more advanced PBN procedures than FAA's current efforts provide—specifically, those that regularly allow for more precise and curved approaches.

FAA FACES PROGRAMMATIC AND COST RISKS WITH NEXTGEN'S AUTOMATION SYSTEMS

FAA's goals for NextGen in the near- and mid-term ultimately depend on the success of its ongoing efforts to deploy new automation systems that controllers rely on to manage air traffic. FAA cannot maximize new PBN routes or implement NextGen technologies (such as ADS-B and DataComm) without delivering new automation platforms for controllers in terminal airspace (near airports) and en route (high altitude) airspace. However, despite recent progress, FAA continues to face technical, cost, and schedule risks with both its Terminal Automation Modernization/Replacement (TAMR) program—FAA's effort to modernize terminal air traffic control facilities—and ERAM—a $2.1 billion system for processing en route flight data.

FAA Faces Significant Cost, Schedule, and Technical Risks in Modernizing or Replacing Automation at Terminal Facilities

FAA's TAMR program aims to modernize or replace all of the automation systems that controllers rely on to manage traffic at terminal facilities with a single automation platform—the Standard Terminal Automation Replacement System (STARS). If effectively implemented, TAMR is expected to reduce Agency costs and facilitate the implementation of NextGen capabilities. TAMR currently involves modernizing automation systems at 11 terminal facilities, 7 of which are the largest and busiest in the Nation. FAA estimates this effort will cost $438 million and be completed between 2015 and 2017.

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[24] Greener Skies is an airspace redesign project focused on using PBN procedures to reduce environmental impact of air traffic around Seattle-Tacoma International Airport.

[25] *Challenges With Implementing Near-Term NextGen Capabilities at Congested Airports Could Delay Benefits* (OIG Report No. AV-2012-167), August 1, 2012.

[26] Surface operations include the management of airport taxiways, gates, and parking areas.

However, as we reported in May 2013,[27] the Agency faces significant cost, schedule, and technical risks to modernize these facilities. Specifically, FAA has yet to identify and finalize all software and hardware requirements that are needed to successfully replace the existing automation system[28] with STARS. Finalizing these requirements involves extensive software development and testing—a lengthy and potentially costly process should issues arise in testing. FAA is currently developing software to address 94 requirements gaps but anticipates identifying more gaps once it begins transitioning to STARS at the busiest facilities. Moreover, because full STARS capability at the 11 terminal facilities is still years away, FAA continues to add new capabilities to existing systems at select facilities to support air traffic operations. The longer FAA must maintain and update existing systems at these sites, the greater the implementation and cost risk because FAA will have to add the same new capabilities to STARS.

Our audit also found that FAA's current cost and schedule estimates for its TAMR effort may not be reliable. For example, FAA's approved program schedule does not include detailed milestones for software testing and implementation, and was not assessed for risk per Agency requirements. In addition, FAA's cost estimates exclude major program cost elements, such as an estimated $270 million in technical refresh[29] and modernization costs. As a result, the true timelines and costs to modernize terminal automation remain unknown.

We made a number of recommendations to better and more cost efficiently manage FAA's terminal modernization efforts. FAA concurred or partially concurred with our recommendations and has begun working to address them.

FAA Is Making Considerable Progress Toward Getting ERAM on Track, but Critical Work on Complex Facilities and Key Capabilities Remains

FAA's NextGen goals depend on the successful deployment of ERAM—a $2.1 billion system for processing flight data at en route locations. Without ERAM, FAA will not realize the key benefits of NextGen's transformational programs, such as new satellite-based surveillance systems and data communications for controllers and pilots. FAA originally planned to complete ERAM by the end of 2010, but significant software problems impacted the system's ability to safely manage and separate aircraft and raised questions as to what capabilities ERAM would ultimately deliver. As a result, FAA rebaselined the program in June 2011, pushing its expected completion to 2014 and increasing cost estimates by $330 million.

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[27] *FAA's Acquisition Strategy for Terminal Modernization Is at Risk for Cost Increases, Schedule Delays, and Performance Shortfalls* (OIG Report No. AV-2013-097), May 29, 2013.

[28] Common Automated Radar Terminal System (CARTS-IIIE) is the existing automation system currently at the 11 large terminal facilities.

[29] Technical refresh or technology refreshment is associated with keeping fielded products, systems, and services maintained and operational.

FAA is making considerable progress with fielding ERAM. The Agency is now using ERAM at 16 of 20 sites either on a full- or part-time basis—a significant step forward given the extensive problems at the two initial sites. FAA plans for all 20 sites to achieve full operational capability and to decommission[30] the legacy system by August 2014. However, as FAA deploys ERAM to the Nation's busiest facilities, such as those in the New York and Washington, DC area, it expects to identify new problems that could impact cost and schedule. FAA is currently spending about $12 million a month on the ERAM contract, excluding NextGen efforts funded through the contract. If the current contract burn rate does not decline significantly, the Agency will need additional funds to complete this stage of the program.[31]

Moreover, controllers and experts continue to raise concerns about ERAM's capabilities. While these issues are not expected to delay ERAM's 2014 implementation, they will need to be addressed for the system to support most NextGen initiatives.

Flight Plan Trajectory Modeler—This capability models aircraft flight paths to predict aircraft collision conflicts and to ensure accurate handoffs between controllers as they communicate with pilots who transit to airspace controlled by another facility. However, the modeler software has often required adjustments to change the flight plan trajectory to ensure accurate handoffs. According to controllers, improvements are needed to support current operations and NextGen capabilities that use trajectory-based operations.[32]

- **Aircraft Tracking and Sensor Fusion**—This capability allows ERAM to integrate—or "fuse"—multiple radars and satellite-based information for controllers. However, thus far, controllers have not been able to take advantage of this improved capability because of problems with the ability to track aircraft accurately and consistently. A MITRE analysis found that the ERAM tracker will require adjustments to use ADS-B and radar together to manage air traffic.

CONCLUSION

NextGen is a necessary and complex undertaking—one that involves cutting edge technologies, new procedures, and a myriad of stakeholders whose priorities may conflict. Given these complexities, it is essential that FAA develop an executable plan with firm requirements, resolve critical design decisions, and address other underlying causes for delays in advancing NextGen. Until FAA implements new performance-based

[30] Decommissioning involves the disconnection, removal, and disposal of the HOST computer system once ERAM has been declared operationally ready at a site.

[31] The Office of Management and Budget approved shifting $44 million from the ERAM operations and maintenance account to the facilities and equipment (F&E) account, increasing total ERAM F&E funding to $374 million. As of February 2013, FAA had spent a total of $241.86 million—about 64.7 percent of the $374 million in F&E funding allocated since the June 2011 rebaseline.

[32] 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.

routes and procedures at congested airports and develops important NextGen automation systems, NextGen benefits will remain unrealized. FAA's recent reorganization is a step toward improving the management and direction of these efforts, but sustained leadership, with clear lines of accountability and authority, will be key to achieving intended outcomes.

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