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United States Senate

COMMITTEE ON COMMERCE, SCIENCE,
AND TRANSPORTATION

WASHINGTON, DC 20510–6125

WEBSITE: http://commerce.senate.gov

December 1, 2016

The Honorable Michael Huerta
Administrator
Federal Aviation Administration
800 Independence Avenue SW
Washington, D.C. 20591

Dear Administrator Huerta:

I am writing to request an update regarding the ongoing efforts of the Federal Aviation
Administration (FAA) to overhaul and modernize the nation's Air Traffic Control (ATC) system.
These efforts, collectively known as NextGen, have the potential to provide enormous safety,
efficiency, and economic benefits for the aviation industry and the American flyer. My concern
is that third-party audits continue to show that the FAA is not implementing NextGen in a
sufficiently timely and effective manner. The FAA must improve upon its record of working
with stakeholders and implementing new policies and technologies to ensure that NextGen's
benefits are realized.

NextGen is composed of an array of technologies, policies, and standards all aimed at improving
air traffic safety and efficiency. These components range from upgrading physical infrastructure,
to establishing new operating procedures for air traffic controllers, to modernizing FAA
computer networks and software. Since its inception, NextGen has received more than seven
billion dollars in funding from Congress.[1] Though the FAA has made some progress in
implementing certain NextGen components, reform efforts aimed at improving the government's
ability to achieve ATC modernization have failed to achieve significant improvements, and full
implementation of major programs remains a challenge.[2] In a recently released report, the
Department of Transportation (DOT) Office of Inspector General (OIG) stated that cost
estimates for the "transformational" programs required to implement the fundamental
capabilities and operational improvements necessary to transition to NextGen have increased by
over $3.5 billion, with timelines that now extend beyond 2020.[3] Moreover, according to the

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[1] *See* Letter from Hon. Calvin L. Scovel III, Inspector Gen., U.S. Dep't of Transp., to Hon. Bill Shuster, Chairman,
H. Comm. on Transp. & Infrastructure (Sept. 30, 2016).
[2] *See, e.g.*, U.S. Dep't of Transportation, Office of Inspector General, AV-2016-015, FAA Reforms Have Not
Achieved Expected Cost, Efficiency, and Modernization Outcomes (Jan. 15, 2016) [hereinafter DOT OIG Report
Jan. 2016]; Gov't Accountability Office, GAO-13-264, NextGen Air Transportation System: FAA Has Made Some
Progress in Midterm Implementation, but Ongoing Challenges Limit Expected Benefits (2013) [hereinafter GAO-
13-264].
[3] U.S. Dep't of Transp., Office of Inspector General, AV-2017-009, Total Costs, Schedules, and Benefits of FAA's
NextGen Transformational Programs Remain Uncertain at 2-3 (Nov. 10, 2016) [hereinafter DOT OIG Report Nov.
2016].

OIG, the FAA has yet to determine when the majority of these programs will start delivering benefits.[4] Of further concern is the fact that OIG does not believe that the FAA has fully identified the "end-state" for any of the transformational programs.[5]

As you know, in 2010, the FAA established the NextGen Advisory Committee (NAC) – made up of stakeholders including airlines, pilots, air traffic controllers, and technology providers – to represent the interests of the aviation community and provide advice on NextGen implementation.[6] In 2014, the FAA agreed to prioritize four capabilities that NAC had designated as having the greatest potential for near-term benefits: 1) Performance-Based Navigation (PBN) procedures, which use satellite guidance to establish more accurate and efficient flight paths; 2) improvement of surface operations such as airport taxiway management through better information sharing; 3) Multiple Runway Operations, which would improve the use and safety of closely spaced runways during periods of low visibility; and 4) Data Communications (DataComm), which allows pilots and air traffic controllers to transmit instructions, warnings, and other routine communications via digital text messages rather than radio voice communications that can be more easily misunderstood.[7]

Given the complexity of NextGen, the concurrent implementation of numerous interconnected programs requires action by the FAA and stakeholders alike. For example, to implement PBN fully, airlines must install new satellite transponder equipment on aircraft in their fleets. At the same time, the FAA must deploy ground stations, develop new flight paths, and train ATC personnel on new procedures. To show stakeholders that their investments in preparing for NextGen are not going to waste, it is essential that the FAA take the lead on implementation, and aggressively pursue the delivery of near- and mid-term benefits.

Unfortunately, it appears that the FAA still has a long way to go to achieve implementation of NextGen's expected benefits. According to a 2014 OIG report, while over 70 percent of aircraft used by major airlines were equipped with the necessary equipment for the curved flight paths made possible by PBN, only two percent of eligible flights into major airports were utilizing these advanced approaches.[8] The OIG cited outdated air traffic controller policies and insufficient training of controllers on new procedures as obstacles to full PBN implementation.[9] Although more recent data from the FAA's website suggest that the percentage of eligible flights utilizing advanced PBN procedures with curved approaches has increased slightly since the issuance of this OIG report, it is clear that further progress must be made to ensure realization of the full benefits of the technology.[10] The FAA Reauthorization Act of 2016, which passed the

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[4] *Id.* at 2.

[5] *Id.* at 4.

[6] Radio Technical Comm'n for Aeronautics (RTCA), NextGen Advisory Comm., http://www.rtca.org/nac (last visited Dec. 1, 2016).

[7] U.S. Dep't of Transportation, Office of Inspector General, AV-2014-57, FAA Faces Significant Obstacles in Advancing the Implementation and Use of Performance-Based Navigation Procedures, at 3 (June 17, 2014).

[8] *Id.*

[9] *Id.* at 10; *see also* U.S. Dep't of Transp., Office of Inspector General, AV-2015-081, FAA Has Not Effectively Deployed Controller Automation Tools That Optimize Benefits of Performance-Based Navigation (Aug. 20, 2015).

[10] U.S. Dep't of Transp., Fed. Aviation Admin., Performance Based Navigation Implementation and Usage, http://www.faa.gov/nextgen/pbn/dashboard/ (last visited Dec. 1, 2016).

Senate by a vote of 95 to three this past spring, contained language to direct the full implementation of PBN procedures and other operational improvements.[11]

In addition, the FAA does not plan to begin implementing en route DataComm, a key factor in another high-priority NAC program, until 2019.[12] Considered to be a transformational NextGen program, DataComm aims to provide direct digital communications between air traffic controllers and airplane cockpits.[13] While the FAA has made progress in bringing this capability to airport towers, the initial, airport-focused DataComm service relies on existing equipment already installed on many aircraft.[14] According to the OIG, however, airspace users have been reluctant to equip with new, costly NextGen technologies such as those needed for full en route DataComm due to significant costs, as well as skepticism about the FAA's ability to deliver specific technologies and related benefits.[15] Specifically, some users have expressed concern about the FAA's previous abandonment of the implementation of a somewhat similar controller-pilot communications system despite joint agency-industry investment.[16]

One of the root causes of the FAA's lack of significant progress toward full NextGen implementation identified by the audit community appears to be a difference in philosophy between the FAA and the aviation industry on timing. NAC's priorities are those programs that can provide the nearest term benefits and justify expensive up-front investments. The FAA, on the other hand, reportedly views NextGen as a nation-spanning "system of systems" that must be implemented across the entire National Airspace System before major benefits can be expected.[17] While the FAA and NAC's focus on keeping the four priority programs discussed above on pace through complementary milestones has shown some recent progress,[18] the FAA still has much to accomplish. The FAA will be unable to complete the diverse and complex programs NextGen comprises if it does not compartmentalize them into manageable near-term goals that provide their own benefits while also laying the groundwork for longer-term achievements. Indeed, in August of this year, the OIG issued a report criticizing the FAA's failure to establish a clear vision of the future of NextGen, which hampers the agency's ability to review the effectiveness of its current research and development efforts.[19] In the November 2016 report discussed above, the OIG again underscored the difficulty the FAA has encountered in establishing long-term benchmarks for NextGen.[20] The report highlighted how, despite the

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[11] S. 2658, 114th Cong., § 4108 (2016).

[12] U.S. Dep't of Transp., Office of Inspector General, AV-2015-012, Planning for High-Priority NextGen Capabilities Underway, But Much Work Remains for Full Realization of Benefits (Nov. 20, 2014), [hereinafter OIG NextGen Report Nov. 2014].

[13] Id. at 4.

[14] U.S. Dep't of Transp., Fed. Aviation Admin., NextGen, Data Communications, https://www.faa.gov/nextgen/update/progress_and_plans/data_comm/ (last visited Dec. 1, 2016).

[15] OIG NextGen Report Nov. 2014, supra note 12, at 9-10.

[16] Id. at 10.

[17] Id. at 5.

[18] U.S. Dep't of Transp., Fed. Aviation Admin., NextGen Priorities Joint Implementation Rolling Plan 2017-2019 Executive Report (Oct. 2016).

[19] U.S. Dep't of Transp., Office of Inspector General, AV-2016-094, FAA Lacks a Clear Process for Identifying and Coordinating NextGen Long-Term Research and Development (Aug. 25, 2016) [hereinafter DOT OIG Report Aug. 2016].

[20] DOT OIG Report Nov. 2016, supra note 3, at 1.

FAA's investment of over $3 billion in the six NextGen transformational programs since 2007, the total costs, schedules, and benefits for these programs remain uncertain.[21] The FAA's reluctance to commit to near- and long-term plans will only further discourage stakeholders from full commitment and financial investment.

The cultural problems at the FAA appear to go beyond merely prioritizing different NextGen components. Earlier this year, the OIG issued a report detailing the ways in which FAA reforms have failed to produce expected improvements in cost control and efficiency gains regarding ATC modernization initiatives such as NextGen.[22] Over the past two decades, reforms mandated by Congress have included increased personnel flexibility, relief from certain acquisition laws and regulations such as the Federal Acquisition Regulation, and reorganization of agency management of ATC modernization.[23] According to the report, though the FAA has implemented the letter of these reforms, "the Agency's total budget, operations budget, and compensation costs have doubled while operational productivity at its network of air traffic facilities has decreased substantially."[24] The OIG cited "an ingrained organizational culture resistant to change" as one of the primary factors leading to these disappointing results.[25] These issues have proven to be persistent obstacles to meaningful reform. For the implementation of NextGen to be a success they must be resolved.

As noted above, the FAA has already invested billions of dollars in NextGen deployment since 2007, and the President's fiscal year 2017 budget requested an additional $877 million in funding for NextGen capital investments.[26] The FAA projects that NextGen will produce $11.4 billion in benefits to airlines and the traveling public over the next 15 years.[27] As discussed above, however, the OIG has reported that costs are estimated to increase by $3.5 billion over the next four years.[28] If key aspects of full NextGen implementation will not emerge for another decade or more, it is difficult to see how airlines, taxpayers, or the flying public will ever break even, much less realize the benefits to the U.S. economy that NextGen has promised. A better accounting of when stakeholders will reap the benefits of investments in NextGen will be important to seeing this ambitious initiative succeed.

In your testimony at the Committee's May 19, 2015, hearing on ATC reform, you discussed the FAA's progress in implementing aspects of certain NextGen programs and plans to improve implementation going forward.[29] In your responses to questions for the record of that hearing posed by myself, Senator Blunt, and Senator Fischer[30] regarding a then-recent report by the

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[21] *Id.* at 9-10.

[22] DOT OIG Report Jan. 2016, *supra* note 2.

[23] *Id.*

[24] *Id.* at 5.

[25] *Id.*

[26] U.S. Dep't of Transp., Budget Highlights – Fiscal Year 2017, at 15 (2016).

[27] FAA Home, NextGen, NextGenWorks, https://www.faa.gov/nextgen/works/ (last visited Dec. 1, 2016).

[28] *See* DOT OIG Report Nov. 2016, *supra* note 3.

[29] *FAA Reauthorization: Air Traffic Control Modernization and Reform: Hearing Before the S. Comm. on Commerce, Sci., and Transp.*, 114th Cong. (2015) (statement of Hon. Michael Huerta, Adm'r, Fed. Aviation Admin.).

[30] *Id.* (questions for the record, Hon. Michael Huerta, Adm'r., Fed. Aviation Admin.).

National Research Council that highlighted NextGen's limited progress,[31] you addressed the FAA's intention to remain flexible and continue to work closely with stakeholders. Since then, more reports critical of the FAA's NextGen progress have been released.[32] As we look forward to a future reauthorization effort, it is essential that this Committee receive an up-to-date look at where the FAA's NextGen implementation stands and what improvements have been made. Therefore, please provide responses to the following:

1. For each of the four NAC priority programs discussed above, please provide a summary of implementation progress made both by the FAA and industry partners, including a gap analysis that compares currently available technologies, standards, and procedures to those that were expected to be available by now when the NAC priority program was initially proposed. Please also provide a timeline for expected completion of the implementation of these programs, including the date that the FAA estimates each program will achieve a positive return on investment for the government and users.

2. In an April 2013 report, the Government Accountability Office (GAO) made five recommendations to improve the FAA's ability to implement NextGen programs.[33] For each recommendation, please provide a summary of new policies that you have implemented since 2013 to address GAO's concerns.

3. The FAA lists the En Route Automation Modernization (ERAM) computer system, which was completed in March 2015, as a NextGen program.[34] ERAM, however, has received funding since 2003, well before NextGen first appeared in the FAA budget in 2007.[35] For each line item included in the Administration's NextGen budget request for FY 2017, please indicate whether the program had received funding prior to 2007. In addition, please state how each program relates to the goals and expected outcomes of NextGen, including how it will contribute to a measurably safer and more efficient ATC system.

4. In its November 2016 report, the OIG highlighted the fact that "FAA considers the $2.7 billion ERAM program to be the backbone for NextGen that allows controllers to better manage flights from gate to gate."[36] Despite your announcement of completion[37] of the program, however, the OIG identified serious integration issues with more than half of

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[31] Nat'l Research Council, A Review of the Next Generation Air Transportation System: Implications and Importance of System Architecture (2015).

[32] See, e.g., supra notes 2, 3, & 19.

[33] GAO-13-264, supra note 2, at 56-57.

[34] FAA Home, Air Traffic, Technology, En Route Automatic Modernization (ERAM), https://www.faa.gov/air_traffic/technology/eram/ (last visited Dec. 1, 2016).

[35] Gov't Accountability Office, GAO-12-223, Air Traffic Control Modernization: Management Challenges Associated with Program Costs and Schedules Could Hinder NextGen Implementation (Feb. 2012).

[36] DOT OIG Report Nov. 2016, supra note 3, at 10.

[37] Hon. Michael Huerta, "En Route Automation Modernization" (speech, Ronald Reagan National Airport, April 30, 2015), Federal Aviation Administration.

the NextGen transformational programs and ERAM. The OIG concluded that modifications to ERAM are necessary before the expanded capabilities of the transformational programs can be realized in the National Airspace System (NAS). In fact, the OIG explained that the FAA already has plans to spend millions of dollars to further modify ERAM in order to address some of these integration issues.[38] Please outline the expanded capabilities that ERAM currently allows for in the NAS beyond the legacy system. In addition, provide an estimate for the total cost of ERAM, including the estimated costs of the modifications necessary to fully integrate ERAM with the NextGen transformational programs and deliver the benefits associated with full NextGen capabilities.

5. In its January 2016 report, the OIG made three recommendations that would improve the FAA's ability to manage acquisition for NextGen programs and to implement reforms fully. For each recommendation, provide a summary of the actions the FAA has taken or intends to take to fulfill the recommendation.

6. The OIG has identified insufficient outreach to stakeholders as a NextGen implementation obstacle. Have you implemented any policy changes aimed at improving stakeholder outreach so that NextGen's costs, benefits, and expected return on investment are more easily quantifiable and stakeholders can make more informed business decisions? If so, please describe these policy changes. In your response, please also provide specific dates by which system users can expect a return on their investments for each program listed in the FAA's budget as a NextGen program and the date by which taxpayer investments in these NextGen programs are expected to result in actual savings for taxpayers.

7. GAO has identified cybersecurity as another area of challenge for NextGen implementation. This is a serious matter given the high degree of interconnectivity inherent in NextGen technologies. In an April 2015 report,[39] GAO stated that the FAA currently has no plans to produce a cybersecurity threat model and that without such a model, the agency may be improperly allocating resources to defend NextGen aircraft and facilities against the most serious cybersecurity threats. The FAA Extension, Safety, and Security Act of 2016 requires the FAA to research and assess the creation of an agency-wide cybersecurity threat assessment model. What are the FAA's current plans for complying with the Act's directive? Will the FAA consider whether a threat model should include threats specific to NextGen programs? What is the estimated date of completion for the FAA's threat model research?

8. How do multilateral and bilateral commitments and agreements, including with the International Civil Aviation Organization, impact implementation timelines for NextGen programs?

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[38] *Id.*

[39] Gov't Accountability Office, GAO-15-370, FAA Needs a More Comprehensive Approach to Address Cybersecurity Challenges as It Transitions to NextGen (Apr. 2015).

9. Has the FAA conducted an analysis to identify potential risks to NextGen interoperability with other Air Navigation Service Providers? If so, does the agency anticipate NextGen implementation delays due to interoperability concerns?

10. In 2014, the National Academies issued a report highlighting challenges the FAA may face in developing and retaining a workforce with the appropriate skills needed to manage a large, complex initiative such as NextGen.[40] What actions have FAA officials taken to implement this report's recommendations?

11. In an August 2016 report, the OIG highlighted that the FAA has not yet established a structure to coordinate research and development (R&D) transfer with all NextGen partner agencies, potentially resulting in missed opportunities to build upon past R&D efforts at other agencies or the potential for duplication of efforts across agencies.[41] What steps is the FAA currently taking to increase interagency coordination to better leverage the R&D being conducted at NextGen partner agencies?

12. The OIG has observed that, according to the FAA's data, only 651 out of 7,000 commercial aircraft have been equipped with rule-compliant avionics as of August 2016. Furthermore, industry has raised concerns regarding both the availability of ADS-B avionics and repair station time slots to install the avionics in time to meet the 2020 mandate.[42] Please provide an update on the steps the FAA is taking to ensure that the 2020 ADS-B equipage mandate is met.

Please provide your response as soon as possible, but by no later than December 15, 2016. In addition, please direct your staff to provide a staff-level briefing by no later than December 22, 2016. If you have any questions, please contact Ashok Pinto of the Majority Committee staff at (202) 224-1251. Thank you for your cooperation and prompt attention to this matter.

Sincerely,

JOHN THUNE
Chairman

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[40] Transportation Research Board, Special Report 314, The Federal Aviation Administration's Approach for Determining Future Air Traffic Controller Staffing Needs, at 77 (2014).
[41] DOT OIG Report Aug. 2016, *supra* note 19.
[42] DOT OIG Report Nov. 2016, *supra* note 3, at 15.

cc: The Honorable Bill Nelson, Ranking Member

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