U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

February 10, 2016

The Honorable Peter DeFazio
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Rick Larsen
Ranking Member
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

Subject: *Federal Aviation Administration: Preliminary Observations of Potential Air Traffic Control Restructuring Transition Issues*

Since 1987, several countries have shifted the responsibility for providing air traffic control (ATC) services from national civil aviation authorities, to independent, self-financed air navigation service providers (ANSP) with either public or private ownership. The ownership structure of these ANSPs varies from government-owned entities (e.g., either wholly owned or partially owned government corporations) to privately owned entities (e.g., entities with private ownership and control of an air-traffic services corporation). A privately-owned entity can be a "for-profit" or a "non-profit" entity.

In the United States, which is generally considered to have the busiest, most complex and safest ATC system in the world, the Federal Aviation Administration (FAA)—operates both the ATC service and is the safety regulator. Over the past two decades, U.S. aviation stakeholders have debated whether the FAA should remain the entity that operates and modernizes the ATC system or whether a restructured entity should take on this role. In 2014, we found that, according to stakeholders and FAA officials we interviewed, it is important to identify what problem or problems separating ATC services out of FAA is intended to solve, before proceeding with it as a solution. Specifically, the current system faced challenges related to (1) mitigating the effects of an uncertain fiscal environment and (2) modernizing the ATC system.[1]

You asked us to explore potential transition issues to be addressed if the current U.S. ATC organization were restructured. This report provides preliminary information on the nature and scope of key issues associated with such a transition, according to selected experts and literature, and is based on our ongoing review of transition issues associated with a potential ATC restructure.

[1] GAO, *Air Traffic Control System: Selected Stakeholders' Perspectives on Operations, Modernization, and Structure*, GAO-14-770 (Washington, D.C.: Sept. 12, 2014).

For our ongoing work, we identified transition issues primarily through a review of our prior related work[2] and available literature on restructuring of ATC organizations as well as through exploratory interviews with academics, professionals in the U.S. aviation industry, and officials involved in transitions in other countries—Canada, the United Kingdom (UK), and New Zealand.[3] This work identified ATC restructure transition issues related to: (1) funding and financing, (2) asset valuation and transfers, (3) separating safety and regulatory functions from ATC operations, (4) managing potential impacts of a restructure to airspace users, (5) human capital, and (6) ATC modernization efforts, as well as other related issues. We then selected 33 experts with a range of expertise to speak on these ATC transition issues. We identified these experts through a contract with the National Academies of Sciences (NAS), literature on ATC reform, and related GAO reports. We provided NAS with criteria for selecting experts, including: (1) type and depth of experience, including the expert's recognition in the professional community and relevance of any published work; (2) present and past employment history and professional affiliations, as well as any potential conflicts of interest; and (3) other experts' recommendations. The views represented are not generalizable to those of all experts on ATC transition issues; however, we were able to secure the participation of a diverse, highly qualified group of experts and believe their views provide a balanced and informed perspective on the topics discussed. This report is based on the results of interviews to date with 29 of 32 experts using a semi-structured interview approach.[4] See Enclosure I for a detailed description of our scope and methodology. For our final product we plan to follow up with each expert for a second round of data collection, using a more structured set of questions to allow for more quantification of their collective views as well as interview FAA and industry stakeholder positions on potential transitions issues.

We conducted this performance audit from June 2015 to February 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The FAA operates and maintains the U.S. national airspace system which handles over 50,000 flights a day and more than 700 million passengers each year. Various offices within the FAA are responsible for operating and managing all aspects of the ATC system, regulating safety, implementing modernization efforts, and conducting research and development activities. For example:

- ATC operations and management: The FAA Air Traffic Organization (ATO) operates and maintains this system through (1) the FAA workforce that includes approximately 6,000 technicians and 14,500 air traffic controllers who work in airport towers, terminal areas, en-

[2] GAO, *Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from Their Commercialization*, GAO-05-769 (Washington D.C. July 29, 2005) and GAO-14-770.

[3] We judgmentally selected academics and professionals to interview based on their expertise of ATC transition issues and published studies on the topic.

[4] Of the 33 experts that we selected and contacted to interview, one expert declined to be interviewed for this review and, at the time we analyzed our interview responses for this report, we had not yet completed our interviews with three experts.

route centers, oceanic ATC centers, and other facilities,[5] and (2) ATC and other supporting systems and infrastructure, including ground-based surveillance radar-facilities, communication equipment, and automation systems and facilities that house and support these systems.

- Safety and regulatory functions: Several offices within FAA serve safety and regulatory functions. For example, the FAA's Office of Aviation Safety and two offices within it—the Aircraft Certification Service and Flight Standards Service offices—issue certificates for new air operators, new aircraft, and aircraft parts and equipment, and grant approvals for such things as changes to air operations and aircraft, based on federal aviation regulations.[6] The Unmanned Aerial Systems (UAS) Integration Office is responsible for ensuring that UASs are integrated into and operate safely in the national airspace system.[7]

- ATC modernization and capital investment efforts: A number of offices within FAA are involved in the management and implementation of modernization and capital investment efforts, including ATO, the Office of Aviation Safety, and the Next Generation Air Transportation System (NextGen) office, which is responsible for implementing NextGen—a complex, long-term initiative to modernize the ATC system with fiscal year 2015 funding totaling over $850 million.

- Research, development, and training: FAA also funds research and development centers, such as the Mike Monroney Aeronautical Center and the William J. Hughes Technical Center, which support aviation research, development, testing, and training and evaluation of ATC and aircraft safety, among other aviation areas.

FAA is funded from appropriations primarily from the Airport and Airway Trust Fund (Trust Fund). In fiscal year 2015 FAA's funding was over $15 billion. This funding finances air traffic operations, facilities and equipment, research engineering and development, and grants in aid for airports. Trust Fund revenues come from a set of excise taxes paid by users of the national airspace system. The majority of Trust Fund revenues come from taxes levied on passenger tickets. The percentage of FAA's funding for operations received from the Trust Fund has changed over time, averaging 60 percent over the past 10 fiscal years, with the remainder coming from General Fund appropriations over that same period.[8]

Transition Issues

We have identified the following key issues through preliminary discussions with experts and the literature we have reviewed (see fig 1):

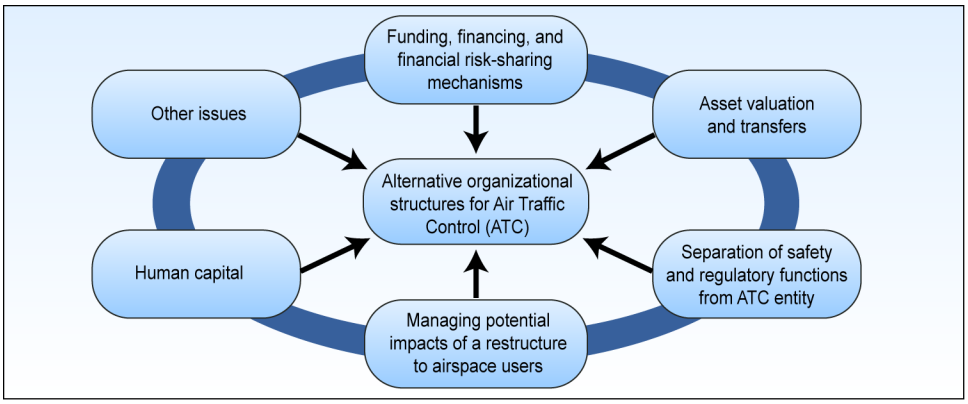
[5] In fiscal year 2015, FAA had a workforce of 40,000 thousand employees including approximately 14,500 air traffic controllers, 5,000 air traffic supervisors and managers, 7,800 engineers, maintenance technicians, and over 7,000 FAA safety staff.

[6] FAA inspectors and engineers interpret and implement these regulations governing certificates and approvals through FAA policies and guidance, including orders, notices, and advisory circulars.

[7] This office consolidates Aviation Safety and ATO personnel with UAS expertise into a single organization.

[8] The percent from the General Fund for FAA's overall funding is lower. For example, in 2009, 75 percent of FAA's overall funding came from the Trust Fund.

Figure 1: Key Potential ATC Transition Issues



Source: GAO analysis of literature and expert interviews. | GAO-16-386R

Funding, Financing, and Financial Risk-Sharing Mechanisms

When considering a reorganization of the ATC system, a central area of focus is how the funding of the entity should be structured.[9] The experts we interviewed identified many issues that would need to be considered regarding funding and other elements of the financial structure of a restructured ATC, such as (1) developing a funding and fee structure, (2) oversight of fee structure and rates, (3) methods to mitigate economic and financial risks, and (4) liability issues.

- *Developing a funding and fee structure*: A restructured ATC could have a variety of governance and ownership structures. Depending on how legislation governing funding is written, a new ATC entity might require a funding mechanism other than the current tax and general fund funding. A user fee system, with ATC charges levied based on use of the system, would be one way to fund the ATC system. Experts cited a variety of elements to consider in determining the most appropriate structure of such fees.[10] One issue cited is that it would be important to recover, in aggregate, all costs of running the system. However, many of these costs are fixed costs that relate to broad elements of the system that need to be in place to provide any ATC services at all. Because there is not a truly cost-based means to assign fixed costs across users, their assignment involves judgment and consideration of policy goals. As an ATC transition issue, the experts noted that coming to an agreement on how fee formulas should be structured would require involving all stakeholders of the system as well as ensuring that fees are adequate in aggregate to enable the ATC entity to be financially sustainable over the long term. Experts we spoke to had varied views about the structure and level of stakeholder input that would be needed.

  Further, determining how costs would be borne by different users and what types of exceptions, if any, should be made was an issue raised by the experts we spoke to. For example, according to these experts, whether certain users (such as government, General Aviation (GA)) should be charged according to the same formula as commercial users would be an important consideration. It was noted that non-commercial GA flights often use

[9] In 2014 we found that 36 of 64 stakeholders who suggested a change in FAA's funding suggested modifying how FAA's ATC operations and NextGen programs are funded. GAO-14-770.

[10] We previously reported on criteria and tradeoffs to consider in the design of federal user fees. GAO, *Federal User Fees: A Design Guide*, GAO-08-386SP (Washington D.C.: May 29, 2008).

minimal ATC services and that it may be difficult to track their use. Moreover, these users may have minimal ability to pay, so much so that significant charges might substantially curtail their use of the system. Other users, such as the military and state and local government users may also be considered unique in their use of the system, as they are providing social benefits through their activities.

- *Oversight of fee structure and rates:* If the ATC system is restructured, a transition issue to consider is economic oversight of its operations. The ATC entity would be a monopoly provider of ATC services and may have substantial leeway regarding its user fee structure. According to our preliminary discussions with experts, the determination of whether an economic regulator would need to be in place would depend on the nature of the ATC entity. For example, an oversight board made up of stakeholders—such as commercial air carriers, business and general aviation, government officials, and unions, as in the Canadian model, might not require economic regulation because the board's membership has a vested interest in keeping rates at appropriate, cost-based levels. According to these experts, if it is determined that some oversight is needed, another transition issue would be how to provide that oversight—such as through an existing government agency such as the Department of Transportation (DOT), or some new structure.

- *Mitigating economic and financial risks*: Another key issue that would need to be considered, according to the experts, is how a new entity would mitigate risk of unforeseen events or economic downturns that could affect traffic and revenue. For example, following the 2001 terrorist attacks in New York City and Washington D.C., the United Kingdom (UK) and Canada ANSPs experienced downturns in aviation traffic and associated declines in revenue. As a result, both ANSPs adjusted their funding and financing structure to mitigate the impacts of these declines. For example, the UK ANSP took several steps to mitigate the declines in revenue, which included refinancing its debt, obtaining additional funds from the government and private shareholders, and setting up a new regulatory structure that allows it to mitigate the effects of an industry downturn through automatic price increases that are triggered by reductions in air traffic. To maintain operations, the Canadian ANSP cut costs and raised its user fees, consulting with users as required. According to our literature review and preliminary discussions with experts, considerations for mitigating economic and financial risks might include a reserve fund and careful considerations of the financial structure of the entity—in particular, ensuring the entity is not overly reliant on debt financing.

- *Liability*: According to our preliminary discussions with experts another transition issue is ascertaining whether the ATC entity would be fully insurable in the private market. The extent of insurance coverage needed might be substantial, and as such, a consideration would be whether the federal government should play a role in insuring certain risks that may not be privately insurable. For example, according to some experts, the federal government might provide insurance coverage in case of unusual events, such as a terrorist incident. In the case of commercial space, for example, the federal government, subject to the availability of appropriations, provides for a payment of claims in excess of the required insurance mandated by law.[11]

[11] See *Federal Aviation Administration: Commercial Space Launch Industry Developments Present Multiple Challenges,* GAO-15-706 (Washington D. C., Aug. 25, 2015).

Asset Valuation and Transfers

As discussed above, FAA has a broad array of assets and obligations including physical assets (i.e., facilities, equipment, land, etc.) and software, as well as leases and service contract obligations. The experts we interviewed noted that, in an ATC restructuring, several transition issues, related to how assets are valued and transferred to the ATC entity, would need to be considered including (1) whether the federal government should seek remuneration for the transfer of ATC assets, and (2) if so how, the ATC system should be valued.

- *Remuneration to federal government for transferred assets:* Based on our preliminary discussions with experts, whether the ATC system should be sold or transferred without payment would need to be decided based on consideration of several factors, including: (1) the governance and ownership structure of the ATC entity; (2) the extent to which the government and ATC entity agree that users of the system already paid for ATC assets through ticket and fuel taxes; and (3) considerations regarding the financial impact of such a payment on the ATC entity and on user fees it will charge. For example, if the ATC entity is a government corporation, then the issue of whether the federal government should seek remuneration for the transferred ATC system might not be relevant. If the new entity is either a private non-profit or for-profit entity, then the issue of whether the federal government should seek remuneration for the transfer of the ATC system would be an important consideration. Another potential option, according to these experts, is that the government could have a lease arrangement in which the ATC entity would operate the system but the government maintains ownership of the assets. Another consideration cited would be whether any transfer would involve all assets and whether the ATC entity would have the option of deciding how to use and repurpose the transferred assets.

- *ATC system valuation:* If the ATC entity pays the federal government for acquiring the ATC system, our preliminary discussions with experts suggested that a variety of factors might need to be considered in determining the ATC system's value and potential sale. For example, experts indicated that determining the appropriate amount of the remuneration would need to consider the system's value based on future revenues as well as the financial impact of any payment on the ATC entity and system users. Experts noted that the higher the agreed upon payment for the ATC system, the higher the revenue requirements for an ATC entity. According to experts, coming to an agreement on a sale price should involve considering the views of all the parties involved (e.g., the government, ATC entity, and aviation stakeholders). In particular, the rate of fees that system users pay might be part of the price determination for the system.

Separation of Safety and Regulatory Functions from an ATC Entity

Preliminary discussions with experts have raised several transition issues that would need to be considered when separating safety oversight from ATC operations, such as (1) challenges with delineating roles and responsibilities, (2) potential impacts to coordination, and (3) potential impacts to the remaining safety regulator.

- *Delineating roles and responsibilities*: According to experts, while it may be easy to identify some existing FAA safety and regulatory functions that would clearly remain with the safety regulator such as certification, development of safety standards and policies, and oversight activities, other safety roles and responsibilities may not easily be split between the safety regulator and ATC entity. For example, one expert stated that it is not clear how activities

such as the development of flight standards and procedures and approvals of new procedures, which spans FAA's operations and safety organizations, would be easily separated between the safety regulator and ATC entity. Another expert stated that within the FAA, there are many offices that have shared responsibilities and that a transition period may be needed to figure out the functional separation of the ATC entity and the safety regulator. Further, according to experts, how decisions about safety criteria, standards, and processes (e.g., separation standards for runways) would be made and who should be involved in that decision-making process would need to be addressed. Some experts stated that a process will need to be put into place to address disagreements between the safety regulator and the ATC entity regarding safety decisions.

- *Coordination impacts*: Another issue to consider is how coordination between the safety regulator and an ATC entity might be affected in a restructured organization. Current modernization and recapitalization efforts span across several FAA lines of business (e.g., the NextGen Office, ATO, and Office of Aviation Safety) and require coordination between multiple FAA lines of business. In a restructure, staff currently in these areas might be split between the ATC entity and the safety regulator. A consideration would be how to preserve coordination and expertise on ongoing work, such as NextGen. For example, according to one expert, a critical part of NextGen, is developing and implementing new ATC procedures which might be more difficult to do if the ATC entity and safety regulator are separated. See below for further discussion of issues related to NextGen.

- *Potential Impacts to remaining safety regulator:* Finally, according to experts and literature we reviewed, another key transition issue that would need to be considered is mitigating potential impacts to the safety regulator as a result of a restructuring, such as funding and hiring impacts. According to one expert, a restructuring could result in the safety regulator being more vulnerable to funding challenges because the safety regulator would no longer have the ability to shift resources among programs as FAA has some ability to do. Additionally, one expert stated that another potential impact to the safety regulator is that it may face challenges hiring skilled staff because it would be competing with the ATC entity for skilled labor. For example, Transport Canada—the safety regulator of the Canadian ANSP—lost many skilled staff that went to the ATC entity. According to Transport Canada officials, they have continued to face challenges filling technical positions within the organization. Finally, according to our interviews with experts, another area where continued coordination would be important is in ensuring that the safety regulator has access to safety data and other information to continue to maintain oversight and safety.

Managing Potential Impacts of a Restructured FAA to Airspace Users

Another transition consideration according to experts and literature we reviewed is how to mitigate potential impacts to airspace users associated with a restructure, including (1) cost impacts to different users and (2) impacts to users' access to the airspace.

- *Fee impacts:* Currently an array of users access the U.S. airspace, and the costs of the system are paid by these users through a series of taxes and fees paid as described above. If a system of user fees were to replace the current financing structure, there may be differential effects of the new funding structure across these different users. As we previously noted, a transition issue identified through our preliminary discussions with experts is how any user fee structure might differentially affect varied users and, in turn, how this would impact the use of the airspace. For example, some of the experts we spoke with

noted that, depending on how user fees are structured, it is possible that general and business aviation might see their contribution to the cost of ATC services rise and that this increase could reduce the use of the airspace by these users. One expert stated that the United States benefits from a healthy GA community because it promotes the development of pilots, some of whom will go onto work in the commercial airline industry. Considering how each user group's fees would vary from their current payment of taxes and fees would be important to determine so as to develop a means to understand and potentially mitigate the extent of such effects on certain groups of users. As we reported—a revised fee structure that better aligns fees with costs imposed by the various types of users could result in a more economically efficient use of the traffic control system.[12]

- *Access impacts*: In addition, another concern raised by experts during our interviews is that small and rural communities could be negatively affected by a restructured ATC. According to one expert whom we spoke to, rules need to be in place for the ATC entity to not restrict access so that only high value customers, such as commercial airlines are served; access should be maintained for small communities and other services, which are important but don't make a lot of money. In the case of the Canadian restructure, Canada's law addresses this issue by providing protections for designated services in northern or remote areas.[13]

Human Capital

Based on our preliminary discussions with experts, consideration must be given for issues related to human capital issues including (1) employee compensation and other benefits, (2) collective bargaining, and (3) leadership and managing the organizational cultural change. According to our selected experts, these issues may affect morale, retention, and financial viability.

- *Employee compensation and benefits*: FAA employees participate in the federal government's various employee benefit programs, which include, for eligible employees and retirees, pension benefits, employee health insurance, and retiree health insurance. These programs include the Civil Service Retirement System (CSRS), the Federal Employees' Retirement System (FERS), and the Federal Employees Health Benefits Program, all administered by Office of Personnel Management. One issue is whether employees of the new entity would have these same benefit provisions or something different. During preliminary discussions, experts expressed concerns about how providing varying benefit structures to existing employees and new employees might affect employee satisfaction, retention, and future hiring. For example, in transitioning to a private entity, the Metropolitan Washington Airports Authority and Canadian ANSP provided similar benefits to the employees before and after the transition to maintain morale.

[12] See GAO, *Assigning Air Traffic Control Costs to Users: Elements of FAA's Methodology Are Generally Consistent with Standards but Certain Assumptions and Methods Need Additional Support*, GAO-08-76 (Washington, D.C.: Oct. 19, 2007) and GAO, *Aviation Finance: Observations on the Current FAA Funding Structure's Support for Aviation Activities, Issues Affecting Future Costs, and Proposed Funding Changes*, GAO-07-1163T (Washington, D.C.: Aug. 1, 2007).

[13] Specifically, the legislation specifies that NAVCanada—the Canadian ANSP—must, under specified circumstances give notice before terminating or reducing services to northern or remote services, and that charges for designated northern or remote services must not be higher than charges for similar services utilized to a similar extent elsewhere in Canada. See GAO, *Commercial Aviation: Status of Air Service to Small Communities and the Federal Programs Involved*, GAO-14-454T (Washington D.C., April 30, 2014).

In the case of the United States Postal Service (USPS), the Postal Reorganization Act[14] established USPS as an independent establishment of the executive branch of the government in 1970. Subsequently, in 1974 Congress amended statutory provisions to allocate responsibility to USPS for Civil Service Retirement System benefits attributable to post-1971 salary increases for employees who worked both for the postal department, which had been a federal agency, and USPS. [15] In this instance, Congress considered that USPS was to be self-sustaining and that the federal government, which had no control over USPS's pay increases, should not be liable for pension benefits attributable to those increases.[16] According to our literature review and preliminary interviews with experts, transferring too much unfunded liability to the ATC entity could negatively affect its long-term viability.

A second set of issues involves the governance and funding of retirement benefits (i.e., of pension and retiree health insurance benefits). For example, the new entity's benefit programs might be privately administered by the new entity, or the new entity might continue to participate in the federal government's benefit programs, with a separate accounting of costs attributable to the new entity (a related question is whether the new entity's employees would be considered federal government employees). Further, numerous decisions would have to be made regarding the funding of retirement benefits. Because retirement benefits involve obligations extending decades into the future, actuarial estimates have to be made of the size of an entity's retirement liabilities and the amounts that would be needed to fund these benefits. One question is whether retirement benefits would have any kind of guarantee, and by whom, if funding for them proved to be inadequate. A related issue would be appropriate safeguards on how potentially large pools of retirement funds would be invested, which could affect risks borne by FAA workers, retirees, or customers, or by taxpayers. Another consideration would be the allocation of responsibility for funding these benefits between the new entity and the federal government. For example, the federal government might be given responsibility for the portion of retirement benefits attributable to employees' years of service prior to the establishment of the new entity, but even that principle requires additional definition. To the extent the new entity is made responsible at its outset for existing pension and retiree health liabilities, another funding issue is the extent to which the new entity is provided corresponding retirement funds to offset these initial liabilities.

- *Collective bargaining*: During discussions, experts told us that transferring collective bargaining agreements to the ATC entity could raise some challenges. For example, currently there are multiple unions that could be affected in a transition and determining how to proceed with bargaining agreements would take time. Discussions with experts indicate that union agreements could be transferred for a time period to avoid major disruption. In addition, according to experts, the ability of air traffic controllers to strike should be resolved. Currently, ATC controllers, as federal employees, are prohibited from striking, and in discussions, experts generally ATC controllers should not be given the authority to strike given the importance of the ATC function to safety and the economy.[17]

[14] Pub. L. No. 91-375, 84 Stat. 719 (1970).

[15] Pub. L. No. 93-349, 88 Stat. 354 (1974).

[16] GAO-12-146.

[17] 5 U.S.C. § 7311.

- *Leadership and managing the organizational culture change:* According to our literature review and preliminary discussions with experts, another key consideration is how a transition would impact the existing organizational culture and what can be done to mitigate barriers from the existing organizational culture. Our discussions with experts have focused on the nature of organizational culture and the difficulties that are entailed in bringing about substantial changes through reorganization. In prior GAO work, aviation stakeholders have cited FAA's organizational culture as a primary challenge for FAA in successfully implementing large-scale change management initiatives. We previously found that changing FAA's culture would take a significant amount of time and leadership given the organization has been conducting its work for many years.[18] We have also previously found that implementing large-scale change management initiatives, such as organizational transformations, are not simple endeavors and require the concentrated efforts of both leadership and employees to realize intended synergies and to accomplish new organizational goals.[19] Further, we found that recognizing the "people" element in these initiatives, while managing the risk of reduced productivity and effectiveness that often occurs as a result of such changes, is key to a successful merger and transformation. Experts we spoke to also noted the importance of communicating with staff often to help manage potential concerns and having strong leadership involved in a restructure.

Other Issues

According to our preliminary interviews, additional issues to be considered include (1) ensuring an adequate amount of time to adequately plan and implement a transition and (2) mitigating impacts on current FAA initiatives.

- *Time to plan and implement a transition:* Experts indicated that it would take time to find answers to all of these issues, as well as any others identified. It would also take time to change from the current organizational culture to a new culture. According to officials we spoke to in Canada, it took about 1 to 2 years to put in place the ANSP organization with all the legal and financial decisions required, and 2 years to phase in collection of fees from users. Experts indicated that the transition time for a U.S. restructure could be at least a couple of years. Also, we have reported that any large transformation could take 5 to 7 years given multitude of issues that have to be worked through.[20]

- *Impacts on current FAA initiatives:* In preliminary discussions, experts mentioned the importance of ensuring that a restructure does not adversely impact current FAA initiatives, including modernization efforts and UAS integration. We have noted that FAA needs to continue improving these areas because many of these recommendations represent a significant shift in how FAA normally conducts business, and if the workforce is reluctant to implement such changes, FAA's planned initiatives for addressing the recommendations could be delayed.[21] In our preliminary discussions with experts, experts had mixed views

[18] GAO, *Aviation Manufacturing: Status of FAA's Efforts to Improve Certification and Regulatory Consistency*, GAO-14-829T (Washington D.C. July 31, 2014).

[19] GAO, *Results-Oriented Cultures: Implementation Steps to Assist Mergers and Organizational Transformations*, GAO-03-669 (Washington D.C., July 2, 2003).

[20] GAO-03-669.

[21] GAO-14-829T.

about whether a restructure would negatively impact or delay the implementation of NextGen. For example, some experts we interviewed stated that a restructure of any kind would delay implementation of NextGen. According to one expert, with a separation, the most difficult and critical part of NextGen, that is, developing and implementing new ATC procedures would be put on hold while the remaining safety organization develops new oversight procedures. For example, the Metroplex[22] initiative and work that's involved in implementing a new Performance Based Navigation (PBN)[23] procedure requires conducting significant community outreach and completing environmental reviews. Other experts we spoke to did not think there would be a negative impact on NextGen timelines. One of these experts said that a restructure would allow the ATC entity to make better, timelier decisions about modernization improvements that would have a positive impact on NextGen over time.

In addition, while FAA is making efforts to improve and accelerate progress toward integrating UAS into the national airspace system, additional challenges remain, including in the areas of authority, resources, and potential leadership changes. As we noted in February 2014, the establishment of the UAS Integration office was a positive development because FAA assigned an Executive Manager and combined UAS-related personnel and activities from the agency's Aviation Safety Organization and Air Traffic Organization. [24] However, in preliminary discussions experts expressed concern that FAA's, current 5 staff in the UAS office that were quickly overwhelmed by rapidly developing technology, would face greater problems if it's unclear what FAA's authority and resources would be to regulate UAS under a restructured ATC.

Agency Comments

We provided a draft of this report to the Department of Transportation (DOT). Via email, the Director, Audit Relations and Program Improvement in the Office of the Secretary told us that DOT, including FAA, did not have any comments in response to the draft report.

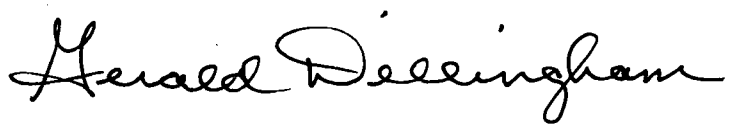
We are sending copies of this report to the appropriate congressional committees and the Secretary of Transportation. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

[22] Metroplexes are geographical areas that include several commercial and GA airports in close proximity (e.g., the D.C. Metroplex encompasses several major airports in the greater Washington, D.C. area, including Baltimore and Northern Virginia).

[23] PBN procures are intended to deliver new routes and procedures that primarily use satellite-based navigation and on-board aircraft equipment to navigate with greater precision and accuracy through all phases of flight.

[24] GAO, *Unmanned Aerial Systems: Efforts Made Toward Integration into the National Airspace Continue, But Many Action Still Remain*, GAO-15-254T (Washington D.C., Dec. 10, 2014).

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or DillinghamG@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made key contributions to this report are listed in enclosure II.



Gerald Dillingham, Ph.D.
Director, Civil Aviation Issues

Enclosure(s) – 2

Enclosure I: Objective, Scope, and Methodology

This report provides preliminary information on experts' views of the nature and scope of key transition issues associated with a potential transition of the current air traffic organization in the United States to an organization different than the Federal Aviation Administration (FAA).

To identify transition issues associated with a potential restructure of the U.S. ATC system, we examined prior GAO work, reviewed available literature on restructuring of ATC organizations, and interviewed academics, professionals in the U.S. aviation industry, and officials involved in transitions in other countries.[25] This work identified ATC restructure transition issues related to (1) funding and financing, (2) asset valuation and transfers, (3) separating safety and regulatory functions from ATC operations, (4) managing potential impacts of restructuring to airspace users, (5) human capital, and (6) ATC modernization efforts, as well as other related issues.

We then selected 33 experts with a wide range of expertise who can speak to the ATC transition issues that we identified.[26] We identified these experts through a contract with the National Academy of Sciences (NAS), literature on ATC reform,[27] and related GAO reports. In particular, we provided NAS with criteria for selecting experts. The criteria included: (1) type and depth of experience, including the expert's recognition in the professional community and relevance of any published work; (2) present and past employment history and professional affiliations, as well as any potential conflicts of interest; and (3) other experts' recommendations.

NAS provided us biography and resume information on various experts. To obtain a balanced set of perspectives, we used the NAS information along with our research on other experts to develop our final list of 33 experts to interview, a listing that we believe, as a whole, provides a balanced set of perspectives.[28] See table 1 for a list of experts that agreed to be interviewed.

[25] The literature we reviewed did not consist of empirical studies, but rather were largely publications describing the transitions of ATCs in other countries. The transition issues that we identified from this body of literature were corroborated by our interviews with experts and stakeholders.

[26] We also confirmed our list of transition issues with the selected experts.

[27] We conducted a literature search for studies that examined issues related to restructuring the U.S. ATC system. Some of the reports that we reviewed included GAO, *Air Traffic Control System: Selected Stakeholders' Perspectives on Operations, Modernization, and Structure*, GAO-14-770 (Washington, D.C.: Sept. 12, 2014); GAO, *Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from Their Commercialization*, GAO-05-769, (Washington D.C. July 29, 2005); MITRE, *CAA International Structures*, October 2014; and Bart Elias, CRS, Air Traffic Inc.: *Considerations Regarding the Corporatization of Air Traffic Control* CRS Report R43844 (Jan. 5, 2015).

[28] NAS provided us with a list of 40 possible candidates for our expert interviews. In addition, we identified an additional 21 possible interview candidates. To select our final list of experts to interview, we combined the two lists of NAS and GAO identified experts. For each expert, we identified the issue area that different experts would be able to respond to, based on their area of expertise. After categorizing each of the experts, we then selected 5 to 8 experts within each issue area to ensure that our final list of experts represented experts with a balanced set of perspectives. Our final list of experts included 22 experts identified by NAS and 11 additional experts identified by GAO.

Table 1: List of Experts Who Agreed to be Interviewed on Potential Transition Issues Associated with an ATC Restructure

Expert	Organization
Catherine Deluz	Moody's
George Donohue	George Mason University
Bart Elias	Congressional Research Service
Edward Faggen	Metropolitan Washington Airports Authority (Retired)
William Fenton	KPMG (Retired)
Craig Fraser	Fitch Ratings, Inc.
Craig Fuller	The Fuller Company
Richard Golaszewski	GRA, Inc.
David Grizzle	Dazzle Partners, LLC
John Hansman	Massachusetts Institute of Technology
Thomas Hickey	Virginia Railway Express
James Higgins	University of North Dakota
Jeff Holt	Bank of Montreal
Margaret Jenny	RTCA
David John	Brookings Institution
Michael Lexton	RBC Capital Markets
Sid McGuirk	Embry-Riddle Aeronautical University
Donna McLean	Donna McLean Associates, LLC
Clinton Oster	Indiana University
Robert Poole	Reason Foundation
Jack Potter	Metropolitan Washington Airports Authority
John Putnam	Kaplan Kirsch Rockwell
John Samuels	Revenue Variable Engineering, LLC
Jack Schenendorf	Covington & Burling LLP
Michael Scott	Self Employed
David Seltzer	Mercator Advisors, LLC
Jeffrey Shane	International Air Transport Association
James Straker-Nesbit	Lloyd's of London
John Strong	College of William and Mary
Oliver Pulcher	Deutsche Flugsicherung GmbH (DFS)
Stephen Welman	MITRE
James Wilding	Metropolitan Washington Airports Authority (Retired)

Source: GAO information | GAO-16-368R.

This report is based on the results of interviews to date with 29 of the 32 experts that agreed to be interviewed during our ongoing review of transition issues associated with a potential ATC restructure.[29] We used a semi-structured interview format with open-ended questions to conduct these interviews. Since this work is still ongoing, we are unable to quantify the experts'

[29] Of the 33 experts that we selected and reached out to interview, one expert declined to be interviewed for this review and, at the time we analyzed our interview responses for this report, we had not yet completed our interviews with three experts.

responses, and as a result, we provided in this report examples of some of the issues experts mentioned during our meetings to date. For our final product we plan to follow up with each expert for a second round of data collection, using a more structured set of questions to allow for more quantification of their collective views.

We conducted this performance audit from June 2015 to February 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Enclosure II: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

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