



**ENO CENTER** for TRANSPORTATION  
**NEXTGEN**  
WORKING GROUP

# Final Report



## Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>4</b>
<b>HISTORY OF ATC GOVERNANCE IN THE U.S.</b>	<b>4</b>
<b>INTERNATIONAL EXPERIENCES</b>	<b>5</b>
<b>POLICY OPTIONS</b>	<b>5</b>
<b>INTRODUCTION</b>	<b>7</b>
<b>METHODOLOGY</b>	<b>7</b>
<b>PART ONE: U.S. AIR TRAFFIC CONTROL GOVERNANCE</b>	<b>8</b>
<b>HISTORY OF GOVERNANCE</b>	<b>9</b>
<b>CURRENT ATC GOVERNANCE</b>	<b>9</b>
<b>HISTORY OF FAA FUNDING</b>	<b>11</b>
<b>CURRENT FUNDING</b>	<b>13</b>
<b>STAKEHOLDER AND DECISION MAKER INFLUENCE</b>	<b>14</b>
CONGRESS	14
COMMERCIAL AIRLINES	15
GENERAL AVIATION AND BUSINESS AVIATION	16
LABOR	16
AIRPORTS	18
<b>PREVIOUS ATTEMPTS AT U.S. ATC GOVERNANCE REFORM</b>	<b>18</b>
THE REAGAN ADMINISTRATION	19
THE EARLY 1990S AND THE AIR TRAFFIC CONTROL CORPORATION STUDY	20
THE MINETA COMMISSION AND THE BUSH YEARS	23
<b>LESSONS LEARNED FROM PREVIOUS ATC REFORM EFFORTS</b>	<b>26</b>
<b>PART TWO: INTERNATIONAL CASE STUDIES</b>	<b>27</b>
<b>NEW ZEALAND</b>	<b>28</b>
<b>GERMANY</b>	<b>29</b>
<b>AUSTRALIA</b>	<b>30</b>
<b>CANADA</b>	<b>31</b>
<b>UNITED KINGDOM</b>	<b>33</b>
<b>FRANCE</b>	<b>34</b>
<b>USER FEES OVERVIEW</b>	<b>35</b>
COMMERCIAL AIRLINES	35
GENERAL AVIATION	37
<b>KEY TAKEAWAYS FROM INTERNATIONAL EXPERIENCES</b>	<b>38</b>
<b>PART THREE: REFORM ALTERNATIVES</b>	<b>40</b>
<b>OPTION 1: GOVERNMENT CORPORATION</b>	<b>41</b>
OPTION 1: BENEFITS	43
OPTION 1: CHALLENGES	43
OPTION 1: OTHER CHARACTERISTICS	44
<b>OPTION 2: NON-PROFIT, INDEPENDENT ORGANIZATION</b>	<b>45</b>
OPTION 2: BENEFITS	47
OPTION 2: CHALLENGES	47

OPTION 2: OTHER CHARACTERISTICS	48
<b>OPTION 3: FOR-PROFIT, PRIVATE CORPORATION</b>	<b>49</b>
OPTION 3: BENEFITS	49
OPTION 3: CHALLENGES	50
OPTION 3: OTHER CHARACTERISTICS	51
<b>OPTION 4: FUNDING REFORM WITHIN CURRENT STRUCTURE</b>	<b>52</b>
OPTION 4: BENEFITS	52
OPTION 4: CHALLENGES	53
OPTION 4: OTHER CHARACTERISTICS	54
<b>LIABILITIES</b>	<b>54</b>
TRANSFER OF ASSETS	54
PENSIONS	55
INSURANCE	56
ENVIRONMENTAL	56
<b>REMAINING FUNCTIONS OF THE FAA</b>	<b>57</b>
SAFETY REGULATION AND CERTIFICATION	57
GRANT-IN-AID FOR AIRPORTS AND THE AIRPORT IMPROVEMENT PROGRAM	57
<b>POLICY RECOMMENDATIONS</b>	<b>58</b>
GOVERNANCE	61
PROPOSED FUNDING STRUCTURE	61
<b>CONCLUSION</b>	<b>62</b>
<hr/>	
<b>APPENDIX</b>	<b>64</b>
<hr/>	
<b>APPENDIX A: HISTORY OF GOVERNANCE</b>	<b>64</b>
<b>APPENDIX B: GOVERNMENT CORPORATIONS IN THE UNITED STATES</b>	<b>67</b>
AMTRAK	68
TENNESSEE VALLEY AUTHORITY	70
UNITED STATES POSTAL SERVICE	71
SUMMARY	72
<b>APPENDIX C: CONGRESSIONALLY CHARTERED NON-PROFIT ORGANIZATIONS</b>	<b>73</b>
AMERICAN RED CROSS	73
UNITED STATES OLYMPIC COMMITTEE	74
SUMMARY	75
<b>ENDNOTES</b>	<b>75</b>
<hr/>	

## **Executive Summary**

The nation's aviation system is part of the lifeblood of our economy, yet the system is facing rising demand, limited airport capacity, and aging navigation technology. In response, the Federal Aviation Administration (FAA) has developed the Next Generation Air Transportation System (NextGen) in an effort to modernize the nation's air traffic control (ATC) system. Once implemented, this system will continue to perpetuate safety performance and promote a more efficient, state-of-the-art satellite-based system. This system has the potential to facilitate economic growth, increase mobility, and provide the United States with the ability to keep pace with our international competitors.

However, NextGen has experienced unstable federal funding, causing implementation issues and increasing costs to the U.S. economy. Like other federal agencies, the FAA is subject to federal procurement rules, which create additional challenges when it comes to managing large scale projects such as NextGen. The inability of federal agencies to issue bonds or any other form of long-term financing further exacerbates these challenges. The Eno Center for Transportation brought together key stakeholders, former policymakers, and academics into a NextGen Working Group to discuss how to best accelerate modernization and to analyze the institutional barriers that have contributed to NextGen's delayed implementation. Exploration of the causes of these issues highlights the potential drawbacks of the existing federal institutional structures for delivering NextGen, suggesting that governance and funding reform could accelerate the implementation timeline.

The Working Group's research was comprised of two different components. Part one explored air traffic control governance in the United States, detailing its history and attempts that have been made to reorganize ATC governance since its inclusion into the United States Department of Transportation (USDOT) in 1967. Part two explored the international experience of corporatized ATC systems in six different countries. Using the analysis of U.S. ATC governance history and the international experiences, our research concludes by outlining four possible reform options along with policy recommendations.

### **History of ATC Governance in the U.S.**

After a few decades of experimentation when aviation was starting, the federal government took over the provision of ATC services between 1936 and 1941. The exponential growth of air traffic following World War II, along with a serious concern over the safety of our skies, brought the introduction of radar and the creation of the Federal Aviation Agency in the 1950's. In the following decade, with the creation of the USDOT, the FAA became a modal agency of this larger administration. This is the basic governance structure that the United States has in place today. The current funding structure was also established during the same period, with funding for ATC coming, since 1970, from a combination of taxes on the aviation system along, which are deposited in the Aviation and Airway Trust Fund, and are augmented with general funds.

Since the 1980's, there have been several attempts to modernize the U.S. ATC system to accommodate future growth in demand. However, the FAA has proved unable to

expediently implement these plans and to update the numerous systems that comprise U.S. ATC. This has catalyzed calls for the internal reorganization of FAA multiple times and has prompted many proposals to reform ATC governance and funding. The most substantial change in governance was the introduction of a performance-based ATC organization, the Air Traffic Organization (ATO), which was created as an arm of FAA in 2000. While governance was reformed, funding for the system remained unchanged.

The creation of the ATO was a culmination of a long discussion exploring the potential of reforming ATC governance. Since the 1980's there have been a multitude of studies and reports, from both government entities and outside groups. These included efforts in the Reagan administration to remove the FAA from USDOT and a plan to create a government corporation to provide ATC services. This latter proposal even reached Congress, but the legislation never left committee. These efforts have been unsuccessful largely because of a historical lack of consensus between stakeholders and policy makers.

### **International Experiences**

While in the United States the system is operated by the federal government and financed through taxation, most other developed countries have departed from a system of ATC provision directly from the national government. In our research, we analyzed six of those countries. Three of the countries (Australia, Germany, and New Zealand) created government corporations to provide ATC services. The other three all had unique structures: an independent non-profit user co-operative in Canada, a reformed government agency in France, and a public-private partnership in the United Kingdom. All six countries avoid relying on taxation to finance their operation, and are instead financed by fees charged to users.

While there have been concerns within the United States that non-governmental ATC provision could lead to increased costs to the airspace users, poor service, or unsafe operations, the experience of these countries demonstrates that commercialized providers have the ability to keep costs in check, upgrade their systems without public funds, and improve safety. Some key factors that are essential to the success of these systems include reliable, independent sources of revenue, independent, but accountable, management, and stakeholder involvement.

### **Policy Options**

Based on this research, the Eno NextGen Working Group explored four options for ATC reform in the United States. These options offered various levels of governmental involvement. The four options are:

- Financing reform while maintaining the governance unchanged;
- A government corporation;
- An independent non-profit;
- A fully private for-profit company.

Ultimately, maintaining the status quo governance structure with financing reform or creating a for-profit corporation were both considered to be unlikely to succeed and

politically unfeasible. On the other hand, a government corporation and an independent non-profit organization both have the potential to offer strong benefits. We propose that the U.S. should adopt a new governance and funding model for ATC provision that is either a *government corporation* or a *non-profit independent entity*.

The proposed organization would be free from both federal procurement and federal personnel rules, facilitating stable funding streams and expediting modernization. Providing airspace stakeholders an opportunity to be represented on its governing board and have influence over the system would ensure that the system would be run based on the interest of its users. This would create a more efficient ATC system that would have the potential to continue the growth of the national aviation system, promote economic growth and increased mobility, while maintaining the high standards of safety that the system enjoys today. The current financing would be replaced with direct payments to the ATC provider.

The rest of the FAA would be able to focus on its core missions, retaining its role as the aviation safety regulator. FAA would regulate safety and administer grants in a manner similar to the other modal administrations currently in the USDOT. Congress and the Federal Government would continue to play a substantial role in promoting the growth of the aviation system and assuring that strong safety oversight remains intact.

With reformed governance and funding structures, aviation stakeholders would act closely with the ATC provider to rapidly improve the U.S. aviation system. This collaboration has the potential to promote faster modernization of the ATC system, leading to more fuel saved and less congestion. Implementation of NextGen would also increase the reliability of the system, leading to faster and more efficient travel for passengers and cargo. It would also allow the aviation system to grow, allowing the system to continue to fuel economic growth and to continue increasing mobility. After 30 years of attempted reforms, there is now an opportunity to move forward and reform the U.S. ATC provision into a system more ready to tackle the challenges of the future.

## **Introduction**

The nation's aviation system is part of the lifeblood of our economy, yet the system is facing rising demand, limited airport capacity, and aging navigation technology. The Federal Aviation Administration (FAA) has developed the Next Generation Air Transportation System (NextGen) in an effort to modernize the nation's air traffic control system (ATC). Once implemented, this system will continue to perpetuate safety standards and promote a more efficient, state-of-the-art satellite-based navigation system. This system has the potential to facilitate economic growth, increase mobility, and provide the United States with the ability to keep pace with our international competitors.

However, NextGen has experienced unstable federal funding, causing implementation issues and increasing costs to the U.S. economy. Like other federal agencies, the FAA is also subject to federal procurement rules, which create additional challenges when it comes to managing large scale projects such as NextGen and pursuing incremental technology development, as is standard in high-tech enterprises. The inability of federal agencies to issue bonds or any other form of long-term financing further exacerbates these challenges. Exploration of the causes of these issues has highlighted the potential drawbacks of the existing federal institutional structures for delivering NextGen, suggesting that reform could accelerate the timeline.

The FAA also has responsibility for other important activities beyond ATC services. These activities include overseeing the safety of the U.S. skies and certifying and regulating aviation products and people. Within the context of maintaining the U.S. airspace as the safest in the world, safety regulation and aviation certification should be streamlined and improved to ensure that the national aviation system has the ability to achieve greater economic outcomes. This would also facilitate the introduction of new users, like unmanned aircraft systems and commercial space transport, into the national aviation system. In addition, airports also fall under the FAA's regulatory oversight in regards to safety, development, and funding.

Recognizing the challenge of ATC modernization, the Eno Center for Transportation brought together key stakeholders, former policymakers, and academics into a NextGen Working Group to discuss how to best accelerate modernization and to analyze the institutional barriers that have contributed to NextGen's delayed implementation. Our research aimed to define an institutional and financing structure that would be best suited to effectively and efficiently implement NextGen and its accompanying benefits.

## **Methodology**

Our research contains two parts. Part One explores air traffic control governance in the United States, detailing its history and attempts that have been made to reorganize ATC governance since its inclusion into the United States Department of Transportation (USDOT) in 1967. The aim of Part One is to provide context to understand the current incarnation of ATC governance and to define why past attempts to reform FAA's governance structure have failed.

Part two explores the international experience of corporatized or otherwise reformed ATC systems. The case studies include the following systems:

- Australia's Airservices
- Canada's NavCanada
- France's DSNA
- Germany's DFS Deutsche Flugsicherung GmbH
- New Zealand's Airways
- United Kingdom's NATS

Using the analysis of U.S. ATC governance and the international experiences, our research concludes by outlining four possible reform options.

## **Part One: U.S. Air Traffic Control Governance**

Since the 1980's there have been several attempts to reform ATC governance. These efforts have been challenged by a historic lack of consensus between stakeholders and policy makers. Due to the financial instability of the U.S. budget and the demonstrated success of other forms of governance abroad, the ground has shifted and the United States is now at a crossroads where the political landscape has revealed an opportune environment for pragmatic, innovative change.

In recent years, limited and unreliable funding has challenged the ability of the FAA to maintain and expand the U.S. ATC system. In 2011, FAA's authority to collect revenues into the Airport and Airway Trust Fund (AATF) and expend money temporarily lapsed, resulting in furloughs and stopped projects. In 2013, implementation of the Budget Sequester began, forcing FAA to furlough personnel at a rate of one day every two weeks, including air traffic controllers.<sup>1</sup> While this furlough was repealed, later that same year FAA employees again found themselves in a precarious situation. During the 2013 Government Shutdown, 33.7 percent of FAA employees were temporarily furloughed.<sup>2</sup> This financial instability demonstrated to stakeholders the unpredictability of the current system based on annual appropriations, resulting in increased concern over future budget stability.

Concurrently, countries around the world have had measured success implementing new approaches to ATC governance. These successes suggest that alternative approaches to ATC have the potential for providing improved service, offering a blueprint for best practices.

Most importantly, stakeholders from all parts of the spectrum have acknowledged the pressing need to modernize ATC systems, recognizing that the current governance and funding structure impede implementation of new technologies in a timely manner. Stakeholders have also demonstrated their willingness to come to the table to discuss approaches for modernizing the system. Furthermore, influential policy makers, including Secretary of Transportation Anthony Foxx, have voiced their willingness to discuss new solutions.



Part One explores the development of the current ATC governance structure and its funding systems, the roles of stakeholders, and the efforts to reform ATC governance since the early 1980's.

### **History of Governance**

The federal involvement with aviation began in 1926 with the Air Commerce Act. As it evolved, the federal role in aviation ultimately encompassed the economic regulation of airlines, safety oversight over the entire aviation industry, and the provision of air traffic control.<sup>3</sup> This section provides an overview of the most important waypoints of the history of U.S. ATC governance. A more detailed account can be found in Appendix A.

In the beginning of aviation there was no formal ATC. Pilots had to be aware of their surroundings, and separate themselves from other traffic. In the 1920s, technologies like radio communications and ground beacons started to be used to make flying safer. This would not be enough, and after a series of accidents, the federal government took over the provision of en-route ATC services in 1936, while control at airports remained a local issue. In 1941, in preparation for the war effort, the federal government took over control at airports, and thus began the current system where both en-route and terminal services are provided by the federal government. After the exponential growth of air traffic following World War II, along with a serious concern over the safety of our skies, the 1950's brought the introduction of radar and the creation of the Federal Aviation Agency. In the following decade, with the creation of the USDOT, FAA became a modal agency of this larger administration. This is the basic structure that we have to this day.

Since the 1980's, there have been several attempts to modernize the U.S. ATC system to accommodate future growth in demand. However, the FAA has been criticized for its inability to expediently implement these plans and update the numerous systems that ATC is composed of. This criticism has catalyzed the internal reorganization of FAA multiple times. The most substantial change in governance was the introduction of a performance-based ATC organization, the Air Traffic Organization (ATO), created as an arm of FAA through an Executive Order in 2000.<sup>4</sup> Since then, the agency has been involved in implementing its latest iteration of modernization: the Next Generation Air Transportation System (NGATS), later re-branded as NextGen, first introduced in Congress's 2003 FAA reauthorization bill, Vision 100 – Century of Aviation.<sup>5</sup>

### **Current ATC Governance**

Currently, FAA is the largest component of USDOT with over 46,000 employees. FAA's Administrator, who is appointed to a five-year term (currently Michael Huerta), reports directly to the Secretary of Transportation (currently Anthony Foxx). Within FAA there are two primary 'arms': air traffic control and everything else, including certification, safety regulation, airport oversight, and grant programs. FAA is headquartered in Washington, D.C., its Technical Center is in Atlantic City, and its Aeronautical Center (which includes controller training) is in Oklahoma City. FAA also has nine regional offices and hundreds of staffed operational facilities. It is a relatively devolved administration with most day-to-day operations occurring at the regional offices and numerous staffed facilities.<sup>6</sup>

Created in 2000 by Executive Order and opened in 2004, the ATO is responsible for ATC operations within the FAA. ATO is also the largest arm of the FAA, employing about 75 percent of its employees. ATO was in part founded on the principles of separating ATC from the regulatory arms of FAA, and introducing more business-like performance standards. ATO has separate management and a separate organizational structure from the greater FAA, and provides some degree of separation between regulatory components of FAA and provision of ATC services. The ATO Chief Operating Officer (COO, currently Teri Bristol) heads ATO, with leadership shared among seven vice presidents.<sup>7</sup> There are two primary service units within ATO: air traffic services, responsible for en-route and terminal air traffic control, and technical operations, responsible for infrastructure management and maintenance.<sup>8</sup>

The primary role of ATO is to provide “safe and efficient air navigation services to 30.2 million square miles of airspace.”<sup>9</sup> To do this, the United States’ domestic and oceanic airspace is divided into 24 flight information regions. Each region is home to an air route traffic control center (ARTCC) whose function is to separate aircraft along their flight routes. ATO also operates ATC around 120 towers at airports across the nation.<sup>10</sup>

ATO has the responsibility to approve an aircraft’s flight plan, direct its flight through the various airspace sectors along its route, respond to requests from pilots for route changes, etc. The three main components of air traffic control infrastructure are communications, navigation, and surveillance. NextGen is intended to modernize all three.

General aviation planes have the option of flying in “uncontrolled” airspace, in which they are responsible for visual self-separation from other planes, or filing a flight plan to fly in the same controlled airspace used by airlines. Privately contracted, but FAA regulated, Flight Service Stations (FSSs) exist to assist private pilots with both options, enabling them to get weather briefings and to file flight plans.<sup>11</sup>

In recent years there has been some progress towards air traffic facility consolidation in order to reduce costs and improve services. Terminal Radar Approach Control Facilities (TRACONS) in very large urban areas (such as metropolitan Washington, D.C. and both southern and northern California) have been the primary successes in consolidation thus far. FAA, mandated by its last reauthorization, and outside researchers have studied much larger-scale consolidation.<sup>12</sup>

After the formation of the ATO in the early 2000’s, the focus of FAA had been on delivering NextGen, and governance reform has been outside of the spotlight. This began to change with the budget sequestration and federal government shutdown in 2013. With the FAA reauthorization approaching in 2015, key stakeholders have once again started to discuss the possibility of funding and governance reform in order to expedite the delivery of FAA’s modernization efforts.

## History of FAA Funding

Through its almost 80 year history of formalized, federal level governance, ATC has frequently been underfunded and policy makers have struggled to define a long-term, sustainable funding structure. This section details how the current funding structure came to be.

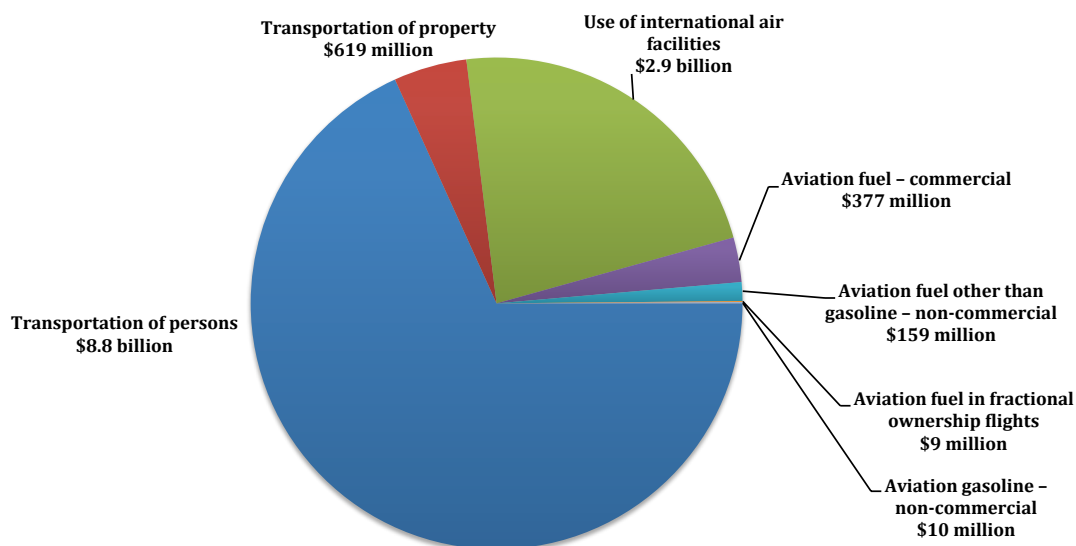
The General Fund initially funded ATC infrastructure and operation. However, by the late 1960s air traffic was increasing at an unprecedented rate. This increase in demand necessitated an expansion of the system, posing a financial challenge. In an effort to provide the necessary resources for the system, HR 14465 was passed in 1970.<sup>13</sup> This Act established the Airport and Airway Trust Fund (AATF) and authorized the dedication of aviation user fees, including fuel taxes and ticket taxes, into the AATF for a period of ten years.

From the outset, there was contention about whether AATF should be used as a capital account or if it should be used for both operational and capital expenditures. This ambiguity was not solved until 1982, when the Airport and Airway Improvement Act was passed, reauthorizing the collection of aviation taxes dedicated to the AATF. This act and subsequent acts allowed the AATF to pay at least a portion of FAA's *Operations and Maintenance* subaccount.<sup>14</sup>

Presently, the AATF is the primary source of funding for FAA accounts. The AATF receives its revenues from the following indexed excise taxes (rates as of 2014):<sup>15</sup>

- **Domestic Passenger Ticket Tax:** 7.5 percent of ticket price.
- **Domestic Flight Segment Tax:** \$4.00 per passenger segment (indexed to inflation).
- **Passenger Ticket Tax for Rural Airports:** 7.5 percent of ticket price, flight segment fee does not apply.
- **International Arrival & Departure Tax:** \$17.50 (indexed to inflation).
- **Flights between continental U.S. and Alaska or Hawaii:** \$8.70 international facilities tax plus applicable domestic tax rate (indexed).
- **Frequent Flyer Tax:** 7.5 percent of value of miles.
- **Domestic Cargo Mail:** 6.25 percent of amount paid for the transportation of property by air.
- **General Aviation Fuel Tax:** Aviation Gasoline, \$0.193/ gallon; Jet Fuel, \$0.218/ gallon; 14.1 cents per gallon surcharge on fuel for aircraft used in fractional ownership program.
- **Commercial Fuel Tax:** \$0.043/ gallon.

Figure 1 presents the total amounts of AATF revenue for FY2013.



**Figure 1: AATF revenues for FY2013.**

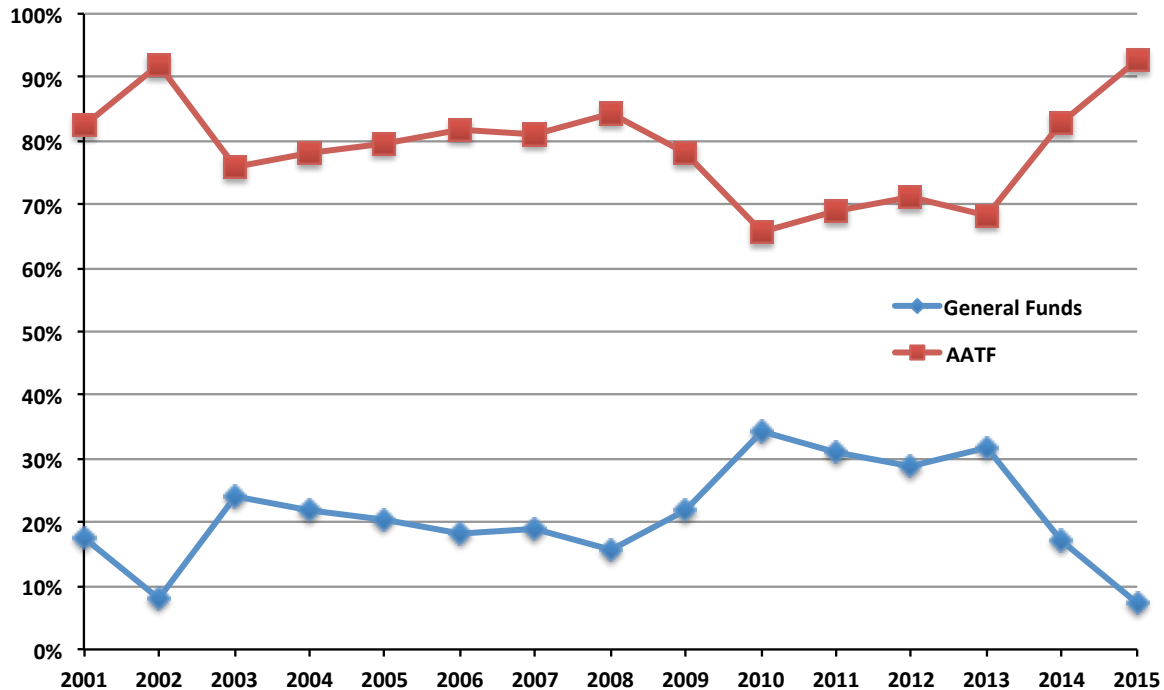
Source: Federal Aviation Administration (2014). AATF Fact Sheet.

*Note: "Transportation of persons" includes domestic passenger ticket tax, domestic flight segment fee, rural airports ticket tax, and frequent flyer tax; "Transportation of property" includes the cargo and mail tax; "Use of international air facilities" includes international arrival/departure tax and Alaska/Hawaii tax.*

Historically, the AATF brought in considerably more than it has expended. However, since 2001, the uncommitted balance of the AATF has been sharply decreasing.<sup>16</sup> The 2000 Aviation Investment Reform Act of the 21<sup>st</sup> Century (AIR-21) changed the way that Congress appropriated money from the AATF to be based on the forecasted level of revenue and interest from the AATF in each specific year. This allowed for the fund to invest the excess balance in the system, and as revenues were projected to increase, it was thought that the AATF would provide more annual funding. However due to unforeseen events such as the September 11, 2001 terrorist attacks, the projections were much higher than reality. As a result of the inaccuracy of forecasting, in a number of years Congress appropriated more money from the AATF than annual revenues, effectively drawing on the balance of the fund.<sup>17</sup> If this trend continues, there is a risk that the AATF's balance may be insufficient to cover obligations.<sup>18</sup>

## Current Funding

Currently, the General Fund plays a significant role in funding FAA. Figure 2 shows the ratios of AATF funding and general funds funding from 2001 through 2015:



**Figure 2: General funds and AATF contributions to FAA budget.**

Source: Federal Aviation Administration (2015 and other years),  
Budget Estimates – Fiscal Year 2016 (and other years)

Because the AATF is dependent on revenues from air traffic – passengers and cargo – its contribution to the FAA budget follows the aviation industry trends. After the 2008 recession, the decline in traffic led to less revenue entering the AATF, and in order to maintain funding levels the General Fund contribution had to increase. With the budget sequestration of 2013, funding levels from the General Fund were decreased, and the relative contribution of the AATF increased in 2014 and once again in 2015 to a 16-year maximum of 93 percent.

The AATF funds four subaccounts, all administered by the FAA. All four subaccounts are funded from the AATF, and Operations and Maintenance is the only subaccount that receives partial funding from the General Fund:<sup>19</sup>

- **Operations and Maintenance (O&M):** Funds ATC operations and FAA aviation safety regulation. This account partially funds NextGen.
- **Facilities and Equipment (F&E):** Funds the acquisition and maintenance of staffed ATC facilities as well as numerous ground-based navigation aids, as well as engineering and development for air traffic system technologies. This account provides the primary funding for NextGen.<sup>20</sup>
- **Grants for Airport Improvement:** Funds the Airport Improvement Program (AIP), which provides money for grants-in-aid for projects including runways, rehabilitation, and noise mitigation.
- **Research, Engineering, and Development:** Funds research and development aimed at improving aviation safety, mitigating environmental impact, and improving efficiency. This account partially funds NextGen.

O&M is also the largest account, receiving more than 60 percent of FAA appropriations.<sup>21</sup> Of the O&M account, more than 50 percent of the funding is from the General Fund.<sup>22</sup> From a budget of around \$15.8 billion for FY2013, approximately \$ 11.2 billion was dedicated to ATC, \$3.2 billion to the AIP, and the remaining funds support the rest of FAA's functions.<sup>23</sup>

While the AATF was created to provide the majority (but not all) of the funding necessary for the FAA, General Fund appropriations have become an important factor in supplementing the AATF contribution, and from 1990 through 2015 an average of 23 percent of FAA's budget has been appropriated from the General Fund.

### **Stakeholder and Decision Maker Influence**

Following the study of funding and governance structures of the FAA, an overview of the stakeholders that shaped those structures is presented in this section.

Over the years, there have been numerous proposals to reform governance and funding that have gathered varying levels of support at different times. Among the stakeholders and decision makers there has been ongoing contention about these proposals and their implementation. In this section we explore the stakeholders and decision makers that have exerted substantial power over determining the structure of ATC funding and financing and their motivations. Included stakeholders are:

- Congress
- Commercial Airlines
- General Aviation and Business Aviation
- Labor
- Airports

### **Congress**

Currently Congress must authorize all the funding for the FAA and ATC provision. In the U.S. House of Representatives, power is shared between the Committee on Transportation and Infrastructure (T&I), the Committee on Ways and Means, and the Committee on Appropriations. In the U.S. Senate, the Committee on Commerce, Science, and Transportation, the Committee on Finance, and the Committee on Appropriations share

jurisdiction. As with most trust funds, there have been battles between the authorizers and the appropriators. This was highlighted in the implementation of the AIR-21 reauthorization Act of 2000. This Act mandated that the annual revenues that were accrued in the AATF must be spent, increasing the amount of money that the authorizers could commit to outlay.

Congress has frequently debated whether ATC is an inherently governmental role. Congressional support for maintaining ATC within the federal government can be demonstrated by The *Air Traffic Control System Integrity Act*, which was sponsored by former Representative Oberstar (D-Minn.), and was introduced in 2003. This Act was introduced after president George W. Bush removed language saying that ATC was as inherently governmental function in the Executive Order that created the ATO. The bill would have prohibited the Secretary of Transportation from authorizing the corporatization of ATC or outsourcing of control towers or Flight Service Stations, but died in Committee.<sup>24</sup>

Additionally, members of Congress prefer to endorse spending that has a direct benefit for their districts. For example, a Representative from a district that is home to general aviation (GA) airports may be more interested in updating the outdated infrastructure at his or her hometown airport rather than investing in a modernized air traffic control system that would bring the greatest benefits in more congested airspace. Within the limited budget, members of Congress may champion airport grants over increased funding for ATC.

Beyond controlling the taxes that fund the FAA and its different accounts, Congress also has the ability to impose other taxes on air travel, which affect both passengers and airlines, and ultimately affect the FAA. An example of a taxes levied on airline passengers that is not dedicated to the AATF are the taxes imposed by the Transportation Security Administration (TSA) to partially fund its operations, including the September 11 Security Fee imposed on passengers and the Aviation Security Infrastructure Fee imposed on airlines<sup>25</sup>. Although traditionally used to directly fund the TSA, starting in FY2014, the September 11 Security Fee will now be deposited in the General Fund and used for deficit reduction.<sup>26</sup>

### **Commercial Airlines**

Commercial airlines are businesses that seek to be profitable by providing a service to their customers. As such, their largest interest is ensuring that there is a funding structure that is fair to their industry, does not discourage passengers or goods from flying or being shipped by air, and helps to encourage the growth of their business. In addition, commercial airlines also have an interest the having the ability to use the most cost-effective technology that can help improve their ability to provide safe services to their customers at the lowest cost possible.

Commercial airlines have been involved in discussions about ATC governance reform in the United States for a long time. This has also been true during the period leading to the 2015 FAA re-authorization process. In testimonies before Congress, Airlines for America (A4A),

the airlines' largest lobbying group, has supported Transportation & Infrastructure Subcommittee's Chairman Shuster for transformational changes in the structure and funding of the ATC system. After studying a number of foreign systems, including Canada and Germany, A4A has concluded that "transformation, not renovation, is required".<sup>27</sup> Their preferred solution would be a non-profit model like NAV CANADA, with stakeholder-driven governance, as it "would deliver the greatest benefits for a reformed ATC entity because such a structure would continue to put safety first, while driving value for all stakeholders".<sup>28</sup> The International Air Transport Association (IATA) endorsed the A4A position on behalf of its 250 international airline members.

### **General Aviation and Business Aviation**

General and business aviation includes all non-commercial aircraft. Revenue streams to fund GA and business aviation are different than commercial airlines because they do not transport ticketed passengers. Historically, GA and business aviation have been opposed the introduction of user fees such as per flight fees or landing fees. If introduced, these fees would have the potential to discourage GA or business aviation because pilots and businesses would not have the ability to spread these fees out over a large group of people (such as is possible in commercial aviation). As a result, per flight fees or landing fees could make it cost-prohibitive for many who currently enjoy the ability to fly to continue to be able to afford to do so. This sector of the industry currently pays into the AATF through excise taxes on aviation gasoline and jet fuel.<sup>29</sup>

In 2011, the Obama administration unveiled a proposal that included a \$100 per flight fee that would apply to commercial aviation, and both GA jets and turboprops if the flight occurred in controlled airspace. GA campaigned against this fee and suggested it was slippery slope to an ATC system funded wholly through dedicated user fees.<sup>30</sup> In 2012, Marian Epps of the National Air Transport Association said, "The costs associated with user fees far outweigh any benefit to deficit reduction".<sup>31</sup> The Administration's proposal was ultimately rejected, as was a similar U.S. Senate proposal.<sup>32</sup>

### **Labor**

To understand the role of labor in ATC, it is necessary to first understand the history of labor in the industry. Aviation labor in the U.S. ATC system organized in 1968 with the formation of the Professional Air Traffic Controllers Organization (PATCO). The union highlighted challenging working conditions that were exacerbated by the increasing congestion of the national airspace.<sup>33</sup> In addition, flight service station specialists organized in 1972 with the National Association of Air Traffic Specialists.

After a number of labor actions during the 1970's, on August 3, 1981, PATCO went on strike. This strike was illegal, and resulted in President Reagan firing over 11,400 air traffic controllers who refused to return to work within a 48 hours timeframe. To help rebuild the system in the face of a greatly reduced workforce, down to around 4,200 controllers, the FAA began the Federal Contract Tower (FCT) program in 1982, with five towers in "low activity" areas.<sup>34</sup> While this program was initially limited to a few remote regions, the program has expanded to over 250 non-radar towers throughout the United States, or roughly half of the towers in operation nationwide.<sup>35</sup> According to the Office of the



Inspector General, contract towers are “cost-effective,” averaging “\$1.5 million less to operate than a comparable FAA tower”. While a FAA tower cost on average \$2.025 million to operate, a contract tower cost only one-fourth, around \$537,000.<sup>36</sup>

In 1987 the National Air Traffic Controllers Association (NATCA) was formed, following the decertification of PATCO. NATCA is affiliated with the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). NATCA currently serves as the exclusive representative for the air traffic controller bargaining unit with the FAA.

In recent years, limited and unreliable funding has challenged job stability. On July 23, 2011, FAA’s authority to collect revenues into the AATF and expend money temporarily lapsed. This resulted in a number of projects being stopped and almost 4,000 employees being furloughed. Authority was renewed on August 5, 2011 through the Airport and Airway Extension Act of 2011 and work was reinstated.<sup>37</sup>

In FY2013 the implementation of the budget sequester began, forcing FAA to furlough personnel including air traffic controllers beginning on April 21, 2013.<sup>38</sup> On May 1, 2013 H.R. 1765: *Reducing Flight Delays Act of 2013* was signed into law. This bill authorized the “transfer of up to \$253 million from funding available for airport grants or other FAA programs and accounts to the FAA operations account for necessary costs to prevent reduced operations and staffing and ensure a safe and efficient air transportation system”.<sup>39</sup> This new funding allowed for the suspension of all employee furloughs.

However, FAA employees again found themselves in a precarious situation during the 2013 government shutdown, which lasted from October 1 to October 16. On day one of the shutdown, 33.7 percent of FAA employees were furloughed.<sup>40</sup> Air traffic controllers were exempt from furlough, as their jobs were deemed essential.<sup>41</sup> However, the budget sequester and government shutdown halted all air traffic controller hiring until full appropriations in January 2014. Following the government’s reopening, NATCA issued a statement urging the government to establish a stable funding mechanism:

“In order to grow, modernize, and help power the U.S. economy, aviation cannot be subjected to repeated budget crises. Sequestration, the shutdown, and the uncertainty they have wrought have disrupted flight schedules, peeled away layers of safety redundancies and threatened our ability to maintain fully staffed and trained workforces.”<sup>42</sup>

The history of the relationship of labor with the FAA has been troubled in the past, and eventually resulted in the dissolution of PATCO, the previous air traffic controllers’ union. In the past few years, the union focus has been on the stability of funding for key FAA functions, including ATC provision and safety regulation, and on improving the FAA regulatory functions in order to more effectively serve the industry. In 2015, while keeping its focus on funding predictability and stability, NATCA has shown willingness to discuss any potential structural changes, as long as those changes safeguard the safety and diversity of the system, ensure a smooth transition, and lead to a mission driven, not-for-profit, model.<sup>43</sup>

## **Airports**

There are over 3,000 airports included in the National Plan of Integrated Airport Systems (NPIAS). These facilities include nearly 400 primary airports (hub and non-hub airports) and nearly 3,000 nonprimary airports (general aviation, reliever, and nonprimary commercial service airports). FAA's Office of Airports provides oversight and services related to safety, security, capacity, project funding, and environmental compliance. Maintaining and improving airport safety, capacity, and sustainability benefits the National Airspace System (NAS).<sup>44</sup>

The official position of Airports Council International – North America (ACI-NA), the trade association for commercial airports in North America, is that “NextGen begins and ends with airports”.<sup>45</sup> Data has demonstrated that delays often begin at airports due to limited capacity and continually increasing demand. ATC modernization has the potential to decrease delays and allow airports to use their limited capacity more effectively. Recognizing the benefits to airports, ACI-NA has advocated for “airport involvement in NextGen planning and implementation”.<sup>46</sup> They have also advocated for a “stable and predictable funding system to ensure sufficient capital resources are available”.<sup>47</sup>

As proposals to reform the nation's ATC system and transform how the FAA is funded are considered, airports are concerned with keeping the fundamental structure of the federal AIP program intact. Airport groups want to maintain a sufficient and stable revenue stream to support capital projects at large and small airports and want airports to continue to receive revenue from a dedicated airport trust fund, rather than the less predictable general fund.<sup>48</sup>

During the 2015 FAA re-authorization, the focus of airport representatives has been the increase of the Passenger Facility Charge (PFC), which are federally-authorized fees that commercial airports charge, with a limit up to \$4.50 for every eligible boarded passenger and a cap of \$18 for a round-trip flight. Together with AAAE and U.S. Travel's Gateway Airports Council, ACI-NA wants the federal cap to rise to \$8.50 and to be indexed to inflation.<sup>49</sup>

Each stakeholder has played and will continue to play a significant role in U.S. ATC governance and funding. The following sections will explore how the stakeholders have influenced previous attempts at ATC governance reform, shedding light on what influences were prevalent in the past.

## **Previous Attempts at U.S. ATC Governance Reform**

In the last three decades there have been a multitude of attempts to reform the governance structure of U.S. ATC. These attempts culminated in the birth of ATO. Its creation was the result of a long discussion that began in the early 1980's. Since this time, and through each attempt to reform the system, there have been discussions about possible FAA reorganization. However, there has been a lack of consensus on what reform should entail, and although it has been suggested several times, a separately managed and funded organization was never created. This section explores these attempts and discusses the barriers that have existed to separating ATC provision from the FAA.

## **The Reagan Administration**

The exploration of ATC reform began over three decades ago in 1981 when President Reagan took office, just three years after the 1978 deregulation of airlines. The Reagan Administration entered the White House aiming to reduce the size and scope of the government, and ATC governance was among the governmental functions that were under scrutiny.<sup>50</sup> After some discussion, the Administration realized that in order to have an informed discussion about ATC reform, it would be necessary to go through an education process.<sup>51</sup>

Some reform occurred through contracting out control towers in 1982 – a solution that was implemented after thousands of air traffic controllers were fired in 1981 as a result of an illegal strike leading to labor shortages across the country. At the time, five low traffic, Visual Flight Rules (VFR)-only, towers were contracted out; the number increased in the 1990's and more than half of towers in the U.S. were eventually contracted out.<sup>52</sup>

While contract towers were a step towards a more privately controlled system, it was not satisfactory for the Reagan Administration. The concept of privatization was revisited in 1983 and was described as being “good for the country”, but there were concerns that the proposed model had not been tried before and reform did not occur.<sup>53</sup>

By 1985, the airlines joined the conversation publicly with the release of an Air Transport Association (ATA, now Airlines for America) report – “Federal Corporation Approach to the Management and Funding of the Air Traffic Control System”. This report explored what a government corporation for ATC would look like, and suggested that there may be benefits associated with a “business-like” approach.<sup>54</sup> The following year, the National Academy of Public Administration (NAPA) (“The Air Traffic Control System: Management by a Government Corporation, a Study for the Air Transport Association of America”) and Apogee Research Inc. (“The Proposed National Aviation Authority: A First Review”) each independently released reports that explored what an ATC government corporation would look like and what its potential benefits would be. The NAPA study was sponsored by ATA, while the Apogee study was in response to ATA. The release of this set of reports demonstrated the airlines’ skepticism that the current governance of ATC would properly foster modernization.

In 1987, the Reagan Administration issued Executive Order (EO) 12607, establishing a Commission “to review the appropriate division of responsibilities between the federal government and the private sector”, titled the “President’s Commission on Privatization”.<sup>55</sup> ATC was among the responsibilities that the Commission evaluated. The Commission held a series of hearings to examine the potential of privatizing ATC, featuring testimonies from Ken Mead of the General Accounting Office (GAO), and from former FAA Administrators Donald Engen (1984-1987) and J. Lynn Helms. Mr. Mead stated that while challenges exist within FAA, “[the GAO did] do not believe that structural deficiencies in the current system prevent their solution”.<sup>56</sup> Administrators Engen and Helms both separately stated their concerns with the potential of privatization and did not endorse any moves towards that.<sup>57</sup>

Meanwhile, in 1986 Congress passed the Aviation Safety Commission Act, which established a Commission to study “how the Federal Aviation Administration may most effectively perform its responsibilities and increase aviation safety”.<sup>58</sup> This Commission was wholly separate from the Commission on Privatization. The Aviation Safety Commission published their final report and recommendations in 1988. The report recommended that, “FAA be transferred from DOT and be established as a user-funded authority”.<sup>59</sup> In the same year DOT released the *Report of the Joint OST/FAA Working Group to Establish an Independent ATC Corporation*, which evaluated organizational restructuring options.

The Aviation Safety Commission was mostly created to undo the consolidation of FAA into DOT that had occurred 20 years prior. The merger was still fresh in the memories of many people, and many believed that the organization had suffered from this amalgamation. This view was supported by a number of Congressional members. DOT acknowledged that there were challenges within the current FAA structure, namely in terms of procurement and safety, but felt that separating FAA from the DOT would be a mistake and would lead to a lack of accountability and have potential detrimental impacts on safety.<sup>60</sup>

The view that the separation of DOT and FAA would be harmful was supported by a 1988 U.S. Congress’ Office of Technology Assessment (OTA) report, *Safe Skies for Tomorrow: Aviation Safety in a Competitive Environment*. This report stated, “OTA concludes that FAA’s functions cannot be separated into regulator and operating (ATC) components without diminishing the effectiveness of the entire system. Furthermore, without more emphasis on system safety at the very top, FAA agency-wide problems that have hampered the organization’s capabilities are likely to continue”.<sup>61</sup>

At the time, movement towards the concepts of commercialization or privatization of ATC did not come to fruition. This was not unexpected as these concepts were novel at the time, and it was perceived that there were significant safety risks, especially when it was believed that was still much to be done to improve, safety-wise, the system as it was.

### **The Early 1990s and the Air Traffic Control Corporation Study**

The 1990’s brought new attempts to reform ATC that eventually materialized in the reorganization that created the ATO within the FAA. This followed a long series of reports and studies published throughout the decade and the introduction of concrete legislation in Congress to corporatize the system.

The decade began with the Transportation Research Board ‘s (TRB) 1991 publication, *Winds of Change: Domestic Air Transport Since Deregulation*. This report suggested that only a public corporation:<sup>62</sup>

“Would provide the authority and discretion needed to improve operational performance without severing links between regulatory and operational functions, which may compromise safety.”

Additional reports exploring the subject released in the early 1990s included: *A Review of Federal Aviation Administration Financial and Acquisitions Systems*, Phaneuf Associates Incorporated; *A Proposal for a Restructured, Independent Federal Aviation Administration*, the FAA Conference of the Federal Managers Association; and *How to Spin Off Air Traffic Control*, The Reason Foundation. But the main push towards reform came from two different sources: a report produced by the *Commission to Ensure a Strong Competitive Airline Industry*, headed by former Governor of Virginia Gerald Baliles (the Baliles Commission), and the National Performance Review (NPR) from the White House.

The Baliles Commission was created in 1993 and aimed to develop policy recommendations that could improve the aviation industry. Beyond ATC, it also made recommendations about general aviation manufacturers and bankruptcy laws for airlines. While it was not an initial goal of the Baliles Commission to suggest the restructuring of the FAA, the analysis of the aviation industry by the commission concluded that governance reform would be necessary to improve the system.<sup>63</sup> Among the Commission's recommendations was the creation of a new entity within the DOT to operate ATC.

Simultaneously, the National Performance Review – an initiative to streamline governmental duties created by President Bill Clinton in 1993 – also suggested corporatization. At its official unveiling, President Clinton announced,

“Our goal is to make the entire federal government less expensive and more efficient, and to change the culture of our national bureaucracy away from complacency and entitlement towards initiative and empowerment”.<sup>64</sup>

Unlike the review during the Reagan administration, the primary aim of this review was not to promote privatization but instead to revisit how the government functioned. NPR released its initial report in 1993 titled *From Red Tape to Results*, which stated “we should restructure the ATC into a government-owned corporation, supported by user fees and governed by a board of directors that represents the system's customers”.<sup>65</sup>

With these two reports in hand, the Secretary of Transportation, Federico Peña, established the Executive Oversight Committee to study how the ATC system could be restructured. The committee report, the *Air Traffic Control Corporation Study*, was published in 1994. This report evaluated the challenges that the ATC system was facing and examined potential approaches to improving the system, ultimately recommending the creation of a United States Air Traffic Services Corporation (USATS). A discussion of government corporations in the United States can be found in Appendix B.

This proposal highlighted the need for change to allow the FAA to keep up with rapidly advancing technology, including the use of satellite-based navigation systems, and to change procurement procedures that increase costs and delay deployment of new technologies. Both of these issues are still raised today. Additionally, the difficult budgetary situation of the federal government was also pointed as a catalyst for change, a theme that still resonates today.<sup>66</sup>

To address these issues, the report proposed the creation of a government corporation to provide ATC services. This corporation was to be a not-for-profit financially self-sufficient businesslike enterprise, with no reliance on appropriated funds. Funding would have come from user fees charged to airspace users. These users, along with the corporation employees, would have been represented on the governing board, having a direct voice in decision-making. To help modernization efforts, this new entity would not only have been freed from procurement procedures that the FAA was subjected to, but it would also have had the ability to borrow money on capital markets. The FAA would have continued to exist as the safety regulator of the aviation system.<sup>67</sup> In sum, the proposal would have created a system in the United States much in line with what has subsequently been implemented in many peer nations. A discussion of some of those peer nations can be found on Part Two.

Following the release of the USATS proposal, a hearing was held before the Senate Appropriation Subcommittee titled *Proposal to Corporatize the Nation's Air Traffic Control System*. Witnesses included representatives from Professional Airways System Specialists (PASS), NATCA, National Business Aircraft Association (NBAA), Aircraft Owners and Pilots Association (AOPA), National Association of Air Traffic Specialists, and Controllers United. In this hearing both PASS and NATCA supported the proposal for corporatization put forth by the *Air Traffic Control Corporation Study*; NBAA and AOPA did not support the proposal<sup>68</sup>.

From the perspective of PASS, USATS would allow ATC to have “a more business like way of doing business” leading to a more flexible organization in terms of hiring, among other things. Representing air traffic controllers, NATCA was also supportive of the proposal, which was similar to a 1992 initiative of their own. From NATCA’s perspective, the change to a government corporation would allow more flexible labor arrangements and a procurement system that was free from federal procedures and regulations. They were not supportive of any proposals to create a private or non-governmental entity to manage ATC, which they viewed as an “inherently governmental” function. NATCA also believed that user fees should not replace the current funding mechanism.<sup>69</sup>

A NBAA representative stated that they were in favor of institutional reform because of the influence of politics on the budget, but had doubts that a “corporate structure will be effective in confronting these problems”. NBAA was willing to pay for their “fair share of the costs of the system,” but had concerns that the break up of the FAA would lead to inefficiencies and price increases for everyone. Safety was their final concern, with worries about how a monopolistic provider of ATC would be regulated by the FAA.

The final witness was from AOPA. Representing the general aviation community, he voiced reservations that user fees would be “both an economic and safety concern” and that the “Administration’s assurance of no user fees imposed on general aviation might not survive the legislative process”. Concerns about governance were also raised, with fears that airlines and unions would dominate the USATS governing board. Finally, AOPA also suggested that Congress and the Administration would lose regulatory and policy oversight.<sup>70</sup>

The following year, Representative Norman Mineta (D-Calif.) introduced a bill, HR 1441 – *United States Air Traffic Service Corporation Act* on April 6, 1995, which aimed to “provide for the transfer of operating responsibility for air traffic services currently provided by the Federal Aviation Administration on behalf of the United States to a separate corporate entity”.<sup>71</sup> This proposed corporation would charge user fees to the airlines, have budget autonomy from Congress, have permission to issue revenue bonds, and would be subjected to distinct procurement procedures from the rest of the federal government. Lacking support from the airlines, general aviation, and many members of Congress, this bill died in Committee.

The efforts of the early 1990s were thwarted by the stakeholders, specifically the commercial airlines, GA, and Congress. More concerned with their financial situation, the airlines were not supportive of the ATC governance restructuring efforts. While the majority of airlines were ambivalent about a new set of user fees, Southwest Airlines differentiated itself from the industry through its opposition to user fees. At the time, due to the size of the airline and the length of their average flights (which at the time tended to be shorter) they believed that a restructured funding system would adversely affect their bottom-line. Instead, Southwest lobbied for tax breaks and other financial incentives to support their operation.<sup>72</sup> The GA community was also not supportive of reform, fearing that user fees would be imposed on them. Finally, Congress was reluctant to lose oversight power over appropriations if the system moved to user fees and bond financing. The combination of these fears resulted in none of the proposals moving forward.

#### **The Mineta Commission and the Bush Years**

The opposition from the GA community and the lack of support for the airlines was sufficient to temporarily move the conversation about corporatization out of the spotlight. However, the White House continued to push for reform, and in 1996, H.R. 3539 (104<sup>th</sup>): *Federal Aviation Reauthorization* was signed into law. This reauthorization bill included the establishment of a National Civil Aviation Review Commission that was tasked to perform an independent assessment of FAA financial requirements. The Commission members were selected and it was chaired by now former Representative Mineta and became colloquially known as the Mineta Commission. During the same period Congress also passed provisions to make FAA’s procurement and personnel rules exempt from some federal regulations, with the aim to make them more flexible and adjusted to the technical and operational environment the FAA works on. The implementation of the provisions in the 1996 legislation is considered to be unsuccessful. This has been attributed to either FAA improperly managing their implementation, as well as other government agencies with oversight roles acting as a barrier to their full implementation.<sup>73</sup>

The Mineta Commission’s report was released on September 10, 1997, and it evaluated both funding for civil aviation and aviation safety. It was critical of the current funding mechanism based on excise taxes and appropriations from Congress, stating that federal budget rules were “crippling” and “inappropriate” and were a hindrance to capital investments that were needed to modernize the system. From a governance perspective, it concluded that the system had “too many cooks” – FAA, USDOT, White House, Congress –

making accountability and authority “too diffused to run a 24 hour-a-day, high technology, rapidly changing operating system for a major commercial industry”.<sup>74</sup>

Although the report did not suggest the corporatization of the system, it recommended “broad and sweeping changes in the ways the FAA was managed”, set priorities, and defined performance outcomes. It also suggested new methods for funding the system, including the move towards user fees and the ability to issue bonds.<sup>75</sup> The following is a summary of the Commission’s suggestions:<sup>76</sup>

- **Change in budget treatment:** User fees and spending should be directly linked and shielded from discretionary budget caps.
- **Introduction of Performance Based Management:** ATC should be a performance-based organization. FAA should also be able to employ innovative financing.
- **More cost-based revenue stream:** A cost based revenue stream should support the air traffic system.
- **Controlling operating costs:** Operating costs should be controlled in order to allow increased capital investment.
- **Airport capital needs should be met:** AIP should continue at an annual minimum expenditure of \$2 billion.

Following the release of the Mineta Commission’s report, the discussion on how to reform ATC governance continued. In 1996 Canada had corporatized their system as a non-profit user co-op governed by aviation stakeholders, and some U.S. stakeholders, including airlines, voiced their support for a similar solution to be implemented in the United States.<sup>77</sup> Labor unions, on the other hand, were still opposed to taking ATC out of governmental control. This view prevailed and the Performance-Based Organization within the FAA was believed to be the best achievable alternative in political terms.<sup>78</sup>

On December 7, 2000, President Bill Clinton signed Executive Order (EO) 13180 creating the ATO.<sup>79</sup> This followed the 2000 *Air Investment Reform Act of the 21<sup>st</sup> Century* (AIR-21) legislation, which mandated that a COO be appointed as part of the efforts to reform FAA – the COO eventually became the head of the ATO. With opposition from GA to user fees, the proposal did not include any provisions to allow the ATO to charge user fees or to issue bonds. In addition, the EO noted that the provision of air traffic services was an “inherently governmental function”<sup>80</sup>, a definition that had already been mentioned by NATCA’s representative in the 1994 hearing discussing USATS.<sup>81</sup>

Although the events of September 11, 2001 delayed its implementation, the ATO was fully operational by February 2004, with around 36,000 FAA employees being moved to the new organization. This was the last time that significant changes in ATC governance were enacted. The debate about governance, however, continued. On June 4, 2002 President Bush issued an EO that amended President Bill Clinton’s 2000 EO 13180, deleting the language suggesting that the provision of air traffic services is an inherently governmental function.<sup>82</sup>



This change followed a proposal in the President's Budget for FY2002 to, "examine the success that various nations, including Canada, have experienced with individual air traffic control systems owned and operated by private companies."<sup>83</sup> At a time when the FAA was already implementing ATO, coupled with opposition from Congress and NATCA<sup>84</sup> (both of which had concerns about safety and security), further ATC reform efforts were not enacted.<sup>85</sup>

On April 10, 2003, Rep. Oberstar demonstrated his opposition, based on safety and security concerns in the aftermath of 9/11, to any proposal to privatize by introducing H.R. 1711: *Air Traffic Control System Integrity Act*. H.R. 1711 aimed to amend:<sup>86</sup>

"Federal transportation law to prohibit the Secretary of Transportation for authorizing the conversion to a private entity or non-Federal public entity of any (1) facility controlled by the Federal Aviation Administration (FAA) (...) (2) operations performed, on the date of enactment of this Act, by Federal employees at an FAA-controlled facility (...)."<sup>87</sup>

The bill garnered 18 cosponsors, including Rep. LoBiondo (R-NJ), Rep. DeFazio (D-OR), and Rep. Quinn (R-NY).<sup>88</sup> It ultimately died, but was revived a couple of weeks later by Senator Lautenberg (D-NJ) who was able to get it approved, with a 56-41 vote<sup>89</sup>, as an amendment to the Senate version of the FAA reauthorization Act. However, with veto threats from the White House, the conference committee did not include the provision in the final version of the bill, and the 2003 FAA reauthorization Act – Vision 100 - Century of Aviation Reauthorization Act – signed into law on December 12, 2003 did not include it.

Within the administration, the debate about reform continued. This included a proposal to remove the ATO from the FAA and create a new modal administration within the DOT. This proposal would separate the provision of ATC from its regulation, thus removing the inherent conflict of interests that having the FAA performing both functions creates. Although not considered as a perfect solution, it was seen as a first step towards a new, better suited, form of governance. Having other political priorities, the Administration did not support this idea.<sup>90</sup>

One significant reform achieved during this period was the contracting out of the Flight Service Stations (FSSs). These facilities provide private pilots free weather information along with other services, and also allow the pilots to file flight plans in case any problems occur with the flight. Citing rising costs and a need for modernization, FAA launched in 2003 an Office of Management and Budget (OMB) Circular A-76 to contract out FSSs services. The contract was awarded to Lockheed Martin in 2005, with 58 facilities and 1,900 personnel being transferred to Lockheed Martin. With a cost of \$1.8 billion for a 10-year contract, the FAA estimated at the time that the savings for the agency over that period would total \$2.2 billion.<sup>91</sup> Currently, the FAA is looking into replacing the FSSs program with a new Future Flight Service Program that by 2015 will replace both the FSSs and the Direct User Access Terminal Service (DUATS), a similar service, also contracted-out by the FAA, that has been offered by two different companies since the 1980's.<sup>92</sup>

During the Bush years, the subject of ATC reform popped-up again in the *President's Budget* for Fiscal Years 2007 and 2008, but the focus shifted to an ATC tax and charge reform and did not suggest governance reform. By 2009, the aim was to move toward a user-fee system "to create a direct relationship between revenue collected and services received".<sup>93</sup> Like in the USATS proposal from the previous decade, only commercial airlines would pay these user fees, and GA would continue to pay fuel taxes, which would be increased and would now fund the AIP. The proposal also included demand and congestion pricing at airports. Proposed at a time when fuel prices were skyrocketing and delays were becoming headline news, the focus of attention shifted, and this proposal was also not enacted.<sup>94</sup>

### **Lessons Learned from Previous ATC Reform Efforts**

Many attempts have been made to reform air traffic control since the discussion began in the early 1980's. While the transition to the ATO was a step towards reform, the majority of attempts failed to introduce any significant institutional reforms to the provision of air traffic control in the United States.

Each previous reform effort was anchored around the idea that a ATC system outside of the government would operate in a more efficient manner. In the 1980's, the concept of corporatization of ATC was still a fairly new idea, and garnering stakeholders for such a novel idea was a significant challenge and proposals to separate the FAA from the DOT were met with significant skepticism and concerns about safety. By the early 1990's the concept had already been tried elsewhere. In 1994 ATC corporatization within the United States was attempted, but lack of agreement and support from some stakeholders impeded progress. The late 1990's brought the Mineta Commission, which eventually led president Clinton to create the ATO, an organization established within the FAA and based on the Commission's recommendations, but without the budget autonomy it envisioned. While the ATO was being formed, president Bush declared that ATC was not an inherently governmental role and internal discussion within his Administration suggested approaches towards corporatization, but, in a post 9/11 world, concerns about safety and the security of airspace were raised by some stakeholders, and the lack of support from the Administration stopped any changes. Later attempts to reform financing by implementing user fees were also sidestepped by other events and their implementation efforts also failed.

A constant within each reform previous effort was the lack of consensus among key stakeholders on what reform should entail. Without that consensus, Congress was hesitant to support any moves towards substantial reform. It is likely that Congress will be unwilling to take up any future substantial reform effort without stakeholder consensus on what that reform should be.

Presently, FAA is focused on implementing NextGen, their most-recent technological initiative. However, more than a decade since NextGen was introduced, there are still challenges in implementation.<sup>95</sup> The dependence on appropriations from Congress, the effects of the 2013 budget sequester and federal government shutdown, and the lack of a funding structure that allows for more efficient ways of implementing major capital

projects like NextGen has led to a situation where stakeholders are once again discussing the possibility of institutional reform.

## **Part Two: International Case Studies**

While in the United States the various attempts to reform FAA have not resulted in major shifts in governance, many countries have attempted and successfully reformed their systems. This section explores how and why some of these countries have attempted reform, what these systems evolved into, and what lessons can be drawn out to be applied to the United States.

Modern ATC systems, in the United States and abroad, were created by necessity as the aviation industry boomed and demand increased. Following World War II, most ATC systems had similar governance structures that were directly provided by national level governmental agencies and funded by taxes on aviation activities and government appropriations from general funds. The current U.S. ATC system fits into this mold: it is governed by a federal level agency and is funded through the AATF and the general fund.

However, multiple countries have restructured their ATC governance into corporatized structures. All of these systems charge user fees and are able to access capital markets for system investment. This section provides an overview of six countries that have restructured ATC governance. It provides a brief historical perspective of the changes and details their current governance structures and funding mechanisms. The countries analyzed are the following:

- Australia
- Canada
- France
- Germany
- New Zealand
- United Kingdom

The countries chosen include three countries that have adopted the government corporation model (Australia, Germany, and New Zealand), which is by far the most adopted corporate structure to provide ATC services. The other three countries all offer unique perspectives to the issue of ATC institutional reform: France reformed their governance structure, but still kept ATC provision in a government agency: the United Kingdom uses a public-private partnership (P3) to provide these services, while Canada uses a private, non-profit, user co-op.

By studying the process of reform and its consequences, a more informed discussion of the different possibilities for the United States can take place. This section provides an overview of the history of each system, in chronological order, and how the current structures came to be.

## **New Zealand**

New Zealand handles a small amount of air traffic, but provides services for geographically large portion of land and sea– roughly three times the size of U.S. continental airspace.<sup>96</sup> New Zealand is considered the first country to implement ATC corporatization; Airways New Zealand was created in 1987.

Similar to other countries, governmental ATC provision in New Zealand was identified as having challenges including an inability to modernize the system, keep costs in check, and maintain accountability. Further, the system was criticized as existing to serve the government and the Minister of Transport, not the airspace users – a criticism that was voiced in many nations. Following a difficult economic and fiscal environment in the late 1980's, New Zealand's national government launched a program to restructure different sectors of the economy, including ATC provision and other transportation activities. As part of that reform effort, a number of state-owned enterprises were created. These new state-owned enterprises were for-profit organizations operating in a commercially oriented manner, even though the government maintained full ownership.<sup>97</sup>

Airways New Zealand was introduced as a state-owned company in 1987 to provide ATC services. The Minister of Finance and the Minister of State-Owned Enterprises became the two shareholders. The Minister of Transport was not included in this arrangement because he retained the role of safety regulator of the system. Airways New Zealand aimed to ensure profitability and to provide services that are in its commercial interest. Service not in its commercial interest was to be contracted out.<sup>98</sup>

Airways New Zealand is run by a Board of Directors appointed by the two shareholding Ministers. This board has between two and nine members, and currently operates with eight members. After nomination, Board members are expected to work with independence and the commercial interest of the company in mind. Before the beginning of each fiscal year, a corporate plan, which includes accounting information, performance targets, and a corporate strategy, must be produced.

Airways New Zealand has a user-fee system where all airspace users, including general aviation, pay to use the system. General aviation is relatively small in New Zealand, with less than 5,000 aircraft, including helicopters registered – this compares to around 12,000 aircraft in neighboring Australia, or 210,000 in the United States.<sup>99</sup> The Commerce Commission of New Zealand has the power to impose price control regulation if it determines that those charges are unfair, and airspace users can appeal to it any changes that are proposed to the user fees imposed. Airways New Zealand also has the authority to issue bonds for its long-term capital needs.<sup>100</sup>

Like other state-owned enterprises in New Zealand, Airways New Zealand's commercial goals include the pursuit of profits, which are then reinvested in the system or returned to its government shareholders.<sup>101</sup> Between 2006 and 2013, Airways New Zealand accumulated around NZD\$66 million (USD\$54 million, both figures in nominal values) in

profits, paying NZD\$35 million (USD\$29 million) to the government in the form of dividends.<sup>102</sup>

Airways New Zealand paved the way for other experiments with corporatization around the world. The rationale for its corporatization, the inability of a governmental ATC system to provide efficient services and modernize, has been used as the main argument for corporatization in a number of countries. At the time, New Zealand was also one of the first systems to separate provision from safety regulation, which became relatively standard in the following decades and became an official recommendation of ICAO in the early 2000's.

### **Germany**

The German ATC provider, Deutsche Flugsicherung GmbH (DFS), was created in 1993 as a fully government-owned corporation operating under German private corporate law. Prior to DFS's creation, a federal government agency operated and regulated ATC. Currently, DFS controls both civil and military traffic, operating around 20 facilities, employing 5,500 staff and 1,700 air traffic controllers.<sup>103</sup>

The creation of DFS followed a process that began in 1992 with a constitutional amendment that allowed ATC to be operated under private law. Delays and costs had become a concern for airlines (which lobbied for change), and technological innovation and modernization was lacking.<sup>104</sup> These challenges helped to catalyze action.

DFS has a 12-member supervisory board. Six members are appointed by the federal government – the Chairman of the board, one appointee from the Ministry of Finance, two appointees from the Ministry of Transport, and two appointees from the Ministry of Defense. The six remaining members represent the employees; these include the spokesman of the executive employees, the chairman of the staff council, three air traffic controllers, and a union representative.<sup>105</sup>

From a financial perspective, DFS is self-funded and does not receive any federal subsidies. It charges user fees according to European regulation<sup>106</sup> and the user fees are regulated by the Federal Supervisory for Air Navigation Services.<sup>107</sup> DFS has non-profit status and any surplus revenue is reinvested into the corporation. DFS can finance itself in capital markets, and its debt is rated by accredited financial companies and is not guaranteed by the State.<sup>108</sup>

Following corporatization, a major consolidation program was enacted that aimed to cut costs. The consolidation included merging the functions of three upper-airspace centers into one, five lower airspace centers into three, and seventeen service stations into one.<sup>109</sup> According to DFS, this restructuring process and other cost-cutting measures allowed user fees to remain flat for the first 12 years of operation, while traffic increased by 175 percent.<sup>110</sup>

In 2004, the government of Gerhard Schröder developed a plan to sell up to 74.9 percent of the company to private investors. The proposal was brought to the federal Parliament in 2006 and was approved. However, the President of Germany, Horst Köhler, opposed the

sale on constitutional grounds and did not sign the legislation.<sup>111</sup> DFS remains a 100 percent government-owned corporation.

Reform took place in Germany after it was determined that a government-run system would not be able to effectively adapt to the expected growth. But the government did not act by its own initiative, and the involvement of airlines and other stakeholders was a central factor pushing the government to discuss and implement reform. Attempts to further reform the system into a privately owned company have failed and the issue was dropped by the current government.

### **Australia**

Controlling the airspace above 11 percent of the Earth's surface, ATC provider Airservices Australia is responsible for one of the largest airspaces in the world. Airservices Australia is a government-owned, corporatized system. Efforts to restructure ATC governance began in 1988 with the creation of the Civil Aviation Authority, a government-owned corporation that provided and regulated ATC services.<sup>112</sup> In 1990, Australian domestic airline passenger services were deregulated, ending the duopoly of the two existent airlines, and leading to increased traffic that was challenging to accommodate.<sup>113</sup>

Following airline deregulation, a new set of reforms on aviation infrastructure was implemented. These included a program launched in 1994 to privatize airports and the split of the Civil Aviation Authority in 1995 to create a corporatized ATC provider, Airservices Australia. Safety regulation remained under government control with the Civil Aviation Safety Authority, a new government agency created in tandem with Airservices Australia.<sup>114</sup>

Airservices Australia's governance consists of a nine-person board whose members are appointed for renewable five-year terms by the Minister of Transport. This board, which may include Airservices Australia employees, appoints a Chief Executive Officer. The board is required to present an annual report of operations to the Minister of Transport.<sup>115</sup>

Airservices Australia charges user fees for the facilities and services it provides – a discussion of the levels of user fees in each of the six countries studied is provided at the end of this section. The charges are subject to the Minister's approval, except when services are provided under a contract between Airservices Australia and a client. For contracted services, Airservices Australia is able to negotiate freely with their customers. For its longer-term financing needs, Airservices Australia can borrow money from the government or can access commercial capital markets. The operating profits it generates are either reinvested in the company or paid to the government as dividends.<sup>116</sup>

The first few years of operation of Airservices Australia were complicated as it faced a number of crises that included the bankruptcy of one of Australia's biggest airlines and an economic downturn. To cope with this, a restructuring program began in 1997. Restructuring allowed the company to reduce cost by 20 percent in real terms of user fees between 1997 and 2001. In 2001, Airservices Australia achieved profitability for the first time. Also in 2001, Airservices Australia launched a technological modernization program

to upgrade its systems, using many of the same technologies, including the move to satellite-based navigation with a 2017 mandate for all aircraft, which are also part of the NextGen initiative in the United States.<sup>117</sup>

What happened to Airservices Australia after corporatization is common throughout the other countries studied: a complicated transition period where major changes have to be made to adjust to the new, more independent reality. Dependence on revenues from air traffic can result in challenges with transition when recessions impact the ATC provider's financial bottom line. This is what happened not only in Australia, but also in Canada and the UK.

### **Canada**

As Canadian air traffic grew in the 1980s and 1990s, stakeholders, including the unions, suggested the exploration of a corporatized ATC entity. The Canadian government became involved in the discussion, and Transport Canada, the Ministry responsible for transportation issues and the operator of the system at the time, established a team to study potential alternatives for reform, initiating a public consultation process. This process concluded that a move to a more corporatized form of governance would bring facilitated procurement procedures, access to capital markets, and more stable funding than the governmental system that existed at the time. It also concluded the airspace users should play a role in the governance of a new organization to provide ATC services.<sup>118</sup>

This process culminated in 1996 with the creation of NAV CANADA, a non-governmental and non-profit ATC provider. This made Canada the first country with an ATC provider that the government did not own or control. With NAV CANADA's creation, the government of Canada received CAD\$1.5 billion, which was paid for by a CAD\$3 billion loan that was assembled from a consortium of banks.<sup>119</sup>

Following the creation of NAV CANADA, a few transition issues ensued. These were not operational issues. In that regard, on day one NAV CANADA took over operations and air traffic control was seamlessly delivered in the country as it had been delivered before by Transport Canada. The transition issues that were identified were more in the culture change required of the management cadre inherited from government and in the high wage expectations of certain labor groups. The first issue resulted from differences in the new corporate culture at NAV CANADA, which as an independent company was different from the government institution it replaced. Negotiated retirements and layoffs, along with the ability for some employees to return to the public sector, helped ameliorate this problem. As for the demand for salary increases, they were a result of a number of years without them under Transport Canada. In fact, one of the reasons unions were in support of the move to a non-profit model was because their salaries had been frozen for a number of years. When NAV CANADA was created unions began demanding salary increases to make up for those years. The good financial situation of NAV CANADA following its creation allowed for deals to eventually be reached with the unions, and the relationship between management and labor is normalized today and in many ways innovative, as demonstrated by the recent agreements to address pension sustainability issues.<sup>120</sup>

NAV CANADA is governed by a 15-member board. Four members are nominated by commercial airlines, three by government, two by NAV CANADA unions, and one by general aviation. These ten members then appoint the other four board members. These four members are appointed internally with the hope that they will be able to act independently from stakeholders. The Chief Executive Officer (CEO) is the 15<sup>th</sup> member and is nominated by the rest of the board.<sup>121</sup> The board structure aims to ensure that the views of all major stakeholders in the industry are represented without allowing any interest to dominate.<sup>122</sup>

In addition to a new board structure, the creation of NAV CANADA also led to changes in funding. Prior to becoming a non-profit, the system was funded by a passenger ticket tax, and funding gaps were filled by appropriations from the federal budget – similar to the system that exists in the United States today. To create a funding system that included full-cost recovery, 18 months after NAV CANADA started to operate the existing tax system was ended and a new system of user fees was implemented. This new set of user fees included a provision requiring flights that crossed over Canadian airspace to pay to use NAV CANADA's ATC services.<sup>123</sup>

There is no active economic regulation by the government on user fees (Transport Canada regulates safety) and the board can set new fee structures without governmental approval. In order to restructure the user fees, however, a consultation process with users is required. NAV CANADA is able to bypass governmental approval because it functions as a user cooperative, representing key stakeholders on its Board. Additionally, there is a provision that allows changes to be appealed to the government after implementation, which has been used twice.<sup>124</sup> According to NAV CANADA, from 1999 to 2014 user charges increased by five percent, 33 percentage points less than the compounded inflation rate over the same period.<sup>125</sup>

NAV CANADA also has the ability to obtain bank loans and issue revenue bonds for its financing needs. These debts are not guaranteed by the Canadian government. Because of NAV CANADA status as a non-share corporation, it has no shareholders, and any operating surpluses are reinvested back into the company. NAV CANADA also has a "rainy day" rate stabilization fund to provide a financial cushion in the case of an economic or traffic downturn.<sup>126</sup> The goal is to keep at least 7.5 percent of revenues in this fund. The fund was depleted after 9/11 due to a drop in air traffic, but it has since rebounded: at the end of 2014, it had CAD\$93 million and was within its target range.<sup>127</sup>

Besides providing ATC services, NAV CANADA, under its commercial arm, NAVCANatm, also develops many technological solutions, both for its own use or to sell to other ATC providers worldwide. The profits from these commercial activities are used to fund NAV CANADA itself, helping it charge lower user fees to users of Canadian airspace. NAV CANADA is also the majority owner of Aireon LLC, a Virginia-based company that aims to deliver satellite-based location services worldwide from 2018 onwards.<sup>128</sup>

Canada used a model for NAV CANADA governance that is still unique in today's ATC industry: a non-profit user co-op with stakeholder representation on the governing board. The major concerns with this model have been the management of transition and how



declines in traffic and revenue are handled. The issues with transition are mostly inevitable, as moving a large operational system away from direct control of government is challenging, especially if the move is to an independent organization like NAV CANADA, which on day one took over all ATC responsibilities from the Canadian federal government. Helped by strong financial outlooks in the late 1990's, NAV CANADA managed to successfully move into the new system. For the latter point, the use of the rate stabilization account appears to have addressed concerns that an independent organization would not be able to withstand major declines in traffic; although it was depleted after the September 2001 terrorist attacks, leading to increases in user fees, NAV CANADA managed to avoid further increases during the 2008 recession. Overall, management independence and stakeholder representation in the Board have been identified as key to NAV CANADA's successful experience with ATC reform.

### **United Kingdom**

The United Kingdom is the only country that provides ATC service through a P3, NATS Holdings (NATS), created in 2001. Attempts to reform began in the 1980's when the Thatcher government began mandating that the UK ATC system fully recover its costs through its own revenues. At the time, the ATC system was operated and self-regulated by the Civil Aviation Authority, a governmental agency, and NATS was a department within that Civil Aviation Authority that was responsible for providing ATC services. Although self-funded, as a governmental agency the Civil Aviation Authority was subject to borrowing regulations and was unable to directly borrow capital for its long-term financing and investment needs.<sup>129</sup>

In 1996, further changes were implemented and the system was corporatized, becoming a 100 percent government-owned corporation. Shortly after, in 1998 the new Labour government was elected and began a new discussion about governance reform. The aim of this reformation was to create a system that would have the capability to attract capital to invest in the system and to separate service provision from safety regulation. The options studied included reforming the public corporation that existed, full privatization, creating a non-profit system, or creating an entity that was a public-private partnership. The conclusion was that a P3 would be the best fit, as it would be able to solve the NATS's budget and capital restraints, and would provide more incentives for efficiency than a government corporation.

In July 2001, the existing NATS was taken out of the Civil Aviation Authority and restructured into a P3. The Civil Aviation Authority remained a governmental agency and continued to be responsible for safety and economic regulation. In the creation of NATS, 46 percent of its shares were sold to a consortium of airlines, five percent to employees, and the remaining 49 percent remained under state control.<sup>130</sup> NATS is governed by a board of 14 members, including nine non-executive directors. These non-executive board members are appointed by both the public and private shareholders. The government nominates four members and the private sector nominates five members. As the biggest shareholder, *The Airline Group* can nominate the Chair of the board, but the government retains veto power.<sup>131</sup>

NATS is unique in terms of economic regulation because it is the only system that is subjected to a price-cap regulatory regime. Under this rule, prices cannot increase in a year more than a set value; this value is periodically revised by its economic regulator. Currently, prices cannot increase more than inflation minus 1.44 percentage points every year.<sup>132</sup>

NATS was formed a few months before the terrorist attacks of September 11<sup>th</sup>, 2001, which resulted in far less traffic and revenue than was forecasted. NATS revised its revenue forecasts, and predicted a shortfall of £230 million until 2006. Because NATS was heavily leveraged, a major restructuring plan was put in place. This included a reduction of 10 percent of operating costs (approximately £170 million) until 2006, restructuring debt from loans to bonds, and introducing a new partner, BAA plc (now Heathrow Airport Holdings Limited) – the owner of several airports in the UK – that brought £65 million in equity in exchange for four percent of NATS shares. This sum was matched by the government, but the government did not increase their ownership. In 2004, NATS broke even.<sup>133</sup>

NATS is unique in a number of ways. It was one of the first systems to impose direct, dedicated user fees. It was briefly corporatized in the mid-1990s, but in 2001 NATS was restructured into a public-private partnership. This new entity underwent a competitive bidding process that attracted three different consortiums, and the winning consortium paid £758 million to the national government. Its form of economic regulation is also unique. Instead of its user fees being set by the board, minister, or legislature, they are subjected to a price-cap mechanism. The terrorist attacks of September 11<sup>th</sup> put NATS in a difficult financial situation, and the government had to step in to provide liquidity. An extensive restructuring and cost cutting was also implemented, and the P3 broke even in 2004. Since then, NATS has been able to achieve profits consistently (more than \$240 million in 2014, e.g.), including during the years following the 2008 Great Recession.<sup>134</sup>

## France

The French ATC provider, *Direction des Services de la Navigation Aérienne* (DSNA), is directly controlled by the national government (as the FAA is in the U.S.), yet it has some characteristics that are often found in corporatized providers. France's current incarnation of ATC governance was born in 2005 and is part of the Directorate General for Civil Aviation, a department of the Ministry of Ecology, Sustainable Development, and Energy.<sup>135</sup> The need to separate the safety regulation and operational functions of ATC was the impetus to reform the system. Operating ATC and regulating safety has been identified as a potential conflict of interest, resulting in the International Civil Aviation Organization (ICAO) recommending<sup>136</sup> that these functions be separated. This separation was also a requirement of the Single European Sky framework – an initiative established by the European Commission and EUROCONTROL to reform European ATC. Additionally, in 2002 France's *Cour des Comptes* (court of accounts) also recommended the separation of safety regulation and operational functions to improve accountability between the different functions.<sup>137</sup>

Although both the regulatory and operational functions remained within the Directorate General for Civil Aviation, they were separated within the Directorate General. Provision

for ATC is now the responsibility of DSNA, while safety (and economic) regulation is under the purview of the Directorate for Air Transport.<sup>138</sup> As a public agency, the *Cour des Comptes* has maintained its role of oversight of the entire system.<sup>139</sup>

In keeping with European regulation,<sup>140</sup> DSNA charges user fees that are regulated by the Directorate for Air Transport and by the Ministers responsible for Finance and Transport.<sup>141</sup> In terms of financing, the system has had access to the financial markets since 1985. Debt issued by DSNA remains part of the French national public debt.<sup>142</sup>

The French system can be considered a hybrid system, containing aspects of both corporatization and central government control. This governance structure is similar to the proposals made within USDOT during the George W. Bush Administration in the early 2000's. These proposals aimed to split ATO from the FAA, restructuring it as a new modal agency within the USDOT to provide ATC. If this structure were to be implemented in the United States, the FAA would remain the safety regulator (as it would within all potential reforms that have been outlined).<sup>143</sup>

### **User Fees Overview**

A common characteristic of these countries, and most developed countries except for the United States, is that the ATC funding comes not from taxation but from user fees charged by the ANSP to users of the airspace. (Since the fees are paid directly to the ANSP, they are kept outside of the government's budgetary process.) This section provides an overview of the user fees structure in place in each of the six countries for both commercial airlines and GA.

### **Commercial Airlines**

All countries studied in this in this report, with the United States being the exception, charge airlines based on distance flown and weight of the aircraft, following ICAO guidelines. These charges are the major source of revenue for all these systems.

The basic formula, for en-route and terminal charges, is the following:

$$\text{En-route charge} = r \times W \times D$$

$$\text{Terminal charge} = r \times W$$

Where "r" is the respective unit rate for the type of service, "W" is the aircraft maximum takeoff weight (MTOW), and "D" is the distance travelled.

Within this basic framework, there are variations in the application of the formula. For example, in Canada, France, and Germany terminal charges are the same regardless of the airport used; in Australia, New Zealand, and the UK unit rates vary between airports.

Using an average flight, an Airbus A319 weighing 70 metric tons that travels 426 miles – the distance between Calgary and Vancouver, for example – would pay the following in en-route charges (one-way):

**Table 1: En-route user fees in selected countries (May 2015)**

Country	Charge (USD\$)	Charge (local currency)
<b>Australia</b>	\$157.11	AUD\$193.88
<b>Canada</b>	\$133.77	CAD\$159.97
<b>France</b>	\$606.10	€535.06
<b>Germany</b>	\$780.29	€688.84
<b>New Zealand</b>	\$254.81	NZD\$340.61
<b>United Kingdom</b>	\$875.20	€772.71*

\*All en-route charges in Europe are collected by EUROCONTROL in Euros and the distributed to the countries. For the countries that do not use the Euro, conversion rates are adjusted every month.

As Table 1 shows, there is a wide gap between the least expensive and the most expensive, with the en-route charge in the UK being six times more expensive than in Canada. The problem of high costs in Europe has been identified as the result of the fragmentation in the European airspace. With an airspace about the same size as the U.S., Europe has 37 different ANSPs with over 60 en-route centers, compared with 20 in the United States. In a typical flight, airplanes have to transition between the systems of many different countries. This results in increased costs (the European Commission estimates that this fragmentation leads to costs of over \$5 billion annually) and results in higher user charges. Initiatives to handle this fragmentation problem are under way, under the umbrella of the “Single European Sky”.<sup>144</sup> Still, France, Germany, and the UK have en-route rates that are some of the most expensive in Europe; all of them are in the 75<sup>th</sup> percentile.<sup>145</sup>

Table 2 provides estimated terminal charges for the same flight A319 flight. For Australia, New Zealand, and the UK, rates vary between airports. To provide a clear example, two airports in each country were chosen to be representative.

**Table 2: Terminal user fees in selected countries (May 2015)**

Country	Charge (USD\$)	Charge (local currency)
<b>Australia</b>	\$981.38	AUD\$1,211.00*
<b>Canada</b>	\$598.11	CAD\$715.28
<b>France</b>	\$651.27	€574.94
<b>Germany</b>	\$522.56	€461.32
<b>New Zealand</b>	\$281.66	NZD\$376.50**
<b>United Kingdom</b>	\$689.64	£439.30***

\*Canberra and Sidney airports.

\*\*Auckland and Wellington airports.

\*\*\*London-area and Aberdeen airports.

Table 3 presents the total charges for this flight.

**Table 3: Total user fees in selected countries (May 2015)**

<b>Country</b>	<b>Charge (USD\$)</b>
<b>Australia</b>	\$1,321.30
<b>Canada</b>	\$731.87
<b>France</b>	\$1,257.37
<b>Germany</b>	\$1,302.86
<b>New Zealand</b>	\$536.46
<b>United Kingdom</b>	\$1,564.93

Although currency valuations affect these results, overall European countries are more costly to fly in, and Canada and New Zealand charge several hundred dollars less than other systems.

Comparisons with the situation in the United States are not easy due to the United States' reliance on excise taxes to fund the ATO. To make a crude comparison, considering the United States' average round-trip domestic fare of \$393 (including all taxes and fees) in the last quarter of 2014<sup>146</sup>, and the 84.5 percent average domestic load factor in 2013<sup>147</sup>, passengers in the United States of a similar Airbus A319 airplane with 120 seats would pay around \$1250 in passenger taxes for this flight.

#### **General Aviation**

Unlike user fees on commercially airlines, fees on GA flights in the countries explored vary considerably. The number of registered GA aircraft in each of these countries, plus the United States, is presented on Table 4. The table shows the significant discrepancy between the number of GA aircraft registered in the U.S. compared with other nations.

**Table 4: Number of registered general aviation aircraft, including helicopters (2013)**

<b>Country</b>	<b>Registered GA aircraft</b>
<b>United States</b>	199,927
<b>Canada</b>	36,078
<b>France</b>	32,410*
<b>Germany</b>	21,462
<b>United Kingdom</b>	19,850
<b>Australia</b>	12,564**
<b>New Zealand</b>	4,874

\* Data for 2011.

\*\* Data for 2010.

Source: General Aviation Manufacturers Association (2015). 2014 General Aviation Statistical Databook & 2015 Industry Outlook

In Australia, GA aircraft are charged regular user fees, both en-route and terminal. However, aircraft owners can enroll in a "General Aviation Option" where the first AUD\$500 (around \$405) of charges each year are free – an AUD\$45 (around \$36) administrative fee is

charged annually for those wishing to use this option. After that, regular user charges apply.<sup>148</sup>

In Canada, lighter aircraft pay an annual flat fee that covers both en-route and terminal charges. For certain international airports, a surcharge of CAD\$10 (\$8.38) is due when GA aircraft use those airports. Fees for general aviation in 2014 are presented in Table 5.

**Table 5: General Aviation user fees in Canada**

<b>MTOW (lbs)</b>	<b>Annual fee (CAD\$/USD\$)</b>
< 1,360	None
1,360-4,409	68/56.05
4,409-6,614	227/190.13
>6,614	Daily rate or commercial fees

Source: NAV CANADA (2013). Customer Guide to Charges.

Aircraft heavier than three metric tons (6,614 pounds) have the option of either paying a daily rate for en-route and terminal charges, which varies from \$35 to \$2,027 according to MTOW, or they can pay regular user fees similar to the airlines.

In the European countries, all aircraft with a MTOW of less than two metric tons (around 4,400 pounds) or aircraft that are operating under Visual Flight Rules (VFR) do not pay en-route charges. They do pay terminal charges in commercial airports if they use them; however, general aviation airports normally do not charge any terminal fees.<sup>149</sup>

Finally, in New Zealand, all aircraft operating under Instrument Flight Rules pays regular en-route and terminal user fees. Aircraft operating under VFR do pay regular terminal fees based on weight, but they do not pay en-route charges. They do have to pay, however, a charge when they file a flight plan with Airways New Zealand: NZD\$4.55 (\$3.40) or NZD\$6.60 (\$4.94) if filed online or not, respectively.<sup>150</sup>

### **Key Takeaways from International Experiences**

Over the last 30 years, several dozen countries have concluded that having a highly technical service, such as ATC, directly provided by the government and dependent on national budgets and public sector regulations is not conducive to providing an efficient and cost-effective operation. These six countries independently determined that they would be able to better provide ATC services by restructuring their ATC governance and funding mechanisms.

Following the lead of New Zealand in 1987, the countries studied in this report are among the many that moved towards other forms of provision. While most countries chose a government corporation as the new form of provision, the United Kingdom and Canada chose a public-private partnership and a non-profit user cooperative, respectively. All of these countries kept safety regulation of the system strictly within the government and separate from the ATC provider. Table 6 summarizes the main characteristics of the systems studied.

**Table 6: Overview of corporatized ATC providers**

Country	Governance	Year Reformed	Fully Self-funded?	Funding	Economic Regulation	Safety Regulation
Australia	Government corporation	1995	Yes	User fees	Commission oversight	Separate agency
Canada	Non-profit user cooperative	1996	Yes	User fees	Self-regulating	Separate agency
France	Government agency	2005	Yes	User fees	Approved by minister	Same agency
Germany	Government corporation	1993	Yes	User fees	Approved by minister	Separate agency
New Zealand	Government corporation	1987	Yes	User fees	Self-regulating	Separate agency
UK	Public-private partnership	2001	Yes	User fees	Price-caps	Separate agency
US	Government agency	2004	No	Ticket and fuel tax and general funds	Legislature	Same agency

While there were concerns across the board that non-governmental ATC provision would lead to increased costs to the airspace users, poor service, or unsafe operations, the experience of these countries demonstrates that commercialized providers can keep costs in check, upgrade their systems without public funds, and improve safety.<sup>151</sup>

Research has demonstrated that the following aspects are needed for governance reform to be effective:<sup>152</sup>

- **Reliable, independent sources of revenue** have materialized in each country by allowing providers to charge user fees to airspace users, which provides a means to match revenues with costs. Providers have also been able to access capital markets for their capital investment needs. Since ATC is dependent on demand for other industries - i.e., airlines –it is important that provisions, like NAV CANADA’s “rainy day” rate stabilization account, exist so that providers are able to cope with episodic decreases in traffic.

- **Independent, but accountable, management** is important to efficiently manage the system and stakeholder interest. Independence allows the management and staff to focus on what is best for the provider and the airspace users. Without independence, managers may be beholden to interest groups or legislators.
- **Separation of provision from safety regulation** curbs the fears that a corporatized system would be more interested in profits than safety. It is also essential to ensure that regulators have access to the information needed to effectively regulate; experiments in other countries suggest that keeping government in the management board is an effective way to achieve this.
- **Bring all stakeholders to the process**, including unions, the military, industry, and other stakeholders that have concerns regarding corporatization. In Canada and the UK, for example, air traffic controllers are involved in designing, testing, and implementing new technologies. Canada also includes its key stakeholders on the board of NAV CANADA, allowing it to mostly self-regulate from an economic standpoint, and to make decisions that promote the stakeholders' goals more effectively.

In many of the cases that we reviewed, reforms were reactive and in response to serious concerns about the capabilities of the existing systems to modernize their technology and to cope with increases in traffic. These concerns were due to a combination of factors including the belief that the existing government bureaucracies were simply not capable of making those improvements. Another concern was that national budgets would not be able to accommodate the necessary multi-year capital investments that were needed to implement any modernization efforts. These countries viewed corporatization as a part of the solution. Freed from the dependence on appropriations and with mechanisms in place to fund themselves, commercialized systems have been able to restructure, modernize, and deliver more efficient services to their customers.

### **Part Three: Reform Alternatives**

This section explores four potential approaches to reforming the current structure of U.S. air traffic control provision based on our analysis of systems in other countries. Three of these potential models provide reforms for both the governance and the funding of the current structure. The fourth option reforms only the funding of ATC, leaving the current governance structure intact. ATC reform could help create a more efficient aviation system that would have the potential to promote economic growth and increased mobility, while maintaining the high standards of safety that the system enjoys today.

The first option would be a 100 percent government-owned federal corporation, the second option would be an independent, non-profit organization, and the third option would be a private, for-profit, corporation. In theory, all these three arrangements would result in organizations that would be independent of the congressional appropriation process, and federal procurement and personnel rules. Additionally, all three of these governance structures could provide airspace stakeholders representation on the governing board, allowing them to have greater influence over the system.



The fourth option included within this section would reform the system's funding stream, while maintaining the system's current governance structure. This option would not address challenges associated with the governance structure, but it would have the potential to provide more stability in funding. Furthermore, it could alleviate transition issues that are associated with a completely new governance structure.

For each option, the Federal Aviation Administration would retain its role as the aviation safety regulator, regulating safety and administering grants in a manner similar to the other modal administrations within the USDOT. Congress and the federal government would continue to play a substantial role in promoting growth of the aviation system and ensuring continued strong safety oversight. Ultimately, regardless of the model chosen, both Congress and the federal government would be able to intervene in behalf of the public interest if necessary.

Separating ATC provision from the larger FAA under any governance reform option would allow ATC's governance structure to be in accordance with ICAO guidelines, which recommends separating service provision from safety regulation.<sup>153</sup> With separate service provision and safety regulation, the inherent conflict of interest that results from an entity providing and regulating a single service would be eliminated. This rationale has been used before in the United States with the Atomic Energy Commission (AEC). Until 1975, AEC performed research and development (R&D) for the nuclear industry, and also regulated the safety of the same industry. In order to eliminate this potential conflict of interest, in 1975 these functions were split into two separate entities: the Nuclear Regulatory Commission for safety regulation and the Energy Research and Development Administration (merged into the Department of Energy in 1977) for R&D.

The post-reform FAA would be similar to other federal agencies within USDOT in the sense that it would be the safety regulator and would not operate the service. For example, the Federal Railroad Administration regulates railways and issues grants, but does not manage train dispatching. The National Highway Traffic Safety Administration regulates the safety of motor vehicles, but does not set speed limits or control traffic lights. Separation allows each organization to focus on their core businesses and avoid potential internal conflicts of interest. A new ATC organization could focus on serving customers without having broader regulatory responsibilities, and the FAA could focus on regulating ATC safety and the rest of the aviation industry, ensuring that the United States airspace continues to be the safest in the world.

### **Option 1: Government Corporation**

Creating government corporations to provide ATC services has been the preferred route of reform for many countries, including Australia (reformed in 1995), Germany (1993), and New Zealand (1987). This form of governance was also proposed in the United States in 1994 through the United States Air Traffic Service Corporation (USATS) proposal, but the bill associated with this proposal never left committee.

In a government corporation model, a corporation fully owned by the federal government, but acting in a commercial manner, would provide ATC services. This would be similar to many government corporations that exist in all levels of government in the United States, including, at the federal level, the Tennessee Valley Authority (TVA), Amtrak, and the U.S. Postal Service (USPS). There has also been demonstrated business success in government corporations operated by state and local governments, including port and airport authorities.

No government corporation in existence at the federal level provides a perfect parallel to a government corporation that would provide ATC services. The example of TVA – which will be discussed in more detail in Appendix B, along with an overview of government corporations at the federal level in general – is most similar to a government corporation that provides ATC services. TVA is similar to a potential ATC government corporation in the sense that it is a large corporation that provides 24/7 continuous operational services, is very capital intensive, and does not need public subsidies to operate. Amtrak and USPS also provide operational services, but they do not need to fully recover their costs, which would be an expectation of the ATC government corporation.

An ATC government corporation would have budget and managerial independence granted by the charter of Congress that created the corporation. Congress would retain an oversight role, but instead of performing that role via the annual appropriations process, Congress would provide oversight through annual business and financial reports and audit requirements.

The Board of Directors would be composed of members appointed by the President and confirmed by the Senate. The Board would be composed of appointees that directly represent the government, as well as representatives of key stakeholders in the aviation industry, allowing the Board to be more responsive to the airspace users needs.

The majority of funding for the corporation would come from user fees levied on commercial airlines. This would allow airspace users to be directly charged, creating a clear connection between services provided and the revenue stream. User fees would be subjected to general principles, including the requirement that they are not set at a level that exceeds the corporation financial requirements (including debt service), and maintaining prudent financial reserves and credit ratings. A consultation process with stakeholders would be conducted and would be essential in the formulation of these user fees, and the right to appeal the fee structure would be guaranteed. The Office of the Secretary of Transportation (OST) would become the economic regulator for the user fees. General and business aviation would also contribute to the system at a level consistent with their current contributions, and the remaining functions and programs of the FAA would be funded through a combination of taxes and general funds.

The corporation's charter would also include provisions that would allow it to issue bonds and other forms of debt. This would allow the corporation to be completely self-funded for both operational and capital expenditures. Access to capital markets would allow the corporation to make long-term capital investments to modernize the system without

annual appropriations. Some existing government corporations, such as the Tennessee Valley Authority, currently have the authority to issue bonds.<sup>154</sup>

### **Option 1: Benefits**

ATC provision by a government corporation has been used extensively in other countries. In the United States, this structure could have the following benefits:

- A more independent budget and management.
- Removal from the annual appropriations process.
- ATC operation and funding would be shielded from budget sequesters and government shutdowns.
- The continuation of safety improvements, on par with what has been achieved across different governance structures worldwide.
- Self-funded modernization efforts, facilitated by the corporation's budgetary independence.
- Revenue streams from user fees, ensuring that those who benefit from the system are the same that are contributing to the system.
- The corporation would be government-owned, resulting in potentially fewer transition issues in matters such as the transfer of assets and employees' pensions, compared to the non-profit and for-profit alternatives.
- There would be user representation on the Board, which would potentially make the corporation more responsive to the airspace users' needs.

Some of the benefits that would be associated with a government corporation overlap with benefits that would be associated with the independent governance structures, both non-profit and for-profit. These include the ATC entity's ability to be self funded, a separation of safety regulation from provision, and the provision of services in a more business-like manner.

However, a government corporation will be distinct from the more independent, non-governmental, entities. First, as a government entity, there would be a level of direct government oversight (e.g., congressional committees, GAO, etc.) that would not exist with other options. Secondly, the transition to a new governance model in a 24/7, highly technical service, such as ATC provision, is likely to be challenging. Transitioning to a government corporation, rather than an independent corporation, may experience fewer of those transition challenges. Nevertheless, there is the possibility that the government corporation would be responsible for existing pension liabilities, insurance, and environmental liabilities, and would have to pay for the transfer of assets to the same extent that an independent organization would.

### **Option 1: Challenges**

This governance model may also experience challenges, such as the following:

- Inclusion within the federal government might result in the corporation being subject to political and funding battles, potentially not removing it entirely from the appropriations process again and jeopardizing modernizations efforts like NextGen.

- The management of the transition process might be challenging, although it might be less challenging than a transition to a non-profit or a private corporation.
- Potential for the need for economic regulation to avoid monopolistic behavior.
- The Department of the Treasury might make the corporation's bonding ability difficult or even impossible.
- Some Board members would be political appointees who might lack the operational insights of a stakeholder-designated board.

Government corporations are generally created to provide a business-like approach to service provision and are created to be relatively independent. However, the experience with federal government corporations in the United States has demonstrated that maintaining independence within a government corporation structure is often difficult. This has occurred in cases where government corporations remain dependent on appropriations (and the ATC government corporation would theoretically not be, although Congress could potentially create a structure where it still was) and where they provide services with high visibility to the general public (which is true of ATC).<sup>155</sup> This might ultimately lead to the government corporation being in the midst of political and funding battles, affecting its operation. Additionally, the government corporation would be the monopolistic provider of an essential service for the aviation industry. Without proper supervision, there is potential for abuse of this monopoly. The stakeholder presence on the Board, if correctly structured, would help ameliorate this problem. Since the users are paying into the system, they would have an incentive to keep the costs of operating the system low. The users presence on the Board would therefore help curb any attempts to exploit monopoly power.

Another potential problematic issue is bonding authority. Bonding authority is of crucial importance to improve capital management at the ATC provider. By issuing bonds backed by its future revenues, the government corporation would be able to modernize its systems much more effectively than what is possible today in the current pay-as-you-go annual appropriations system the FAA is subject to. Congress can give this bonding authority to a government corporation, as it has done before with the TVA, for example. However, more recent attempts to give bonding authority to governmental entities, including during the USATS proposal in 1994, have met resistance from the Department of the Treasury. During these attempts, Treasury has insisted that any bonds could not be issued directly in capital markets, but had to be issued by them. Although this might result in lower interest costs, as the U.S. government can issue bonds at lower rates than average, it comes at a cost of more oversight and less financial independence for the government corporation.

### **Option 1: Other Characteristics**

There are a number of other characteristics that are not necessarily positive or negative:

- Government retains 100 percent ownership.
- Reduced Congressional influence compared with the current situation.
- Board of Directors not as stakeholder driven as the non-profit alternative.
- The government corporation would be subjected to oversight from a number of entities, including Congress, the Government Accountability Office, the Office of

Management and Budget, and others. This oversight may reduce the corporation's ability to be truly independent, potentially becoming a de facto government agency with the responsibility to satisfy all these entities instead of acting exclusively in its commercial interest. The examples of Congressional oversight over Amtrak and the U.S. Postal Service demonstrate that government corporations sometimes are pushed to make decisions that are against their commercial interest.

- Federal government might receive monetary compensation to transfer assets to new entity.

Although a government corporation has the potential to experience reduced Congressional influence than a government agency, some have identified interference from lawmakers and executive branch officials as a challenge. Often, this interference causes government corporations to have to behave like a government agency, but maintaining the expectation that they will deliver services like a private business. Two highly publicized examples are Amtrak and the Postal Service. Both of these government corporations have been compelled by Congress to act in a manner that is against their commercial interest – after its creation in the 1970s, Amtrak tried to cut service on many low-traffic routes, which was ultimately stopped by Congress. In addition, the Postal Service has tried multiple times (the last time in 2013) to end mail delivery on Saturdays, a move that Congress has always blocked.<sup>156</sup>

The government corporation would also continue to have to report to a number of entities in the different branches of government, which the Mineta Commission in 1997 identified as an issue. The Mineta Commission also suggested that the influences from various government entities can result in “too many cooks,” or entities influencing decision-making, resulting in accountability and authority that is “too diffused to run a 24 hour-a-day, high technology, rapidly changing operating system for a major commercial industry”.<sup>157</sup> To reduce some of the issues that the FAA was facing at the time, the Mineta Commission suggested the introduction of a Performance-Based Organization to provide ATC services. This suggestion materialized between 2000-2004 with the creation of the Air Traffic Organization (ATO) within the FAA. However, some of the recommendations of the Mineta Commission, such as ability for the new organization to charge user fees and issue bonds, were not included in the ATO. There is a risk that if a government corporation were introduced, it too would not include some of the suggested reforms.

### **Option 2: Non-Profit, Independent Organization**

Two other potential options that could be considered for ATC reform involve taking ATC provision out of the federal government altogether. In this section, an independent, non-profit organization is discussed, and the next section details a for-profit private corporation.

As a non-profit, the new organization could focus exclusively on providing safe, cost-effective ATC services to its users. There are precedents in the United States of Congress granting charters to non-profits to provide services of recognized public relevance – a discussion of existing organizations of this type is discussed in Appendix C.

Like a government corporation, a non-profit ATC would not be subject to congressional appropriations or federal procurement and personnel rules. A potential benefit of this approach is that ATC provision would have a further degree of separation from government oversight (Congress, Office of Management and Budget, Government Accountability Office, etc.), which would allow it to have more independence in day-to-day operations and long-term planning. Any eventual excess revenues in a given year would be reinvested in the system.

To create a system where ATC services are provided in the best interest of the airspace users, stakeholders would need a voice in the system. To provide a platform for stakeholders to influence the future of the ATC system, the non-profit could be governed by a Board that would include industry stakeholders. The Board's composition would allow decision-making to take into account what is best for the non-profit and for the industry as a whole. Stakeholders would be equitably represented on the non-profit's Board, ensuring that the interests of no individual stakeholders would dominate. This would allow the non-profit to be a user co-operative, with a system run by the users, for the users. There are precedents for this model in the U.S. aviation industry, such as the Aeronautical Radio, Inc. (ARINC), a non-profit created by the airlines in 1929 to provide air-to-ground communications for the airlines. In the early 1930s, AIRNC became a de facto air traffic control provider in the United States, a role it had before the federal government did; the federal government began providing ATC services in 1936.

Although this non-profit would be a completely independent organization, the federal government would also be represented on the Board, as it would continue its responsibility of promoting safety. The federal government's representation on the board would also help to ensure the general public's interest. Representation of federal nominees on non-government entities' Board of Governors has precedents in the United States, including in the original COMSAT Corporation. This organization was created by an act of Congress in 1963, and prior to its merger with Lockheed Martin in the late 1990s, three out of 15 Board members were nominated by the President. The American Red Cross is another organization where the President nominates representatives to the governing Board – eight out of 50 members on the Board of the American Red Cross are nominated by the federal government.

The balance of key industry stakeholders and the federal government on the Board would provide incentives for the non-profit to act in a way that satisfies the stakeholders' interests. These include the goal to place safety as the primary goal above all else, to act in the general public interest, and to act in an efficient, customer-focused, commercial manner.

Similar to a government corporation, the non-profit would rely on user fees levied on commercial airlines for the majority of its funding needs. A consultation and the right to appeal to the OST would also be guaranteed. The non-profit would have the authority to issue bonds and other kinds of debt that would not be guaranteed by the federal government. The Congressional charter that created the non-profit would give tax-exempt

status, allowing the entity to issue bonds in more favorable conditions compared to for-profit entities.

### **Option 2: Benefits**

If implemented in the United States, this model could have the following benefits:

- The corporation would have independent budget and management, which would allow decisions to be made in the interest of the system and its users, not outside actors.
- User fees would support the system and no taxpayer money would be used to deliver ATC services.
- ATC operation and funding would be shielded from budget sequesters and government shutdowns.
- There would be stakeholder representation on the Board, allowing the system to be run by the users for the users, without the uncertainties of the political appointment process.
- Stakeholder presence on the Board provides incentives for economic self-regulation.
- The continuation of safety improvements, on par with what has been achieved across different governance structures worldwide.
- The entity would be a non-profit organization, which would allow eventual surpluses reinvested back into the system.

This non-profit option would have some benefits that would be similar to the government corporation option outlined in the previous section. This includes the ability to be self-funded, the separation of safety regulation from provision, and providing ATC services in a more business-like manner, taking into account the airspace users' needs.

The non-profit could also have a significant potential benefit that is exclusive to this option: the larger presence of key stakeholders in the Board. The large presence of key stakeholders in the Board, with no stakeholder having a majority position, would make the non-profit a user co-op, where the system is run by its users for the interest of its users, not external entities. This stakeholder presence on the Board also provides the right set of incentives for the non-profit economic regulation. As the users would be both running and paying into the system, they would have an incentive to keep the non-profit's cost of operating the system low, which simultaneously keeps their own costs for using the system low as well. In times of fiscal constraints at the federal level, this model would ensure that ATC provision is completely self-funded and would not be influenced by financial strategies such as federal sequesters and government shutdowns.

### **Option 2: Challenges**

Potential drawbacks of this governance model include the following:

- Concerns about the role of public interest in the decision making process and the motivation of the non-profit to ensure the continual growth of the system.
- Disagreements between stakeholders could make decision-making difficult, and some decisions might require a super-majority vote.
- Transfer of assets might put the non-profit in a difficult financial situation.

- Other liabilities such as insurance, pensions, and environmental liabilities could also affect the financial situation of the non-profit.
- The management of the transition process could be a challenge.

Perhaps the biggest concern with this governance model will be that removal from government control could potentially jeopardize the public's interest, particularly in terms of the diversity and growth of the system. To mitigate these concerns, the federal government could nominate representatives to be appointed to the non-profit's Board of Governors (as discussed above), allowing the federal government to be able to influence how the system is run. Additionally, a number of safeguards could be included in the non-profit corporate by-laws, specifically mandating that certain decisions in crucial aspects of the public interest require more than a simple majority in the Board.

The liabilities that the non-profit could absorb also present a significant concern. The three types of liabilities that the corporation would face are environmental, insurance, and pensions. Environmental liabilities could result from a potentially large number of ATC facilities across the country that could be decommissioned (because of obsolescence, consolidation, etc.) in the next few decades. Secondly, the non-profit organization would need substantial insurance levels to reduce the financial exposure of the non-profit in case of claims, suits, liabilities, damages, losses, or other risks. Finally, existing pension commitments could potentially also present a risk. The creation of the non-profit would lead to tens of thousands of federal employees currently working for the FAA to terminate their federal employment and become employees in the non-profit sector. For this transition, the federal government and the non-profit would have to negotiate how to accommodate pensions for employees that are transferred from the ATO to the non-profit. These issues would make the transition process a challenge, potentially more challenging than if the government corporation model was adopted.

### **Option 2: Other Characteristics**

The characteristics that are not directly identifiable as positive or negative are the following:

- Removal from direct control of the government, with reduced Congressional oversight.
- Lower level of Congressional influence. The federal government would retain its regulatory and safety role.
- Federal government would receive monetary compensation to transfer assets to new entity.

As an independent organization, the non-profit would be further insulated from political interference when compared to the government corporation. Some might see that as problematic, and others may interpret this level of independence as a benefit. Nonetheless, because the federal government would nominate some members of the Board of Governors, it would have an influence over how the system is run. From an economic and safety standpoint, OST and the FAA, respectively, would be the regulators, ultimately reporting to Congress.



As part of the creation of the non-profit, the federal government would receive monetary compensation to transfer assets to the new entity. From the perspective of the Treasury, this might be a benefit. On the other hand, depending on its value, that monetary compensation may hinder the capacity of the non-profit to make capital investments at the level the stakeholders want. In any case, the valuation of these assets would probably be very difficult and would have to be negotiated between the different interested parties.

### **Option 3: For-Profit, Private Corporation**

A third option is to create a fully privatized, for-profit corporation. No system like this currently exists in any country. The closest system to this model is UK's NATS, which is a Public-Private Partnership where the national government owns 49 percent of the company's shares, and several private sector entities, including airlines, employees, and an airport operator, own the remaining 51 percent of the company's shares. The systems in Australia and New Zealand are for-profit corporations, but are wholly owned by the respective national governments.

A private corporation would ensure that there would be clear separation from political interference. This model would also provide the greatest incentives for achieving efficient outcomes, from an economic perspective. The initial transfer of ATC to a private corporation illuminates an example of inherent incentives. The right to operate ATC in the United States would likely be granted to the corporation via a competitive bidding process. This bidding process would introduce competition between potential providers, and this competition would be used to determine the market value of the provision of ATC services. That value would not only include potential revenues, but also expected liabilities.

Similar to the two previous models, the private corporation would rely on user fees levied on commercial airlines for the majority of its funding needs. A consultation and the right to appeal to the OST would also be guaranteed. Like other private entities, this corporation would have the authority to issue bonds and other kinds of debt for its financing needs, and this debt would not be guaranteed by the federal government.

### **Option 3: Benefits**

The following benefits could be expected from a for-profit private corporation:

- User fees would support the system and no taxpayer money would be used to deliver ATC services.
- ATC operation and funding would be shielded from budget sequesters and government shutdowns.
- The valuation of assets to be transferred would be priced by market forces during the competitive bidding process.
- Liabilities, like insurance and environmental, would also be priced by market forces during the competitive bidding process.

The most significant difference of this model compared to other options is the use of a competitive bidding process to select the provider of ATC in the United States. This would introduce competition for this market, allowing market forces to value both the assets and the liabilities associated with ATC provision. Bidders could, however, overestimate the

value of the new corporation to win the bid, leading to a potentially difficult financial situation. This happened in the United Kingdom, and the private partner had to be “bailed out” by a cash infusion from the national government shortly after operation of the P3 began. This did, however, happen after the economic downturn that was a result of the September 11, 2001 terrorist attacks in the United States.

### **Option 3: Challenges**

Some potential drawbacks of this governance model include:

- Natural monopoly needing economic regulation.
- Potential for profit-driven entity putting profits ahead of safety; strong safety regulatory supervision would be needed (as it would be for all other options).
- Stakeholders might not be happy with contributing to another entity’s profit.
- Concerns about the role of public interest in the decision making process and the motivation of the private corporation to ensure the continual growth of the system.
- The management of the transition process could be a challenge.

In a perfect, competitive market, a private corporation seeking profits is best suited to achieve the best economic efficiency outcomes. However, the provision of ATC services is not a competitive market, being instead a natural monopoly where having only one service provider delivers the most efficient outcomes. This is also the case of many public utilities, such as water and electricity distribution systems.

While there would be initial competition within the bidding process, after a contract is awarded the competition would cease. A contract could, however, last a set period of time, and a competitive bidding could occur at intervals consistent with the useful lives of major investments. This could bring new players into the market, helping to encourage efficiency and improvements. On the other hand, bidding processes have costs and may be disruptive for operations, and disincentivize long-term investments.

Since the ATC provider would have no competition once operation began, some sort of economic regulation of its activities would be needed. However, the imposed economic regulations run the risk of being overly burdensome, discouraging interest in the system’s operation. On the other hand, if no or little economic regulation is imposed, the public interest could be put at risk. The private corporation would likely aim to maximize its profits and shareholder value, and without some level of oversight, it could disregard the growth of the system or other areas of public interest.

Regarding safety, it is not possible to know whether having ATC services provided by a for-profit corporation would have any detrimental effects on safety. Literature on corporatized ATC providers across the world has shown that safety outcomes have continued to improve regardless of ownership. However, there are no precedents for a fully private company providing the ATC services of an entire country. In other sectors of the aviation industry though, the existence of for-profit private companies, such as airlines and manufacturers, has not been associated with lower levels of safety as long as effective safety regulation, like what is provided by the FAA, exists. As with other options for governance structures, the FAA would remain the safety regulator to ensure the existence of a safe airspace.

Another issue with this form of governance is that some stakeholders in the aviation community might not be willing to support the profits of another entity. While ATC services are a necessity for the aviation system to exist, these stakeholders might not support reform if these services are to be provided on a for-profit basis. This makes this reform option less likely from a political standpoint as it might lack the support of crucial stakeholders.

### **Option 3: Other Characteristics**

The characteristics that are not directly identifiable as positive or negative are the following:

- The corporation would have independent budget and management, which would allow decisions to be made in the interest of the system and the shareholders of the corporation.
- Use of market principles to achieve economic efficient outcomes.
- Unknown outcomes from a safety perspective.
- If an excessive economic regulation framework was imposed or if potential liabilities are such that the business case of the corporation is jeopardized, the private sector might not be willing to provide the service.
- Federal government would receive monetary compensation in exchange for assets.

As with the non-profit option, and potentially also with the government corporation option, the federal government would receive a monetary compensation from the new operator of the system. The difference from the other options considered is that a competitive bidding process would be used to determine the value of that compensation. With the other options considered, a negotiation between the different stakeholders would be probably be used to determine that value.

After the private operator took charge of the operation, the goals of the corporation would dictate how the system would be governed. It could be argued that this autonomy would be the best way to achieve economic efficient results. It could also be argued that in some markets, with ATC provision potentially being one of these cases, this autonomy may not be the approach to provide a given service. A balance between the goals of the corporation and the goals of other stakeholders could be imposed through economic regulation. However, the level of economic regulation imposed, together with the estimated and unforeseen liabilities, has the potential to create a situation where the private sector might not be willing to provide the service.

In terms of safety, there is a risk that a private operator might prioritize profits over safety. On the other hand, it could be argued that existing private players in the aviation industry always consider safety as a top priority. If for nothing else, they do it because not having a safe operation is not a sound business strategy – but they are also regulated for safety at arm's length by the FAA, which would be the case with all the above corporation alternatives.

#### **Option 4: Funding Reform within Current Structure**

An alternative to reforming both the governance and funding of ATC would be to reform only funding of the current system. Reforming the funding of ATC would have the potential of introducing an element of funding stability for ATC provision and modernization, while maintaining the current governance structure within the FAA. Within this option, ATC would be funded entirely through a trust fund and would not be subject to the traditional appropriations process.

While no service within the federal government is entirely exempt from Congressional appropriations mechanisms, there is the possibility of creating a more robust funding system while maintaining the current governance structure. This could be achieved by funding all ATC-related expenditures, including the ATO and NextGen research, development, and deployment exclusively by the Airports and Airways Trust Fund.

Within FAA's current funding portfolio, only the operations sub-account receives general funds, while the three other sub-accounts are exclusively funded by the AATF. To insulate ATC operation and modernization from annual appropriations, one option would be to restructure the FAA so that all ATC provision and grant-making functions would be completely separate from certification and safety regulation. Under this scenario, all ATC capital and operating costs would be funded by the AATF and would not receive any general fund contributions. Only certification and other safety functions, like airport oversight, would be funded by the general fund.

An alternative option, which would allow FAA to avoid internal restructuring, is that the AATF could fund the entire FAA, including airport oversight and the other safety functions, along with FAA certification functions. This would make the entire FAA independent from the general fund. However, this would mean that the financial burden to the airspace users would greatly increase. Since 1990, an average of 24 percent of FAA's budget (\$15.8 billion for FY2014) has been appropriated from the general fund.

Within this option, Congress would set the taxes and fees that fund the AATF to an appropriate level to fund both operational and capital expenditures for ATC provision, as well as fund other FAA functions. These functions would be 100 percent funded by the AATF and would not receive any general fund contributions. Congress could also dictate how funds between the ATC functions and other AATF-funded functions, like grant-making, should be distributed. Alternatively, Congress could give the FAA administrator liberty to decide how to best allocate funds.

#### **Option 4: Benefits**

Funding reform could result in the following benefits for FAA and ATC:

- Increased funding stability, in comparison to the current funding model, without having to go through governance reform and the potential transition issues governance reform may bring.

- ATC funding would not be subjected to budget sequesters if programs are 100 percent funded by the trust fund and are classified as “split treatment programs”; government shutdowns would also not affect ATC operations.

A reworked trust fund has the benefit of maintaining the current governance structure and eliminating the transition challenges that governance reform could instigate. Additionally, if ATC provision were completely funded by a trust fund, funds would not have to be appropriated every year by Congress. Instead, ATC funding levels would be designated through contract authority during each FAA reauthorization bill. Appropriating committees, however, would maintain the power to set obligation limits annually. To further increase the stability of the AATF funding, Congress could also classify the different AATF programs as “split treatment programs”, preventing them from being subjected to budget sequesters or government shutdowns.<sup>158</sup>

#### **Option 4: Challenges**

The following potential drawbacks were also identified:

- Potential for funding instability in the future.
- ATC provision would still be directly controlled by the federal government and would be subject to federal procurement and personnel rules.
- As operational expenditures take precedence over capital expenditures, there is the risk that modernization efforts would continue to be subjected to uncertainties, especially when revenues are below forecasted.
- If successful, there is a risk of funds being diverted for other governmental expenditures. Such diversions have occurred in the cases of the Highway Trust Fund, the Harbor Maintenance Fund, and the Inland Waterways Trust Fund.
- This scenario is highly unlikely in the current budget and political environment.

Although increasing funding stability, this approach would not fully insulate ATC from Congressional influence. Congress would continue to control how contract authority is used and the levels of taxes and fees that fund the AATF, and would still dictate the level of obligations limitations, which could limit the levels of expenditures that the FAA could make.<sup>159</sup> In addition, in the option that would take the entire FAA out of the federal budget, ATC safety regulation and the provision of ATC services would remain together, contrary to ICAO principles calling for organizational separation of these functions.

Funding would continue to be provided based on annual revenues because trust funds are subjected to “pay-as-you-go” rules and cannot have a deficit; this would be an added challenge if traffic (and revenues) were to be below forecasted levels. As reauthorizing legislation is passed every few years, traffic and revenue fluctuations could be a concern. Forecasting operational expenditures for the medium-term for the aviation industry is difficult, as it is subjected to many external factors like the overall state of the economy. Furthermore, the issue of stability for long-term capital expenditures and modernization efforts could potentially remain unresolved: whenever revenues are below forecasted, operational expenditures would necessarily take precedent, and capital expenditures would be cut. Also, if this scenario does indeed prove to be possible and successful, there is a risk that Congress might decide to divert funds from aviation and into other

governmental expenditures. Regardless of the success of this funding mechanism, it would still have to be re-authorized every few years, creating potential instability for the industry.

#### **Option 4: Other Characteristics**

The characteristics that are not directly identifiable as positive or negative are the following:

- There would be no governance reform. ATC provision would still be directly controlled by the federal government and would be subject to federal procurement and personnel rules.
- Uncertainty regarding the outcomes.

Reworking ATC funding would not solve issues that have been identified with the current governance structure, including federal personnel and procurement rules that some believe cannot be satisfactorily adjusted to provide for the needs of an agency that provides around-the-clock, 365 days a year, operational services.

This option would ensure funding stability in the short term. However, there is the potential that after a certain period of time that stability would no longer be present. This could happen if air traffic, and therefore revenues, fell below forecasts. If this were to happen, Congress would need to act in order to stabilize the funding situation, leading to essentially the same system of funding instability that there is today.

#### **Liabilities**

If ATC were taken out of the federal government, the new entity would face a liability environment that the ATO, as part of the federal government, does not. Pension, insurance, and environmental liabilities pose a challenge to moving an organization, such as ATC, out of the federal government. Further, it is expected that the federal government would demand a cash payment to transfer all its ATC-related assets to the new organization. This section outlines how an eventual new organization to provide ATC services could potentially deal with these liabilities.

#### **Transfer of Assets**

When the potential new organization begins its operation, all assets related to ATC provision would be transferred from the government to this new entity. In exchange, the government would likely be compensated for the release of these assets. A government corporation may not go through this process, as ATC provision would technically remain a governmental function. However, since the government corporation will not be a government agency, it is possible that Congress would make the government corporation pay for these assets.

The estimation of that value for the purchase price of assets would need to be negotiated between the new organization, the Administration, and Congress. The estimation of this purchase price of assets would need to take into account the projected cost savings of the new organization, the capital expenditures envisioned, the resulting free cash flow, and the debt coverage.

The compensation paid to the government has to be such that the government is appropriately compensated for selling those assets, while not crippling the new organization with an excessive amount of debt needed to buy those assets.

### **Pensions**

If a new organization were to be created, there would need to be a rigorous assessment of the amount of pension liabilities for employees that would move to the new organization. In the creation of a new organization, it is likely that current ATO employees within FAA move to the new organization. This would allow the new organization to have access to the expertise of the current ATO employees who currently safely run the largest aviation system in the world, it would also help to ensure stakeholder support for the transition. There should also be safeguards built into the transition to allow current ATO employees that do not wish to join the new organization to continue to work within the federal government, whether at FAA or at other agencies. During any eventual transition, a stable and secure working environment for the employees of the agency will have to be provided, including the continuity of the collective bargaining relationships and processes for employees who currently are represented.

FAA employees, like other federal employees, have a pension scheme that is different from the private sector. Within the agency, there are also varying pension schemes that depend on the role of the employee. Additionally, over time pension plans have shifted – employees who began before 1984 have a different scheme than those who began at a later date. Most employees hired before 1984 are covered by the Civil Service Retirement System (CSRS), while all employees hired after 1984 are covered by the Federal Employees' Retirement System (FERS).<sup>160</sup> Regardless of regime, all employees contribute to a defined benefit pension scheme deposited into the Civil Service Retirement and Disability Fund (CSRDF), and also have the option to contribute to a defined contribution account (the Thrift Savings Plan – TSP); people hired after 1984 also make contributions to Social Security.

If a new organization were to be created, tens of thousands of people currently working for the FAA would terminate their federal employment and become employees of the non-profit sector. In this transition, the federal government and the new organization would have to negotiate how to accommodate pensions for employees that are transferred from the ATO to the new organization. For the newer employees that contribute to the FERS regime, the Social Security contributions are made on the same basis as in the private sector, which would be continued within the new structure. Assets within the defined contribution TSP can be kept where they are or, since they are defined contribution plans, they can be easily rolled into new accounts that the non-profit offers.

The most difficult transfer is how to properly account for the contributions to the CSRDF. After assessing the amounts in question, an agreement needs to be reached between the federal government and the new organization to safeguard the rights of employees to ensure that they receive their pensions. An option would be to terminate the relationship between the employees and the CSRDF at the time of transfer, as if the employees were retiring, and creating a new pension scheme moving forward. If the new organization becomes responsible to provide pensions for the years that the employees spent in the

federal government, a cash payment from the federal government to the new organization would be needed to account for those liabilities.

### **Insurance**

Due the exceptional safety that has been cultivated within the aviation industry in the U.S., the number of cases where ATC services have been the cause of legal claims has been historically very small. However, the possibility does exist and as such there would be a need for liability insurance.

Within the current system, ATC liability is ultimately a government liability. If a new organization were to be created, this would not be the case, especially if a new independent organization is created. Adequate levels of insurance would be needed to reduce the financial exposure of the non-profit in case of claims, suits, liabilities, damages, losses, or other risks.

Considering the size of the ATC system in the United States – by far the largest in the world in terms of traffic controlled – and the potential size of the new organization, the insurance needed against these risks would be substantial. As an example, NAV CANADA, has liability insurance of up to US\$3.75 billion per occurrence, subscribed by a number of international underwriters and syndicated at Lloyds of London to pool and spread risk.<sup>161</sup> Given the size of the U.S. system, it is likely that no single insurer would underwrite such a policy and a syndicate of insurers would be needed.

The aviation system can also be subjected to acts of war and terrorism. For those types of events, regular commercial insurance available in public markets might not exist. This has been the case of airlines in the aftermath of the 2001 terrorist attacks. To allow the airlines to continue to operate, the U.S. Congress included provisions in the Homeland Security Act of 2002 to limit the liability of airlines in the event of cases of terrorism. Since then, those provisions have been extended, with the last time being the FAA Modernization and Reform Act of 2012. To protect the new organization against this kind of liability, Congress should enact legislation to extend this benefit to the non-profit.

### **Environmental**

The new organization would become the owner of a large number of facilities that are currently owned and operated by the federal government. These include radars, Terminal Radar Approach Control Facilities (TRACON), VHF Omni Directional Radio Range (VOR), and others. With the modernization efforts that are in place, like the NextGen initiative, along with the natural renewal and replacement of older facilities, a potentially large number of facilities across the country would be decommissioned in the next few decades.

Although at this stage there are no certainties about what facilities would close or not, there are concerns about what environmental liabilities related to those facilities that the new organization have to face, and what effects they would have from an accounting standpoint. During the transition there would be a need to evaluate what environmental liabilities the new organization can expect when it takes ownership of the previously



government-owned assets, and this assessment would influence the purchasing price of those assets.

### **Remaining Functions of the FAA**

If ATC is indeed removed from the FAA, the agency would still exist and play a crucial role as the safety regulator and distributor of grants. This section explores these functions in a post-reform FAA.

### **Safety Regulation and Certification**

FAA and the aviation industry play a crucial role in maintaining the safety of the aviation system. After reform, that role would continue and FAA would remain as important as it is now, maintaining the exemplary safety levels that the national aviation system currently enjoys.

A critical component of FAA's role as safety regulator is the certification and approval processes of aviation products, including airplanes and their components. FAA issues these certificates and approvals based on its evaluation of aviation industry submissions, considering the standards set forth in federal aviation regulations and FAA guidelines. Additionally, FAA also certifies airmen, including pilots and mechanics, airlines, and airports.

Effective and timely certification processes are essential for the industry and the nation's economy, and delays in the approval processes can be extremely costly and disruptive to the successful implementation of NextGen, third class medical reform, updating the existing general aviation fleet with modern equipment that will improve flight safety, among other concerns. Moreover, the current processes are unable to keep pace with the rapid advancements in technology and must be reformed quickly, in order for the national aviation system to continue to be the best and safest in the world. The FAA culture, as well as the regulatory and certification processes, especially in the area of general aviation, need to evolve in order to better keep pace with changes in technology. Since safety regulation and the certification and approval processes are inherently governmental functions, these functions should be funded by appropriations from general funds.

### **Grant-in-aid for Airports and the Airport Improvement Program**

Around 21 percent, or \$3.3 billion, of FAA's budget for FY2014 was dedicated to the grant-in-aid for airports subaccount. From that amount, around 95 percent was spent on the AIP, and the rest in a number of other items, including personnel, airport technology research, and the Airport Cooperative Research Program.

The FAA involvement with these programs aims to promote safety and capacity, environmental, and efficiency improvements throughout the nation's airports, including the funding of research on topics relevant to airports. The AIP in particular is a program that addresses the need for airport investment by providing grants primarily to public agencies for the planning and development of public-use airports. These funds are mostly allocated to airports that serve a role in promoting access to the national aviation system in many smaller markets, promoting the economic competitiveness of these regions.

To fund this subaccount, including the AIP, there is a need to determine where the funds would be coming from. Different structures could be envisioned and there is an opportunity for stakeholders to get involved in defining how the federal government involvement in aviation should be funded.

### **Policy Recommendations**

There are a number of possible avenues for governance reform for the U.S. ATC system, from small changes to the status quo to complete divestiture of the federal government. Table 7 summarizes the main findings regarding the four options. Regardless of the option chosen, given the size of the U.S. ATC system, an effective management of the transition would be extremely important. For that, the participation of all stakeholders is crucial to ensure a smooth transition.

Experiences in other countries have shown that budget and managerial independence are crucial to achieving the goals of improved efficiency and deployment of modern technologies. Importantly, safety has been improving across the board within all forms of governance, suggesting that safety concerns should not be a limiting factor when deciding for a governance structure. Within each reform option, the FAA would remain as the safety regulator of the system.

**Table 7: Summary of proposed reform alternative**

<b>Alternative</b>	<b>Governance</b>	<b>Funding</b>	<b>Bonding</b>	<b>Safety regulation separated from provision</b>	<b>Transition issues</b>	<b>Congressional influence</b>	<b>Political feasibility</b>	<b>Other</b>
Government corporation	Independent, potential to be stakeholder driven	Self-funded	Not with direct access to capital markets	Yes	Yes	Reduced	Possible	Model most used in the developed world
Non-profit independent organization	Independent, stakeholder driven	Self-funded	Yes	Yes	Yes	Lowest level	Possible	Model is a user co-op, common with natural monopolies, like utilities
For-profit corporation	Independent, profit and shareholder value driven	Self-funded	Yes	Yes	Yes	Minimal, more than non-profit	Unlikely	Model not used anywhere, UK model (a P3) is the closest
Funding reform within current structure	Status quo	Self-funded through AATF	No	No	Minimal	Status quo	Unlikely	Uncertainty about outcomes and long-term stability

**Based on extensive research into potential models, the Eno NextGen Working Group proposes that either option 1, a new government corporation, or option 2, an independent, non-profit organization, should be chosen as the new provider of ATC services in the United States.**

The two other options, a for-profit corporation and funding reform within the current structure, have too many potential issues to be considered worthwhile alternatives. The for-profit corporation, which theoretically might work, in practice it offers too many issues, from the need for economic regulation to its lack of political feasibility. Funding reform within the current structure does not do enough to fix the current issues with ATC provision in the United States and is also politically unrealistic. While it might solve, at least temporarily, the unstable funding, its continued inclusion within the federal government will mean that ATC would likely still be subjected to federal procurement, personnel rules, and Congressional micromanagement.

Under either the two preferred options, the ATC provider would be free from federal procurement and personnel rules, allowing for more efficient development and deployment of modern technologies. It would also allow airspace stakeholders to be represented and have influence over the system. This would create a more efficient ATC system that has the potential to continue the growth of the national aviation system, promote economic growth and increased reliability and mobility, while maintaining the high standards of safety that the system enjoys today.

The FAA would continue to operate, retaining its role as the aviation safety regulator. FAA would regulate safety and administer grants, in a manner similar to the other modal administrations currently in USDOT. Congress and the Federal Government would continue to play a substantial role in promoting the growth of the aviation system and assuring that strong safety oversight is still in place.

Separating ATC provision from the larger FAA would allow ATC's governance structure to be in accordance with ICAO recommendations, which suggest the separation of service provision from safety regulation. With separate service provision and safety regulation, the inherent conflict of interest of having an entity provide and regulate a single service would be eliminated.

This new FAA would be similar to other federal agencies within USDOT in the sense that it would regulate safety and would not operate the service. For example, the Federal Railway Administration regulates railways and issues grants, but does not manage train dispatching. The National Highway Traffic Safety Administration regulates the safety of motor vehicles, but does not set speed limits or control traffic lights. Having separate entities allows each organization to focus on their core businesses. The new ATC organization could focus on serving their customers without having broader regulatory responsibilities, and the FAA could focus on regulating ATC safety and the rest of the aviation industry, ensuring that it continues to be the safest in the world.

In addition to governance reform, we also propose a new funding structure. The current system relies on a number of taxes on cargo, passengers, and aviation fuel that are combined with appropriations from the general fund. Since ATC services are not charged directly to airspace users, there is currently little connection between the services provided and the revenue streams. Additionally, ATC provision is dependent on annual appropriations for both operational and capital expenditures, leading to uncertainties for medium and long term planning. To solve these issues, we propose a new funding structure that relies on direct payments to the ATC provider.

### **Governance**

The Eno NextGen Working Group proposes that in order to provide the greatest benefit for our system, ATC services should be taken out of the direct control of the federal government and should be provided by a more independent organization, be it a non-profit organization or a government corporation.

The entity would be a mission-driven organization, with a non-profit mandate, which would ensure that the pursuit of profits would not take precedent over safety. With this non-profit mandate, the ATC provider could focus on providing safe, cost-effective ATC services to its users. This would encourage system reinvestment, as any eventual excess revenues in a given year would be reinvested back into the system – for modernization or to reduce user fees, for example. A key benefit of this approach is that ATC provision would not be subject to congressional appropriations and federal procurement and personnel rules, allowing the new organization to more efficiently provide these services.

To further advance these goals and create a system where ATC services are provided in the best interests of the airspace users, the key stakeholders would need a voice in the system. This would allow the ATC provider to be responsive to the needs of its users and other aviation stakeholders. This involvement would promote a system that is more attentive to the stakeholders' needs. All key stakeholders would be represented in a governing board, making certain that that the interests of individual stakeholders do not dominate. The federal government would always have a role in the governance structure as a guarantor of the public interest, regardless if the model chosen were a government corporation or a non-profit.

### **Proposed Funding Structure**

After the proposed reform, there would be two new organizations: the independent ATC provider, and the FAA, which would be an agency with the role of safety regulator and grant provider. To fund these organizations, a new funding structure is needed.

The current funding of the ATC system, which is based on a mix of taxes and general revenues, should be replaced, to the extent possible, with direct payments to the air traffic control provider. This funding method would create a self-sustaining system and would be in line with international principles. It would also improve the link between the services provided and the revenues coming in, providing an incentive for efficiency. There also needs to be adequate funding for the remaining FAA functions: safety regulation, including airport oversight, certification, and grant-making.

The stakeholder presence on the board would allow the new ATC provider to mostly self-regulate economically, with the stakeholders' nominees ensuring that user fees are in the best interest of the non-profit and the aviation community as a whole. In order to provide an additional safeguard, a consultation process would be required to change user fees. Additionally, there would be an ex-post right to appeal user fees, with the OST serving as the economic regulator for those user fees. As a non-profit organization, any eventual surpluses would be reinvested back into the ATC provider to pay debts, make capital investments, and/or reduce user fees.

Between the two options, a government corporation and an independent non-profit organization, there are a few differences regarding financing. The independent non-profit would be subjected to the regular financing regulations that all non-profits are subjected to, and its management would be constrained by those laws and the decisions by its board of governors. As a government entity, however, the government corporation would still be subjected to regulations that limit what government entities can and cannot do. One of the issues in which government regulations would probably be restrictive is bonding. In the past, the Department of the Treasury has insisted that any bonds from government corporations could not be issued directly in capital markets, having to go through Treasury instead. This has the potential to lead to lower interest costs, but might have the downside of limiting the financial independence of the government corporation. The payments to the ATC provider are another matter where federal regulations might intervene. The Independent Offices Appropriation Act limits the way federal entities collect fees from their users.<sup>162</sup> Fulfilling all the requirements of the Act might create a politically infeasible solution, as all users would need to be charged full cost. However, Congress could in theory exempt the ATC government corporation from that act.

## **Conclusion**

FAA governance and funding reform has been proposed several times since the 1980's. While some incremental changes have been implemented since then, many of the problems that were identified in the '80s still persist today, including the persistence of inflexible procurement and personnel rules, and dependence on annual budget appropriations. These issues, exacerbated by a constrained fiscal environment, have once again been in the spotlight with the implementation of NextGen – a 20-year long, multi-billion dollar project, to modernize the system with the latest technology.

With the current FAA authorization expiring in September of this year, many stakeholders agree that now is the time to finally implement reforms that could facilitate modernization and create an efficient, cost-effective system to promote the growth of the industry and the economy, while maintaining the high levels of safety that exist today.

To facilitate stakeholders' goals, ATC services should be taken out of the direct control of the federal government and a new independent organization should be set up to provide these services. We propose to do this either by creating a government corporation or a

non-profit user co-operative. This independent organization would be governed by key stakeholders in the industry, which would allow it to take into account the best interests of all parties involved in the national aviation system, including passengers, general and business aviation, labor, airports, airlines, manufacturers, and the government.

With this model, the ATC provider would have the leeway to act in its best commercial interest. However, since the ATC provider would be a natural monopoly in the provision of ATC services, regulatory oversight would be essential to ensure that the public interest is taken into account.

From an economic standpoint, there would be safeguards against the non-profit changing user-fees unilaterally. A consultation process would be mandatory and the right to appeal to the OST would be ensured. User fees would also be subjected to general principles, including the requirement that they are not set at a level that exceed the non-profit's financial requirements (including debt service), and those amounts needed to maintain prudent financial reserves and credit ratings.

From a safety standpoint, FAA would continue to regulate the system, ensuring that the services provided continue to have the same exceptional standard that exists today. Air traffic control would be regulated like the other components of the aviation system. Ultimately, Congress and the Administration would have the right to intervene if the public interest is not adequately provided for.

Given the governance structure envisioned, the stakeholders are likely to act closely with the ATC provider to advance the U.S. aviation system. This collaboration has the potential to promote the modernization of the ATC system, leading to more fuel saved, increased reliability, and less congestion. It would also promote the continuous growth of the aviation system, fueling economic growth and increasing mobility, with benefits for both passengers and cargo.

After 30 years of attempted reforms, there is now an opportunity to move forward and reform the U.S. ATC provision into a system more ready to deal with the challenges that the increase of air traffic in the next decades will bring.

## Appendix

### Appendix A: History of Governance

Federal involvement in aviation oversight and ATC governance developed as needs arose and technologies became available. Measures in reaction to, sometimes tragic, events were a constant throughout the decades. This section will explore how the current governance structure came to be.

When the Wright Brothers took their initial flight in 1903, few had hopes that this experiment could become a useful and prominent mode of transportation. Innovation occurred and by 1911 mail began being carried by air, and in 1914 the first scheduled passenger flight took off in Tampa, Florida. The military also began experimenting with flight before and during World War I. As mail service by air grew in the early 1920s, it started to become clear that aviation might have a genuine role in transportation.<sup>163</sup> Recognizing this future, the 1926 Air Commerce Act took the first step towards formalized, federal involvement in aviation<sup>164</sup>. The Act placed the responsibility to “promote civilian aviation” within the purview of the Department of Commerce (DOC). The aim of this placement was to establish airways navigation aids, not to encourage regulation.<sup>165</sup>

At this time radio was already being used as a means of communication between airline personnel on the ground and airplanes. Each airline had to individually apply for a license to become a radio operator, a system that was deemed to be inefficient. Because of this, some airlines joined efforts in 1929 to create Aeronautical Radio, Inc. (ARINC), a non-profit organization that from then on was responsible for ground-to-air communication with aircraft. Its role would eventually expand, and during the 1930's ARINC would become the *de facto* air traffic control provider in the United States, until the federal government started to take over existing towers in 1936.<sup>166</sup> ARINC is an early example of a user co-op created to provide services related to air traffic control; an experience that would be replicated in Canada several decades later, with the creation of NAV CANADA in 1996.

With the U.S. Post Office Department providing a constant stream of airmail revenue to airlines, air traffic escalated in the early 1930s, suggesting the potential need for bolstered governance. Through an Act of Congress in 1934, the Bureau of Air Commerce was created within the DOC. In addition to the Bureau's duty of establishing and maintaining aviation navigation aids, the Act allowed the Bureau to license pilots, promote safety, and separate aircraft.<sup>167</sup>

In 1935, in part due to a publicized airline crash that killed a U.S. Senator, Congress commissioned the Copeland Committee to explore air traffic safety and governance. The report determined that the Bureau had become ineffective as a result of political challenges and inadequate funding. In response to this publication, the Civil Aeronautics Authority was created in 1938 with the passage of the Civil Aeronautics Act<sup>168</sup>. The Civil Aeronautics Authority operated as an entity separate from any cabinet level department, the only one that existed at that time. Its regulatory powers included the responsibility of economic



regulation, safety, maintaining the airways, providing ATC, and promoting aviation. However, its governance structure, with three different boards responsible for different areas of regulation, was deemed to be ineffective, namely in terms of safety issues. Just a few years after formation, the Reorganization Act of 1939 put the Civil Aeronautics Authority back under DOC and renamed it the Civil Aeronautics Administration (CAA). In the meantime, since 1936 the Civil Aeronautics Authority had starting to take over control of en-route control towers that had been operated by ARINC and paid for by the airlines.

Following the 1939 Act, the different responsibilities of the previous Civil Aeronautics Authority were split, in 1940, into two agencies: the Civil Aeronautics Administration and the Civil Aeronautics Board (CAB). The CAA was in charge of ATC and airway development, while the CAB was responsible for safety rulemaking, accident investigation, and the economic regulation of the air transportation system. The CAB would keep that role of economic regulator until cargo and passenger airlines were deregulated in 1977 and 1978, respectively – emptied of its economic regulation role, the CAB would eventually be dissolved in 1984.

With thousands of former military airplanes being transformed into civilian airliners and the economic boom that ensued after the war ended, the post World War II years brought tremendous growth in civilian air traffic. ATC procedures and technology, however, did not accompany this growth, and by the 1950's traffic delays were widespread. This lack of ability to cope with the increases in traffic also led to safety problems, which came to a head in 1956 with a mid-air collision over the Grand Canyon that killed 128 people. This was just one of dozens – 65 between just 1950 and 1955 – mid-air collisions in the post-war years that highlighted that safety improvements were much needed.<sup>169</sup>

In 1958 the Federal Aviation Agency was created with the aim to free aviation from the political and financial challenges associated with its placement in the DOC. The Agency was funded directly from Congressional appropriations and the Agency's Administrator reported directly to the President.<sup>170</sup> The newly formed Agency was created during a time when radar systems were still being implemented and had substantial ground to make up due to decades of underfunding of air traffic control.

Shortly after the Federal Aviation Agency was created, President Johnson's Administration determined that transportation as a whole would benefit from a coordinated system. On April 1, 1967 the USDOT opened its doors. In turn, Federal Aviation Agency changed its name to Federal Aviation Administration, becoming one of a number of modal agencies within the USDOT.<sup>171</sup>

By the mid-1960s the need to update ATC technology in order to accommodate the growing demand became apparent. At that time, manually controlled radar, general-purpose computers, radio communications, and air traffic controllers operated the NAS.<sup>172</sup> In order to increase capacity, FAA began developing the automated radar traffic control system (ARTS).

By this time radar traffic control was semi-automated, helping to accommodate the growing demand. This system required perpetual improvement as aviation demand grew, in part due to airline deregulation in 1978. In 1982, FAA released the first detailed NAS Plan that proposed modernization of ATC to accommodate current and future demand. The plan aimed to consolidate facilities, standardize computer hardware and software, and increase automation for improved safety, fuel efficiency, and productivity.<sup>173</sup> In 1987 the Advanced Automated System (AAS) was launched as part of this initiative; the program was mothballed in 1994 after spending \$1.5 billion, from which \$1 billion were considered to be “wasted”.<sup>174</sup>

Since the introduction of the 1982 NAS plan, FAA has been attempting to modernize U.S. ATC. Its inability to expediently update the system, however, has resulted in widespread criticism. This criticism has catalyzed the internal reorganization of FAA multiple times. The most substantial change in governance since the beginning of modernization was the introduction of a performance-based ATC organization, the ATO, which was created as an arm of FAA through an Executive Order in 2000.<sup>175</sup>

FAA’s 2003 Vision 100 – Century of Aviation Reauthorization Act established the current technological modernization effort: the Next Generation Air Transportation System, later re-branded as NextGen.<sup>176</sup> To help implement NextGen, Vision 100 also established the Joint Planning and Development Office (JPDO), a public-private partnership with government, academia, and private-sector organizations with the responsibility to plan and coordinate the development and deployment of NextGen. From the government side, the following agencies were initially part of JPDO:<sup>177</sup>

- Department of Transportation;
- Department of Commerce;
- Department of Defense;
- Department of Homeland Security;
- Federal Aviation Administration;
- National Aeronautics and Space Administration;
- White House Office of Science and Technology Policy;
- Office of the Director of National Intelligence.

JPDO had a troubled start, and by 2006, three years after its formation, GAO stated that the roles and responsibilities of each different agency had yet to be assigned resulting in diffused accountability.<sup>178</sup> At that time JPDO congregated more than 190 stakeholders across 70 different organizations, with many people being part of JPDO only on a part-time basis.<sup>179</sup> Since its creation a number of initiatives have begun, but JPDO became increasingly dormant and it has not held any events since 2011.<sup>180</sup> JPDO’s last progress report was published in FY2011<sup>181</sup>. Its latest publication is a 2013 report about the use of Unmanned Aircraft Systems (UAS), commonly referred as drones, in the US airspace<sup>182</sup>. The FY2014 Appropriations Bill cut all the funding for JPDO and its future is unknown.<sup>183</sup>

However, like in previous attempts of modernization, the FAA continued to receive criticism for slow execution of modernization under the current institutional paradigm. In response, the FAA Research, Engineering and Development Advisory Committee (REDAC) established a working group to explore financing and funding options for NextGen. Its report was published in 2006. Key findings included the need for new revenues, including general funds, to help augment the multi-decade, multi-billion-dollar NextGen's investment. Despite efforts to accelerate modernization implementation, institutional barriers might be again hindering the quick deployment of modernization initiatives. Previous reforms seem to have been inadequate to resolve the core issues that inhibit the modernization of ATC.

## **Appendix B: Government Corporations in the United States**

Government corporations are the most prevalent governance structure for air traffic control around the world. The possibility of a government corporation to provide ATC services in the United States has been discussed since the 1980s, including with the introduction of legislation in the House of Representatives in 1994. As government corporations have differing structures in each country, this section provides a short history and analysis of federal government corporations within the United States, highlighting both their benefits and their challenges.

There are numerous government corporations within the United States, but some of the most widely known federal-level government corporations are Amtrak, the Tennessee Valley Authority, and the Postal Service. Amtrak and the Saint Lawrence Seaway Development Corporation are example of two federal government corporations that provide transportation services. The most common rationale for the creation of a government corporation is to allow the entity more autonomy and less political influence, while remaining within government oversight. This autonomy applies specifically to organizations that provide services that have control over their own revenue streams and are designed to be (at least eventually) self-sustaining. For such an independent entity, it is useful to have a governance structure that provides greater flexibility to act in a commercial manner than the budget annual appropriations process permits, including the ability to develop long-term planning.<sup>184</sup>

One of the primary aims of corporatization is to insulate an entity from volatile politics, allowing managers to make decisions and provide service that are similar to a private enterprise. To provide this insulation, government corporations are given budgetary independence and are exempted from governmental management laws. This has been the rationale used in many countries to corporatize ATC services into government corporations, including in the failed USATS proposal in the first Clinton Administration.<sup>185</sup>

There is no single definition of what constitutes a government corporation, but a number of common characteristics are as follows:<sup>186</sup>

- Established in a statute passed by a legislative body and signed into to law by the President;
- Changeable only by statutory amendment;
- Authorized to finance or build public and private projects and deliver services;

- Governed by a board composed of Presidentially appointed members for fixed terms of office;
- Managed by a full-time professional hired by the board;
- Permitted to issue bonds;
- Given the freedom to set fees, charges, and rents for services;
- Exempt from most executive and legislative control over staff appointments, salaries, budgets and contracts;
- Capable of suing (and of being sued) in their own name;
- Required to hold public hearing before making major decisions;
- Permitted to exercise the power of eminent domain.

These definitions are general enough that apply to government corporations created at all levels of governments. When discussing government corporations at the federal level, a more strict definition could be the following:<sup>187</sup>

“A government corporation is a government agency that is established by Congress to provide a market-oriented public service and to produce revenues that meet or approximate its expenditure”.

Under this definition there were, in 2011, 17 federal government corporations. Each individual corporation is created under a unique charter from Congress and is overseen by the committees that have responsibility in their respective policy area. They can exist indefinitely, like the TVA or the Postal Service, or they can be created as a stopgap measure before a future privatization, like Conrail or the U.S. Enrichment Corporation. There are standardized budget, auditing, and debt management procedures under the Government Corporation Control Act of 1945. Government corporations are also still agents of the state and are subject to constitutional limitations.<sup>188</sup>

The next sections provide summaries of three government most prominent corporations: Amtrak, TVA, and the Postal Service.

### **Amtrak**

The Rail Passenger Service Act of 1970 created a National Railroad Passenger Corporation (now branded as Amtrak), saying it "shall be a for-profit corporation, the purpose of which shall be to provide intercity rail passenger service employing innovative operating and marketing concepts so as to fully develop the potential of modern rail service in meeting the Nation's intercity passenger transportation requirements. The Corporation will not be an agency or establishment of the United States Government."<sup>189</sup>

Following the growth of automobile and airplane transportation after World War II, demand for intercity passenger rail services began a fairly rapid decline and the private railroads started incurring substantial deficits providing the services. Eventually Congress created Amtrak in 1970 to take over those intercity passenger services and remove the burden of the passenger deficits from the freight railroads. At the time of the passage of the Rail Passenger Service Act, the Penn Central, the operator of the most passenger trains in

the US, had already gone bankrupt, and several other railroads in the Northeast were to enter bankruptcy in the next several years.<sup>190</sup> Within a decade, Congress recognized that Amtrak would not be profitable, and amended the Rail Passenger Service Act so that it now reads, "The Corporation shall be *operated and managed as* a for-profit corporation...".<sup>191</sup>

Technically, Amtrak is owned by both the government and the private sector. The government, represented by the Secretary of Transportation, owns 109,396,994 preferred shares, each with a face value of \$100. A total of 9,385,694 shares common shares, valued at \$10 each, i.e., less than 1 percent of the stock value, are owned by four different stockholders. Following 1997 legislation, Amtrak was supposed to redeem those stockholders at "fair market value" by 2002, but a long-standing legal battle has ensued, with Amtrak arguing that the fair market value of its common stock is \$0, which the stockholders disagree. Prior to 1997, Amtrak was also, in theory, obligated to distribute a dividend of no less than six percent each year, but has never done so; that requirement was eliminated in the 1997 reauthorization bill.<sup>192</sup>

Amtrak has a nine-member board of directors, including seven appointees by the President, plus the Secretary of Transportation and the president and CEO of Amtrak, who is appointed by the other board members.<sup>193</sup> Although it technically has financial autonomy, Amtrak does not have the authority to issue bonds. The Pennsylvania Economic Development Financing Authority has, however, issued \$50 million in bonds for development on Amtrak facilities in Philadelphia, with Amtrak guarantying the payment of the principal and interest on those bonds.<sup>194</sup>

In the last few years Amtrak has achieved record ridership, with an increase in ridership of 55 percent from 1997 to 2012, culminating with 31.6 million passengers transported in FY2013.<sup>195</sup> Nonetheless, Amtrak has constantly needed public money to operate, from both the federal government and the 15 states where it has partnerships to provide service. For example, in FY2012 ticket revenue covered 88 percent of operating costs, and operating losses reached \$362 million. If including capital expenditures, net losses reached \$1.2 billion.<sup>196</sup>

Since its inception, Amtrak has been the subject of numerous political fights, namely regarding its money-losing long-distance trains. Routes over 400 miles carry only 17 percent of Amtrak's passengers and lose more than \$600 million annually in operating costs; on the other hand, routes under 400 miles generated \$46 million in positive cash flows in 2012.<sup>197</sup> Right after it was chartered, Amtrak tried to cut service in many of those routes, an effort that was ultimately stopped by Congress due to political pressures from elected officials to retain service within their districts.<sup>198</sup> Since then, the issue of long-distance trains has been discussed in Congress regularly, with members of Congress criticizing Amtrak for losing money in its service, while refusing to allow Amtrak to rationalize its network.<sup>199</sup>

Amtrak's problems are not all a result of its status as a government corporation. For example, Amtrak's own Inspector General has found that the corporation has had issues in the management of capital projects (a \$1 billion-plus annual expenditure). Problems

included keeping costs within their budgets, keeping schedules, and ensuring proper oversight.<sup>200</sup>

### **Tennessee Valley Authority**

The Tennessee Valley Authority is a federally-owned government corporation that provides wholesale electric power, manages the Tennessee Valley natural resources, and promotes economic development in the region. Created by Congress in 1933 in the New Deal, it was initially funded partially by the government. Since 1999, it does not rely on any appropriations for its capital and operating expenditures; it had stopped receiving subsidies for its power generation business in 1959 (when Congress allowed the corporation to issue bonds) but kept receiving subsidies for its environmental and economic development activities.<sup>201</sup>

TVA's initial governance structure was a full-time three-member board of directors, who were appointed by the President, with the advice and consent of the Senate, for nine-year terms.<sup>202</sup> In 2006, a new governance structure was introduced. Within this new structure the board of directors is composed of eight part-time members and a CEO. New term limits of five years were also established. Appointments to the Board continue to be a responsibility of the President, with the advice and consent of the Senate.<sup>203</sup> This board has the power to establish the rates TVA charges for its electricity, and these rates are not subjected to any local, state, federal, or judicial review. They do however have to follow a set of guidelines put forward in federal legislation, including the goal of covering all costs, including debt service and payments to the states in lieu of taxes, and having to be as low as possible.<sup>204</sup>

TVA's main business is as a provider of wholesale electric power, and it accounts for almost 99 percent of TVA's revenues.<sup>205</sup> TVA supplies wholesale power to 155 municipal and cooperative power distributors that in turn supply around 9 million people. TVA also supplies 58 large industries and government installations directly.<sup>206</sup> Power distributors with contracts with the TVA are obligated to buy all their power from TVA and termination of said contracts is subjected to five to 15 year notices; contracts with industrial customers are subjected to clauses agreed between TVA and the customers.<sup>207</sup>

In fiscal year 2013, TVA revenues were \$11 billion. TVA is exempt from local, state, and federal taxes, but it does have to pay to the states where it operates five percent of gross revenues from the sale of power; in FY2013 those payments amounted to \$548 million.<sup>208</sup> TVA is also authorized to issue bonds and notes (but not equity securities such as stock) up to a statutory limit of \$30 billion in outstanding debt. These bonds are not obligations of the United States.<sup>209</sup> By the end of FY2013, outstanding TVA debt amounted to \$24.8 billion, or 83 percent of the statutory limit.<sup>210</sup> Its proximity to the statutory limit has raised concerns, by both the board of governors and the GAO, that TVA's capital plan until 2029 may not be possible to accomplish, even without taking into account eventual cost overruns. This plan includes expansion and modernization of facilities to cope with demand and a \$3-to-5 billion agreement with the Environmental Protection Agency to retrofit facilities in order to reduce the environmental impact of TVA's activities.<sup>211</sup>

## **United States Postal Service**

The United States Postal Service was established as a government corporation in 1971 to provide postal services in the United States. Previously, that role had been the responsibility of a governmental agency, the U.S. Post Office Department. By moving postal services out of the direct control of the federal government, Congress hoped to provide the new independent corporation adequate financing authority and autonomy from politics.<sup>212</sup>

In terms of governance, USPS' board of governors consists of eleven members. Nine of these members are appointed by the President, with the advice and consent of the Senate, and no more than five can belong to the same political party. The nine appointed members select the Postmaster General, the CEO of the organization and a member of the board. The nine members and the Postmaster General then select the Deputy Postmaster General, who is the 11<sup>th</sup> member. The board members appointed by the President serve up to two seven year terms, while the Postmaster General does not have term limits.<sup>213</sup>

Due to other alternatives, mail volume has been on the decline in recent years. In FY2006, USPS delivered 213 billion pieces of mail,<sup>214</sup> and by FY2013 mail volume dropped to 158 billion pieces of mail.<sup>215</sup> Due to the decline in mail volume USPS has attempted to rationalize their business model, but these attempts have been thwarted by political influence at the Congressional level.

An example of continued Congressional oversight is Congress's unwillingness to allow USPS to end mail delivery on Saturday, a move that would save \$500 million dollars per year.<sup>216</sup> Since 1983, Congress has included language in USPS-related appropriation legislation prohibiting USPS from ending mail delivery on Saturday. This language was last included in 2014 legislation, after USPS and the Administration made a strong push in 2013 for Congress to allow the end of Saturday mail delivery.<sup>217</sup>

Congress has also been involved in requiring USPS to pre-fund its retiree health benefits since 2006. Unlike other governmental agencies and corporations, which use pay-as-you-go mechanisms to fund their retiree health benefits, USPS retiree health benefits must be pre-funded at a rate of \$5.5 billion to \$5.8 billion per year. The rationale for this was that USPS' pensions were identified as being underfunded by \$78 billion. In response Congress mandated that the gap should be closed within the next ten years.<sup>218</sup> The immediate outcome of the passage of this law was that from a net income of \$900 million in FY2006, in FY2007 net losses reached \$5.1 billion.<sup>219</sup> From FY2007 through FY2013, total accumulated losses reached \$46.2 billion,<sup>220</sup> exceeding its \$15 billion statutory limit for indebtedness.<sup>221</sup> This level of debt is only partially a result of the requirement to pre-fund retiree health benefits; operating revenues have also gone into the red in some years following the Great Recession.<sup>222</sup>

USPS has requested that Congress restructure its retiree health benefit obligation, with a preference to return to the pay-as-you-go system.<sup>223</sup> The GAO has also urged Congress to change the current system to let USPS enact cost-cutting measures to deal with declining mail volumes.<sup>224</sup>

## Summary

Government corporations have a history that is now more than a century old in the United States. They have been used extensively at the state and local level, including in the transportation industry. At the federal level, the big push for their creation came during the presidencies of Woodrow Wilson and Franklin Roosevelt. Recently they have been used more sparsely, and fewer than 20 currently exist. Their role has been controversial since the beginning, namely because it has been argued that the services some of these corporations provide should either be done by the private sector (TVA, for instance) or by traditional government agencies (FDIC, for example).<sup>225</sup>

In general, the economic literature suggests that government corporations are capable of having several positive characteristics that make them more attractive than a government agency. These include:<sup>226</sup>

- Managerial and budgetary flexibility to adapt to meet changes in market factors, e.g., consumer demand;
- Private sector-like rules allow easier management of large-scale projects;
- Special government powers and privileges, like eminent domain and exception from taxes on their property and profits;
- Access to tax-exempt bond market;
- Attract capital to projects that would be impossible with restriction on government's debt and taxation.

On the other hand, a number of criticisms have also been raised:<sup>227</sup>

- Complex bureaucracies, that make government corporations opaque to legislators, the voters, and the market economy;
- General incompetence in planning, finances, decision-making, etc.;
- Abuse of power, in the form of patronage, political appointed boards, revolving door with companies they do business with, self-benefit, criminal corruption, etc.;
- Might not be financially self-sufficient, which is often the rationale for their creation;
- Limitations on bond issuance.

Government corporations have been praised for their independence and the ability to generate their own revenue. On the other hand, they have been criticized for their lack of accountability, and specifically for not delivering results and being unable to operate with total independence from legislators. This has been particularly challenging in cases where they are still dependent of appropriations and where they provide services with high visibility to the general public.<sup>228</sup>

Interference from lawmakers and executive branch officials has been identified as the primary challenge that government corporations at the federal level face in delivering the initial promises made when they are created. This political influence has resulted in entities that must act like a government agency, but also must deliver services like a private business. Both Amtrak and the Postal Service have been compelled by Congress to act in a manner that is against their commercial interest.<sup>229</sup> This conflict between having to deliver



a commercially viable service and having to appease legislators has been a constant feature of federal government corporations.

### **Appendix C: Congressionally Chartered Non-Profit Organizations**

Congress has the power to grant charters for both for-profit and not-for-profit organizations. An example of a for-profit congressionally chartered corporation is the COMSAT Corporation; the Boy Scouts of America, the American Red Cross, the National Academy of Sciences, and the United States Olympic Committee are examples of congressionally chartered non-profits.<sup>230</sup> This section explores not-for-profit organizations, also called “Title 36 corporations.”

Under Title 36, Congress can grant non-profit charters to organizations with a patriotic, charitable, historical, or educational purpose. Currently, around 100 organizations carry such a charter.<sup>231</sup> These charters create non-profits that are not directly affiliated with the federal government: they are not a government agency, they do not receive direct appropriations, their debts are not covered by the full faith and credit of the United States, and they do not enjoy original jurisdiction in the federal courts. While these non-profits must report their activities to Congress, Congress does not serve in a supervisory role. That is, except for the requirement to report their activities to Congress, these organizations are much like non-congressionally chartered non-profits. However, due to the fact that Congress has created these organizations, there is often public confusion regarding the role of congressionally chartered non-profits. These organizations benefit from this confusion, using the charter as a sort of “approval” from Congress, sanctioning their work.<sup>232</sup>

#### **American Red Cross**

First established in 1881 by Clara Barton, the American Red Cross (Red Cross) was officially chartered in 1900 (prior to 1900 it was a private charitable corporation).<sup>233</sup> Further changes were implemented in 1905 and 1947. The current charter was last updated in 2007.<sup>234</sup> Red Cross’s charter has “perpetual succession”, i.e., which means that it does not expire and will remain valid until an act of Congress. This charter is unique in that it is the only organization under Subtitle III, “treaty obligation organization”, of Title 36 of the U.S. Code. The treaty in question was the Geneva Convention of 1864.<sup>235</sup>

The responsibilities given to Red Cross in its congressional charter are in response to the Geneva Convention obligations, and include the supply of relief supplies and medical care in times of war and peace. The Red Cross was also mandated by Congress to serve as a liaison between the people of the United States and its armed forces’ personnel.<sup>236</sup> During the decades since the Red Cross was first established, its role has evolved. According to the Red Cross, the organization currently operates in five areas: people affected by disasters in America; support for members of the military and their families; blood collection, processing and distribution; health and safety education and training; international relief and development.<sup>237</sup>

The Red Cross is a large organization with an operating budget of \$3.4 billion in fiscal year 2013.<sup>238</sup> In FY 2013 the Red Cross responded to over 61,000 disasters, ran more than 900 shelters for people temporarily relocated, served almost 20 million meals, and processed

5.7 million units of blood from 3.3 million donors. Internationally, it provided assistance to more than 1.3 million people and vaccinated 98 million children.<sup>239</sup>

Like other congressional charters, the Red Cross's charter gives the organization most of the powers associated with a corporation, including the right to set its own by-laws and its managerial and administrative structures. It is not a government agency, but does receive money from the Treasury as grants and contracts – which many non-profits, Congressionally-chartered or not, also do. Like other federally chartered organizations, the Red Cross is obliged to report its activities annually to the Secretary of Defense and Congress, but these two entities are not directly involved in its operations or governance and cannot intervene, except by changing the charter itself.<sup>240</sup>

The Red Cross's congressional charter set the organization's governance structure. The 1947 charter mandated a 50-person Board of Governors. The President appoints eight members for this board, and the remaining 30 members of the Board represent the Red Cross's local chapters. There are also 12 independent "members-at-large". The Board then nominates an 11-person "executive committee" that exercises the power of the Board when the Board is not in session.<sup>241</sup>

### **United States Olympic Committee**

With roots dating back to 1894, the United States Olympic Committee is a Congressionally chartered non-profit that is responsible for the training, entering, and funding of U.S. teams for the Olympic, Paralympic, Youth Olympic, Pan American, and Parapan American Games. The Olympic Committee also oversees the bidding process for U.S. cities to host the Olympic/Paralympic Games, the Youth Olympic Games, and the Pan/Parapan American Games.<sup>242</sup> In 2012 (the year the London Summer Olympics took place), the United States Olympic Committee grossed revenues of \$341 million;<sup>243</sup> in 2013 revenues declined to \$169 million.<sup>244</sup>

The predecessor to the current United States Olympic Committee was created in 1894 in response to the need to establish a U.S. committee to participate in the first Olympic Games of the Modern Era in Athens in 1896. In 1921, the committee was formally organized as the American Olympic Association. In 1940 and 1945 the committee would change its name, first to United States of America Sports Federation and then to United States Olympic Association. The current name was adopted in 1961.<sup>245</sup>

The Olympic Committee was granted its Congressional charter in 1950. With this charter, the organization could now "solicit tax-deductible contributions as a private, nonprofit corporation."<sup>246</sup> In 1978, the Amateur Sports Act gave the Olympic Committee the exclusive rights to coordinate all Olympic-related athletic activity in the United States. This act also establish that "recent and active athletes" would have at least 20 percent of the seats and voting power in the Olympic Committee 16-member governing board.<sup>247</sup>

## Summary

While congressionally chartered non-profits are not agents of the United States government, they are often confused with governmental agencies. Private organizations seek these charters because they grant an “official” status to their work and they benefit from the confusion of the status.<sup>248</sup>

Due to this challenging public perception, the House Judiciary Committee, which oversees congressional charters, has imposed a moratorium in 1992 on the establishment of new charters.<sup>249</sup> However, other committees or the full Congress still can (and have done so) grant charters and have them listed in Title 36, essentially limiting the effects of the moratorium. Because of this, a number of organizations have been granted charters despite the moratorium.<sup>250</sup>

## Endnotes

- <sup>1</sup> Ortutay, B. (2013). FAA Furloughs Suspended: Air Traffic System Soon At Full Operation. Huffington Post. Retrieved from [http://www.huffingtonpost.com/2013/04/27/faa-furloughs-suspended\\_n\\_3170293.html](http://www.huffingtonpost.com/2013/04/27/faa-furloughs-suspended_n_3170293.html) on May 8, 2014.
- <sup>2</sup> Bellamy III, W. (2013). Government Shutdown: FAA Furloughs 3,000 Aviation Maintenance Inspectors. Aviation Today. Retrieved from [http://www.aviationtoday.com/the-checklist/Government-Shutdown-FAA-Furloughs-3000-Aviation-Maintenance-Inspectors\\_80327.html#.U2vt7q1dXlo on](http://www.aviationtoday.com/the-checklist/Government-Shutdown-FAA-Furloughs-3000-Aviation-Maintenance-Inspectors_80327.html#.U2vt7q1dXlo on) May 8, 2014.
- <sup>3</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>4</sup> National Register (2000). Executive Order 13180 – Air Traffic Performance-Based Organization. The White House.
- <sup>4</sup> Research, Engineering, and Development Advisory Committee (2014). Financing the Next Generation Air Transportation System. Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ang/offices/tc/about/campus/faa\\_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faa_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf) on February 24, 2014.
- <sup>5</sup> Next Generation Air Transportation System: Status and Issues, House of Representatives Committee on Science and Technology. 108<sup>th</sup> Congress. 2008. Retrieved from <http://www.gpo.gov/fdsys/pkg/CHRG-110hrg44270/html/CHRG-110hrg44270.htm> on March 3, 2014.
- <sup>6</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>7</sup> Federal Aviation Administration (2007). Air Traffic Organization, En Route and Oceanic Services. Retrieved from [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/enroute/](https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/) on February 24, 2014.
- <sup>8</sup> Federal Aviation Administration (2015). Air Traffic Organization, Leadership. Retrieved from [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/leadership/](https://www.faa.gov/about/office_org/headquarters_offices/ato/leadership/) on May 11, 2015.
- <sup>9</sup> Federal Aviation Administration (2014). Air Traffic Organization. U.S. Department of Transportation. Retrieved from [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/](https://www.faa.gov/about/office_org/headquarters_offices/ato/) on February 28, 2014
- <sup>10</sup> Federal Aviation Administration (2014). Airport Traffic Control Towers (ATCT). Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/air\\_traffic\\_services/atct/](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/atct/) on May 14, 2015.
- <sup>11</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>12</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>13</sup> House of Representatives (1970). H.R. 14465: An Act to provide for the expansion and improvement of the Nation’s airport and airway system, for the imposition of airport and airway user charges, and for other purposes. 91<sup>st</sup> Congress. Retrieved from <https://www.govtrack.us/congress/bills/91/hr14465/text> on July 1, 2014.
- <sup>14</sup> Murphy, R. P. (1999). Whether the Airport and Airway Trust Fund was created solely to finance aviation infrastructure. Government Accountability Office. Retrieved from <http://www.gao.gov/decisions/archive/281779.pdf> on March 3, 2014.
- <sup>15</sup> Federal Aviation Administration (2014). Current Aviation Excise Tax Structure. Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/aatf/media/14.1.17ExciseTaxStructureCalendar2014.pdf](http://www.faa.gov/about/office_org/headquarters_offices/apl/aatf/media/14.1.17ExciseTaxStructureCalendar2014.pdf) on February 24, 2014.
- <sup>16</sup> Dillingham, Gerald (2011). Airport and Airway Trust Fund: Declining Balance Raises Concerns over Ability to Reach Future Demands. Government Accountability Office. Retrieved from <http://www.gao.gov/assets/130/125456.pdf> on February 24, 2014.
- <sup>17</sup> Dillingham, Gerald (2011). Airport and Airway Trust Fund: Declining Balance Raises Concerns over Ability to Reach Future Demands. Government Accountability Office. Retrieved from <http://www.gao.gov/assets/130/125456.pdf> on February 24, 2014.
- <sup>18</sup> Government Accountability Office (2011). Airport and Airway Trust Fund: Declining Balance Raises Concerns over Ability to Meet Future Demands. GAO. Retrieved from <http://www.gao.gov/assets/130/125456.pdf> on February 28, 2014.
- <sup>19</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>20</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.

- 
- <sup>21</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>22</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>23</sup> GRA, Inc. (2014). FAA Cost and Activity Data— Business Roundtable Initial Request. Presentation at the Business Roundtable, October 30.
- <sup>24</sup> House of Representatives (2003). H.R. 1711 Air Traffic Control System Integrity Act of 2003. 108<sup>th</sup> Congress. Retrieved from <http://beta.congress.gov/bill/108th-congress/house-bill/1711> on March 3, 2014.
- <sup>25</sup> Transportation Security Administration (undated). Transportation Security Fees. Retrieved from <http://www.tsa.gov/stakeholders/transportation-security-fees> on April 17, 2014.
- <sup>26</sup> The Hill (2013). Air tax increased \$3.10 in budget deal. Retrieved from <http://thehill.com/blogs/transportation-report/aviation/192777-air-tax-increased-310-in-budget-deal> on April 17, 2014.
- <sup>27</sup> Parker, D. (2015). Hearing to the Committee on Transportation and Infrastructure, Subcommittee on Aviation, of the US House of Representatives, Options for FAA Air Traffic Control Reform, 114<sup>th</sup> Congress.
- <sup>28</sup> Parker, D. (2015). Hearing to the Committee on Transportation and Infrastructure, Subcommittee on Aviation, of the US House of Representatives, Options for FAA Air Traffic Control Reform, 114<sup>th</sup> Congress.
- <sup>29</sup> Advocacy Briefs (2013). Aircraft Owners and Pilots Association. Retrieved from <http://www.aopa.org/Advocacy/Advocacy-Briefs.aspx> on April 17, 2014.
- <sup>30</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on April 17, 2014.
- <sup>31</sup> Lowe, P. (2012). User Fee Plan Would Be Devastating to GA. AIN Online. Retrieved from <http://www.ainonline.com/aviation-news/nbaa-convention-news/2012-10-25/user-fee-plan-would-be-devastating-ga> on April 17, 2014.
- <sup>32</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>33</sup> Federal Aviation Administration (2011). A Brief History of FAA. Retrieved from [https://www.faa.gov/about/history/brief\\_history/](https://www.faa.gov/about/history/brief_history/) on February 24, 2014.
- <sup>34</sup> Office of the Inspector General (2012). Audit Report: Contract Towers Continue to Provide Cost-effective and Safe Air Traffic Services, But Improved Oversight of the Program is Needed. U.S. Department of Transportation. Retrieved from <http://www.oig.dot.gov/sites/dot/files/FAA%20Federal%20Contract%20Tower%20Program%20Report%5E11-5-12.pdf> on February 28, 2014.
- <sup>35</sup> Elias, B. (2013). Federal Civil Aviation Programs: In Brief. Congressional Research Service. Retrieved from <http://www.fas.org/sgp/crs/misc/R42781.pdf> on February 24, 2014.
- <sup>36</sup> Office of the Inspector General (2012). Audit Report: Contract Towers Continue to Provide Cost-effective and Safe Air Traffic Services, But Improved Oversight of the Program is Needed. U.S. Department of Transportation. Retrieved from <https://www.oig.dot.gov/sites/default/files/FAA%20Federal%20Contract%20Tower%20Program%20Report%5E11-5-12.pdf> on February 28, 2014.
- <sup>37</sup> Government Accountability Office (2012). Airport and Airway Trust Fund - Factors Affecting Revenue Forecast Accuracy and Realizing Future FAA Expenditures, GAO-12-222. Retrieved from <http://www.gao.gov/assets/590/587866.pdf> on April 17, 2014.
- <sup>38</sup> Elias, B. *et al.* (2013). Sequestration at the Federal Aviation Administration (FAA): Air Traffic Controller Furloughs and Congressional Response. Congressional Research Service. Retrieved from <https://www.fas.org/sgp/crs/misc/R43065.pdf> on April 17, 2014.
- <sup>39</sup> Elias, B. *et al.* (2013). Sequestration at the Federal Aviation Administration (FAA): Air Traffic Controller Furloughs and Congressional Response. Congressional Research Service. Retrieved from <https://www.fas.org/sgp/crs/misc/R43065.pdf> on April 17, 2014.
- <sup>40</sup> Davis, J. (2013). Federal Government Shuts Down, But Most of USDOT Remains Open. Transportation Weekly.
- <sup>41</sup> Plumer, B. (2013). Absolutely everything you need to know about how the government shutdown will work. Washington Post Wonkblog. Retrieved from <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/09/30/absolutely-everything-you-need-to-know-about-how-the-government-shutdown-will-work/> on April 17, 2014.
- <sup>42</sup> National Air Traffic Controllers Association (2013). NATCA Statement - With shutdown finally over, establishing stable funding mechanism is essential next step for lawmakers. Retrieved from [http://www.natca.org/press\\_releases.aspx?aID=6580#6580](http://www.natca.org/press_releases.aspx?aID=6580#6580) on April 17, 2014.
- <sup>43</sup> Rinaldi, P. (2015). Hearing to the Committee on Transportation and Infrastructure, Subcommittee on Aviation, of the US House of Representatives, Options for FAA Air Traffic Control Reform, 114<sup>th</sup> Congress.
- <sup>44</sup> Federal Aviation Administration (2015). Airports – Fiscal Year 2015 Business Plan. Retrieved from [https://www.faa.gov/about/plans\\_reports/media/2015/ARP\\_Business\\_Plan.pdf](https://www.faa.gov/about/plans_reports/media/2015/ARP_Business_Plan.pdf) on May 13, 2015.
- <sup>45</sup> Airports Council International – North America (undated). NextGen and Airports. Retrieved from [http://www.aci-na.org/sites/default/files/airports\\_and\\_nextgen\\_fact\\_sheet.pdf](http://www.aci-na.org/sites/default/files/airports_and_nextgen_fact_sheet.pdf) on April 17, 2014.
- <sup>46</sup> Airports Council International – North America (undated). NextGen and Airports. Retrieved from [http://www.aci-na.org/sites/default/files/airports\\_and\\_nextgen\\_fact\\_sheet.pdf](http://www.aci-na.org/sites/default/files/airports_and_nextgen_fact_sheet.pdf) on April 17, 2014.
- <sup>47</sup> Airports Council International – North America (undated). Air Traffic Modernization. Retrieved from <http://www.aci-na.org/static/entransit/Air%20Traffic%20Modernization%20Fact%20Sheet.pdf> on April 17, 2014.
- <sup>48</sup> AirportsUnited (2015). Resources. Retrieved from <http://www.airportsunited.com/#!/resources/cytg> on May 13, 2015.
- <sup>49</sup> Hauptli, T. (2015). Hearing to the Committee on Commerce, Science, and Transportation US Senate, FAA Reauthorization: Airport Issues and Infrastructure Financing, 114<sup>th</sup> Congress.
- <sup>50</sup> Tingle, M. (1988). Privatization and the Reagan Administration: Ideology and Application. Yale Law and Policy Review (volume 6, no 1)
- <sup>51</sup> C-SPAN (1987). Statements to the President's Commission on Privatization. Retrieved from <http://www.c-span.org/video/?930-1/air-traffic-control-system> on April 4, 2014
- <sup>52</sup> Interview with Spencer Dickerson. April 18, 2014. As of 2013 there were 252 contract towers in the US.

- 
- <sup>53</sup> C-SPAN (1987). Statements to the President's Commission on Privatization. Retrieved from <http://www.c-span.org/video/?930-1/air-traffic-control-system> on April 4, 2014
- <sup>54</sup> Executive Oversight Committee to the Secretary of Transportation (1994), Air Traffic Control Corporation Study.
- <sup>55</sup> National Register (1987). Executive Order 12607 – President's Commission on Privatization. The White House
- <sup>56</sup> United States General Accounting Office (1987). Statement of Kenneth M. Mea Before the President's Commission on Privatization. Retrieved from <http://www.gao.gov/assets/110/101901.pdf> on April 4, 2014
- <sup>57</sup> C-SPAN (1987). Statements to the President's Commission on Privatization. Retrieved from <http://www.c-span.org/video/?930-1/air-traffic-control-system> on April 4, 2014
- <sup>58</sup> United States Senate (1986). S.2417 - Aviation Safety Commission Act of 1986. 99<sup>th</sup> Congress.
- <sup>59</sup> Executive Oversight Committee to the Secretary of Transportation (1994), Air Traffic Control Corporation Study.
- <sup>60</sup> Interview with James Burnley. April 21, 2014.
- <sup>61</sup> Executive Oversight Committee to the Secretary of Transportation (1994), Air Traffic Control Corporation Study.
- <sup>62</sup> Transportation Research Board (1991). Winds of Change: Domestic Air Transport Since Deregulation.
- <sup>63</sup> Interview with Greg Principato. April 17, 2014.
- <sup>64</sup> National Partnership for Reinventing Government (2001). A Brief History of Vice President Al Gore's National Partnership for Reinventing Government. Retrieved from <http://govinfo.library.unt.edu/npr/whoware/historyofnpr.html> on April 4, 2014.
- <sup>65</sup> National Partnership for Reinventing Government (1993). From Red Tape to Results: Creating a Government that Works Better and Costs Less
- <sup>66</sup> Executive Oversight Committee to the Secretary of Transportation (1994), Air Traffic Control Corporation Study.
- <sup>67</sup> Executive Oversight Committee to the Secretary of Transportation (1994), Air Traffic Control Corporation Study.
- <sup>68</sup> Hearing to the Subcommittee on Appropriations of the US Senate (1994), Proposal to Corporatize the Nation's Air Traffic Control System, 103<sup>th</sup> Congress.
- <sup>69</sup> Hearing to the Subcommittee on Appropriations of the US Senate (1994), Proposal to Corporatize the Nation's Air Traffic Control System, 103<sup>th</sup> Congress.
- <sup>70</sup> Hearing to the Subcommittee on Appropriations of the US Senate (1994), Proposal to Corporatize the Nation's Air Traffic Control System, 103<sup>th</sup> Congress.
- <sup>71</sup> United States House of Representatives (1994). HR.1441- United States Air Traffic Service Corporation Act. 103<sup>rd</sup> Congress
- <sup>72</sup> Interview with Greg Principato. April 17, 2014.
- <sup>73</sup> Government Accountability Office. (2003). National Airspace System: Reauthorizing FAA Provides Opportunities and Options to Address Challenges, GAO-03-473T. Washington DC
- <sup>74</sup> National Civil Aviation Review Commission (1997). Avoiding Aviation Gridlock: A Consensus for Change. Retrieved from <http://californiaaviation.org/commissionreport.html> on February 24, 2014.
- <sup>75</sup> National Civil Aviation Review Commission (1997). Avoiding Aviation Gridlock: A Consensus for Change. Retrieved from <http://californiaaviation.org/commissionreport.html> on February 24, 2014.
- <sup>76</sup> National Civil Aviation Review Commission (1997). Avoiding Aviation Gridlock: A Consensus for Change. Retrieved from <http://californiaaviation.org/commissionreport.html> on February 24, 2014.
- <sup>77</sup> Airport News (1999), An urging to privatize air-traffic control. Retrieved from <http://archives.californiaaviation.org/airport/msg01342.html> on April 4, 2014.
- <sup>78</sup> Interview with Dorothy Robyn. April 24, 2014.
- <sup>79</sup> National Register (2000). Executive Order 13180 – Air Traffic Performance-Based Organization. The White House.
- <sup>79</sup> Research, Engineering, and Development Advisory Committee (2014). Financing the Next Generation Air Transportation System. Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ang/offices/tc/about/campus/faq\\_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faq_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf) on February 24, 2014.
- <sup>80</sup> National Register (2000). Executive Order 13180 – Air Traffic Performance-Based Organization. The White House.
- <sup>81</sup> Hearing to the Subcommittee on Appropriations of the US Senate (1994), Proposal to Corporatize the Nation's Air Traffic Control System, 103<sup>th</sup> Congress.
- <sup>82</sup> National Register (2002). Executive Order 13264 – Amendment to Executive Order 13180, Air Traffic Performance-Based Organization. The White House.
- <sup>83</sup> Office of Management and Budget (2001). A Blueprint for New Beginnings – Budget of the United States Government for FY2002
- <sup>84</sup> National Air Traffic Controllers Association (2002). Bush Official Fumbles Essential Air Traffic Control Safety Question. Retrieved from [http://www.natca.org/press\\_releases.aspx?alD=1597](http://www.natca.org/press_releases.aspx?alD=1597) on April 4, 2014
- <sup>85</sup> National Air Traffic Controllers Association (2002). Bush Official Fumbles Essential Air Traffic Control Safety Question. Retrieved from [http://www.natca.org/press\\_releases.aspx?alD=1597](http://www.natca.org/press_releases.aspx?alD=1597) on April 4, 2014
- <sup>86</sup> Oberstar, J. (2003). Introducing The Air Traffic Control System Integrity Act. Retrieved from [http://capitolwords.org/date/2003/04/11/E742-2\\_introducing-the-air-traffic-control-system-integri/](http://capitolwords.org/date/2003/04/11/E742-2_introducing-the-air-traffic-control-system-integri/) on April 4, 2014
- <sup>87</sup> United States House of Representatives (2003). HR.1711 - Air Traffic Control System Integrity Act of 2003. 108<sup>th</sup> Congress
- <sup>88</sup> House of Representatives. H.R.1711 - Air Traffic Control System Integrity Act of 2003. 108<sup>th</sup> Congress. Retrieved from <http://beta.congress.gov/bill/108th-congress/house-bill/1711/cosponsors> on April 4, 2014
- <sup>89</sup> Vote on the Lautenberg Amendment No. 893 ). Retrieved from [http://www.senate.gov/legislative/LIS/roll\\_call\\_lists/roll\\_call\\_vote\\_cfm.cfm?congress=108&session=1&vote=00222](http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=108&session=1&vote=00222) on April 4, 2014
- <sup>90</sup> Interview with Jeffrey Shane. May 1, 2014.
- <sup>91</sup> Office of the Secretary of Transportation (2007). Controls Over the Federal Aviation Administration's Conversion of Flight Service Stations to Contract Operations Federal Aviation Administration. Washington, D.C.: U.S. Department of Transportation.
- <sup>92</sup> Federal Aviation Administration (2013). Future Flight Services Program (FFSP) Market Research. Retrieved from <https://www.fbo.gov/index?s=opportunity&mode=form&id=b97db60d552cb1981d77660d724068e2&tab=core&cview=1> on August 1, 2014.

- 
- <sup>93</sup> Office of Management and Budget (2007). Budget of the United States Government for FY2008
- <sup>94</sup> Interview with Mary Peters. April 28, 2014.
- <sup>95</sup> Government Accountability Office (2012). Air Traffic Control Modernization - Management Challenges Associated with Program Costs and Schedules Could Hinder NextGen Implementation.
- <sup>96</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>97</sup> Majumdar, A. (1995). Commercializing and Restructuring Air Traffic Control: A Review of the Experience and Issues Involved. *Journal of Air Transport Management*, 2(2), 111–122.
- <sup>98</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>99</sup> General Aviation Manufacturers Association (2014). *2013 General Aviation Statistical Databook & 2014 Industry Outlook*. Washington, D.C.: General Aviation Manufacturers Association. Retrieved from <http://www.gama.aero/media-center/industry-facts-and-statistics/statistical-databook-and-industry-outlook> on September 1, 2014.
- <sup>100</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>101</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>102</sup> Airways New Zealand. (2013 and other years). *Annual Report 2012-13 (and other years)*. Retrieved from [http://www.airways.co.nz/about\\_Airways/corporate-publications.asp](http://www.airways.co.nz/about_Airways/corporate-publications.asp) on May 13, 2014.
- <sup>103</sup> EUROCONTROL Performance Review Commission. (2013). *ATM Cost-Effectiveness (ACE) 2011 Benchmarking Report with 2012-2016 outlook*. Brussels: EUROCONTROL.
- <sup>104</sup> Hearing before the Subcommittee on Aviation of the US House of Representatives (2005), *Air Traffic Management in Foreign Countries*, 109<sup>th</sup> Congress.
- <sup>105</sup> Hearing before the Subcommittee on Aviation of the US House of Representatives (2005), *Air Traffic Management in Foreign Countries*, 109<sup>th</sup> Congress.
- <sup>106</sup> European Commission (2010). *Commission Regulation (EU) 1191/2010*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:333:0006:0020:EN:PDF> on July 1, 2014.
- <sup>107</sup> EUROCONTROL Performance Review Commission. (2013). *ATM Cost-Effectiveness (ACE) 2011 Benchmarking Report with 2012-2016 outlook*. Brussels: EUROCONTROL.
- <sup>108</sup> Hearing before the Subcommittee on Aviation of the US House of Representatives (2005), *Air Traffic Management in Foreign Countries*, 109<sup>th</sup> Congress.
- <sup>109</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>110</sup> Hearing before the Subcommittee on Aviation of the US House of Representatives (2005), *Air Traffic Management in Foreign Countries*, 109<sup>th</sup> Congress.
- <sup>111</sup> Squire, Sanders & Dempsey L.L.P. (2006). *DFS Privatization in Jeopardy*. Retrieved from [http://www.squiresanders.com/files/tbl\\_s29Publications/FileUpload5689/9702/DFSPrivatization.pdf](http://www.squiresanders.com/files/tbl_s29Publications/FileUpload5689/9702/DFSPrivatization.pdf) on May 15, 2014.
- <sup>112</sup> Australia ICAO representation (2000). *Developments in Airport Ownership and Reforms to the Provision of Air Navigation Services in Australia*. Presentation at the ICAO Conference on the Economics of Airports and Air Navigation Service. Retrieved from <http://www.icao.int/Meetings/ansconf2000/Documents/wp59e.pdf> on August 1, 2014.
- <sup>113</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>114</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>115</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>116</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>117</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>118</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>119</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>120</sup> Written interview with John W. Crichton, President and CEO, NAV CANADA. May 1, 2015.
- <sup>121</sup> NAV CANADA (2014). *2013 Annual Report*. Ottawa, Canada: NAV CANADA.
- <sup>122</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>123</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>124</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>125</sup> NAV CANADA (2015). *2014 Annual Report*. Ottawa, Canada: NAV CANADA.
- <sup>126</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>127</sup> NAV CANADA (2015). *2014 Annual Report*. Ottawa, Canada: NAV CANADA.
- <sup>128</sup> NAV CANADA (2014). *2013 Annual Report*. Ottawa, Canada: NAV CANADA.

- 
- <sup>129</sup> Goodliffe, M. (2002). The New UK Model for Air Traffic Services - A Public Private Partnership Under Economic Regulation. *Journal of Air Transport Management*, 8(1), 13-18.
- <sup>130</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>131</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>132</sup> Civil Aviation Authority (2011). *UK Performance Plan for Air Navigation Services - Reference Period One, 01 January 2012 to 31 December 2014*. London, UK: Civil Aviation Authority.
- <sup>133</sup> Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>134</sup> NATS Holdings (2015). *Annual Report & Accounts*. Retrieved from <http://www.nats.aero/about-us/financial-performance/annual-reports/> on April 30, 2015.
- <sup>135</sup> Ministry of Ecology, Sustainable Development and Energy (2013). *DGAC, the French Civil Aviation Authority*. Retrieved from [http://www.developpement-durable.gouv.fr/IMG/pdf/DGAC-The\\_French\\_Civil\\_Aviation-Version\\_Anglaise-2013.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/DGAC-The_French_Civil_Aviation-Version_Anglaise-2013.pdf) on May 15, 2014.
- <sup>136</sup> International Civil Aviation Organization (2011). *Document 9734 – Safety Oversight Manual, Part A, Second Edition*. Retrieved from [http://www.icao.int/safety/fsix/Library/Doc9734\\_Part\\_A.pdf](http://www.icao.int/safety/fsix/Library/Doc9734_Part_A.pdf) on May 19, 2014.
- <sup>137</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>138</sup> EUROCONTROL Performance Review Commission. (2013). *ATM Cost-Effectiveness (ACE) 2011 Benchmarking Report with 2012-2016 outlook*. Brussels: EUROCONTROL.
- <sup>139</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>140</sup> European Commission (2010). *Commission Regulation (EU) 1191/2010*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:333:0006:0020:EN:PDF> on July 1, 2014.
- <sup>141</sup> EUROCONTROL Performance Review Commission. (2013). *ATM Cost-Effectiveness (ACE) 2011 Benchmarking Report with 2012-2016 outlook*. Brussels: EUROCONTROL.
- <sup>142</sup> Dempsey, P. S. *et al.* (2005). *The McGill Report on Governance of Commercialized Air Navigation Services*. Montreal: McGill University Center for Research on Air & Space Law.
- <sup>143</sup> Interview with Jeffrey Shane. May 1, 2014.
- <sup>144</sup> European Commission. (2012). *Single European Sky*. Retrieved from [http://ec.europa.eu/transport/modes/air/single\\_european\\_sky](http://ec.europa.eu/transport/modes/air/single_european_sky) on June 1, 2014.
- <sup>145</sup> EUROCONTROL (2014). *Monthly adjusted Unit Rates – June 2014*. Retrieved from <https://www.eurocontrol.int/services/monthly-adjusted-unit-rates> on June 1, 2014.
- <sup>146</sup> Federal Aviation Administration (2015). *4th-Quarter 2013 Domestic Air Fare Up 0.3% from 4th Quarter 2012 (Adjusted for Inflation)*. Retrieved from [http://www.rita.dot.gov/bts/press\\_releases/bts021\\_15](http://www.rita.dot.gov/bts/press_releases/bts021_15) on May 13, 2015.
- <sup>147</sup> Federal Aviation Administration (2015). *Load Factor*. Retrieved from <http://www.transtats.bts.gov/DataElements.aspx?Data=5> on May 13, 2015.
- <sup>148</sup> Airservices Australia (2011). *Contract for the provision of aviation facilities and services*. Retrieved from <http://www.airservicesaustralia.com/wp-content/uploads/Charges-for-Facilities-and-Services-Standard-Contract-Terms-July2012.pdf> on July 1, 2014.
- <sup>149</sup> EUROCONTROL (undated). *Establishing Route Charges*. Retrieved from <https://www.eurocontrol.int/articles/establishing-route-charges> on May 13, 2015.
- <sup>150</sup> Airways New Zealand (undated). *Pilots and Airline Information*. Retrieved from [https://www.airways.co.nz/airways\\_services/index.asp](https://www.airways.co.nz/airways_services/index.asp) on July 1, 2014.
- <sup>151</sup> Government Accountability Office (2005). *Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from their Commercialization*. Washington DC; Mbs ottawa inc. (2006). *Air Traffic Control Commercialization Policy: Has It Been Effective?* Ottawa: Mbs ottawa inc.
- <sup>152</sup> Government Accountability Office (2005). *Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from their Commercialization*. Washington DC; Oster, C. V. and Strong, J. S. (2007). *Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management*. Aldershot, England; Burlington, VT: Ashgate.
- <sup>153</sup> International Civil Aviation Organization (2006). *Document 9734 – Safety Oversight Manual, Part A, 2<sup>nd</sup> edition*. Retrieved from [http://www.icao.int/safety/fsix/Library/Doc9734\\_Part\\_A.pdf](http://www.icao.int/safety/fsix/Library/Doc9734_Part_A.pdf) on May 23, 2014.
- <sup>154</sup> Janney Corporate Credit (2013). *Tennessee Valley Authority*. Retrieved from [http://www.janney.com/File%20Library/Unassigned/tva\\_3\\_2013.pdf](http://www.janney.com/File%20Library/Unassigned/tva_3_2013.pdf) on August 21, 2014.
- <sup>155</sup> Tierney, J. T. (1984). *Government Corporations and Managing the Public's Business*. *Political Science Quarterly* (volume 99, no 1), pp. 73-92
- <sup>156</sup> Stanton, T. H. and Moe, R. C. (2002). *Government Corporations and Government-Sponsored Enterprises*. In Salamon, L. M. (editor), *The Tools of Government – A Guide to New Governance*. New York City: Oxford University Press
- <sup>157</sup> National Civil Aviation Review Commission (1997). *Avoiding Aviation Gridlock: A Consensus for Change*. Retrieved from <http://californiaaviation.org/commissionreport.html> on February 24, 2014.
- <sup>158</sup> Sessions, J. (2012). *Budget Bulletin, July 31, 2012*. U.S. Senate, Committee on the Budget. Retrieved from [http://www.budget.senate.gov/republican/public/index.cfm/files/serve?File\\_id=28a4ad0b-fd4f-47b4-9e52-cad34b17c1b6](http://www.budget.senate.gov/republican/public/index.cfm/files/serve?File_id=28a4ad0b-fd4f-47b4-9e52-cad34b17c1b6) on August 21, 2014.
- <sup>159</sup> Sessions, J. (2012). *Budget Bulletin, July 31, 2012*. U.S. Senate, Committee on the Budget. Retrieved from [http://www.budget.senate.gov/republican/public/index.cfm/files/serve?File\\_id=28a4ad0b-fd4f-47b4-9e52-cad34b17c1b6](http://www.budget.senate.gov/republican/public/index.cfm/files/serve?File_id=28a4ad0b-fd4f-47b4-9e52-cad34b17c1b6) on August 21, 2014.
- <sup>160</sup> Isaacs, K. P. (2014). *Federal Employees' Retirement System: Benefits and Financing*. Washington, D.C.: Congressional Research Service.

- 
- <sup>161</sup> NAV CANADA (2013). 2013 Annual Information Form 51-102F2. Retrieved from <http://www.navcanada.ca/EN/about-us/Financial%20Information/Annual-Information-Form-2013-EN.PDF> on July 1, 2014.
- <sup>162</sup> Government Accountability Office (2008), Principles of Federal Appropriations Law, Third Edition, Volume III - GAO-08-978SP. Washington, DC.
- <sup>163</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>164</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>165</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>166</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>167</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>168</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>169</sup> Federal Aviation Administration (2011, February). A Brief History of FAA. Retrieved from [https://www.faa.gov/about/history/brief\\_history/](https://www.faa.gov/about/history/brief_history/) on February 24, 2014.
- <sup>170</sup> Nolan, M. S. (2011). Fundamentals of Air Traffic Control (5th ed.) Belmont, CA: Wadsworth Pub. Co.
- <sup>171</sup> Federal Aviation Administration (2011, February). A Brief History of FAA. Retrieved from [https://www.faa.gov/about/history/brief\\_history/](https://www.faa.gov/about/history/brief_history/) on February 24, 2014.
- <sup>172</sup> Federal Aviation Administration (2011, February). A Brief History of FAA. Retrieved from [https://www.faa.gov/about/history/brief\\_history/](https://www.faa.gov/about/history/brief_history/) on February 24, 2014.
- <sup>173</sup> Dodge, Lowell (1982). Transportation: Examination of the Federal Aviation Administration's Plan for the National Airspace System-Interim Report. Government Accountability Office. Retrieved from <http://www.gao.gov/products/AFMD-82-66> on February 24, 2014.
- <sup>174</sup> Office of Inspector General (1998). Advance Automation System - Federal Aviation Administration. Department of Transportation.
- <sup>175</sup> National Register (December 11, 2000). Executive Order 13180 - Air Traffic Performance-Based Organization. The White House.
- <sup>176</sup> Research, Engineering, and Development Advisory Committee (2014). Financing the Next Generation Air Transportation System. Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ang/offices/tc/about/campus/faq\\_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faq_host/RDM/media/pdf/Report-FNGATS-FINAL.pdf) on February 24, 2014.
- <sup>177</sup> Next Generation Air Transportation System: Status and Issues, House of Representatives Committee on Science and Technology. 108<sup>th</sup> Congress. 2008. Retrieved from <http://www.gpo.gov/fdsys/pkg/CHRG-110hrg44270/html/CHRG-110hrg44270.htm> on March 3, 2014.
- <sup>178</sup> Joint Planning and Development Office (undated). About us. Retrieved from [http://www.jpdo.gov/About\\_Us.asp](http://www.jpdo.gov/About_Us.asp) on April 17, 2014.
- <sup>179</sup> Government Accountability Office (2006), Preliminary Analysis of Progress and Challenges Associated with the Transformation of the National Airspace System - GAO-06-915T. Washington, DC.
- <sup>180</sup> Oster, C. and Strong, J. (2007). Managing the Skies: Public Policy, Organization and Financing of Air Traffic Management. Aldershot, England: Ashgate
- <sup>181</sup> Joint Planning and Development Office (undated). Events. Retrieved from <http://www.jpdo.gov/eventsArchive.asp?theYear=2011> on April 17, 2014.
- <sup>182</sup> Joint Planning and Development Office (2012, July 17). JPDO FY11 Progress Report Now Available. Retrieved from <http://www.jpdo.gov/newsArticle.asp?id=173> on April 17, 2014.
- <sup>183</sup> Joint Planning and Development Office (2013, November 12). JPDO's UAS Comprehensive Plan Released. Retrieved from <http://www.jpdo.gov/newsarticle.asp?id=186> on April 17, 2014.
- <sup>184</sup> Transportation Weekly (2014, January 16). House Passes FY2014 Omnibus Spending Bill; Senate Up Next.
- <sup>185</sup> Stanton, T. H. and Moe, R. C. (2002). Government Corporations and Government-Sponsored Enterprises. In Salamon, L. M. (editor), The Tools of Government - A Guide to New Governance. New York City: Oxford University Press
- <sup>186</sup> Mitchell, J. (1999). The American Experiment with Government Corporations. Armonk, New York: M. E. Sharpe Inc.
- <sup>187</sup> Mitchell, J. (1999). The American Experiment with Government Corporations. Armonk, New York: M. E. Sharpe Inc.
- <sup>188</sup> Kosar, K. E. (2011). Federal Government Corporations: An Overview. Congressional Research Service Report for Congress.
- <sup>189</sup> Kosar, K. E. (2011). Federal Government Corporations: An Overview. Congressional Research Service Report for Congress.
- <sup>190</sup> Rail Passenger Service Act of 1970, Public Law 91-518, October 30, 1970, Section 301.
- <sup>191</sup> Gallamore, Robert and John R Meyer. *American Railroads: Decline and Renaissance in the Twentieth Century*. Cambridge: Harvard University Press, 2014. Chapter 5, The Decline of Railway Passenger Service, 1900-1970.
- <sup>192</sup> Rail Passenger Service Act (as amended). *Compilation of Certain Railroad Laws within the Jurisdiction of the Committee on Interstate and Foreign Commerce*. Committee Print, House Committee on Interstate and Foreign Commerce. February 1979.
- <sup>193</sup> National Railroad Passenger Corporation (2013). Annual Report Fiscal Year 2013. Retrieved from <http://www.amtrak.com/ccurl/103/360/Amtrak-Annual-Report-2012.pdf> on November 4, 2014.
- <sup>194</sup> National Railroad Passenger Corporation (2013). Annual Report Fiscal Year 2013. Retrieved from <http://www.amtrak.com/ccurl/103/360/Amtrak-Annual-Report-2012.pdf> on November 4, 2014.
- <sup>195</sup> National Railroad Passenger Corporation (2013). Annual Report Fiscal Year 2013. Retrieved from <http://www.amtrak.com/ccurl/103/360/Amtrak-Annual-Report-2012.pdf> on November 4, 2014.
- <sup>196</sup> National Railroad Passenger Corporation (2014). Amtrak National Facts. Retrieved from <http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&cid=1246041980246> on November 4, 2014.
- <sup>197</sup> National Railroad Passenger Corporation (2013). Annual Report Fiscal Year 2013. Retrieved from <http://www.amtrak.com/ccurl/103/360/Amtrak-Annual-Report-2012.pdf> on November 4, 2014.
- <sup>198</sup> Puentes, R., Tomer, A. and Kane, J. (2013). A New Alignment: Strengthening America's Commitment to Passenger Rail. The Brookings Institution. Washington, DC. Retrieved from <http://www.brookings.edu/research/reports/2013/03/01-passenger-rail-puentes-tomer> on November 4, 2014.
- <sup>199</sup> Stanton, T. H. and Moe, R. C. (2002). Government Corporations and Government-Sponsored Enterprises. In Salamon, L. M. (editor), The Tools of Government - A Guide to New Governance. New York City: Oxford University Press



- <sup>199</sup> Tomer, A. and Kane, J. (2014). New Amtrak Bill Still Means the Same Old Funding Debate. The Brookings Institution. Retrieved from <http://www.brookings.edu/blogs/the-avenue/posts/2014/09/16-amtrak-bill-funding-debate-tomer-kane> on November 4, 2014.
- <sup>200</sup> Amtrak Office of the Inspector General (2014). Governance: Improved Policies, Practices, and Training Can Enhance Capital Project Management. Retrieved from [http://www.amtrakoig.gov/sites/default/files/reports/oig-a-2014-009\\_0.pdf](http://www.amtrakoig.gov/sites/default/files/reports/oig-a-2014-009_0.pdf) on November 4, 2014.
- <sup>201</sup> Tennessee Valley Authority (2014). From the New Deal to a New Century. Retrieved from <http://www.tva.com/abouttva/history.htm> on November 4, 2014.
- <sup>202</sup> Government Accountability Office (1995). Government Corporations: Profiles of Existing Government Corporations - GGD-96-14. Washington, DC.
- <sup>203</sup> Tennessee Valley Authority (2014). Board of Directors. Retrieved from <http://www.tva.com/abouttva/board/index.htm> on November 4, 2014.
- <sup>204</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>205</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>206</sup> Tennessee Valley Authority (2014). Frequently Asked Questions About TVA. Retrieved from <http://www.tva.com/abouttva/keyfacts.htm> on November 4, 2014.
- <sup>207</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>208</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>209</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>210</sup> Tennessee Valley Authority (2014). 2013 Annual Report on Form 10-K. Retrieved from <http://www.snl.com/IRWebLinkX/file.aspx?IID=4063363&FID=20876667&O=3&OSID=9> on November 4, 2014.
- <sup>211</sup> Government Accountability Office (2011). Tennessee Valley Authority: Full Consideration of Energy Efficiency and Better Capital Expenditures Planning Are Needed – GAO-12-107. Washington, DC.
- <sup>212</sup> United States Postal Service (2012). The United States Postal Service: An American History. Retrieved from <http://about.usps.com/publications/pub100.pdf> on November 4, 2014.
- <sup>213</sup> United States Postal Service (2014). About the Board of Governors. Retrieved from <https://about.usps.com/who-we-are/leadership/board-governors.htm> on November 4, 2014.
- <sup>214</sup> Government Accountability Office (2013). High-Risk Series: an Update – GAO-13-283. Washington, DC.
- <sup>215</sup> United States Postal Service (2014). The Year in Review – Financial Highlights. Retrieved from [https://about.usps.com/publications/annual-report-comprehensive-statement-2013/annualreport2013\\_002.htm#ep998349](https://about.usps.com/publications/annual-report-comprehensive-statement-2013/annualreport2013_002.htm#ep998349) on November 4, 2014.
- <sup>216</sup> Washington Post’s Editorial Board (2014). A Postal Service Reform on Which Nearly Everyone Agrees: Ending Saturday Delivery. Washington Post. Retrieved from [http://www.washingtonpost.com/opinions/a-postal-service-reform-on-which-nearly-everyone-agrees-ending-saturday-delivery/2014/04/27/0ca966d0-cb21-11e3-95f7-7ecdde72d2ea\\_story.html](http://www.washingtonpost.com/opinions/a-postal-service-reform-on-which-nearly-everyone-agrees-ending-saturday-delivery/2014/04/27/0ca966d0-cb21-11e3-95f7-7ecdde72d2ea_story.html) on November 4, 2014.
- <sup>217</sup> Katz, E. (2014). House Committee Requires USPS to Keep Saturday Mail Delivery. Government Executive. Retrieved from <http://www.govexec.com/management/2014/06/house-committee-requires-usps-keep-saturday-mail-delivery/87262/> on November 4, 2014.
- <sup>218</sup> Government Accountability Office (2013). U.S. Postal Service: Health and Pension Benefits Proposals Involve Trade-offs, GAO-13-283. Washington, DC.
- <sup>219</sup> Government Accountability Office (2013). High-Risk Series: an Update, GAO-13-283. Washington, DC.
- <sup>220</sup> Government Accountability Office (2013). High-Risk Series: an Update, GAO-13-872T. Washington, DC.; United States Postal Service (2014). The Year in Review – Financial Highlights. Retrieved from [https://about.usps.com/publications/annual-report-comprehensive-statement-2013/annualreport2013\\_002.htm#ep998349](https://about.usps.com/publications/annual-report-comprehensive-statement-2013/annualreport2013_002.htm#ep998349) on November 4, 2014.
- <sup>221</sup> Government Accountability Office (2013). U.S. Postal Service: Health and Pension Benefits Proposals Involve Trade-offs, GAO-13-283. Washington, DC.
- <sup>222</sup> Rein, L. and Hicks, J. Postal Service Records Revenue Increase, but Losses Remain as Overhaul Bill Appears to Stall. The Washington Post. Retrieved from [http://www.washingtonpost.com/politics/postal-service-records-revenue-increase-but-losses-remain-as-overhaul-bill-appears-to-stall/2013/11/17/1850fdcc-4895-11e3-b6f8-3782ff6cb769\\_story.html](http://www.washingtonpost.com/politics/postal-service-records-revenue-increase-but-losses-remain-as-overhaul-bill-appears-to-stall/2013/11/17/1850fdcc-4895-11e3-b6f8-3782ff6cb769_story.html) on November 4, 2014.
- <sup>223</sup> United States Postal Service (2014). Retiree Health Benefits Prefunding. Retrieved from [http://about.usps.com/who-we-are/financials/annual-reports/fy2010/ar2010\\_4\\_002.htm](http://about.usps.com/who-we-are/financials/annual-reports/fy2010/ar2010_4_002.htm) on November 4, 2014.
- <sup>224</sup> Government Accountability Office (2013). High-Risk Series: an Update, GAO-13-283. Washington, DC.
- <sup>225</sup> Stanton, T. H. and Moe, R. C. (2002). Government Corporations and Government-Sponsored Enterprises. In Salamon, L. M. (editor), *The Tools of Government – A Guide to New Governance*. New York City: Oxford University Press
- <sup>226</sup> Mitchell, J. (1999). *The American Experiment with Government Corporations*. Armonk, New York: M. E. Sharpe Inc.
- <sup>227</sup> Mitchell, J. (1999). *The American Experiment with Government Corporations*. Armonk, New York: M. E. Sharpe Inc.
- <sup>228</sup> Tierney, J. T. (1984). Government Corporations and Managing the Public’s Business. *Political Science Quarterly* (volume 99, no 1), pp. 73-92
- <sup>229</sup> Katz, E. (2014). House Committee Requires USPS to Keep Saturday Mail Delivery. Government Executive. Retrieved from <http://www.govexec.com/management/2014/06/house-committee-requires-usps-keep-saturday-mail-delivery/87262/> on November 4, 2014.
- <sup>230</sup> Kosar, K. (2008). Congressionally Chartered Nonprofit Organizations (“Title 36 Corporations”): What They Are and How Congress Treats Them. Congressional Research Service Report for Congress.
- <sup>231</sup> Kosar, K. (2011). *The Quasi Government: Hybrid Organizations with Both Government and Private Sector Legal Characteristics*. Congressional Research Service Report for Congress.

- 
- <sup>232</sup> Kosar, K. (2008). Congressionally Chartered Nonprofit Organizations (“Title 36 Corporations”): What They Are and How Congress Treats Them. Congressional Research Service Report for Congress.
- <sup>233</sup> Kosar, K. (2006). The Congressional Charter of the American National Red Cross: Overview, History, and Analysis. Congressional Research Service Report for Congress.
- <sup>234</sup> American Red Cross (2014). A Brief History of the American Red Cross. Retrieved from <http://www.redcross.org/about-us/history> on November 4, 2014.
- <sup>235</sup> Kosar, K. (2006). The Congressional Charter of the American National Red Cross: Overview, History, and Analysis. Congressional Research Service Report for Congress.
- <sup>236</sup> Kosar, K. (2006). The Congressional Charter of the American National Red Cross: Overview, History, and Analysis. Congressional Research Service Report for Congress.
- <sup>237</sup> American Red Cross (2014). A Brief History of the American Red Cross. Retrieved from <http://www.redcross.org/about-us/history> on November 4, 2014.
- <sup>238</sup> American Red Cross (2014). 2013 Annual Report. Retrieved from [http://www.redcross.org/images/MEDIA\\_CustomProductCatalog/m39440096\\_2013AnnualReport.pdf](http://www.redcross.org/images/MEDIA_CustomProductCatalog/m39440096_2013AnnualReport.pdf) on November 4, 2014.
- <sup>239</sup> American Red Cross (2014). 2013 Annual Report. Retrieved from [http://www.redcross.org/images/MEDIA\\_CustomProductCatalog/m39440096\\_2013AnnualReport.pdf](http://www.redcross.org/images/MEDIA_CustomProductCatalog/m39440096_2013AnnualReport.pdf) on November 4, 2014.
- <sup>240</sup> American Red Cross (2014). 2013 Annual Report. Retrieved from [http://www.redcross.org/images/MEDIA\\_CustomProductCatalog/m39440096\\_2013AnnualReport.pdf](http://www.redcross.org/images/MEDIA_CustomProductCatalog/m39440096_2013AnnualReport.pdf) on November 4, 2014.
- <sup>241</sup> Kosar, K. (2006). The Congressional Charter of the American National Red Cross: Overview, History, and Analysis. Congressional Research Service Report for Congress.
- <sup>242</sup> United States Olympic Committee (2015). About the USOC. Retrieved from <http://www.teamusa.org/About-the-USOC> on May 12, 2015.
- <sup>243</sup> United States Olympic Committee (2013). 2012 USOC Annual Report. Retrieved from <http://www.teamusa.org/~media/TeamUSA/Documents/Financial/2012%20USOC%20Annual%20Report.pdf> on May 12, 2015.
- <sup>244</sup> United States Olympic Committee (2014). 2013 USOC Annual Report. Retrieved from <http://www.teamusa.org/~media/TeamUSA/Documents/Financial/2013%20USOC%20Annual%20Report.pdf> on May 12, 2015.
- <sup>245</sup> United States Olympic Committee (2015). About the USOC. Retrieved from <http://www.teamusa.org/About-the-USOC> on May 12, 2015.
- <sup>246</sup> United States Olympic Committee (2015). About the USOC. Retrieved from <http://www.teamusa.org/About-the-USOC> on May 12, 2015.
- <sup>247</sup> United States Olympic Committee (2015). About the USOC. Retrieved from <http://www.teamusa.org/About-the-USOC> on May 12, 2015.
- <sup>248</sup> Kosar, K. (2011). The Quasi Government: Hybrid Organizations with Both Government and Private Sector Legal Characteristics. Congressional Research Service Report for Congress.
- <sup>249</sup> Kosar, K. (2008). Congressionally Chartered Nonprofit Organizations (“Title 36 Corporations”): What They Are and How Congress Treats Them. Congressional Research Service Report for Congress.
- <sup>250</sup> Kosar, K. (2011). The Quasi Government: Hybrid Organizations with Both Government and Private Sector Legal Characteristics. Congressional Research Service Report for Congress.