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Air Traffic Inc.: Considerations Regarding the Corporatization of Air Traffic Control

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Summary

Over the past 40 years, Congress has intermittently considered proposals to establish a government corporation or private entity to carry out air traffic functions currently provided by the Federal Aviation Administration (FAA). While the issue had been relatively dormant since a proposal offered by the Clinton Administration in the 1990s failed to gain the support of Congress, interest reemerged following budget sequester-related funding cuts to FAA in FY2013. In the 114th Congress, the House Transportation and Infrastructure Committee ordered H.R. 4441, an FAA reauthorization bill that proposed to establish a government-chartered air traffic services corporation, to be reported. However, the bill was never reported in the House, and the FAA extension act passed by Congress in July 2016 (P.L. 114-190) did not make any organizational reforms regarding air traffic services. Authorizations under that extension expire at the end of FY2017, and debate over air traffic services reform has arisen once more.

Many other countries have established government corporations, quasi-governmental entities, or private firms to perform air traffic services. While none of these air traffic service organizations are comparable to FAA in terms of their size or complexity, they represent a broad array of organizational models including a large number of wholly government-owned corporations, a public-private partnership model in the United Kingdom, a government-controlled joint stock company in Switzerland, and a fully private nonprofit entity controlled by aviation industry stakeholders in Canada.

Direct comparisons among these models have been limited. There does not appear to be conclusive evidence that any of these models is either superior or inferior to others or to existing government-run air traffic services, including FAA, with respect to productivity, cost-effectiveness, service quality, and safety and security. Certain corporate and private air traffic service providers have improved cost-effectiveness and performance as a result of access to financial markets to fund large-scale acquisition projects, and of faster implementation of technologies. In this regard, the tax status of a potential air traffic entity's debt could become a significant issue in the United States, as a privatized or a government-owned corporation could end up paying more to borrow in the financial market than the federal government does.

The prospect of reforming FAA air traffic services raises many unique challenges for congressional consideration, including

- the framework and governance of a future air traffic services corporation;
- its organizational structure and elements;
- corporate financing and FAA funding mechanisms;
- measures to ensure a smooth transition;
- labor provisions to address legal rights of labor organizations while minimizing potential system disruptions;
- safety regulation and oversight of the corporation;
- measures to address corporate liability; and
- safeguards to assure equitable treatment to the wide array of system users.

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Background

For four decades, Congress has intermittently debated whether the public would be better served if air traffic services currently provided by the Federal Aviation Administration (FAA) were instead provided by an independent entity. The many proposals and bills on this subject put forth over the years have distinguished two main alternatives to continued operation of the air traffic control system by a federal agency:

- **corporatization**, which, in this context, generally refers to establishing air traffic services as a wholly owned government corporation or quasi-governmental entity; and
- **privatization**, which would entail creating some form of private ownership and control of an air traffic services corporation.

Proposals under both of these models have generally sought to establish stakeholder involvement in the business entity providing air traffic services though representation on a board of directors or other similar oversight body. Aviation stakeholders include the airlines, various general aviation interests, other aviation businesses, and military users of the airspace.

Interest in restructuring air traffic services, relatively dormant in recent years, reemerged in 2013 after budget sequester-related funding cuts led to staggered furloughs of FAA controllers at air traffic facilities across the country, deferral of plans to upgrade air traffic control facilities, and suspension of hiring and training of air traffic controllers. Delays in implementing the satellite-based NextGen air traffic control system have renewed interest in corporate or private models for providing air traffic services. A November 2016 audit report issued by the Department of Transportation Office of Inspector General found that costs and timelines for delivering core NextGen transformational technologies remain unclear and that several key elements of NextGen will provide only limited benefits to users for the foreseeable future.[1] In August 2016, the Office of Inspector General found that FAA lacks a clear process for identifying and coordinating high-priority research and development projects to support NextGen development, and ongoing efforts have not be aligned with any long-term vision for NextGen.[2]

While a proposed privatized model was offered as part of the FAA reauthorization bill considered by the House Transportation and Infrastructure Committee in the 114th Congress (see H.R. 4441), Congress included no such proposals in reauthorizing FAA through the end of FY2017 (P.L. 114-190). The need to reauthorize FAA programs and revenue authority beyond the end of FY2017 and the Trump Administration's stated desire "to shift the air traffic control function of the Federal Aviation Administration to an independent, non-governmental organization"[3] have brought air traffic control reform to the fore once more.

This report looks at past proposals to corporatize or privatize FAA air traffic functions and examines the way air traffic management is structured in other countries, particularly focusing on those that have opted for corporatization or privatization.

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[1] Department of Transportation, Office of Inspector General, *Total Costs, Schedules and Benefits of FAA's NextGen Transformational Programs Remains Uncertain*, AV-2017-009, November 10, 2016.

[2] Department of Transportation, Office of Inspector General, *FAA Lacks a Clear Process for Identifying and Coordinating NextGen Long-Term Research and Development*, AV-2016-094, August 25, 2016.

[3] Office of Management and Budget, *America First: A Budget Blueprint to Make America Great Again*, https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/2018_blueprint.pdf.

How U.S. Air Traffic Control Is Organized

FAA, an agency of the U.S. Department of Transportation (DOT), oversees all civilian air traffic control operations across the United States. Air traffic control and modernization of air traffic facilities are funded through two accounts in the FAA budget. The Operations and Maintenance account, with an authorization of $9.91 billion in FY2016, funds air traffic operations, as well as aviation safety programs not related to air traffic control. The Facilities and Equipment account, authorized at $2.85 billion in FY2016, provides funding for the acquisition and maintenance of air traffic facilities and equipment, and for engineering, development, testing, and evaluation of technologies related to the federal air traffic system.

Under FAA's Operations and Maintenance account, FAA's Air Traffic Organization (ATO) operates 315 air traffic facilities, including 21 en route control centers, 24 stand-alone terminal radar approach control (TRACON) facilities, and more than 260 airport control towers (including towers with combined radar approach control facilities) across the country.[4] ATO federal employee staffing totals about 35,000, of which more than 14,000 are air traffic controllers.

In addition, ATO oversees more than 250 airport towers run by private operators under the Federal Contract Tower program. Controllers and other staff in a contract tower are employees of the contractor, not of the federal government. FAA also has contracted out operations at flight service stations that provide weather briefings and flight planning services to owners of private aircraft (general aviation).

Slightly over two-thirds of FAA's total funding, and all funding for the Facilities and Equipment account, is provided through the Airport and Airway Trust Fund (AATF). Revenue sources for the trust fund include a 7.5% passenger ticket tax, a 4.3-cent-per-gallon tax on commercial jet fuel, a 21.8-cent-per-gallon tax on general aviation jet fuel, and other taxes on cargo, frequent flyer awards, international departures and arrivals, and fuel used by planes with fractional ownership. FAA also collects user fees from aircraft that fly in U.S.-controlled airspace but do not take off from or land in the United States. A portion of this fee, which is similar to overflight fees charged by other countries in conformance with agreements of the International Civil Aviation Organization (ICAO), is used to fund ATC services.

Four Decades of Privatization Proposals

Proposals to restructure air traffic control have been offered since at least 1974. While many of these proposals have been drafted into legislation introduced in Congress, none of the measures has ever made it out of committee. These various proposals have purported to offer means of minimizing or avoiding a number of identified problems:

- FAA funding is tied to annual appropriations and multiyear authorizations that can suffer delays or cuts due to political wrangling, making it difficult to carry out long-range planning. FAA lacks a dedicated budget for long-term capital expenditures and has no independent access to financial markets to fund such investments;

[4] Federal Aviation Administration, *A Plan for the Future: 10-Year Strategy for the Air Traffic Control Workforce, 2014-2023*, 2014 CWP, Washington, DC, 2014, http://www.faa.gov/air_traffic/publications/controller_staffing/media/CWP_2014.pdf.

- FAA management and procurement processes have proven inadequate for meeting equipment and facilities modernization needs, leading to lengthy delays, cost overruns, and failures to fully achieve stated objectives;
- federal workforce restrictions have encumbered FAA's ability to recruit and maintain highly qualified air traffic controller and technical personnel, particularly in high-cost areas;
- strained relations between management and labor have, at times, impeded progress in developing new air traffic technologies and procedures; and
- inadequate stakeholder engagement in planning and executing technological and procedural initiatives has resulted in approaches that have not fully met users' expectations.

The Glen Gilbert Report (1974)

In 1974, a study commissioned by the Professional Air Traffic Controllers Organization (PATCO), the air traffic controllers union at the time, and conducted by Glen A. Gilbert and Associates, concluded that an independent government corporation with assured financing should carry out the air traffic control functions performed by FAA.[5] Under the proposal, corporate policy was to be set by a board of directors, appointed by the President with Senate confirmation. The board was to comprise individuals representing the air transportation industry, government, consumers, and "environmentalists." The proposal called for the air traffic control organization to be managed by a president and chief executive officer, with smaller units headed by vice presidents and a senior vice president of operations.

Gilbert's report led to the introduction of two bills in 1976 (H.R. 12165 and H.R. 13004, 94th Congress) to establish a United States Air Traffic Services Corporation. Under the proposals, the corporation would have been managed by a 10-member board of directors with broad authority to appoint corporate officers and set tax rates for Airport and Airway Trust Fund revenue sources such as aviation fuel taxes, passenger ticket taxes, and cargo taxes. More modest measures introduced in the 94th Congress (S. 2434, H.R. 9930, and H.R. 11978) sought to reestablish FAA as an independent agency outside of DOT, a status it had held from its inception in 1958 until the creation of DOT under the Department of Transportation Act (P.L. 89-670) in 1967. None of these bills was reported out of committee.

The Heritage Foundation Proposal (1982)

In August 1981, more than 11,000 striking air traffic controllers were fired after failing to heed a presidential directive ordering them back to work within 48 hours.[6] Warning that this was not an isolated incident, the Heritage Foundation issued a report in 1982 proposing an alternative corporate model for air traffic control.[7] The report, prepared by Robert Poole of the Reason Foundation, proposed a two-tiered corporate model, with a not-for-profit corporation responsible for system design and coordination and for awarding long-term contracts to a second tier of for-

[5] Glen A. Gilbert & Associates, Aviation Consultants, *The Future ATC System: Inside or Outside FAA (Executive Summary)*, http://digitalcollections.library.gsu.edu/cdm/ref/collection/PATCO/id/143568.

[6] Theresa L. Kraus, *The Federal Aviation Administration: A Historical Perspective, 1903-2008*, Federal Aviation Administration, 2008, https://www.faa.gov/about/history/historical_perspective/.

[7] Robert W. Poole Jr., *Air Traffic Control: The Private Sector Option*, Heritage Foundation, Backgrounder No. 216, October 5, 1982.

profit contractors that would operate air traffic facilities. Each contractor was to be limited to operating no more than three facilities to promote competition and protect against monopoly pricing. Decentralization at this second tier, the report argued, would provide safeguards against system-wide strikes while allowing for unionization and collective bargaining at the local level. The report concluded that its proposal was consistent with Reagan Administration objectives to reduce the size of the federal government while at the same time being amenable to labor interests. This proposal did not result in legislation.

The National Academy of Public Administration Study (1986)

The corporatization concept was taken up in 1985 by the Air Transport Association of America, an airline trade group (now called Airlines for America). At that organization's behest, the National Academy of Public Administration examined the concept in detail in 1986.[8] That study recommended separating FAA from DOT, either by turning it into a government-owned corporation or by spinning off FAA's air traffic functions into a stand-alone government-owned corporation. Elements of that second alternative were incorporated into S. 1159 (100th Congress), which would have created a National Aviation Authority as an independent government corporation headed by a presidentially appointed director. The authority would have taken over all air traffic control services administered by FAA, funding itself through user fees. A policy advisory board was to conduct twice-yearly reviews of the authority's operations and submit its observations and recommendations to the President and congressional oversight committees. Safety standards for the proposed authority were to remain the responsibility of FAA.

President Reagan's Commission on Privatization (1988)

Air traffic control was among the functions studied by a commission established by President Ronald Reagan to evaluate opportunities for privatization across the federal government. The commission's final report, released in 1988,[9] found that post-deregulation airline traffic growth, particularly at hub airports, was placing serious strains on FAA air traffic resources. It also criticized "micromanagement" of FAA operations by DOT, the Office of Management and Budget (OMB), and Congress.

The commission's recommendations were more complex than those of previous studies. It urged that safety regulation remain under the purview of FAA, but that portions of the system be considered for private operation. More specifically, it suggested that FAA should retain authority over en route centers, but that certain functions performed in those facilities, such as equipment maintenance and weather briefings, be contracted. The commission recommended that FAA move incrementally toward a system of privately operated airport traffic control towers, starting with towers at smaller airports. Additionally, the commission suggested that FAA contract operation of its flight service stations, but argued against imposing user fees for flight services over safety concerns. Some of these recommendations were subsequently implemented, notably the growth of contract tower operations since 1993 and the 2005 contract for flight service station operations. However, the commission's recommendation to increase the portion of FAA expenditures paid for through direct user charges has never been accepted by Congress.

[8] National Academy of Public Administration, *The Air Traffic Control System: Management by a Government Corporation*, March 1986.

[9] President's Commission on Privatization, *Privatization: Toward More Effective Government, Report of the President's Commission on Privatization*, March 18, 1988.

National Commission to Ensure a Strong Competitive Airline Industry (1993)

In 1993, the National Commission to Ensure a Strong Competitive Airline Industry, created pursuant to P.L. 103-13, found that FAA was incapable of performing its future mission under its existing organizational structure.[10] It cautioned that the existing federal budget process did not provide a stable, predictable source of revenue or a means to leverage that revenue to fund FAA operations and capital programs. Rather, the commission found that FAA was severely limited by its dependence on a political and unpredictable budgetary process, a cumbersome procurement system, and a "pay-as-you-go" approach to major capital investments rarely seen in the business world. It recommended the creation of a corporation within DOT to manage and fund air traffic control.[11] It called for removing the funding of these activities from the federal budget, and creating sufficient flexibility in the corporate structure to develop systems for procurement, staffing, and financing consistent with best practices in the private sector.

National Performance Review (1993)

These recommendations by the National Commission to Ensure a Strong Competitive Airline Industry were echoed in the findings of the National Performance Review, led by Vice President Al Gore, as part of a broad initiative to "reinvent" government to reduce costs and deliver services more efficiently.[12] The review concluded that FAA's air traffic control system was "constantly hamstrung by budget, personnel, and procurement restrictions."[13] The review found that FAA's 10-year National Airspace Plan, first released in 1981 and revised numerous times, was, at that point, 10 years behind schedule and 32% over budget. It found that air traffic control technology modernization had been stymied by annual appropriations that precluded long-range fiscal planning, and that the federal personnel system made it difficult for FAA to attract experienced controllers in high-cost areas. It recommended a government-owned corporation within DOT that would be able to borrow from capital markets, make equipment purchases as needed, and hire and fire workers more easily than FAA. The review recommended that the corporation be supported by user fees and governed by a board of directors representing the system's customers. FAA, relieved of its operational role under this plan, was to focus on safety regulation.

The United States Air Traffic Service Corporation Act (1995)

In January 1994, the Clinton Administration released its "Initiative to Promote a Strong Competitive Aviation Industry,"[14] largely adopting the work of the airline industry commission and the National Performance Review, including the recommendation to create a government corporation to carry out FAA's air traffic functions. Four months later, FAA released a formal proposal to establish a public corporation to run the nation's air traffic control system. Under the

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[10] The National Commission to Ensure a Strong Competitive Airline Industry, *Change, Challenge, and Competition: A Report to the President and Congress* (Washington, DC: USGPO, 1993).

[11] Ibid., p. 8.

[12] Vice President Al Gore, *From Red Tape to Results: Creating a Government that Works Better and Costs Less, Report of the National Performance Review* (Washington, DC: USGPO, 1993), pp. 60-61.

[13] Ibid., p. 60.

[14] U.S. Department of Transportation, *Growing to Meet Global Competition: Clinton Administration's Initiative to Promote a Strong Competitive Aviation Industry*, January 1994.

proposal, the corporation was to be administered by a chief executive officer and overseen by an 11-member board of directors representing various aviation interests. The corporation was to set fees for services to cover its operational costs.

This plan was introduced in legislative form in 1995 (H.R. 1441, 104th Congress). The bill sought to establish the United States Air Traffic Service (USATS) Corporation starting in FY1996. Although the government was to pay certain transition and startup costs, the corporation's ongoing costs were to come from user fees and other charges imposed by USATS, set so as to satisfy the corporation's obligations without restraining competition or violating obligations under international agreements. The corporation was to carry out a cost allocation study to determine the appropriate fee structures based on air traffic service categories and user categories, including commercial aviation, general aviation, and public-use aviation. The bill, however, would have specifically restricted the corporation from imposing fees on public or military aircraft, as well as on general aviation aircraft not used to provide transportation for compensation or hire. As a government corporation, the proposed corporate entity was to be exempt from corporate taxes.

General aviation interests largely rejected the proposal, despite specific language exempting general aviation users from air traffic service fees. The Aircraft Owners and Pilots Association (AOPA) argued that fees charged to general aviation could eventually become a means for funding the proposed USATS. More immediately, however, general aviation groups expressed concern over the airlines' influence on the USATS board. Turning over control to a board dominated by airline interests was likened to "privatizing ... highways, then turning over control to the truckers," who would give little consideration to the needs of automobile drivers.[15]

In a February 25, 1994, memorandum to House Aviation Subcommittee Members, Chairman James Oberstar criticized the Clinton Administration's ATC reform proposal.[16] He argued that organizational disruption could erode safety, and that having airlines participate in the ATC board could lead to decisions that would not put safety first, such as reducing aircraft spacing to increase capacity or cutting back on staffing to control ATC costs and related airline fees. Representative Oberstar also expressed concern that airlines could come to dominate the board and the shaping of corporate policy. He argued that as a natural monopoly, an ATC corporation would not be subject to competitive pressures that would promote efficiency. He pointed to mismanagement among government contractors as a significant factor in delays and cost overruns in air traffic modernization projects like the Advanced Automation System.

A particularly scathing assessment of the USATS proposal came from May 1994 testimony by the General Accounting Office (now the Government Accountability Office, or GAO).[17] GAO rejected the Clinton Administration's conclusion that procurement regulations were a significant factor impeding FAA's progress on ATC modernization initiatives, finding that technical and managerial factors were the root causes of modernization delays and cost overruns. GAO's analysis attributed some of the blame for these problems to poor performance by private contractors. GAO also expressed skepticism that the proposed corporation could achieve financial self-sufficiency, pointing to Amtrak as an example of a corporatized government agency that had

[15] Phil Boyer, "President's Position: Black Thursday," *AOPA Pilot*, February 1994, p. 2.

[16] Memorandum from James L. Oberstar, Chairman, Aviation Subcommittee, House Committee on Public Works and Transportation, U.S. House of Representatives, to Aviation Subcommittee Members, Re: Reorganization of the FAA, February 25, 1994.

[17] U.S. General Accounting Office, *Air Traffic Control: Observations on Proposed Corporation*, GAO/T-RCED-94-210, May 12, 1994.

responded to financial problems by deferring maintenance and putting off equipment upgrades. GAO concluded that a shift to a corporate structure "does not necessarily correlate with success or serve as a panacea for the problems of the predecessor organization."[18]

FAA Management Advisory Council Report (2014)

While advocates for ATC corporatization or privatization have continued to lobby for FAA reform, the concept has received relatively little policy attention since the failed effort to implement the Clinton Administration proposal two decades ago. However, ongoing concerns over FAA funding and air traffic systems modernization have renewed interest in the topic.

In January 2014, the FAA Management Advisory Council, a stakeholder advisory group, unanimously agreed to four principles for reforming aviation policy. The council recommended completely separating the Air Traffic Organization from the rest of FAA, modeling it after commercialized independent air navigation service providers in other countries, and creating an aviation stakeholder board to oversee its work. Complementing that structure, it recommended financing ATC operations through a transparent schedule of cost-based user fees for air traffic services and phasing out general fund support. The commission also recommended reforms to eliminate redundant regulatory oversight.[19]

The ATC Corporation (2016)

In February 2016, the House Transportation and Infrastructure Committee acted favorably on the Aviation Innovation, Reform, and Reauthorization Act of 2016 (H.R. 4441, 114th Congress). Title II of the bill detailed a plan to establish a not-for-profit, federally chartered corporation that would assume responsibility for providing air traffic services currently provided by FAA. The corporation was to operate as a nonprofit exempt from federal taxes, with primary responsibility to provide air traffic services in domestic airspace and in international airspace delegated to the United States. The proposed corporation was to be operated as a nonprofit without investors, but would have been permitted to issue debt instruments, such as bonds, to raise money for capital investments.

Under the provisions of the bill as introduced, the corporation was to be overseen by a board of directors nominated by individuals appointed by various stakeholder groups. The board of directors was to consist of

- two directors appointed by the Secretary of Transportation;
- four directors representing mainline air carriers;
- two directors representing general aviation owners and operators;
- one director representing the principal air traffic controllers union; and
- one director representing the largest airline pilots union.

Under the proposal, the corporation's chief executive officer would have also served as a board member as well as having responsibility for day-to-day management and direction of the corporation and its employees.

[18] Ibid., p. 15.

[19] Stephen D. Van Beek, *FAA and Aviation Policy Reform: Now Is the Time*, FAA Management Advisory Council 2011-2013, Washington, DC, January 29, 2014.

During a House Transportation and Infrastructure Committee markup held on February 11, 2016,[20] the committee agreed to two amendments that would have added to the board one director representing business aviation[21] and one director representing aerospace manufacturers.[22]

Directors were to serve for three-year terms that were to be staggered to promote stability of the board. The board was to be responsible for adopting the corporation's annual budget, approving a strategic plan, authorizing the issuance of debt instruments by the corporation, setting user fees, setting the bylaws of the corporation, and hiring the corporation's chief executive. The bill required the corporation to publish an annual report detailing its activities and disclosing financial and operational performance information to the public.

In addition to the board of directors, the corporation was also proposed to have an advisory board of up to 15 members representing commercial service airports, general aviation interests, aerospace manufacturers, operators of commercial unmanned aircraft, appropriate labor organizations, small communities, and the Department of Defense.

A key responsibility of the Board of Directors under the plan was to set charges and fees for air traffic services. The bill specified that fees were to be set in compliance with International Civil Aviation Organization policies and would not be imposed on military aircraft, piston engine-powered aircraft, noncommercial jets, or commuter air taxi flights operated in remote locations. Thus, the fees would have largely been limited to passenger and cargo airline operations and some commuter flights or air taxis in turboprops and turbojets, although the legislation left it up to the Secretary of Transportation to specify exactly what geographic areas would be included in the remote location exemption for air taxis.

The Politics of Corporatization

Historically, most proposals to corporatize or privatize air traffic services have envisioned user fees, rather than taxes, as the revenue source for the proposed corporation. Such fees, which could be based on aircraft weight and distance flown, air traffic services provided during approach and landing, and airport surface movements, would be compelled to adhere to policies agreed upon by ICAO.[23] Proposals to replace or augment U.S. aviation taxes with user fees linked to air traffic services have met with considerable opposition. The George W. Bush Administration's proposal to establish user fees for commercial jets and certain other aircraft using busy terminal airspace was not accepted by the 110th Congress. In both the 110th and 111th Congresses, a Senate proposal to impose a $25-per-flight surcharge on commercial flights and general aviation jet traffic was sharply criticized by general aviation interests and was not approved. A proposal by the Obama Administration for a per-flight user charge of $100 on commercial and general aviation jets and turboprops that fly in controlled airspace, first introduced in 2011 and reintroduced in each subsequent FAA budget submission, has not been acted upon by Congress.[24]

General aviation groups have argued that they would have a relatively small stake in the governance and oversight of an air traffic corporation, and that the concerns of private pilots,

[20] http://docs.house.gov/Committee/Calendar/ByEvent.aspx?EventID=104471.

[21] http://docs.house.gov/meetings/PW/PW00/20160211/104471/BILLS-114-HR4441-G000563-Amdt-20.pdf.

[22] http://docs.house.gov/meetings/PW/PW00/20160211/104471/BILLS-114-HR4441-S001154-Amdt-02-Enbloc-2.pdf.

[23] International Civil Aviation Organization, *ICAO's Policies on Charges for Airports and Air Navigation Services*, Eighth Edition, Doc 9082, 2009, http://www.icao.int/publications/Documents/9082_8ed_en.pdf.

[24] Office of Management and Budget, *Living Within Our Means and Investing in the Future: The President's Plan for Economic Growth and Deficit Reduction*, September 2011, pp. 22-23.

corporate jet operators, and noncommercial airports would be overshadowed by those of the airline industry and the major passenger airports. Additionally, general aviation users have often raised concerns that the funding mechanisms for a privatized or corporatized air traffic system could cost them more than the current system of fuel taxes.[25] After indicating its openness to proposals that could lower the costs of flying for general aviation users and address inefficiencies at FAA,[26] the Aircraft Owners and Pilots Association, a general aviation group, opposed the 2016 reform proposals because they would have shifted the financing of air traffic services to a system that is user fee-funded.[27] Business aviation interests also raised concerns that the proposed scheme would replace congressional oversight of FAA with a privatized corporate "board dominated by big airlines," warning that "[g]iving the airlines the unbridled power over our air traffic system, as they have long sought is a dangerous proposition" offering "no means for recourse over the decisions of the board."[28]

Labor organizations representing air traffic controllers and FAA technicians had historically favored a move away from FAA to a corporate structure for air traffic control. This sentiment, however, largely shifted to general support of the FAA-managed system after labor gained collective bargaining rights following personnel reforms made in the 1990s.[29] Under these reforms, controllers and other FAA employees were able to bargain collectively for pay, a situation unique in the federal government. Despite contentious contract negotiations between FAA and controllers during the George W. Bush Administration, the National Air Traffic Controllers Association (NATCA) did not advocate for corporatization or privatization. Instead, in 2003 it commissioned a study highlighting the pitfalls of corporatization or privatization.[30]

In 2016, NATCA reversed its position and came out in support of H.R. 4441, indicating that, in its opinion, the proposed legislation addressed its ongoing concerns by offering stable, predictable funding that would address staffing needs to promote safety, efficiency, and innovation and provide services to all segments of the aviation community.[31] Controller support for the proposal was likely bolstered by the inclusion of labor provisions in the bill that would allow employees transferred from FAA to the corporation to continue coverage under federal retirement systems, health benefit programs, and other federal employee benefit programs, and would have provided unions with statutory dispute resolution requirements to smooth collective bargaining negotiations with the corporation.

Airlines for America, an advocacy group representing several airlines in the United States, has also expressed concern that progress on NextGen, FAA's initiative to modernize the air traffic

[25] Phil Boyer, "President's Position: Black Thursday," *AOPA Pilot*, February 1994, p. 2.

[26] Susan Carey and Andy Pasztor, "Sparks Fly on Privatizing Air-Traffic Control," *Wall Street Journal*, August 24, 2014.

[27] Elizabeth Tennyson, "AOPA Opposes User Fees as Reauthorization Moves to Full House," *AOPA News and Media*, February 11, 2016, https://www.aopa.org/news-and-media/all-news/2016/february/11/aopa-opposes-user-fees-as-reauthorization-moves-forward.

[28] National Business Aviation Association, "Statement of Edward Bolen, President and CEO, Before the Committee on Transportation and Infrastructure, U.S. House of Representatives, Regarding 'Review of ATC Reform Proposals,'" February 10, 2016, https://transportation.house.gov/uploadedfiles/2016-02-10-bolen-.pdf.

[29] See, especially, P.L. 104-264 §253; 49 U.S.C. §40122.

[30] Elliott Sclar, *Pitfalls of Air Traffic Control Privatization*, Columbia University and the HDR Management Consulting Group, Report Commissioned by the National Air Traffic Controllers Association, February 2003.

[31] "Testimony of Paul Rinaldi, President, National Air Traffic Controllers Association (NATCA), 'Review of Air Traffic Control Reform Proposals,'" House Transportation and Infrastructure Committee, February 10, 2016, https://transportation.house.gov/uploadedfiles/2016-02-10-rinaldi-.pdf.

system by converting to satellite-based navigation and aircraft tracking and digital voice and data communications, has lagged and that Congress has been unable to "'fix' NextGen through annual appropriations bills, the FAA Reauthorization bill, or additional oversight."[32] Airlines for America supported H.R. 4441, finding that similar reforms have been successful in other countries and would promote funding stability and greater accountability, and would "make NextGen a reality instead of an unrealized dream."[33] Congressional reluctance to accept aviation user fees leaves unanswered the question of how a corporatized or privatized air traffic control system would be funded. In the 114th Congress, H.R. 4441 would have limited the applicability of user fees to commercial airline operations, thus excluding general aviation and business aviation in particular. This limitation, however, was insufficient to gain the support of important interest groups representing general aviation and business aviation.

Reforms Arising from the Privatization Debate

While opposition to corporatization and user-fee funding of air traffic services stalled the legislation to implement the USATS proposal in the 1990s, the Federal Aviation Reauthorization Act of 1996 (P.L. 104-264) instead included language authorizing reform of the FAA procurement and personnel management systems in order to keep pace with new technology and match resources with personnel needs. The act mandated the creation of a 15-member FAA Management Advisory Council designated by the Secretary of Transportation, including 13 members representing aviation interests, 1 member from the Department of Defense, and 1 member from DOT. The council is charged with providing guidance to FAA with respect to operations and regulatory matters affecting industry stakeholders. As noted above, this council recently recommended further action to fully corporatize or privatize FAA air traffic control functions (see "FAA Management Advisory Council Report (2014)").

The same law established the National Civil Aviation Review Commission and tasked it with analyzing alternative financing and funding for the aviation system. The commission's report, released in December 1997, proposed moving to an ATC system financed by user fees. The commission argued that a fee-based system could be more adaptive to changes in priorities and programs, and was likely to be treated more favorably in the budget process.[34] It called for a user fee-funded Air Traffic Performance Fund to replace the Airport and Airway Trust Fund, which was to be phased out. It also called for the creation of a performance-based structure (i.e., a data-driven, results-oriented business approach) for air traffic services, managed by a chief operating officer and overseen by a stakeholder board. The commission recommended that FAA adopt a comprehensive set of system performance metrics to gauge service and safety.

Creation of the Air Traffic Organization

Some of the National Civil Aviation Review Commission's recommendations were reflected in the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR21; P.L. 106-181), enacted in April 2000. That law created a chief operating officer (COO) position within

[32] Nicholas E. Calio, President and Chief Executive Officer, "Statement of Airlines for America before the U.S. House Of Representatives Committee on Transportation and Infrastructure, Review of ATC Reform Proposals," February 10, 2016, https://transportation.house.gov/uploadedfiles/2016-02-10-calio-.pdf.

[33] Ibid.

[34] National Civil Aviation Review Commission, *Avoiding Aviation Gridlock and Reducing the Accident Rate: A Consensus for Change*, Washington, DC, December 1997, http://www.library.unt.edu/gpo/NCARC/reports/pepele.htm.

FAA to carry out strategic planning for air traffic services, address system modernization, improve productivity, implement cost-saving measures, and develop budget requests. The legislation did not, however, establish an air traffic entity for the COO to manage.

Subsequently, in December 2000, President Clinton issued Executive Order 13180, establishing the Air Traffic Organization within FAA to carry out air traffic services, acquisitions, and research activities under a business-like organizational structure.[35] The order designated the COO as the head of the ATO. Oversight was to be provided by the Air Traffic Control Subcommittee of the Aviation Management Advisory Council.

Controversy over the "Inherently Governmental" Designation

In issuing Executive Order 13180, President Clinton specifically described air traffic services as "an inherently governmental function." According to the Office of Management and Budget (OMB), an inherently governmental function is one whose performance is so intimately related to the public interest that it necessitates or mandates performance by government employees. The designation of air traffic services as inherently governmental proved problematic not only because there were many examples of air traffic services being provided by quasi-governmental and private entities outside the United States, but also because air traffic services were being performed by contract personnel in the United States under the Federal Contract Tower (FCT) program. Moreover, FAA was looking to move forward with a large-scale competitive sourcing initiative to determine if its flight service stations could be managed in a more cost-efficient manner by a private entity.

With FAA facing legal challenges to the FCT program, President George W. Bush issued Executive Order 13264 on June 4, 2002, amending Executive Order 13180 to remove the "inherently governmental" language. The order stirred controversy in the FAA reauthorization debate, prompting the inclusion of provisions to prohibit ATC privatization in FAA reauthorization bills considered during the 108th Congress (see H.R. 2115, S.Amdt. 893 to S. 824). Vision 100, the Century of Aviation Reauthorization Act (P.L. 108-176), did not include any language protecting air traffic services from privatization after Congress received a letter from FAA stating it would take no action on ATC privatization prior to the end of FY2004. Under current law, FAA is not prohibited from engaging in competitive sourcing.

Expanded FAA Contracting of Air Traffic Services

While Congress has not agreed on corporatization or privatization proposals for the entire air traffic system, FAA has exercised existing authorities to take a number of steps expanding the role of contractors in providing air traffic services. These actions have not required legislation, but have generally been well supported by Members of Congress. They include increasing the number of air traffic control towers operated by contract personnel, outsourcing flight service station operations, and using "design, build, maintain" contracts to expand contractor roles in maintaining newly acquired air traffic technologies.

Growth of the Contract Tower Program

FAA contracts out the operations of about half of all airport air traffic control towers in the United States under the Federal Contract Tower (FCT) program. The program came into existence in 1982—initially as a trial program at five airports—in an effort to provide continued air traffic services at low-activity towers in the wake of the nationwide air traffic controller strike and subsequent dismissal of striking FAA air traffic controllers. For the first 12 years, the program remained relatively small, growing to 27 towers by 1993. It was expanded further after gaining the attention of the National Performance Review, which endorsed FCT as an effective means of lowering government costs. In 1999, Congress mandated an FAA study to examine further

[35] Executive Order 13180, "Air Traffic Performance-Based Organization," 65 *Federal Register* 77493-77494, December 11, 2000.

expansion of the program to include all FAA-operated towers without radar capability. At the same time, Congress funded a cost-sharing program allowing towers that would not otherwise meet FAA's cost-to-benefit criteria to remain operational so long as requisite funding, up to 20% of the total operational costs of a tower, is provided by nonfederal sources.

A 2003 audit by the DOT Office of Inspector General (OIG) found that average operating costs at 12 contract towers were $917,000 per year lower than those at comparable FAA-run towers. These cost savings were attributed primarily to lower staffing levels and lower salaries at the contract towers.[36] The OIG audit found no notable differences between FAA-staffed towers and FCT towers with regard to safety.

As of January 2017, there were 253 towers operating under the FCT program, including 16 in the cost-sharing program.[37] Currently, contract towers are staffed by personnel employed by one of three companies under contract to FAA: Midwest Air Traffic Control, RVA Robinson Aviation, and Serco. Tower controllers at contract tower facilities are hired and trained by these companies. Many of the controllers have former experience as military air traffic controllers, while some come from the ranks of FAA controllers.

In March 2013, FAA announced it would close 149 FCT program towers in response to FY2013 budget sequester funding cuts.[38] It subsequently reduced the number of proposed closures to 125 towers, but the closure plan never came to pass. Congress intervened by passing the Reducing Flight Delays Act of 2013 (P.L. 113-9) and directing FAA to keep all FCT program towers open through the end of the fiscal year. The FCT program has been fully funded as a part of FAA's operations account since then. However, the incident illustrates how the need for annual appropriations measures may adversely affect the delivery of air traffic services.

The Automated Flight Services Station Contract

Since 2006, FAA has contracted out the work performed at automated flight service station (AFSS) facilities that provide preflight and in-flight weather briefings and flight planning services, mostly to general aviation operators. In 2005, FAA completed one of the largest competitive source selection processes ever conducted in the federal government, covering the functions of about 2,500 federal positions at 58 AFSS facilities in all states except Alaska. FAA projected that the shift to contract operations and consolidation would save $1.7 billion over 10 years.[39]

Lockheed Martin Corporation was awarded a five-year contract with an additional five-year renewal option to operate AFSS facilities throughout the United States (except in Alaska, where flight services are still provided by FAA employees). Under the contract, Lockheed has consolidated operations into three facilities operating around the clock and two additional facilities open part-time. Collectively, these facilities are staffed by fewer than 900 employees. Thus, the contractor has reduced the number of facilities by more than 90% and the number of

[36] Office of Inspector General, U.S. Department of Transportation, *Safety, Cost, and Operational Metrics of the Federal Aviation Administration's Visual Flight Rules Towers*, Report Number AV-2003-057, September 4, 2003.

[37] U.S. Contract Tower Association, https://aaae.org/uscta.

[38] CRS Report R43021, *Proposed Cuts to Air Traffic Control Towers Under Budget Sequestration: Background and Considerations for Congress*, by Bart Elias

[39] Statement of The Honorable Calvin L. Scovel III Before the Committee on Transportation and Infrastructure, Subcommittee on Aviation, United States House of Representatives, *The Conversion of Flight Service Stations From FAA to Contract Operations*, Office of Inspector General, Department of Transportation, CC-2007-102, October 10, 2007, https://www.oig.dot.gov/sites/default/files/FSS_Testimony_Web_File.pdf.

positions by more than 60% compared to 2005. These reductions reflect changes in user demand for services, largely stemming from increased reliance on web-based information, and increased reliance on automation as well as efficiencies gained from consolidation.

In 2007, soon after Lockheed Martin took over, AFSS operations experienced service disruptions related to equipment modernization and failed to meet a number of performance criteria specified in the contract.[40] As a result, FAA withheld $9.7 million in contract performance incentives in 2007. Since then, performance objectives have been met, and the contract operation has received positive satisfaction ratings from users. The contract has been extended through FY2017, with additional options to further extend it through FY2019.

Design, Build, Maintain Contracts

Historically, FAA has maintained air traffic control equipment through a combination of its own technician workforce and support services contracts. Increasingly, though, instead of contractors designing and building equipment to hand over to FAA to operate and maintain, contracts make private vendors responsible for continuing maintenance of equipment. In some cases, contractors retain ownership of the equipment and may charge FAA for use.

A prime example of these so-called "design, build, maintain" contracting practices is the Automated Dependent Surveillance-Broadcast (ADS-B) ground station contract. ADS-B is the backbone of GPS-based aircraft tracking envisioned as part of the NextGen air traffic modernization initiative. Under the contract arrangement for about 800 ADS-B ground stations that are to relay broadcasts of aircraft position data to ATC facilities, the system developer, ITT Corporation, is to retain ownership of the equipment and maintain and operate the stations through 2025. FAA is to pay a subscription fee to have ADS-B data relayed to its facilities.[41]

The increasing role of contractors in maintaining air traffic control equipment is an interesting development in the context of policy debate regarding ATC corporatization. Advocates of corporatization argue that a corporation would have greater flexibility that could simplify contractual arrangements for maintaining ATC equipment, while those in favor of retaining air traffic as a federal function may point out that FAA is already making effective use of nontraditional contracting practices to implement NextGen.

Air Traffic Corporations in Other Countries

Several countries have established government corporations or private entities to provide air traffic services. Such organizational forms are permissible under international law, which gives countries the exclusive right to regulate and control the use of navigable airspace overlying territorial lands and waters,[42] as well as to regulate and control flight operations in designated airspace regions overlying international waters.

[40] Ibid.

[41] Adrian Schofield, "ADS-B Unleashed," *Aviation Week and Space Technology,* April 27, 2009.

[42] Although there is no uniform consensus regarding the boundaries of sovereign airspace, it is generally considered to correspond with recognized land borders between countries and the limits of territorial waters extending 12 nautical miles from a country's coastline. While no agreement exists regarding the vertical extent of sovereign airspace, common references include a 50-vertical-mile extent and a 62-mile altitude (the Kármán line), both well above the operating altitudes of controlled civilian air traffic, generally below 60,000 feet (roughly 11 miles high).

While most countries have established governmental civil authorities to regulate the use of sovereign airspace, the air traffic services that manage the use of that airspace need not be part of the same entity that establishes regulations. Broadly, these air traffic services include

- air traffic control functions to maintain safe separation between aircraft;
- acquisition and maintenance of air navigation equipment and development and dissemination of procedures and data for safe navigation of the airspace; and
- air traffic management techniques to make efficient use of available airports and airspace, improve traffic flow, and expand airspace and airport capacity.

The term "air navigation services" encompasses all of these components, and has been adopted internationally to refer to the activities carried out by entities performing these functions, which are known globally as air navigation service providers (ANSPs).[43] In addition to its regulatory authority over civilian aircraft operations and airspace, FAA is the ANSP for the United States.

Regulation of flight operations remains mostly a governmental function. Increasingly, however, countries are establishing independent government-owned or private corporations to carry out the operational delivery of air navigation services, including air traffic control, weather reporting, flight planning, and traffic flow management. Wholly government-owned corporations are the predominant organizational structure of air navigation service providers outside the United States, while some countries, like France, Greece, Japan, and Mexico, operate as government agencies similar to FAA and the ATO.

A 2005 GAO study of ANSPs in Australia, Germany, New Zealand, the United Kingdom, and Canada found that all were subject to external safety regulation, operated as self-financed businesses, and, as monopoly providers of their services, constrained by procedural guidelines or economic review and oversight by government.[44] GAO also found that all five of these ANSPs had improved productivity and operational efficiency through investments in facilities and equipment. GAO concluded that commercialization had allowed these ANSPs to implement modernization projects more efficiently through access to cash flow and borrowed funds. Some ANSPs indicated that the corporate model enabled them to buy and modify commercially available products, allowing them to achieve benefits faster and at lower cost than if they had designed and built systems from the ground up. Additionally, the corporate structure allowed European ANSPs to form partnerships for large-scale procurement.[45]

Table 1 provides a general overview of the size and complexity of selected global corporate ANSPs. Data for FAA are provided in the table for comparison.

[43] Civil Air Navigation Services Organisation (CANSO), *Global Air Navigation Services Performance Report 2013: 2008-2012 ANSP Performance Results*, Transpolis Schiphol Airport, the Netherlands, January 2014, https://www.canso.org/sites/default/files/Global%20ANS%20Performance%20Report%202013.pdf.

[44] U.S. Government Accountability Office, Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from Their Commercialization, GAO-05-769, June 2005, http://www.gao.gov/assets/250/247283.pdf.

[45] Ibid.

Table 1. Selected Air Navigation Service Providers

Country	ANSP	Towers	Centers	Employees	Organization
Australia	Airservices Australia	29	2	4,204	Gov't-owned corporation
Belgium	Belgocontrol	5	1	919	Public company
Brazil	Department of Airspace Control (DECEA)	58	5	12,544	Government/ military organization
Canada	NAV CANADA	42	7	4,832	Private company
Estonia	Estonian Air Navigation Services (EANS)	2	1	192	Gov't owned corporation
Finland	Finavia Corporation	25	1	1,612	Gov't-owned public limited corporation
France	DSNA France	86	5	7,846	State agency
Germany	DFS Deutsche Flugsicherung GmbH	16	4	5,938	Gov't-owned company
Greece	Hellenic Civil Aviation Authority	18	2	680	Civil service agency
Georgia	Sakaeronavigatsia Ltd	3	1	767	Gov't corporation
Iceland	ISAVIA Ltd.	3	1	225	Gov't-owned company
India	Airports Authority of India	76	11	18,672	Public sector enterprise
Ireland	Irish Aviation Authority	3	2	642	Commercial state-sponsored body
Italy	ENAV, S.p.A.	40	4	3,276	Joint-stock company
Japan	Japan Air Navigation Service	33	4	4,039	Gov't agency
Lithuania	Oro Navigacija	4	1	314	Gov't-owned company
Mexico	SENEAM	58	4	2,254	Gov't agency
New Zealand	Airways New Zealand	29	1	761	Gov't-owned corporation
Poland	Polish Air Navigation Services Agency (PANSA)	13	1	1,771	"Certified legal entity"
Portugal	NAV Portugal	10	2	993	Gov't-owned company
Romania	Romanian Air Traffic Services Administration (ROMATSA)	16	1	1,516	Self-financed government administration
Russia	State ATM Corporation	250	57	9,500	Gov't-owned corporation
Serbia and Motenegro	Serbia and Montenegro Air Traffic Services (SMATSA)	8	1	865	Limited liability corporation
Slovenia	Slovenia Control, Slovenian Air Navigation Services, Ltd.	4	1	215	Independent gov't-owned company
South Africa	Air Traffic & Navigation Services (ATNS)	23	2	1,050	Gov't-owned corporation

Country	ANSP	Towers	Centers	Employees	Organization
Spain	AENA	22	5	4,249	Publicly owned company
Switzerland	skyguide	14	2	1,330	Nonprofit joint-stock company
Thailand	Aeronautical Radio of Thailand (AEROTHAI)	35	1	2,856	Gov't-owned enterprise
Turkey	State Airports Authority & ANSP (DHMI)	36	2	4,822	Gov't-owned enterprise
Ukraine	Ukrainian State Air Traffic Service Enterprise	15	4	5,464	Gov't corporation
United Kingdom	NATS UK	16	2	4,440	Public-private partnership
United States	Federal Aviation Administration (Air Traffic Organization)	512	21	34,911	Federal agency (separate organization)

Source: Civil Air Navigation Services Organization, *CANSO Members*, available at http://www.canso.org/canso-members.

Note: Bolded countries indicate organizational models examined in further detail in this report.

None of the ANSPs in other countries are comparable to FAA in terms of their size or complexity. Nonetheless, collectively, the ANSPs in Europe bear some similarities to FAA, although European airspace is not as busy as U.S. airspace, primarily because it does not have the volume of nonairline general aviation traffic that the United States does.

Organizational Models of Six Air Navigation Service Providers

The following six sections discuss a broad sampling of the various organizational models seen among ANSPs globally.

Canada

NAV CANADA was established in 1996 as a nonprofit private corporation. It is governed by a 15-member board of directors comprising 4 members representing airlines, 3 representing the Canadian government, 2 from employee organizations, and 1 representing general aviation interests. Additionally, there are four members from outside aviation selected by those stakeholder members, and a company president chosen by those 14. The corporation is broadly described as a private-sector nonprofit company. The company has been established as a nonshare entity, meaning that while user stakeholders are represented on the board, they do not have defined ownership. Long-term financing is obtained through publicly traded bonds.

NAV CANADA sets user fees based on projected flight operations to offset operational costs, capital expenditures, and debt service requirements. NAV CANADA is required to set its charges at levels projected to cover its costs. However, it maintains a rate stabilization account so that it need not raise or lower fees every year in response to changes in air traffic. The process appears to be effective in maintaining stable rates, as NAV CANADA user charges did not increase

between 2007 and 2014. In July 2016 NAV CANADA lowered charges by an average of 7.6% for the year beginning September 1, 2016.[46]

In 2012, NAV CANADA partnered with Iridium Communications Inc., a satellite communications and data network provider, to form Aireon LLC.[47] Aireon is developing a satellite-based global aircraft tracking system using the Iridium NEXT satellite constellation. The system endeavors to provide global air traffic surveillance using 75 low-orbit communications satellites to track aircraft. The company completed its first of eight planned launches, deploying 10 satellites in January 2017, and is conducting testing. Under the arrangement, NAV CANADA will be the first customer for this service, using the satellite-based system to improve surveillance of North Atlantic airspace and of remote regions of northern Canada and the Arctic. Once available, the service may be marketed to other air navigation service providers, airlines, and aircraft operators to provide real-time global flight tracking.

New Zealand

Air traffic services in New Zealand are provided by the Airways Corporation of New Zealand, known as Airways NZ. Airways NZ was one of the earliest corporate models for air traffic control, established in 1987. It is overseen by a seven-member board of directors appointed by the ministers for state-owned enterprises and finance. Airways NZ describes itself as a highly autonomous version of a government-owned corporation, operating largely as a private company with a high degree of economic self-regulation.[48]

Airways NZ sets user fees based on the principle of economic value added (EVA). This operates as a sort of self-regulating scheme under which a portion of net operating profits is returned to system users as rebates. It also consults with users in setting fees through a memorandum of understanding with major airline customers.

Australia

In 1995 the Australian Civil Aviation Authority was divided into Airservices Australia, the ANSP, and the Australian Civil Aviation Safety Authority, the government air safety regulator. Since then, air traffic in Australia has been managed by Airservices Australia, a government corporation. Airservices Australia is managed by a board of directors appointed by the Australian Minister for Infrastructure and Regional Development. The board is composed of a chair, a deputy chair, and six nonexecutive directors, and also includes the chief executive officer.

Airservices Australia revenues derive from a fee-for-service scheme for air traffic services and airport rescue and firefighting services. Airservices' pricing structure is overseen by the Australian Competition and Consumer Commission. Airservices Australia has generally been able to realize operating profits and make investments toward capital expenditures, although a downturn in the domestic aviation market following the collapse of Australia's mining boom has constrained revenue growth. The corporation does not impose charges on most small general aviation aircraft.[49]

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[46] http://www.navcanada.ca/EN/media/Pages/NR-25-2016.aspx.

[47] NAV CANADA, "NAV CANADA Announces Agreement with Iridium To Launch Satellite-Based Aircraft Tracking," press release, June 19, 2012, http://www.navcanada.ca/EN/media/Pages/news-releases-2012-nr21.aspx.

[48] Airways New Zealand, *A Strategic Vision of Air Traffic Management in New Zealand to 2015 and Beyond*, Second Edition, Christchurch, New Zealand, May 2009.

[49] Airservices Australia, *Airservices Annual Report 2015-16*, http://www.airservicesaustralia.com/wp-content/uploads/ (continued...)

Germany

In Germany, air traffic functions were transferred to a state-owned corporation, Deutsche Flugsicherung (DFS), in 1993. The company operates four control centers and manages about 3 million flights annually. It has a staff of about 5,500, of which about 2,000 are air traffic controllers.[50]

In Germany, the push toward a corporate air traffic entity initially came from air traffic controllers who viewed their civil-service wages as being substantially lower than those of colleagues elsewhere in Europe, particularly at Eurocontrol, whose responsibilities include upper airspace in northwestern portions of Germany as well as the Netherlands, Belgium, and Luxembourg. The concept did not move forward for several years, however, until agency officials concluded that the German federal government's annual budget process would constrain efforts to modernize air traffic technical infrastructure. They reasoned that an independent, user fee-funded enterprise could more effectively procure systems and installations. Initially, efforts to privatize air traffic services were hindered by an interpretation that under the German constitution such services were considered "sovereign competencies," or inherently governmental functions typically reserved for civil servants.[51]

Since its inception, DFS has been funded entirely by user fees. Currently, user fees in Germany and across the European Union (EU) are being harmonized under the EU charging scheme. En route service charges have been based on EU regulations since 2012. Terminal services came under EU regulation beginning in 2015. Under the EU scheme, en route charges are based on aircraft weight and distance flown, while terminal services are determined based on aircraft weight.

Switzerland

Air traffic control in Switzerland and portions of adjacent airspace is operated by skyguide. Skyguide operates as a joint-stock company, although the Swiss government must control a majority share. Currently, the Swiss government holds almost all (more than 99%) of the shares, although legally it can hold as little as 51%. Skyguide is overseen by a seven-member board of directors appointed by the shareholders. In principle, skyguide is privately held in a manner similar to NAV CANADA, although in its current form it is more similar to Airways NZ. A successor to Radio Schweiz AG, which had been responsible for air navigation services in Switzerland since 1931 as a nationalized company, skyguide falls under the regulatory authority of the Swiss Federal Office of Civil Aviation.

Skyguide receives the majority of its revenue from charges on overflights, and receives additional revenue from approach charges paid by aircraft using Swiss airports. Skyguide derived about 14% of its 2013 operating revenue for air navigation services from the Swiss government. Additionally, Swiss Air Force compensation for military flights comprises about 8% of skyguide's air navigation services revenue. Skyguide's commercial air traffic revenue has

(...continued)

Annual_Report_2015-16.pdf.

[50] DFS Deutsche Flugsicherung GmbH, *DFS Deutsche Flugsicherung: A Brief Portrait of the Company*, February 2017, http://www.dfs.de/dfs_homepage/en/Press/Publications/dfs_kurzportraet_en.pdf.

[51] Stefan A. Kaiser, "Two Recent German Cases of Privatization: Air Traffic Control and the Space Agency," *Air Law*, vol. XVI, no. 3 (1991), pp. 12-32.

suffered from several years of decline in the number of flights handled, forcing a number of cost-cutting measures and increases to route charges.

Skyguide management was implicated in the July 1, 2002, midair collision north of Überlingen (Lake Constance), Germany, that destroyed a Russian passenger jet and a DHL cargo jet and resulted in 71 fatalities. German air safety investigators found that skyguide did not ensure that all open controller workstations were continuously staffed during late-night shifts. Instead, one controller managed two stations while the other controller on duty rested, a practice that was tolerated by management for several years.[52] Corrective actions were taken based on the findings and recommendations of the investigation. Nonetheless, critics of air traffic control privatization or corporatization have used this as an example of how corporate cost-cutting measures, such as reducing staffing during nighttime lulls, could erode safety.[53]

United Kingdom

In the United Kingdom (UK), air traffic services have operated as a public-private partnership by NATS Holdings Limited since 2001. NATS derives from a predecessor government agency, the National Air Traffic Services. The UK government holds 49% and a controlling "golden" share in the corporation. Initially, the private partner chosen was the Airline Group, a stakeholder conglomerate made up of airlines and aircraft leasing companies. Over the years, the Airline Group ownership has diversified to include institutional investors including the Universities Superannuation Scheme, a pension plan for college educators, which acquired a 49.9% noncontrolling stake in the Airline Group in November 2013.

LHR Airports Limited, formerly the British Airports Authority, was included as a partner in NATS Holdings Limited following a financial restructuring in which it received a 4% stake in the company in exchange for £65 million (roughly $93 million based on exchange rates at the time). As part of the restructuring, the UK government provided a matching £65 million to NATS Holdings to stabilize its finances, which had suffered from the airline industry downturn following the September 11, 2001, terrorist attacks.

Currently, the UK government holds 49% of NATS Holdings, the Airline Group controls 42%, LHR Airports Limited holds 4%, and the remaining 5% is made available to the company's employees through an employee share plan. NATS Holdings operates on a for-profit basis, with its en route air traffic services subsidiary fully regulated economically by the Civil Aviation Authority (CAA). NATS Holdings maintains a separate free-market subsidiary that provides contract air traffic control and other related services at airports both in the UK and internationally. CAA exerts both safety and economic regulation over NATS within the UK.

In December 2014, NATS UK experienced a large-scale system failure at its main air traffic control center in Swanwick, Hampshire, causing widespread delays and cancellations. Some have raised concerns that the failure may be attributable in part to cost-cutting efforts that have delayed upgrades, while others have suggested that NATS UK's selection of a more costly but hard-to-maintain custom configuration may have been a factor.[54] An independent inquiry panel concluded that the event did not lead to any safety incidents and did not fault the CAA's oversight of NATS.

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[52] German Federal Bureau of Aircraft Accidents Investigation, *Investigation Report: Accident, 1 July 2002 (near) Ueberlingen/Lake of Constance/Germany*, AX001-1-2/02, May 2004.

[53] See, e.g., National Air Traffic Controllers Association, *Formalizing 'Inherently Governmental' Status of Air Traffic Services*, http://www.natca.org/legislative_current_issues.aspx?zone=Legislative-Current%20Issues&pID=198.

[54] Peggy Hollinger and Elizabeth Rigby, "Nats Defends Air Traffic System as Failure Scrutinised," *Financial Times*, December 15, 2014.

Rather, the panel found that ongoing efforts to harmonize with European Union Single European Skies initiatives had inadequately addressed system resiliency and the potential impacts of disruptions on system users, including airlines and airline passengers. It suggested that NATS provide stronger financial incentives to managers for meeting goals and develop long-term objectives for mitigating system delays and improving resilience.[55]

Comparisons Among Air Navigation Service Providers

Comparing performance among ANSPs is difficult, as performance may be affected by a variety of unique factors. Europe, for example, has 37 separate ANSPs operating 63 en route facilities to manage airspace only slightly larger than that of the United States, but with only 63% as much air traffic and far fewer general aviation flights.[56] While much of Europe has moved to corporatized models for managing air traffic control over the past 25 years, direct comparisons with the government-run model of the United States have significant limitations due to these differences.

The main source of data on the productivity and relative costs of ANSPs is the Civil Air Navigation Services Organization (CANSO), a global trade organization of which FAA and other major ANSPs are members. While CANSO has endeavored to develop a process for directly comparing productivity and cost among ANSPs, not all members provide it with the necessary data for making direct comparisons. Of the ANSPs providing comparable data to CANSO, only one, NAV CANADA, handles slightly more than one-tenth the volume of air traffic handled by FAA.

Statistical analysis provided by CANSO offers a means to compare ANSPs in terms of productivity and cost-effectiveness. Since productivity and cost metrics are calculated based on air traffic controller workforce size, air traffic controller labor costs, and air traffic volume, productivity will tend to be low in countries where traffic is comparatively sparse, and costs will be comparatively greater in regions where labor costs are generally high. In examining performance and safety, it is often more meaningful to look at changes over time for individual ANSPs, rather than comparisons between ANSPs, recognizing that trends may be influenced by other factors besides the structure and operations of the ANSP.

Productivity

CANSO defines productivity as the number of flight hours completed by aircraft operating under instrument flight rules (IFR)[57] logged by an ANSP divided by its operational air traffic controller workforce. The resulting metric, IFR flight hours per air traffic controller, provides a rough indication of controller workload. Productivity is highly correlated with traffic density.

CANSO data for 2014 show that FAA handled 1,767 IFR flight hours per air traffic controller, while NAV CANADA's productivity topped the list at 1,843 IFR flight hours per controller.[58] By

[55] Robert Walmsley, et al., *NATS System Failure 12 December 2014 – Final Report, Independent Inquiry, May 13, 2015*, https://www.caa.co.uk/WorkArea/DownloadAsset.aspx?id=4294974241.

[56] EUROCONTROL Performance Review Commission and FAA Air Traffic Organization System Operations Services, *2012 Comparison of Air Traffic Management-Related Operational Performance: U.S./Europe*, 2013-AJR-887, Washington, DC, November 2013.

[57] Aircraft operated under instrument flight rules (IFR) are those under direct air traffic control procedures and separation standards.

[58] Civil Air Navigation Services Organization (CANSO), *Global Air Navigation Services Performance Report 2015 (2010-2014 ANSP Performance Results: The ANSP View)*, https://www.canso.org/global-ans-performance-report-2015-ansp-view.

comparison, Japan's ANSP handled 1,639 IFR flight hours per controller, and in Mexico, the typical controller handled 1,421 IFR flight hours. A number of smaller countries, including Iceland, Finland, Lithuania, Georgia, Ukraine, and Slovenia, had fewer than 700 IFR flight hours per controller. In contrast, Estonia's ANSP, while also small in size, handled 1,258 IFR hours per controller in 2014, suggesting that large-scale operations are not necessarily a requisite for attaining high ANSP productivity levels.

FAA controllers logged, on average, 1,824 total work hours in 2014, compared to 1,624 hours for NAV CANADA controllers. The average annual controller working hours across all participating ANSPs was 1,607 hours. In Thailand, controllers logged more than 2,800 work hours on average in 2014 to address high growth in air traffic, whereas controllers in Serbia and Montenegro spent on average 1,152 hours on duty, which was the lowest reported average for controller work hours among participating ANSPs.

Cost-Effectiveness

A 2009 report found that the ANSPs in Australia, Canada, New Zealand, and the United Kingdom reduced costs per IFR aircraft movement between 5% and 15% from 1997 to 2004.[59] The study found that in France, where air traffic services are carried out by a government agency, costs were reduced by about 15%, so cost savings are not entirely unique to corporate or private ANSPs. However, over the same period, FAA's operating costs increased by more than 20%, driven in part by labor costs that increased at rates higher than those of any other ANSP.

As reported by CANSO, operating costs among ANSPs for air traffic services provided to aircraft other than those operated on oceanic routes in 2014 ranged between $122 per IFR hour in India and $1,232 per IFR hour in Iceland, with an average cost among responding ANSPs of $498 per IFR hour. FAA costs were slightly lower than average, at $465 per IFR hour. While FAA's annual costs per IFR hour had been rising at a higher-than-average rate, with an average annual change of 5.8% observed between 2008 and 2012, average annual cost increases dropped to 2% between 2010 and 2014. Comparatively, NAV CANADA's costs were $321 per IFR flight hour, with an average increase of roughly 3% annually between 2010 and 2014.

A major influence on the cost-effectiveness of air traffic services is controller employment costs. Direct comparisons of costs are difficult to gauge due to widely disparate wage rates and cost-of-living differences across the various countries. FAA and NAV CANADA air traffic controller costs per IFR hour were nonetheless very similar at roughly $110 and $123 per IFR hour, respectively. CANSO also examined employment costs per IFR flight hour, adjusted for purchasing power parity (PPP) to reflect those cost-of-living differences. This comparison indicated that controller costs at FAA and NAV CANADA were nearly identical at about $109-$110 per IFR hour. In 2014, annual costs per controller were virtually identical at FAA and at NAV CANADA, totaling roughly $200,000.

This was not previously the case. In 2012, PPP adjusted employment costs for domestic operations averaged $82 per IFR hour at NAV CANADA compared to $110 per IFR hour for FAA.[60] Comparatively smaller increases in controller costs at FAA have narrowed this difference considerably over the past few years. Whereas FAA's annual average change in controller

[59] Glen McDougall and Alasdair Roberts, "Commercializing Air Traffic Control: Have the Reforms Worked?" (Legal Studies Research Paper Series, Research Paper 09-11, Suffolk University Law School, Boston, MA, 2009).

[60] Civil Air Navigation Services Organisation (CANSO), *Global Air Navigation Services Performance Report 2013: 2008-2012 ANSP Performance Results*, Transpolis Schiphol Airport, the Netherlands, January 2014, https://www.canso.org/sites/default/files/Global%20ANS%20Performance%20Report%202013.pdf.

employment costs between 2008 and 2012 was 5.0%, the average annual increase over that period for NAV CANADA was 0.4%. In contrast, between 2010 and 2014, FAA controller costs increased by about 1% annually, whereas NAV CANADA controller costs increased by about 2% annually.[61] This has resulted in a convergence of controller costs per flight hour in comparing FAA to NAV CANADA, with the two organizations closely matched on this metric based on 2014 data.

Performance and Service Quality

A 2009 research report concluded that service quality among corporatized or privatized ANSPs has improved in most cases.[62] Performance improvements included improved flight efficiencies and reduced delays. The study found that between 1997 and 2004, airline delays attributable to air traffic control had decreased at several corporate air navigation service providers including NATS UK, skyguide in Switzerland, DSNA in France, and DFS in Germany. The study attributed service quality and performance improvements to technological modernization. The study reasoned that no longer having to compete for funds with other government projects as well as extensive input from airspace users allowed these ANSPs to pursue technology projects having the greatest anticipated impact on service quality. The researchers found that commercial and private ANSPs were more willing to forgo nonessential features and use off-the-shelf solutions to assure faster implementation and lower acquisition costs. The researchers contrasted this to FAA efforts, which have typically suffered from delays and cost overruns. These acquisition delays, they argue, have affected operational performance and service quality.

While some tangible aspects of service quality have improved under corporate or private models, it remains unclear whether this has had any effect on system users' satisfaction and perceptions of service quality. Data on this issue are limited. In one 2006 survey, perceptions of service quality and satisfaction with the delivery of air traffic services were found to be better among U.S. pilots reporting on FAA performance compared to Canadian pilots reporting on their experiences with NAV CANADA.[63]

Safety and Security

A 2005 study examining ATC systems in Australia, Germany, New Zealand, and Switzerland concluded that these corporate models fostered improved safety, but conceded that safety could not be adequately measured or forecasted.[64] More systematic analysis of safety under several corporate and private ATC models was reported in a 2009 study.[65] Findings indicated that several corporate air traffic service providers reduced rates of serious air traffic-related safety incidents between 1997 and 2004. The researchers concluded that "commercialization" of air traffic services did not erode safety culture and oversight. Executives at air navigation service providers indicated that safety was integral to their business, while government safety regulators described

[61] Civil Air Navigation Services Organization (CANSO), *Global Air Navigation Services Performance Report, 2015 (2010-2014 ANSP Performance Results: The ANSP View)*, https://www.canso.org/global-ans-performance-report-2015-ansp-view.

[62] Ibid.

[63] Michael W. Essner, "Air Traffic Control Service Quality in the United States and Canada: A Comparative Analysis Using the Servqual Model," (PhD Dissertation, Capella University, 2007).

[64] Anthony W. Adams, "The Effects of Air Traffic Control Privatization on Operating Cost and Fight Safety," *Journal of Aviation/Aerospace Education & Research*, vol. 14, no. 3 (Spring 2005), pp. 21-30.

[65] Glen McDougall and Alasdair Roberts, "Commercializing Air Traffic Control: Have the Reforms Worked?" (Research Paper 09-11, Legal Studies Research Paper Series, Suffolk University Law School, 2009).

their role as being the same as conducting oversight and regulatory enforcement among airlines. In Canada, both safety regulators and investigators from Transport Canada and the Canadian Transportation Safety Board reported "that there had been more reliable reporting and a stronger safety culture since commercialization."[66] The view that safety culture, safety data reporting, and visibility of safety improved under corporate or private structures was echoed by several other safety regulators. There was broad consensus among regulators that safety is not compromised by corporatization or privatization, and data indicated a general trend of reductions in serious safety incidents among these ANSPs.

The September 26, 2014, arson at FAA's Chicago air traffic control center highlighted the potential physical security risks posed by contractors and employees with access to facilities. Nonetheless, there is no conclusive evidence that corporate or private entities are less capable then federal agencies of providing adequate security. Most critical infrastructure in the United States, such as chemical plants, refineries, pipelines, and the electrical grid, is owned, operated, and maintained by private corporations.

Considerations for Further Debate

The prospect of reforming FAA air traffic services into a government corporation or private entity raises many unique challenges to be considered in crafting and debating enabling legislation. This section reviews some of the key considerations.

Corporate Framework and Governance

The organizational structure and managerial and financial oversight of a new air traffic services entity could take one of many forms. The U.S. government already has made use of most of these models for other purposes, and they have been employed for air traffic control in other countries.

Government Corporations, Quasi-Governmental Organizations, and Service Contracts

A number of entities fall under the broad rubric of "quasi-governmental organizations" and exist as hybrids between governmental and private sectors. Examples include the Tennessee Valley Authority, mortgage lender Fannie Mae, intercity passenger rail provider Amtrak, the Smithsonian Institution, and the National Academies. FAA itself works closely with the MITRE Center for Advanced Aviation System Development, a congressionally chartered not-for-profit corporation, on air traffic control technologies.

Many federal agencies rely on contracts with private-sector entities to provide goods and services. FAA itself has extensive experience with outsourcing both major acquisitions of air traffic control technologies and certain operational aspects of the national airspace system. To date, FAA has not outsourced any operations associated with radar control of air traffic, such as terminal radar approach control (TRACON) facilities and en route centers, and has contracted out air traffic services only at low-activity nonradar towers.

[66] Ibid., p. 8.

Public-Private Partnerships (P3s)

Although NATS UK is a unique example of public-private partnerships (P3s) in air traffic control, Congress has shown great interest in P3s in other fields as a means to leverage government assets, potentially reduce federal government costs, and share risks with private firms. Some federal agencies, especially the Department of Defense and the Department of Veterans Affairs, have relied extensively on public-private partnerships for real-property management.[67] DOT has encouraged states to use P3s to design, build, maintain, and operate highway and public transportation projects.[68] A P3 approach could be regarded as a hybrid between a government-owned corporation and a completely private entity, with both the federal government and aviation industry stakeholders sharing in financial and organizational oversight.

Private Corporations

Creation of a private corporation regulated by the FAA could be similar in corporate structure to NAV CANADA, in which stakeholders with diverse interests are represented in corporate governance through the board of directors. While a private air traffic services corporation could be publicly traded, it may be preferable to be closely held only by aviation industry stakeholders. NAV CANADA, the one clear example of a private corporation, is relatively closely held by a relatively small group of industry stakeholders. This is considerably different from a company whose stock or shares are publicly traded. In theory, ownership of Switzerland's skyguide, which can profit from the fees collected for its services, could be more widely distributed to interested public parties. However, limited investor interest has meant that skyguide has remained almost totally under government ownership.

Organizational Structure and Elements

The "FAA Management Advisory Council Report (2014)" called for separating out FAA's Air Traffic Organization as a service-oriented unit that could be spun off as a corporate entity. However, corporatizing ATO as it currently exists could prove problematic because certain closely related functions, such as facilities and equipment acquisition and maintenance, would be left with FAA. This might leave ATO to use buildings and equipment over which it would not have control. While the current Federal Contract Tower program operates in this way, it is not the model employed in most international examples of completely corporatized air traffic service organizations. In most countries that have corporate air traffic organizations, the air navigation service provider owns the communications, navigation, and surveillance equipment that provides the technology for air traffic control. Such ownership generally allows air traffic services corporations to invest directly in service contracts, equipment replacement, and large-scale technology modernization initiatives. It is unclear how such arrangements would work in the United States if ATO were spun off without the associated facilities and equipment procurement and maintenance functions.

One of the purported advantages of corporatization or privatization of FAA is that this could facilitate efforts to modernize equipment and technology, particularly the complex and costly NextGen air traffic systems modernization initiative. If the proposed corporation does not have

[67] CRS Report R43337, *Public-Private Partnerships for Purposes of Federal Real Property Management*, by Garrett Hatch and Kathleen Ann Ruane.

[68] CRS Report R43410, *Highway and Public Transportation Infrastructure Provision Using Public-Private Partnerships (P3s)*, by William J. Mallett.

specific ownership of the equipment and facilities it operates, its role in modernization efforts may be more limited, and procurement activity might remain within FAA and under existing legal authorities and appropriations.

A more comprehensive transition to a corporate structure allowing for greater autonomy with respect to acquisitions and maintenance might include facilities and equipment functions directly tied to air traffic services. These functions are now funded through FAA's Facilities and Equipment Account. While they could logically be transitioned to a corporate air navigation service provider, policy makers may wish to retain functions related to performance testing or certification of air traffic and air navigation equipment as governmental regulatory functions. For example, flight testing that checks and certifies the operational performance of navigation facilities like instrument landing systems could arguably be regarded as regulatory certification activities and thus retained under FAA's safety functions. On the other hand, it could be argued that certain elements of such activities are central to maintaining operational reliability of air traffic control.

The one past legislative attempt to deal directly with this issue, the United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress), expressly directed FAA to transfer to USATS possession, use, and control of all real property, equipment, frequency licenses, patents, and software rights necessary to carry out the functions being transferred to the corporation. However, the bill would have left it up to the FAA Administrator and the chief executive officer of the newly formed USATS to determine which functions and employees would be transferred from FAA to the corporation.

Similarly, H.R. 4441 (114th Congress) would have transferred to the proposed ATC Corporation without any cost all property, including air navigation facilities, as well as any rights to licenses, patents, software, and access to radio frequency spectrum systems and data determined necessary and appropriate to carry out air traffic services. It stipulated that if the corporation were to sell assets provided to it by the federal government without charge, it would use any proceeds for the acquisition of air navigation facilities or other capital assets of the corporation. Any property conveyed to the corporation that is located at an FAA technical facility would have been required to be reverted to federal government ownership and placed under the control the Secretary of Transportation if either the corporation determined that it no longer needed the property to carry out air traffic services or the Secretary determined that the reversion was necessary to protect the interests of the United States.

Corporate Financing and FAA Funding

Historically, proposals to corporatize or privatize air traffic services in the United States have been intertwined with debate over the implementation of user fees for air traffic services. Although a government-owned corporation could be financed much as the FAA is financed today, through a combination of taxes and fees on passengers and cargo, an air traffic control organization owned by stakeholders or investors presumably would seek a fee structure that would enable it to recover the costs of providing various types of service.

NAV CANADA offers one example of such a fee structure. NAV CANADA is required by law to set rates for recreational and private aircraft in a manner that is not unreasonable and undue. It charges propeller aircraft weighing less than 2 metric tons (about 4,400 pounds) an annual fee of C$68 (US$59), and propeller planes weighing between 2 and 3 metric tons pay a C$227 (US$196) annual fee. Small propeller planes do not pay additional fees for using traffic control services, except when they fly to or from certain international airports.

For larger private planes and commercial aircraft, on the other hand, NAV CANADA charges fees that take into account aircraft weight and distance flown through controlled airspace. Rates, based on the maximum operating weight of each type of aircraft, are applied to a formula to assess each flight's costs for air traffic services. For example, a Boeing 737 flying from Toronto to Winnipeg may incur the following charges:

- **En route Charge** = En route Rate (0.03194) x En route Weight Factor (8.24621) x En route Distance (1,374 km) = C$**361.89**; plus
- **Terminal Services Charge (Toronto and Winnipeg)** = Terminal Rate (24.14) x Terminal Weight Factor (29.242) = C$705.90.

The total user fee for air traffic services provided for this hypothetical flight (excluding temporary adjustments) would therefore be C$1,067.79. The same route flown with a different aircraft would incur a different fee. Operators of smaller jets are permitted to pay a daily use charge that covers both en route and terminal services rather than fees based on weight and distance, and may find this more advantageous. For example, a 15,000-pound business jet making a round trip from Toronto to Winnipeg in a single day would incur charges totaling approximately C$460 based on the aircraft's weight and distance flown, but the operator could elect to pay a flat daily charge of C$331.34 instead.[69]

The United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have authorized the USATS corporation to impose fees on commercial air traffic for its services. Similarly, the Next Generation Air Transportation System Financing Reform Act of 2007 (H.R. 1356, 110th Congress) sought authorization for FAA to implement a schedule of user fees for air traffic control in terminal, en route, and oceanic airspace. Most small general aviation aircraft would have been exempt from the fees, unless operating in busy terminal airspace, but would have paid higher fuel taxes.

A changeover to user fees to fund air traffic services could create uncertainty as to how other elements of FAA's budget, including airport improvement grants, would be paid for. Currently, AATF revenue collections fund these activities, while FAA operations are funded in part by Treasury general fund appropriations. Under a system in which an air traffic services corporation is funded by user fees, the AATF could be retained and the fee collection schedule revised to provide funding for airport improvements and FAA aviation safety and research and development functions. Alternatively, additional fee structures and funds could be established for these activities. However, attempting to encompass FAA funding in the user fee structure for an air traffic services corporation poses several challenges, as outlined below.

A 2016 GAO report offered several suggestions on transitioning to a user fee-funded structure based on input from officials in selected countries that had implemented user fee systems and transitioned to corporate models for providing air traffic services. Those suggestions included communicating with stakeholders early in the transition about the changes to the financing structure; adopted a transitional or phased approach for moving from current revenue streams such as taxes to user fees; and incorporating risk mitigation mechanisms, such as a dedicated reserve fund, into the finance structure.

The Aviation Innovation, Reform, and Reauthorization Act (H.R. 4441, 114th Congress) would have authorized the proposed ATC Corporation to assess and charge fees for air traffic services and would have required that any proposed charge or fee be approved by the corporate board of

[69] NAV CANADA, *Customer Guide to Charges (Effective September 1, 2016)*, Ottawa, ON, Canada, http://www.navcanada.ca/EN/media/Publications/Customer-Guide-Charges-EN.pdf.

directors. The bill stipulated that the fees must comport with the International Civil Aviation Organization's Policy on Charges for Air Navigation Services. It would have prohibited fees on military aircraft, piston engine aircraft, noncommercial jets and turboprops, and air taxi flights servicing remote locations.

H.R. 4441 did not specify any FAA Operations and Maintenance or any Facilities and Equipment funding derived from the Airport and Airway Trust fund beyond FY2019, the point at which the proposed corporation was to take over air traffic services. The bill, however, sought to authorize Treasury general fund amounts of roughly $1.7 billion annually for FAA Operations and Maintenance in FY2020, 2021, and 2022. This would presumably have allowed for the continued funding of FAA aviation safety programs, including safety oversight or airlines and other aircraft operators as well as safety oversight of the proposed ATC Corporation, included in its Operations and Maintenance portfolio. For FY2019, H.R. 4441 specified $8.374 billion from the trust fund for Operations and Maintenance, and $3,048 for Facilities and Equipment. Beyond FY2019, activities funded under this authorization were to be carried out by the corporation and the costs for conducting those activities were to be recovered through user fees.

The bill was silent with respect to how the underlying tax scheme that currently funds the Airport and Airway Trust fund might be modified to reflect that trust fund revenue would no longer be required to provide for providing air traffic services and for related facilities and equipment costs. While it was not addressed in the bill, one option would be to eliminate or reduce passenger ticket taxes and cargo taxes that currently provide substantial revenue to the Airport and Airway Trust fund. This could, in effect, act as an offset to the proposed user fee for commercial operators. If fuel taxes were to remain, revenue collected from these taxes could be used to offset the cost of FAA safety and airport grant programs rather than being applied to the costs of air traffic services. H.R. 4441 did specify funding authorizations for airport grants of more than $3.6 billion annually in FY2020, 2021, and 2022, suggesting that some modification of the current aviation tax scheme would be sought to continue airport grant funding while adjusting tax revenues to reflect the transfer of air traffic services and associated costs to the proposed ATC corporation.

Fiscal Stability

Funding stability has been one of the key challenges facing corporate air traffic entities, whose operations and fee structures fall under varying degrees of governmental economic regulation.[70] In some cases, government overseers have blocked proposed fee increases, notably in cases where they perceived economic factors contributing to revenue declines to be temporary. Such restrictions can in some case have a destabilizing effect. For example, at its inception, NATS UK was restricted from raising rates beyond a certain level tied to retail price index.[71] This proved problematic following the 9/11 attacks in 2001, when significant declines in commercial aviation activity led to revenue shortfalls for NATS UK.

Various countries have adopted different approaches to addressing the challenge of maintaining fiscal stability for air traffic service providers while controlling rates. NAV CANADA is required to set rates at reasonable levels commensurate with current and future financial requirements, but has been permitted to establish a formal rate stabilization account so it need not raise or lower rates every time air traffic declines or increases. New Zealand has approached this issue quite differently by giving Airways NZ more autonomous self-regulation with regard to fee setting.

[70] Ira Lewis, "Analysis of Alternative Institutional Arrangements for Reform of U.S. Air Traffic Control," *International Public Management Journal*, vol. 7, no. 3 (2004), pp. 385-414.

[71] Ibid.

Under this arrangement, Airways NZ has entered into agreements with stakeholders to create a structure under which Airways NZ sets rates in a stabilized manner, applying excess revenues as adjustments or credits to reduce user charges in subsequent years. This approach, which yielded minimal increases in user charges during the post-2001 decline in air traffic, was lauded by the International Air Transport Association, an international trade organization for airlines, in 2003.[72]

The 2016 GAO report concluded that building risk mitigation mechanisms into the financial structure of a stand-alone air traffic services corporation may help establish fiscal resilience to downturns in air traffic that reduce user fee revenues.[73] To avoid situations in which a highly leveraged company may become troubled if faced with an unanticipated drop in air traffic and user fee revenues, GAO pointed to NAV CANADA's establishment of its rate stabilization account as a means to provide reserve funds to offset decreased revenues, maintain strong liquidity for covering operating costs and servicing debt, and help stabilize user fees so that they are less likely to rise significantly during economic downturns, when fee increases would most likely impose a larger burden on system users.

Access to Financial Markets

One possible advantage of a private or corporate model would be the corporation's ability to issue equity and bonds. Advocates of corporatization or privatization argue that access to bond markets could provide capital to fund major technology upgrades and system modernization projects, such as the NextGen initiative. The ability to issue equity would be more significant if the corporation were to be under private ownership; shares of stock could be sold to attract additional participants to the ownership consortium, to compensate employees, or to acquire other companies.

In 1993, the National Commission to Ensure a Strong Competitive Airline Industry recommended that the corporate entity it proposed to establish within DOT have the ability to issue long-term bonds for capital purchases. Similarly, the United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have given the proposed USATS corporation specific authority to incur debt through notes or other obligations either to the U.S. Treasury or to private entities through instruments such as corporate bonds. The bill would have capped the corporation's total outstanding balance on all debts at $15 billion. Plans to incur debt would have required the review and approval of the Secretary of Transportation under the proposal.

If it wished to give an independent air traffic control corporation the ability to issue bonds, Congress would face consideration of the tax status of those instruments. Publicly owned airports generally issue tax-favored municipal bonds to meet their capital needs; as investors are not liable for taxes on the interest payments, the issuers can obtain lower interest rates than are available with taxable bonds.

Privately owned companies and U.S. government entities, however, generally do not have access to the tax-exempt bond market. Unless Congress were to dictate otherwise, debt issued by an air traffic control corporation owned by private investors or by the U.S. government would be taxable to investors, requiring the corporation to pay higher interest rates than borrowers of similar credit quality in the municipal bond market. In addition, the corporation might have to pay higher interest rates on borrowings than the U.S. government itself, unless the government pledged its full faith and credit to servicing the corporation's debt. The United States Air Traffic

[72] Ibid.

[73] U.S. Government Accountability Office, *Air Traffic Control: Experts' and Stakeholders' Views on Key Issues to Consider in a Potential Restructuring*, GAO-17-131, October 2016.

Service Corporation Act (H.R. 1441, 104th Congress) would have specifically exempted the proposed USATS and interest on its debts from any state and local taxes, although the bill was silent with respect to federal taxes imposed on holders of the corporation's debt.

H.R. 4441 (114th Congress) included language specifying that any debt assumed by the proposed ATC Corporation would not have any implied or explicit backing or guarantee from the federal government. While the bill sought to establish the ATC Corporation as a not-for-profit entity exempt from corporate taxes under the provisions of section 501(a) the Internal Revenue Code of 1986, this would not create any particular tax-related incentives for investors owning the corporation's bonds. The legislation did not provide any explicit tax-preferred treatment to debt issued by the proposed corporation. The lack of government backing or tax incentives may make debt instruments issued by the corporation less attractive to investors. Therefore, the corporation may need to repay money at higher interest rates than, for example, municipal bonds that may offer tax-related incentives for investing or government-backed bonds that may be regarded as less risky investment alternatives.

Transition Plans

Initially, the workforce would change little under a gradual transition from FAA air traffic operations to an air traffic services corporation. The only source for sufficient numbers of qualified air traffic controllers and technicians would be FAA, and under any transition plan, the large majority of the FAA workforce (roughly 35,000 positions tied to air traffic services) would need to be shifted to the new corporation. The new management would face a need to maintain pay and benefits to assure workforce stability and continuity during the transition.

The situation might be different for management personnel, as the new organization might favor different managerial practices and approaches to meeting objectives. For this reason, reform proposals might include long-range plans for aligning the workforce with stated organizational objectives. These might involve performance-driven compensation, rewarding employees who achieve specific targets and deadlines, or providing wider incentive pay if the new organization reaches specified milestones for organizational change, cost savings, and system performance.

There is limited research on the experiences of other air traffic service providers who have transitioned from a government agency to a corporate entity. Anecdotal accounts of fiscal problems faced by corporate and private air traffic service providers suggest that the availability of start-up capital or other mechanisms to stabilize funding during the transition period may be important considerations. During the transition, a start-up fund or similar instrument may help assure that the entity has sufficient operating funds to stabilize itself in the case of unforeseen external events that could significantly impact revenues. Transition plans may therefore want to consider explicit provisions regarding financing for startup and transition costs and mechanisms to ensure the corporation's fiscal stability during the early years. The United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have transferred from the AATF the obligated but unexpended balance of appropriations for air traffic services and facilities to the proposed USATS to cover the commencement of operations.

The 2016 GAO report concluded that transitioning air traffic services from FAA to a separate ANSP would be moderately challenging and would likely involve legal, financial, and administrative costs.[74] Experts interviewed by GAO estimated that it may take about a year to

[74] U.S. Government Accountability Office, *Air Traffic Control: Experts' and Stakeholders' Views on Key Issues to Consider in a Potential Restructuring*, GAO-17-131, October 2016.

negotiate and plan the transfer of duties and responsibilities, and another two years or so to implement the required actions under the transfer. GAO noted that establishing and maintaining good lines of communication between the safety regulator, the new corporate ANSP, employees of the corporation, and stakeholders could help ease the transition.

H.R. 4441 (114th Congress) set up a timeframe of roughly three years before the proposed corporation was to take over responsibility for air traffic services at the beginning of FY2020. The bill would have required FAA and the corporation to meet with labor representatives to resolve issues related to the transition at least one year before the transfer date and included specific provisions for handling disputes that may arise regarding matters pertaining to the transition. It would have also required the Department of Transportation Office of Inspector General to issue quarterly reports informing Congress regarding the progress made on plans to transfer operational control of air traffic services by the Department and the corporation.

Labor Provisions

In general, FAA controllers and technicians, as government employees, are entitled to collective bargaining under the terms set forth in Title 5 U.S.C., Chapter 71. Labor organizations representing FAA employees, however, are prohibited from calling a strike, work stoppage, or slowdown, or organizing a picket that disrupts operations.[75] President Reagan invoked these statutes in 1981, revoking recognition of the Professional Air Traffic Controllers Organization and firing controllers who continued to strike.

In contrast, corporations and labor organizations representing employees outside of government are generally covered under the labor provisions of Title 29 U.S.C., and in particular Chapter 7—Labor-Management Relations, of that title. In general, those provisions allow for lawful strikes or lock-outs as a measure of last resort once collective bargaining obligations have been met. A special provision in law requires a labor organization to give notification 10 days prior to striking, picketing, or engaging in any other concerted refusal to work at any health care facility.[76] No similar provision currently exists for air traffic facilities. The United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have given corporation employees the right to form a union and bargain collectively, but would have expressly prohibited strikes, work stoppages, or slowdowns. Airlines are generally covered under the Railway Labor Act, which bars strikes over minor disputes and permits them over major disputes only after all other negotiations and mediation procedures have been exhausted. The Railway Labor Act also gives the courts authority to order strikers back to work if legal conditions are not met. Such a framework could potentially be an alternative model for an air traffic services corporation, as it would not expressly prohibit strikes, but would place strong legal restrictions on such actions.

H.R. 4441 (114th Congress) included extensive language on employee management. The bill would have given the proposed corporation's CEO full authority over defining needed positions, hiring, and setting the compensation and benefits for employees. In setting wages, hours, and other terms and conditions of employment the corporation would have been required to negotiate with designated labor organizations representing workers, and the bill included extensive rights for designated employee representatives to collectively bargain over such matters. For FAA employees transferred to the corporation, the bill offered specific provisions allowing workers to keep most of their federal retirement, health care, and certain other benefits.

[75] 5 U.S.C. §7116, §7120.

[76] 29 U.S.C. §158(g).

Under the terms of the bill, choosing whether to remain under the federal benefit programs would have been the choice of the transferred employee, and the corporation would have been responsible for paying appropriate costs associated with an employee's continued participation in such benefit programs. Newly hired employees of the corporation would not have had any right to participate in these federal benefit programs, but instead would have been covered under benefit programs established by the corporation and agreed to through collective bargaining. The bill would have specifically required the corporation to recognize and engage in collective bargaining with labor organizations chosen to represent employees regarding such matters.

Safety Regulation and Oversight

Currently, FAA promulgates orders and procedures governing air traffic operations and procedures for both ATO and contract towers. Internal oversight and disciplinary action are largely handled within FAA. However, broad oversight is provided by the DOT Office of Inspector General, as well as by the Department of Justice regarding matters of potential criminal wrongdoing.

FAA's current safety oversight of commercial airlines could readily serve as a framework for safety oversight of one or more air traffic services entities. Also, within the current ATO structure, FAA already oversees operations at federal contract towers, and it has processes in place for monitoring the safety of air traffic operations internally. These various elements could be combined to create safety regulations and policies for an independent air traffic services entity, whether it be a government corporation, a private corporation, or a public-private partnership.

A 2016 GAO survey of aviation experts and stakeholders concluded that delineating roles and responsibilities between FAA and a separate ANSP would be a key consideration in transitioning to a private or corporate ANSP model.[77] All experts polled by GAO agreed that aviation safety oversight and regulation should remain an FAA responsibility. However, experts were split on whether a newly formed ANSP should play a role in defining navigational procedures and other flight operational standards regarding airspace users' interactions with and use of air traffic services. Most experts surveyed expressed the view that global harmonization efforts should be a responsibility of both the safety regulator and the ANSP. GAO emphasized the importance of clearly delineating and documenting roles, noting that current FAA orders and directives would need to be codified to clearly document regulatory requirements of any new stand-alone ANSP that was completely separate from the safety regulator. It also concluded that a defined transitional period would likely be needed to clearly establish roles and responsibilities, noting that during the transition in Canada, the safety regulator (Transport Canada) and the ANSP (NAV CANADA) agreed not to make any changes regarding operations during the first two years, keeping procedures and manuals of operation consistent during that time. Such a moratorium on procedural or operational changes could be difficult to accomplish if the separation of air traffic services from FAA were to overlap with transformational efforts such as changes to air traffic separation standards, flight routes, approach procedures, and pilot-controller communications envisioned under the NextGen program.

H.R. 4441, 114th Congress, would have required the Secretary of Transportation to develop performance-based regulations and safety standards for air traffic services prior to the transfer. The corporation would have been required to integrate conforming airspace management and operational procedures under a comprehensive safety management system that would be subject

[77] U.S. Government Accountability Office, *Air Traffic Control: Experts' and Stakeholders' Views on Key Issues to Consider in a Potential Restructuring*, GAO-17-131, October 2016.

to regulatory oversight. Under the scheme for delineating roles and responsibilities, the proposed ATC Corporation or other interested parties, such as airlines, the military, and other airspace users, would have been allowed to submit proposals for changes to air traffic management procedures, airspace classifications, or other actions affecting airspace access to the Secretary of Transportation for review, consideration, and action. The bill included language generally requiring the Secretary to issue decisions within 45 days and allowing for judicial review of those decisions. Temporary airspace actions and emergency actions would generally have been exempt from this process.

Safety and the Profit Motive

Concerns over potential conflicts between safety and profit have been a central theme of criticisms of a corporate or private approach.[78] NAV CANADA was structured as a nonprofit corporation to address concerns that profit motives could interfere with safety objectives. Other ANSPs, however, including NATS UK and skyguide in Switzerland, are operated on a for-profit basis.

Safety is not incongruent with for-profit models in aviation; the entire U.S. airline industry is privately owned, with a government agency, FAA, providing oversight. However, the analogy is imperfect because air traffic services typically exist as monopolies, similar to utility companies; the lack of competition eliminates the ability for a customer to choose a provider based on its safety record. Safety of a for-profit monopoly air traffic services provider would likely be overseen predominantly by FAA, which would need the power to impose fines or other punitive actions to address regulatory violations. Establishing the ANSP as a nonprofit organization, as NAV CANADA has done, may help improve cooperation among operators and regulators and improve safety culture.

The air traffic services corporation that would have been chartered under H.R. 4441 would have been operated as a not-for-profit entity, without outside investors. Nonetheless, since the proposed corporation was to be user fee-funded, system users might have balked at significant fee increases to support safety programs without direct benefits for themselves. For example, airlines may be hesitant to agree to increased user fees to improve the safety of air traffic procedures at small general aviation airports that they do not use. Balancing the makeup of stakeholder representation on the corporate board may be a prerequisite for assuring that safety initiatives are supported and funded.

Corporate Liability

Financial liability is a potential concern for a corporatized air traffic services entity. Tort claims may arise against the corporation. For example, if the actions of an air traffic controller are implicated in an aviation accident, individuals may seek restitution. Also, the corporation may be sued over its business practices. For example, if one airline perceives that traffic flow management practices at a particular airport disadvantage it by giving preferential treatment to a competitor, it might seek damages through the legal system.

Under current law, FAA is covered under the Federal Torts Claims Act (28 U.S.C. §§1346(b), 2671-2680), which defines the conditions under which tort claims involving property damage or

[78] See, especially, Elliott Sclar, *Pitfalls of Air Traffic Control Privatization*, Columbia University and the HDR Management Consulting Group, Report Commissioned by the National Air Traffic Controllers Association, February 2003.

loss, personal injury, or loss of life can be brought against federal agencies and employees.[79] Under the Federal Tort Claims Act, the United States Government may not be held liable, although there are several exceptions. In contrast, a private company could be held liable under a much broader array of scenarios under certain state and federal laws as well as under civil torts.

The United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have made the Federal Tort Claims Act applicable to activities of the proposed United States Air Traffic Services Corporation. Additionally, it sought to establish a formal legal framework for suits against the corporation challenging final orders or procedures regarding air traffic control. Under the proposal, the corporation would have been represented in the courts by the Department of Justice. However, with the consent of the Attorney General, the corporation could have contracted for legal services or employed its own attorneys. The proposed legislation would have prohibited the use of the Judgment Fund of the United States for satisfying the payment of any claims against the corporation, thus appearing to leave the corporation fully at risk for liabilities against it.

In contrast, the Aviation Innovation, Reform, and Reauthorization Act of 2016 (H.R. 4441, 114th Congress) explicitly stated that the proposed ATC Corporation could sue or be sued and could be held liable under civil and criminal law. The ATC Corporation would have received no special status or apparent protections under the law against civil and criminal actions stemming from its operations, practices, and corporate decisions. The bill specified that the proposed corporation would need to acquire adequate liability insurance to cover its risks and liabilities, including complete indemnification of employees performing duties within the scope of their employment. The Secretary of Transportation would have been responsible for determining the adequate amounts of insurance coverage and insurance policies required of the corporation.

Equitable Treatment of Airspace Users

Equitable treatment of all airspace users could be an important concern under a corporate air traffic services model. This would especially be the case if certain airspace users, such as airlines, were to own a significant portion of the entity's voting shares or to control a large proportion of the seats on the corporate board. Absent restrictions, such an entity could potentially favor commercial airline traffic over general aviation traffic, or could put a new passenger air carrier at a disadvantage by making its planes fly less favorable routings than competitors. Legislation to corporatize or privatize air traffic services could include provisions to safeguard against discrimination in the delivery of air traffic services. As with safety, assuring that the makeup of any proposed corporate board appropriately reflects the diversity of airspace users and stakeholder groups may mitigate concerns regarding potential inequities regarding access to airspace, airports, and air traffic services.

Nondiscriminatory Access to Airspace

Airports that receive federal funding are required to provide equitable, nondiscriminatory access to national airspace system users under specific grant assurances. Specifically, 49 U.S.C. §47107(a)(1) mandates that such airports "be available for public use on reasonable conditions and without unjust discrimination." Provision (a)(2) of that section requires that air carriers "be subject to substantially comparable charges" for similar use of the airport and its facilities. These provisions generally provide a framework under which federally funded airports must provide

[79] See CRS Report 95-717, *Federal Tort Claims Act (FTCA)*, by Vivian S. Chu

equitable treatment to all users of that airport. Similar provisions governing access to airspace and air traffic services could be included in legislation seeking to create an air traffic services corporation.

Canadian legislation has addressed the issue of price discrimination by requiring that NAV CANADA's fees be set so as to not differentiate among air carriers, including both foreign and domestic carriers. Additionally, charges imposed on recreational and private aircraft must not be unreasonable or undue.

H.R. 4441 (114th Congress) included language stating that user fees imposed by the corporation were not to be determinants for airspace access. It also provided that general aviation operators could not be denied access to airspace as a consequence of being exempt from paying user fees under the terms of the bill.

Coordination with Military, Law Enforcement, and Emergency Services

Coordination with military, law enforcement, and emergency management agencies may require access and utilization of air traffic service facilities, equipment, and data. In some cases, coordination and data sharing agreements between the ANSP and military, law enforcement, and homeland security agencies (such as Customs and Border Protection and the U.S. Coast Guard), may be needed to assure appropriate government access to airspace surveillance data and records that may be collected or stored by the corporation. Such data could be important for law enforcement and homeland security functions, particularly monitoring of airspace activities in proximity to U.S. borders and over territorial waters.

The United States Air Traffic Service Corporation Act (H.R. 1441, 104th Congress) would have required the USATS corporation to develop processes for assigning military personnel within the corporation, continue to share logistics and command and control systems with the military, and share aircraft tracking data with law enforcement agencies at no cost to track drug smuggling. The act would have authorized the President to transfer functions of the corporation to the Department of Defense in the event of war or national emergency.

H.R. 4441 (114th Congress) provided that during times of war, the President could temporarily transfer duties, powers, activities, facilities, and employees of the proposed ATC Corporation or of FAA to the Department of Defense.

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