

Executive Summary Backgrounder

No. 2007
February 20, 2006



Published by The Heritage Foundation

The Urgent Need to Reform the FAA's Air Traffic Control System

Robert W. Poole, Jr.

The U.S. economy depends on safe, reliable, and affordable air transportation. Beginning in 1978, airline deregulation transformed commercial aviation from a luxury for the few to a service available to essentially all Americans. U.S. companies depend on the airlines to transport their employees, and a growing number of all sizes make use of business aviation: corporate jets and turboprops, air taxi services, and fractional-ownership programs.

This ubiquitous and affordable air transportation depends critically on the U.S. aviation infrastructure, which consists of airports owned and operated by local government agencies and the air traffic control (ATC) system owned and operated by the Federal Aviation Administration (FAA).

The FAA and other aviation experts predict serious trouble over the next two decades, driven by continued aviation growth. First, a growing number of air travelers are flying in planes of smaller average size as narrow-body planes replace wide-body planes, regional jets replace narrow-body planes, and business jets replace regional jets. This is increasing the number of planes that the ATC system needs to control significantly faster than the number of air travelers is growing, exacerbating the FAA's funding problem. Second, this increased volume of air traffic will soon bump up against the inherent limits of the current air traffic control system.

The Joint Planning and Development Office (JPDO) has estimated that *not* expanding the sys-

tem's capacity by 2020 will cost the U.S. economy \$40 billion per year because the overburdened ATC system will force significant rationing of airline and business aviation flights. This will significantly increase the average price of the restricted flights, and some valuable trips will be eliminated entirely. The leaders of the U.S. Chamber of Commerce have said that, unless the United States acts soon to address this fundamental problem with aviation infrastructure capacity, the consequences could be "devastating." To avoid this crisis, they have called for designing and setting up an ATC system that can safely and efficiently handle this heavier demand.

A Window of Opportunity. The current authorization of the FAA expires on September 30, 2007, which means that Congress will need to address the problems of the air traffic control system in this session. By itself, the fundamental mismatch between the growth in air traffic and the growth in FAA revenue poses a serious problem, but the FAA needs an additional \$1 billion per year to implement the Next Generation Air Transportation System (NGATS) over the next 20 years. For the past year, the FAA has been developing a user fee-based funding

This paper, in its entirety, can be found at:
www.heritage.org/research/budget/bg2007.cfm

Produced by the Thomas A. Roe Institute
for Economic Policy Studies

Published by The Heritage Foundation
214 Massachusetts Avenue, NE
Washington, DC 20002-4999
(202) 546-4400 • heritage.org

Nothing written here is to be construed as necessarily reflecting
the views of The Heritage Foundation or as an attempt to
aid or hinder the passage of any bill before Congress.

reform proposal that could provide a starting point for this aspect of the reauthorization debate.

However, two other key factors that coincide with this scheduled reauthorization argue for reform that goes beyond just the question of funding. Within the next year or so, the JPDO will have developed a plan to phase in NGATS over the next 20 years. Implementing this major paradigm shift—from 20th-century (manual) air traffic control to 21st-century (semi-automated) air traffic management—will be more complex and riskier than any other challenge the FAA has previously attempted. Simply fixing the FAA's funding problem without dramatically reforming its management and governance poses the real risk of larger and more dramatic cases of cost overruns, schedule slippage, and systems that do not deliver value for the prices that customers are paying.

The evidence demonstrates that self-supporting ATC corporations have a better track record than the FAA in delivering technology-intensive modernization programs on time and on budget. They are also consolidating facilities without political interference, which is one of the keys to the large productivity gains that NGATS is supposed to deliver.

Over the next 10 years, between one-half and two-thirds of air traffic controllers will retire and be replaced. This presents a one-time opportunity to recruit and train a different kind of workforce for what will become a much different kind of job. Here again, a self-supporting Air Traffic Organization (ATO) that is freed from civil service constraints and day-to-day political oversight would be much better positioned to redefine the controller's job and make this large-scale personnel transition.

What Congress Should Do. A growing body of evidence from overseas shows that ATC commercialization has worked again and again in solving the underlying problems that are still inherent in

the U.S. system. In 1997, the National Civil Aviation Review Commission (Mineta Commission) made a series of recommendations that would move the ATC system toward a self-supporting government corporation at arm's length from the FAA.

In light of the global trend toward self-supporting air navigation service providers (ANSPs) and recent reports and data on their performance, Congress should revisit the Mineta Commission recommendations and enact an updated set of these recommendations:

- **The ATO should be separated organizationally and physically from the FAA itself**, even if it remains within the Department of Transportation as a government corporation or government-sponsored enterprise.
- **The user fees should be paid not only by passenger and cargo airlines, but also by turbine-powered business aircraft that fly in controlled airspace**, making use of en route, oceanic, and terminal-area ATC services.
- **The ATO board should be a true board of directors** with the normal powers of a corporate board, including responsibility for the ATO's capital and operating budgets and the ability to hire and fire the CEO.

Conclusion. Congress can open the door to NGATS by dramatically reforming the Air Traffic Organization, the entity within the FAA that is responsible for the air traffic control system. By adopting what has become the global model of best practice in air traffic control—the self-funded air navigation service provider—Congress can transform the ATO into the kind of institution that can deliver the next-generation ATC system that America needs.

—Robert W. Poole, Jr., is Director of Transportation Studies at the Reason Foundation in Los Angeles.

Background

No. 2007
February 20, 2006



Published by The Heritage Foundation

The Urgent Need to Reform the FAA's Air Traffic Control System

Robert W. Poole, Jr.

The U.S. economy depends on safe, reliable, and affordable air transportation. Beginning in 1978, airline deregulation transformed commercial aviation from a luxury for the few to a service available to essentially all Americans. U.S. companies depend on the airlines to transport their employees, and a growing number of all sizes make use of business aviation: corporate jets and turboprops, air taxi services, and fractional-ownership programs.

This ubiquitous and affordable air transportation depends critically on the U.S. aviation infrastructure, which consists of airports owned and operated by local government agencies and the air traffic control (ATC) system owned and operated by the Federal Aviation Administration (FAA).

The steady growth in aviation activity was interrupted in 2001 by the 9/11 attacks and by a recession, but flight activity returned to pre-recession levels by 2005, and significant summertime congestion has reemerged. The FAA and other aviation experts predict serious trouble over the next two decades, driven by continued aviation growth.

First, a growing number of air travelers are flying in planes of smaller average size as narrow-body planes replace wide-body planes, regional jets replace narrow-body planes, and business jets replace regional jets. This is increasing the number of planes that the ATC system needs to control significantly faster than the number of air travelers is growing, exacerbating the FAA's funding problem.

Talking Points

- Unless the capacity of the air traffic control system is massively expanded, aviation delays could cost the economy \$40 billion per year by 2020.
- Inadequate funding, organizational sclerosis, and political constraints threaten to thwart implementation of the promising next-generation ATC system.
- Simply fixing the FAA's funding problem without dramatically reforming its management and governance poses the real risk of larger and more dramatic cost overruns, schedule slippages, and systems that do not deliver value for the price that customers are paying.
- All advanced Western countries except the United States have instituted user fees and revenue bonding to make their ATC systems financially self-supporting.
- Congress should revive and update the Clinton Administration's detailed proposals to create a self-supporting ATC corporation.
- The TVA, U.S. Postal Service, and airports in metropolitan Washington, D.C., are examples of self-supporting government corporations that are no longer held hostage to the federal budget process.

This paper, in its entirety, can be found at:
www.heritage.org/research/budget/bg2007.cfm

Produced by the Thomas A. Roe Institute
for Economic Policy Studies

Published by The Heritage Foundation
214 Massachusetts Avenue, NE
Washington, DC 20002-4999
(202) 546-4400 • heritage.org

Nothing written here is to be construed as necessarily reflecting the views of The Heritage Foundation or as an attempt to aid or hinder the passage of any bill before Congress.

Second, this increased volume of air traffic will soon bump up against inherent limits of the current air traffic control system.

In 2003, Congress acknowledged the seriousness of the ATC problem in the Vision 100 reauthorization of the FAA¹ by creating the Joint Planning and Development Office (JPDO) to plan for and coordinate the transition to a Next Generation Air Transportation System (NGATS). NGATS would be a major redesign of aviation infrastructure, aimed at replacing the traditional methods of separating planes “by hand” with a far more automated, technology-intensive system that could triple air traffic capacity by 2025. The JPDO effort is chaired by the Secretary of Transportation, with active participation of the Department of Commerce, the Department of Defense, the Department of Homeland Security, the FAA, the National Aeronautics and Space Administration (NASA), and the White House Office of Science and Technology Policy, as well as considerable involvement by the private sector.

As part of its early efforts, the JPDO modeled future demand for air travel and compared it to a business-as-usual scenario of continued modest annual increases of airport and ATC capacity. It concluded that “the demand scenarios quickly outstrip current and anticipated [ATC] capacities.... At higher levels of demand, system delays quickly rise over the course of a simulated day to untenable levels.” The JPDO white paper summarized the situation: “These extreme delays indicated that anticipated ‘baseline’ levels of current and future capacity will be inadequate for providing even minimally acceptable levels of service quality for National Airspace System users.”²

The JPDO has estimated that *not* expanding the system’s capacity by 2020 will cost the U.S. econ-

omy \$40 billion per year. The white paper noted that, when demand exceeds the system’s capacity, preventing untenable delays will require “a procedure or algorithm for ‘trimming’ flights from the initial demand scenario until [existing capacity] is able to serve the ‘trimmed’ demand while meeting the agreed-upon service quality standard.”

In other words, failure to expand ATC capacity will force significant rationing of airline and business aviation flights. This will significantly increase the average price of the restricted flights, and some valuable trips could not be made at all.

The leaders of the U.S. Chamber of Commerce have said that, unless the United States acts soon to address this fundamental problem with aviation infrastructure capacity, the consequences could be “devastating.” To avoid this crisis, they have called for designing and setting up an ATC system that can safely and efficiently handle this heavier demand.³

Tripling Capacity

The JPDO is well along in fleshing out a technological and operational concept for the Agile Air Traffic System, the ATC component of the overall Next Generation Air Transportation System.⁴ Its basic premise is that system capacity is not a law of nature, but rather a function of the technology and operational concept employed.

The purpose of air traffic control is to keep planes from running into each other—more technically, to provide safe separation between planes in all phases of flight, including on the ground. Before radar was used to separate aircraft, controllers on the ground used procedural separation methods: rules that specified how far apart planes must stay along a given flight path (in-trail separation) and between different altitudes. When planes and controllers can only approximate aircraft latitude, longitude, and

1. Vision 100—Century of Aviation Reauthorization Act, Public Law 108–176.
2. Joint Planning and Development Office, “Baseline NAS Demand and Capacity Scenarios for Direct Effects Models,” Evaluations and Analysis Office *White Paper*, February 3, 2005.
3. Thomas J. Donohue, speech at Wing’s Club, New York, April 27, 2005, at www.uschamber.com/press/speeches/2005/050427tjd_wingsspeech.htm (February 7, 2007).
4. Doug Arbuckle, Col. David Rhodes, Mark Andrews, Dennis Roberts, Susan Hallowell, Dorenda Baker, Carl Burlison, Jack Howell, and Andy Anderegg, “U.S. Vision for 2025 Air Transportation,” *Journal of Air Traffic Control*, January–March 2006, p. 15, at www.jpdo.aero/pdf/vision_2025_air_trans.pdf (February 7, 2007).

altitude, the rules call for huge separation margins to allow for large errors.

The introduction of radar over the land area of the United States in the 1950s and 1960s allowed reduction of lateral and in-trail spacing, since controllers were able to determine approximately where each plane was. Within the past few years, more precise altimeters have allowed reductions in the required vertical separation of jet cruising altitudes, thereby increasing the number of “flight levels” for the en route portion of flights. The increasing availability of GPS units on both airliners and business jets means that pilots themselves have much more accurate information on their locations, although current ATC practices make very little use of this capability.

While the accuracy of locational information has increased over the past several decades, the fundamental concept of ATC is still the manual model developed prior to World War II. Thus, before every significant action, a pilot must receive permission from an air traffic controller on the ground, who watches a traffic display and tells the pilot what to do and when. Even though a great deal of “intelligence” is built into most airliners’ flight management system computers, pilots are not allowed to use it unless authorized by a controller.

Furthermore, planes are still controlled largely “by hand” because, while controllers’ displays have been modernized for the most part, controllers have been given very few automation tools to predict conflicts or to manage large amounts of information in short periods of time. Because of the understandable limits on how much information a controller can manage at a time, the system must retain very large separation margins fore and aft, left and right, and above and below each plane to ensure safe operations.

The premise of the next-generation system is that many routine functions can be automated by obtaining and sharing precision real-time information about planes in flight and the weather and that the separation responsibilities can be shared among control centers on the ground and cockpits in the air. Some have termed this model network-centric air traffic *management* (ATM) as opposed to the tra-

ditional human-centric air traffic *control*. Planes can safely fly much closer together with far more precise, real-time information on:

- Each plane’s exact location and heading (its intention);
- Weather conditions throughout the system; and
- The extent and duration of the vortices that spin off a plane’s wings. These vortices can be hazardous to following aircraft during landings and takeoffs.

This reduction in separation distances could double or triple system capacity.

The network-centric model could greatly improve the quality of air service, both airline and non-airline. The major breakthrough is to let automation on the ground and in the aircraft perform routine functions and separate aircraft based on their known flight profiles. The controller’s role would change dramatically: Automation would manage the flights and monitor conformance with clearances and planned trajectories, and the controller would manage exceptions.

In the aircraft, synthetic vision techniques now in field-testing will enable planes to land in low-visibility conditions that today frequently cut airport arrival rates in half. Other new technologies will provide “precision approaches” to thousands of smaller airports at far less cost than traditional instrument landing systems. More precise information about planes’ positions and their tip vortices will allow planes to use closely spaced parallel runways simultaneously. Some airports could even add an additional parallel runway without having to enlarge their physical land areas.

Shifting to the new model should also produce large cost savings. One premise of the network-centric approach is that control of aircraft will be possible *from* anywhere *to* anywhere. Historically, ATC facilities have been located adjacent to the airspace that they control. A tower is physically at the airport, and each TRACON (Terminal Radar Approach Control) and each of the 21 en route centers is located within the regional airspace it controls. However, with satellites, dispersed sensors, and high-speed data links, facilities can be located virtually anywhere and be sized to do an economically

efficient amount of work. Some tentative plans call for replacing the FAA's 21 centers and 171 TRACONS—most of them fairly old—with 35 new service hubs.⁵ Thousands of costly-to-maintain ground radars and other navigation aids (navaids) could be retired once planes are equipped for network-centric operations.

While all of the details are not yet finalized, experts from the federal agencies sponsoring the JPDO (especially NASA and the Departments of Defense and Transportation) agree that the network-centric ATM model can double or triple the system's capacity and cost no more—and perhaps less—to operate than the current system. This means major productivity gains in a field in which productivity has not fundamentally changed since radar was introduced. This prospect contrasts starkly with the dismal vision of congestion and rationing if aviation continues business as usual.

Obstacles to Implementing the Next-Generation System

This vision of a network-centric ATM system faces several serious obstacles. Some are the normal kinds of resistance to change from those who are comfortable with the status quo. For example, the air traffic controllers union has resisted early moves toward automation technologies and has clearly expressed its preference for retaining a human-centered ATC system over the next several decades. Some aircraft operators (including some airlines and many private pilots) are resistant to any mandates to install new onboard avionics equipment, even though full benefits for all system users (such as large cost savings from retiring costly ground-based navaids) can be realized only after all planes in the system are properly equipped.

Three more fundamental obstacles pose even more serious threats: lack of funding, high modernization risks, and political constraints.

Lack of Funding. As FAA Administrator Marion Blakey and then-Transportation Secretary Norman

Mineta said repeatedly in 2005 and 2006, the changes in aviation over the past decade have devastated the FAA's funding base. A large majority of the FAA budget—the ATC system accounts for nearly two-thirds—comes from aviation excise taxes, and the lion's share of the tax revenue comes from the 7.5 percent tax on the price of airline tickets.

The long-term trends of declining ticket prices due to increased market share for low-cost carriers and increasing air traffic due to increased use of smaller planes have put a serious squeeze on ATC funding. Payroll costs of the labor-intensive human-centric ATC system consume most of the available budget, leaving little for capital investment. In fiscal year (FY) 2005 and FY 2006, the FAA budget for facilities and equipment was reduced by 20 percent (\$500 million) below the authorized levels.

The transition to NGATS will require major capital investments over the next two decades to install new technologies and to replace numerous obsolescent facilities with a much smaller number of new ones. The cost estimate produced by the FAA's Research, Engineering, and Development Advisory Committee—the only estimate available so far—is an extra \$1 billion per year over the next 20 years.⁶ The FAA's current capital spending budget is focused on patching up the existing system, replacing antiquated display consoles with newer ones, and replacing the host computer system. While necessary in the short term, these investments will add little capacity to the system, but they are all that the FAA can afford under the current funding system.

Some, especially in the general aviation community, argue that Congress could solve the problem by appropriating a larger amount of general federal revenue each year, such as 25 percent to 30 percent of the FAA's budget instead of the recent level of about 18 percent to 21 percent. Yet given the federal budget deficit and numerous other claims on general-fund monies, this alternative appears extremely unlikely, especially for a program that has the potential to raise revenue from its users. This is why

5. Michael J. Harrison, "Air Traffic Control Facility Consolidation Strategies," Air Traffic Control Association, 50th Annual Conference, November 2005.

6. Financing Next Generation Air Transportation System Working Group, "Financing the Next Generation Air Transportation System," Federal Aviation Administration, Research, Engineering and Development Advisory Committee, April 2006.

Blakey and Mineta have called funding reform essential for ATC modernization.

Technology Implementation Risks. The FAA has been attempting to modernize the National Airspace System (NAS), expanding its capacity and increasing its productivity, since it launched the NAS Plan in 1982. During the next 25 years, scores (if not hundreds) of reports from the Government Accountability Office (GAO)⁷ and the Office of Inspector General (OIG) in the U.S. Department of Transportation (DOT) faulted the agency for bad management that had led to projects that were chronically late and seriously over budget.

In 2005, two OIG researchers presented an overview of this failed modernization experience, trying to assess what went wrong.⁸ They concluded that FAA modernization efforts had neither reduced costs nor increased productivity:

NAS modernization architecture and project designs have been consistently subverted by requirements growth, development delays, cost escalations, and inadequate benefits management. But all these things were symptomatic of the fact that FAA didn't think it needed to reduce operating costs.⁹

Thus, many observers are greatly concerned that the FAA's institutional culture is poorly suited to implementing anything as dramatic as the shift from human-centric ATC to network-centric ATM. In late 2004, the National Academy of Sciences convened an expert panel to assist the GAO in understanding the cultural and technical factors that have impeded previous ATC modernization efforts.¹⁰ It found that "the key cultural factor impeding modernization has been resistance to

change...[which is] characteristic of FAA personnel at all levels" and that "the key technical factor affecting modernization...has been a shortfall in the technical expertise needed to design, develop, or manage complex air traffic systems."¹¹

The FAA is not designed to take risks, make investments, manage people to produce results, reward excellence, or punish incompetence. It is therefore not equipped to effect fundamental reform of the ATC system. Thus, major *institutional* change is probably a prerequisite for implementing the proposed network-centric ATM system.

Political Constraints. The third impediment to implementing a fundamentally different approach is political. The network-centric model can deliver major cost savings, ultimately providing two to three times the ATC capacity with the same number of—or even fewer—people because the changed paradigm makes the operations dramatically less labor-intensive. However, realizing these gains requires relatively swift retirement of huge numbers of costly radars and other ground-based nav aids and consolidation of numerous ATC facilities. One current proposal would replace 21 en route centers and 171 TRACONs with 35 air traffic service hubs while redesigning all U.S. airspace.¹² Physical control towers located at each airport would gradually be phased out as "virtual tower" functions are built into the new super-hubs.

As with the closing of military bases, Congress has a history of resisting the closure and consolidation of ATC facilities. The original 1982 NAS Plan included plans for facility consolidation, which were quietly dropped after it became clear that getting them through Congress would be very difficult.

7. Before July 2004, the GAO was known as the General Accounting Office.

8. Arthur A. Shantz and Matthew Hampton, "National Airspace System Capital Investments Have Not Reduced FAA Operating Costs," presented at the Transportation Research Forum, March 8, 2005, at www.trforum.org/forum/getpaper.php?id=52 (February 7, 2007; membership required).

9. *Ibid.*, p. 20.

10. U.S. Government Accountability Office, *National Airspace System: Experts' Views on Improving the U.S. Air Traffic Control Modernization Program*, GAO-05-333SP, April 2005, at www.gao.gov/new.items/d05333sp.pdf (February 7, 2007).

11. *Ibid.*, p. 8 and summary page.

12. Michael J. Harrison, "The 'No New Money' Scenario for the Next Generation Air Transportation System," Aviation Management Associates, October 1, 2005, at www.avmgt.com/AMA/AMA%20Publications/AMA%20Publications_files/No%20New%20Money.pdf (February 7, 2007).

Congress came extremely close to forbidding the FAA's recent success in outsourcing its Flight Service Station system, which involved consolidating from 58 facilities to 20 facilities. The prohibition was ultimately defeated due to a credible veto threat from the White House. Many observers expect that, if left to the annual appropriations process, a facility consolidation of the magnitude being considered for the next-generation system would suffer the same fate as the consolidations proposed in the NAS Plan.

An Institutional Alternative: A Self-Supporting Air Traffic Organization

One approach to addressing all three obstacles is to take the ATC system out of the federal budget process and make it a self-supporting entity, funded directly by its customers, analogous to the Tennessee Valley Authority (TVA) or the U.S. Postal Service (USPS). Variants of this approach have been recommended by a series of federal studies and commissions over the past 15 years, including:

- The Aviation Safety Commission in 1988,
- The National Commission to Ensure a Strong Competitive Airline Industry in 1993,
- The National Performance Review in 1993,
- The Secretary of Transportation's Executive Oversight Group in 1994, and
- The National Civil Aviation Review Commission (Mineta Commission) in 1997.

Funding Problem. This approach would address the funding problem by shifting from aviation excise taxes that are paid to the Treasury and appropriated annually by Congress to fees for ATC services that are paid directly by customers to the new self-supporting Air Traffic Organization (ATO). Thus, fees would grow in proportion to the growth of flight activity rather than being tied to something much less relevant, such as airline ticket prices. Moreover, a predictable revenue stream, not subject to the federal budget process, would provide the basis for issuing long-term revenue bonds to fund modernization, in particular the transition to the network-centric system.

Cultural and Technical Obstacles. The commercialization approach would address the cultural and technical obstacles by enabling the ATO to

attract and retain private-sector managers and engineers who are skilled at implementing complex technology projects. The ATO, like the TVA, would operate completely outside the federal civil service system and could hire, fire, and compensate its employees as any other high-tech business does. It would be governed by a board of directors largely representing the aviation customers.

Under this system, the overall NGATS approach, individual projects, and their implementation schedules would have to pass muster as delivering real value for the investment. That kind of vetting process is largely absent from the FAA.

Political Obstacles. A self-supporting ATO would also address the political obstacles to retiring nav aids and consolidating facilities. By passing the enabling legislation, Congress would delegate these contentious issues to the customer-governed ATO.

Of course, persuading Congress to pass the enabling legislation is no small challenge. It is analogous to the problem of military base closings. Members of Congress found it almost impossible to allow the Pentagon to close bases in their individual districts, with the result that obsolete bases were almost never shut down. To resolve the problem, Congress created the Base Realignment and Closure (BRAC) Commission in 1988 to make recommendations on which bases to close, shrink, or expand. Congress must then either accept or reject the entire package without amendment. The success of the first BRAC round has prompted three more rounds, which serve the national interest by making the military more cost-effective.

Congress could similarly vote one time to authorize a self-supporting ATO, thereby delegating the contentious tasks of consolidating numerous ATC facilities and shutting down thousands of nav aids. By constraining itself from future temptations to intervene, Congress would safeguard the process of modernization (and avoid threatening the investment-grade ratings of the revenue bonds issued to finance the modernization process).

Foreign Models. At first blush, this reform may sound like a utopian prospect, but over the past 20 years, several dozen countries have reformed their ATC systems along these lines, transforming

Table 1

B 2007

Major Commercialized Air Navigation Service Providers

Country	Date Established	Name	Ownership	Economic Regulation	Safety Regulation
Australia	1995	Airservices Australia	Government corporation	Commission oversight	Separate agency
Canada	1996	NAV Canada	Not-for-profit corporation	Self-regulating per statutory charging principles	Separate agency
France	2005	DSNA	Government department	Approval by Minister	Internal but separate
Germany	1993	DFS	Government corporation	Approval by Minister	Internal but being separated
Ireland	1993	IAA	Government corporation	Regulatory commission	Internal but separate
Netherlands	1993	LVNL	Government agency	Approval by Minister	Separate agency
New Zealand	1987	Airways Corporation of New Zealand	Government corporation	Self-regulating, per charging principles	Separate agency
South Africa	1993	ATNS	Public company	Ministry of Transport	Separate agency
Switzerland	2001	Skyguide	Not-for-profit company	Approval by Minister	Separate agency
United Kingdom	2001	NATS	Public-private partnership	Commission oversight (price-cap regulation)	Separate agency

Source: MBS Ottawa, "Air Traffic Control Commercialization Policy: Has It Been Effective?" January 2006, Table 4.1.

them from tax-supported government departments to self-supporting air navigation service providers (ANSPs).

Commercialized ANSPs in Other Countries

New Zealand converted its ATC operation from a division of its Ministry of Transport to a self-supporting government corporation in 1987; since then, more than 40 countries have done likewise. All of these commercialized ANSPs belong to the Civil Air Navigation Services Organization (CANSO), which has become an active participant in international aviation discussions and policy debates. Table 1 provides a brief overview of 10 of the leading commercialized ANSPs, which range from government departments (e.g., France) to a private, nonprofit corporation (Canada).

Experts consider financial autonomy the basic prerequisite for a commercialized ANSP, regardless of ownership or placement within or outside of government departments, such as transport ministries. Financial autonomy requires that the ANSP:

- Fund its operations by means of direct charges to its customers and
- Have access to the capital markets to finance major technology and facility projects.

Because ANSPs continue to have a monopoly on provision of ATC services within their airspace, all of them are subject to some form of economic regulation. Further, because their countries are signatories to the International Civil Aviation Organization (ICAO), they are also subject to arm's-length safety regulation.

Only three of the 10 ANSPs in Table 1 can be considered "privatized" in the sense of being outside of government (the governments of the United Kingdom and Switzerland continue to own major blocks of shares of NATS and Skyguide, respectively). The large majority of CANSO member ANSPs are government corporations. Yet, by definition, all are financially self-supporting and free to make business decisions on an ongoing basis, subject only to some kind of economic regulation and, of course, air safety regulation.

The GAO Study. In 2005, the Government Accountability Office conducted the first of several large-scale assessments of the performance of commercialized ANSPs.¹³ The GAO selected five major ANSPs—Australia, Canada, Germany, New Zealand, and the United Kingdom (U.K.)—and GAO staff collected data and made site visits to all five. Among the findings were the following:

- **Safety.** “Available data from the five ANSPs indicate that since commercialization, the safety of air navigation services has remained the same or improved.”
- **Cost Control.** “All five ANSPs have taken steps to control their operating costs, whether by eliminating some administrative positions or by consolidating facilities.”
- **Modernization.** “All five ANSPs have also invested in new technologies and equipment, which the ANSPs say have lowered their costs by increasing controllers’ productivity and produced operating efficiencies, such as fewer or shorter delays.”¹⁴

The GAO’s report notes that the reasons for commercialization were similar in all five countries:

Before commercialization... [m]any were underfunded, as evidenced by freezes on air traffic controllers’ wages and insufficient funds to replace aging technologies. Technology replacement programs often cost more, took longer, and delivered less than promised, and stakeholders complained about performance and customer service. In some cases, the country as a whole faced widespread fiscal problems, and the commercialization of air navigation services was simply part of a larger movement to reform government enterprises.¹⁵

The same problems still beset the FAA’s Air Traffic Organization today.

The report goes into some detail to explain what it means for an ANSP to operate as a commercial entity, albeit usually within government. “Each ANSP makes and carries out its own strategic, operating, and financial decisions,” reports the GAO. “A supervisory board oversees policy making and operations, and, when applicable, has fiduciary responsibility to stakeholders.” As in a corporation:

An executive officer implements the ANSP board’s policies and is, in turn, accountable to the board. Individual business units within the ANSP report to the CEO [chief executive officer] and are directly responsible for various aspects of the ANSP’s day-to-day operations.¹⁶

The ANSPs establish performance measures and report annually on operational and financial performance. Their financial statements are subject to independent third-party audits.

Financial autonomy means that the ANSPs “rely on user charges as their primary source of revenue and on capital markets for additional funding.” The charges are based on the ICAO’s cost-recovery principles and cover oceanic, en route, and terminal-area services. General aviation users may be charged a flat fee for access to the system rather than the per-transaction charges that apply to airlines. ICAO policies allow for the costs of some services not to be recovered via charges “in recognition of local, regional, or national benefits.” The GAO notes that, in Canada, flights for search and rescue, air ambulance, and firefighting are exempt from user charges. ANSPs may also generate revenues from miscellaneous business services, such as consulting, training, and the provision of ATC services in other countries.¹⁷

13. 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, July 2005, at www.gao.gov/new.items/d05769.pdf (February 7, 2007).

14. *Ibid.*

15. *Ibid.*, p. 5.

16. *Ibid.*, p. 11.

17. *Ibid.*, pp. 12–13.

In accordance with ICAO principles, all five ANSPs are subject to economic regulation, primarily to protect users who must obtain their ATC services from the provider in question. The report goes into some detail on the different ways in which this regulation is carried out in the five countries.

The GAO also concluded that “[c]ommercialization has allowed the ANSPs to implement modernization projects more efficiently.” The uncertainty of annual appropriations had made it difficult for them to plan multi-year projects, but access to their own cash flow, along with the proceeds from issuing revenue bonds, “has allowed them to plan and execute projects more efficiently and has improved their ability to deliver projects on time, within budget, and to specifications.”

The ANSPs have also found that “involving stakeholders in efforts to design, acquire, and deploy new technologies can be beneficial.” This involvement continues through the design and implementation process. In addition to involving customers, the ANSPs have found it valuable to involve air traffic controllers throughout the process.¹⁸

The MBS Ottawa Study. MBS Ottawa, a consulting firm, in conjunction with George Mason University, Syracuse University, and McGill University, conducted a larger and more detailed study of the performance of commercialized ANSPs, which was published in January 2006.¹⁹ The project was overseen by a 15-member international advisory committee. The project team made site visits to and collected detailed quantitative data from the 10 commercialized ANSPs listed in Table 1, including all five that were studied by the GAO. In addition to documenting the performance of the ANSPs since they were commercialized, the study and its appendix provide considerable detail on the governance structure and institutional framework of each.

Overall, the MBS study judged ATC commercialization to be a success. With respect to commercial-

ization’s impact on key performance measures, trend analysis found that:

- Safety was neutral or enhanced;
- Modernization was greatly improved;
- Service quality was improved;
- Costs were generally reduced, significantly in some cases;
- Financial stability was maintained; and
- Public interest was neutral or positive in most areas.

The MBS’s “major finding is that commercialization models that provide the right balance of incentives have resulted in significant cost reductions, dramatic improvements in modernization, and major improvements in service quality, while improving safety.” One of the most interesting findings is that:

Providing more autonomy for the ANSP has tended to cause a reorientation from treating government as the primary client to responding to the needs of the aviation community. There is no longer any doubt as to who the customer is. Commercial ANSPs have demonstrated enhanced ability to respond quickly to customer needs.²⁰

In addition, the report notes:

[T]here has been a...clarification of the government’s role. Governments have ensured the public interest through effective safety and economic oversight, financial regulations, environmental laws, protection of consumer rights, and recourse through the legal system.²¹

Summarizing the findings, the report notes that:

Commercialized ANSPs exhibit three main strengths—sensitivity to customer needs, agility in reaching a decision, and ability to carry it through. These characteristics have led to continuous improvements in efficiency, business discipline that delivers projects on

18. *Ibid.*, pp. 23 and 26–27.

19. MBS Ottawa, “Air Traffic Control Commercialization Policy: Has It Been Effective?” January 2006.

20. *Ibid.*, p. 9.

21. *Ibid.*

schedule and on budget, and rapid deployment of modern technology to enhance service quality.²²

The IBM Study. Clinton Oster and John Strong researched and wrote the most recent study, which was published in mid-2006 by the IBM Center for the Business of Government.²³ Their report focused on applying lessons learned from the ATC commercializations in Canada and the U.K. to reforming the U.S. system. Thus, the report provides three parallel studies of ATC reform: the long history of efforts to reform the FAA and case studies of the commercializations of NAV CANADA and NATS. (FAA reform is discussed in the next section of this paper.)

The IBM study provides considerably more detail on how both NAV CANADA and NATS were created in an effort to solve long-standing problems in the provision of ATC services. Although their organization models are quite different and both had to cope with the serious downturn in North Atlantic airline traffic for several years after 9/11, the authors conclude:

[B]oth NAV CANADA and NATS have emerged from the 2001–2004 period as financially solid organizations that are both well positioned not only to modernize to meet the growing needs of their own airspace, but also to extend their provision of various air traffic management services to other parts of the world.²⁴

Several other lessons specific to NAV CANADA are worth highlighting. Unlike most European and Asia–Pacific countries, where ATC user charges have been in effect at least since the end of World War II, Canada was one of the few remaining countries that funded ATC by taxing airline tickets prior to ATC commercialization. Reflecting on that transition, the authors conclude that:

The adoption of a user charge system in principle increased the desire for users to play a role in governance. The not-for-profit structure with board representation by stakeholders creates good incentives for cost control and improved capital program management, and reduces the need for economic regulation....

The customer orientation appears to extend to a capital program and planning approach that has been much better at both modernization and the development of new technology, with respect to cost, delay, and performance.²⁵

Turning to the need for NAV CANADA to cope with the economic downturn following 9/11, the authors conclude that:

Nav Canada's organization structure turned out to be an asset.... The stakeholder model in effect required all parties to make contributions and sacrifices. The nonprofit status established a clear financial objective during the period, while the rate stabilization fund allowed the company to manage the consequences of the downturn over a longer period.²⁶

Lessons from Canada and the U.K.

As Oster and Strong note, "The problems facing the FAA are not new, but have been recurring themes for decades. For nearly 20 years, a series of special commissions have called for reforms in how FAA is funded, organized, and managed." They go on to note that several reforms have been implemented over the past decade: streamlining of FAA personnel and procurement regulations, setting a fixed five-year term for the FAA Administrator, and combining the FAA's ATC operations and ATC facilities and equipment units to form

22. *Ibid.*

23. Clinton V. Oster, Jr., and John S. Strong, "Reforming the Federal Aviation Administration: Lessons from Canada and the United Kingdom," IBM Center for the Business of Government, 2006, at www.businessofgovernment.org/pdfs/OsterReport.pdf (February 7, 2007).

24. *Ibid.*, p. 19.

25. *Ibid.*, pp. 46–47.

26. *Ibid.*, p. 47.

the Air Traffic Organization. Furthermore, the ATO is well along in developing the agency's first true cost accounting system.²⁷

However, despite these reforms, the creation of the ATO did not fix three fundamental problems "that, unless addressed, will severely hinder both management of the air traffic control system and efforts to modernize it to keep pace with the anticipated growth in aviation." Those three problems are:

- The "fundamental disconnect between the factors that drive the costs of providing services and the factors that drive the revenues" of the system;
- Modernization programs "that continue to be hampered by poor performance and high costs"; and
- The lack of organizational independence, which prevents resources from being used in the most effective ways and which also results in self-regulation of the ATC system.²⁸

The first problem is due to the previously noted aviation market trend toward shifting over time toward smaller-size planes while the funding system is still based largely on the number of passengers carried. As a result, the system's air traffic workload is increasing significantly faster than its resources. As Oster and Strong point out, "Only a user charge system is likely to solve this problem."²⁹ NAV CANADA and NATS do not have this problem because their revenue comes from fees and increases in direct proportion to the growth of flight activity in controlled airspace.

The authors attribute the modernization problem largely to "diffused accountability," which means that accountability for capital expenditures and modernization "is diffused among the FAA, Congress, and the administration." Such diffused accountability "can result in inadequate incentives for financial discipline, which is one of the most striking differences between FAA and both NAV

CANADA and NATS." With the commercialized ANSPs, "financial discipline comes primarily from the role of users, aircraft operators, in approving and overseeing capital investment decisions." Users judge proposed projects in bottom-line terms: Do the benefits justify the costs that they are being asked to pay via future user charges? Without this discipline, "the history of FAA's ATC modernization projects has been a pattern of projects being over budget, under-performing, and late."³⁰

The third problem is lack of organizational independence, which manifests itself in several ways. First, Members of Congress are very protective of jobs in their districts. This severely limits the FAA's ability to consolidate facilities, which is one of the keys to the productivity gains promised by NGATS. This lack of independence sometimes leads to congressional earmarks that require the FAA to purchase systems produced by favored contractors. Second, the FAA gets ensnared in government-wide budgetary problems, such as hiring freezes and downsizings. Financially self-supporting ANSPs like NATS and NAV CANADA are immune to such problems.

Another dimension of the lack of independence is that the FAA's safety regulation is not really at arm's length from its ATC operations, as ICAO rules require. "The [safety] rules FAA develops are for itself, and enforcement of those rules is of itself. In other words, FAA self-regulates air traffic control." If the ATO were made organizationally separate from the FAA, "[t]he same trade-offs between safety and capacity would remain and be just as technically difficult, but the regulatory tensions that are now internal to one organization would become external and between two different organizations." In addition, these tradeoffs would become more public and open to outside scrutiny.³¹

Oster and Strong draw six conclusions about attempts to reform the FAA and the U.S. ATC system:

27. *Ibid.*, pp. 12–13.

28. *Ibid.*, p. 13.

29. *Ibid.*, p. 35.

30. *Ibid.*, p. 55.

31. *Ibid.*, pp. 39–40.

- “The problems facing FAA today are not new, but have been recurring themes for decades.”
- “The Airport and Airway Trust Fund was intended to insulate investments in airport and air navigation facilities from having to compete for general funds, but it has failed to do so.”
- “The Airport and Airway Trust Fund has not been a stable source of funding.”
- The several important reforms of the FAA have not solved the underlying problems.
- The creation of the ATO is an important step forward.
- Unless addressed, the three underlying challenges will seriously hinder FAA’s ability to expand and modernize the ATC system.³²

Updating the Mineta Commission’s Recommendations. The most recent national commission to address ATC review was the National Civil Aviation Review Commission (Mineta Commission) in 1997, which was chaired by former U.S. Representative Norman Mineta (D–CA), who has since served as Secretary of Transportation in the Bush Administration. The Mineta Commission concluded that operating ATC under federal budget rules was “crippling” and “inappropriate for a system controlling commercial operations that needs to be driven by demand for services” and criticized the institutional arrangements, arguing that “too many cooks” were involved in ATC management decisions, foreshadowing Oster and Strong’s point about diffusion of responsibility and accountability. The commission also highlighted the trend of rising operating costs “freezing out” capital investment in modernization.³³

As remedies, the Mineta Commission strongly recommended shifting to a financially self-supporting ATC entity within the FAA. Cost-based user fees from passenger and cargo airlines would provide a revenue stream that would be kept outside the federal budget process and that would support revenue bonding to finance large-scale modernization. The new entity would be run by a chief operating officer and would have a board that functioned much as

the board of a corporation functions, although it would be appointed through the political process.

Congress responded by enacting only pieces of what was intended to be an integrated package. It authorized creation of the unified Air Traffic Organization within FAA with a chief operating officer. However, Congress rejected the shift from excise taxes to user fees and, with it, independence from the federal budget process and the possibility of bonding for capital improvements. The board simply turned out to be another advisory board with no decision-making authority.

In defense of the Mineta Commission, its recommendations did not go all the way to a self-supporting government corporation at arm’s length from the FAA for two reasons.

First, the Clinton Administration had introduced legislation, sponsored by Representative Mineta, to create just such a corporation in 1995. This proposal for a U.S. Air Traffic Services (USATS) corporation originated from Vice President Al Gore’s National Performance Review and was strongly supported by then-FAA Administrator David Hinson. Yet it failed to gain traction in Congress or within the aviation community and faded from sight.

Second, neither supporters of the USATS nor members of the Mineta Commission had the results of recent studies on the performance of commercialized ANSPs. At the time, many of these commercializations were just starting and had little or no track record. Given that the U.S. ATC system is by far the largest and busiest in the world, it is not surprising that Members of Congress in the late 1990s were cautious about adopting what might have been viewed as an untried idea.

Today, however, a growing body of evidence from overseas shows that ATC commercialization has worked again and again to solve the underlying problems that are still inherent in the U.S. system. In the meantime, U.S. aviation has undergone an enormous structural change with the ongoing downsizing of average aircraft size

32. *Ibid.*, p. 41.

33. National Civil Aviation Review Commission, *Avoiding Aviation Gridlock and Reducing the Accident Rate: A Consensus for Change*, December 1997, pp. 4–5, at www.faa.gov/NCARC/reports/Summary.doc (February 10, 2007).

and the large recent and projected growth in business jets.

It is therefore relevant to revisit the Mineta Commission's full set of recommendations in light of the global trend toward self-supporting ANSPs. Following the best-practices recommendations of the MBS Ottawa and IBM reports would tweak the Mineta recommendations in three aspects:

1. **The ATO should be separated organizationally and physically from the FAA itself**, even if it remains within the DOT as a government corporation or government-sponsored enterprise. (For an overview of U.S. precedents for a self-supporting ATO, see Appendix A.)
2. **The user fees should be paid not only by passenger and cargo airlines, but also by turbine-powered business aircraft that fly in controlled airspace**, making use of en route, oceanic, and terminal-area ATC services.
3. **The board should be a true board of directors** with the normal powers of a corporate board, including responsibility for the ATO's capital and operating budgets and the ability to hire and fire the CEO.

These changes would provide for a self-supporting ANSP in the mainstream of those listed in Table 1. As such, the revamped ATO would be very close to the USATS model proposed by the Clinton Administration. The FAA would continue to be responsible for all aviation safety regulation and for the airport grants program, which would be funded by general revenues and a residual airport program tax on all flight activity.

This model addresses the three obstacles to timely implementation of NGATS and the underlying structural problems identified by Oster and Strong.

The 2007 Window of Opportunity

The current authorization of the FAA expires on September 30, 2007, which means that Congress will need to address the problems of the air traffic control system in this session. By itself, the fundamental mismatch between the growth in air traffic

and the growth in FAA revenue poses a serious problem, but the FAA needs an additional \$1 billion per year to implement NGATS over the next 20 years. For the past year, the FAA has been developing a user fee-based funding reform proposal that could provide a starting point for this aspect of the reauthorization debate.

However, two other key factors that coincide with this scheduled reauthorization argue for reform that goes beyond just the question of funding. Within the next year or so, the JPDO will have developed a plan to phase in NGATS over the next 20 years. Implementing this major paradigm shift—from 20th-century (manual) air traffic control to 21st-century (semi-automated) air traffic management—will be more complex and riskier than any other challenge the FAA has previously attempted. Simply fixing the FAA's funding problem without dramatically reforming its management and governance poses the real risk of larger and more dramatic cases of cost overruns, schedule slippage, and systems that do not deliver value for the prices that customers are paying.

The evidence demonstrates that self-supporting ATC corporations have a better track record than the FAA has in delivering technology-intensive modernization programs on time and on budget. They are also consolidating facilities without political interference, which is one of the keys to the large productivity gains that NGATS is supposed to deliver.

Over the next 10 years, between one-half and two-thirds of the ATO's workforce of air traffic controllers will retire and be replaced. This presents a one-time opportunity to recruit and train a different kind of workforce for what will become a much different kind of job. Here again, a self-supporting ATO freed from civil service constraints and day-to-day political oversight would be much better positioned to redefine the controller's job and make this large-scale personnel transition.

—Robert W. Poole, Jr., is Director of Transportation Studies at the Reason Foundation in Los Angeles.

APPENDIX A

THREE U.S. PRECEDENTS FOR A SELF-SUPPORTING ATO

In some quarters, the first reaction to the proposal to convert the ATO into a self-supporting government corporation would be to ask why it should not be privatized (i.e., moved entirely into the private sector by lease or sale). Although air traffic control is and will likely remain a monopoly service, the United States has predominantly investor-owned rather than government-owned utilities in other areas with monopoly characteristics, such as electricity and natural gas. Such utilities are regulated as to price and/or rate of return.

The short answer is that outright privatization has virtually zero chance of enactment. Simply removing the ATO from the federal budget process as a self-supporting federal entity within the DOT would be a dramatic (and daunting) step that would face an uphill battle, just as the Clinton Administration's USATS proposal did a decade ago.

One key difference between then and now is that Congress can draw on a decade's worth of performance data on self-supporting ANSPs in leading Organisation for Economic Co-operation and Development countries. While they are nearly all success stories, however, only two are cases of privatization, and neither follows the conventional investor-owned utility model. NAV CANADA is a not-for-profit, non-share corporation, and the U.K.'s NATS is a public-private partnership in which the government owns a 49 percent share. The large majority of self-supporting ANSPs are government corporations, and following that model seems the most prudent and more politically realistic approach.

Moreover, most of the benefits of a NAV CANADA-type ANSP can be obtained by creating a federal corporation, especially if it is given a stakeholder board along the lines of the one that has functioned very well for NAV CANADA.

A 1995 GAO report profiles 22 government corporations, one of which (the U.S. Enrichment Corporation) was subsequently privatized.³⁴ Generally, this form of organization has been used for functions that:

- Are predominantly of a business nature,
- Produce revenue and are potentially self-supporting,
- Involve a large number of business-type transactions with the public, and
- Require greater flexibility than the customary type of appropriations budget ordinarily permits.

These criteria are generally accepted not only by the GAO, but also by the Congressional Research Service and the National Academy of Public Administration. The ATO's business of air traffic control clearly meets these criteria.

The 22 government corporations encompass a wide variety of different enterprises and missions, some of which (Amtrak and the Commodity Credit Corporation) are not really commercial and others of which (such as the TVA and USPS) can be and often have been self-supporting.

Tennessee Valley Authority. The TVA was created in 1933 to generate, transmit, and sell electricity and to provide flood control in the Tennessee River region. It is a wholly owned federal government corporation governed by a board of directors appointed by the President and confirmed by the Senate. Its revenues come from its customers' payments for electricity, not from appropriations. As a formality, the

34. U.S. General Accounting Office, *Government Corporations: Profiles of Existing Government Corporations*, GAO/GGD-96-4, December 1995, at www.gao.gov/archive/1996/gg96014.pdf (February 7, 2007).

TVA's revenues and spending are reported in the federal budget, but the key point is that, as a self-supporting corporation, its operating and capital investment decisions are made by its management and board, not by congressional committees.

Like any other electric utility, the TVA also has access to the bond market. The TVA Act explicitly states that TVA bonds are not guaranteed by the federal government, although "there is the perception in the investment community... that the federal government would support principal and interest payments on TVA debt if TVA's solvency were to be seriously impaired."³⁵ This is one of the reasons that TVA bonds have investment-grade ratings.

From 1933 through 1959, the TVA received annual appropriations from the federal government, but Congress amended the TVA Act in 1959 to enable the company's electricity operations to become self-financing by bonding the revenues from electricity sales. Congress has put a ceiling on TVA borrowing, currently at \$30 billion. In 2004, Congress revamped the TVA's management structure, changing its board from three full-time to nine part-time members and establishing the position of CEO, who is appointed by the board. Thus, over time, Congress has made the TVA more and more like an ordinary electric utility.

U.S. Postal Service. The USPS was created by legislation in 1971, transforming the former U.S. Post Office into what was intended to be a self-supporting commercial enterprise. Like the TVA, the USPS has a statutory monopoly on certain of its services, in this case first-class mail. For more than two decades, it received ongoing subsidies so that certain categories of mail could be provided well below cost, but these subsidies were phased out in the 1990s. In recent years, the USPS has tended to operate in the black.

The USPS is overseen by a board of nine governors, who are appointed by the President and confirmed by the Senate. They, in turn, select the CEO and deputy CEO, who are known as Postmaster General and Deputy Postmaster General and are also voting members of the board. The USPS's spending and revenue, like the TVA's, are reported in the federal budget, but its funds come directly from payments made by customers. Hence, its board and management can make operating and capital spending decisions based on business criteria.

Like the TVA, the USPS has bonding authority, although, as a far less capital-intensive business than electricity, its borrowing has been much smaller relative to its annual revenue than has the TVA's borrowing. Between 2000 and 2004, the USPS retired the large majority of its outstanding debt.

Metropolitan Washington Airports. The Metropolitan Washington Airports Authority is a somewhat different model of a government corporation. In 1985, Dulles International and Washington National Airports were, like the ATC system, an integral part of the FAA. Their revenues from landing fees and other sources were deposited in the U.S. Treasury, and their annual budgets were appropriated by Congress as part of the annual FAA budget. Among all of their other responsibilities, congressional committees also attempted to provide detailed oversight of the airports' policies and operations.

The terminal at National was obsolete and overcrowded, and Dulles was significantly underutilized and still considered something of a white elephant. The airports were starved for capital investment for modernization. Reformers argued that Congress could transform Dulles and National into customer-friendly airports by devolving authority and funding rather than by means of further GAO critiques or tougher oversight hearings. This would allow the airports to be managed in the interests of their users. Reformers pointed to the user-funded models used by hundreds of other airports in which predictable streams of landing-fee and lease revenues covered operating costs and allowed those airports to issue

35. U.S. General Accounting Office, *Tennessee Valley Authority: Bond Ratings Based on Ties to the Federal Government and Other Nonfinancial Factors*, GAO-01-540, April 2001, at www.gao.gov/new.items/d01540.pdf (February 7, 2007).

long-term revenue bonds for expansion and modernization. They also cited the natural interest of customers in influencing operational and investment decisions, as well as the responsiveness of airport management to such customers.

Congress eventually accepted these arguments in 1986, enacting legislation to devolve day-to-day control of the airports to a newly created airport authority, removing the airports from the FAA budget and authorizing them to adopt the self-funding model. In the next two decades, these airports were completely transformed. User-charge funding proved to be robust, and the airports were able to issue large-scale bond offerings to finance their terminal and airside expansion projects. The same management and staff were empowered to provide far better facilities and services to their customers. Probably no one in the Washington metro area, or in Congress, would choose to revert to the old model, under which the airports reported to and received their funding from Congress as part of the federal budget process.

APPENDIX B FREQUENTLY ASKED QUESTIONS

Question #1: Isn't the FAA funding crisis exaggerated or nonexistent?

The funding crisis is very real, resulting from fundamental changes in commercial aviation. Ever-larger numbers of passengers are being transported in increasingly smaller aircraft, thanks both to airlines substituting narrow-body planes for wide-body planes and replacing narrow-body planes with regional jets and to the healthy growth of business aviation, including fractional ownership. These trends all mean more aircraft in the ATC system, increasing its workload and costs, but the primary funding source is still based on a percentage of the ticket price, which continues to trend downward because of continued robust competition. FAA Vice President for Finance Gene Juba has concluded that these structural changes require the agency to develop a funding mechanism based on ATC workload rather than ticket prices.

Question #2: Couldn't the funding problem be solved by increasing the fraction of the FAA budget that comes from the general fund from the current 20 percent to 30 percent?

First, in the context of large federal deficits as far as the eye can see, increasing general-fund support for any federal program is highly unlikely, especially if that program has identifiable users who could be charged for its services.

Second, even if this were possible, it would do nothing to enable the ATO to issue revenue bonds to finance the long-term capital expenditures for the next-generation ATC system. Issuing bonds requires a reliable revenue stream that is not subject to the risks and uncertainties of annual appropriations.

Third, creating a customer-provider relationship is the key to reforming the ATC governance system so that cost control and a clear business case for each new investment become standard practice. The general fund should continue to support the FAA's vital air-safety functions, including the operations of the Flight Service Stations that assist general aviation pilots.

Question #3: Wouldn't general and business aviation be better off if Congress continues to be the de facto board of directors of the ATC system?

ATC is a multibillion-dollar 24/7 high-tech service business. It needs to be governed by people who are highly knowledgeable about aviation, management, technology, and service businesses. Members of Congress are generalists and are driven by political considerations, such as jobs in their districts, rather than by what is in the long-term interest of aviation users: an ATC system that has plenty of capacity and delivers greater value to its customers. Dozens of other countries have created ATC providers that are self-supported by fees and charges and that have real boards of directors empowered to act in the best interests of their customers.

Question #4: Won't the airlines dominate any ATC system board of directors, giving short shrift to the interests and concerns of business and general aviation?

Only Congress can create a commercialized ATC system. In the enabling legislation, Congress could spell out the requirements for a stakeholder board, balanced carefully to represent all segments of aviation. In 2001, the Reason Foundation suggested one possible structure for such a board:

- Four seats for airlines (legacy, low-cost, regional, and cargo);
- Three seats for general aviation (business, recreational, and charter/fractional);
- One seat for airports;

- One seat for ANSP employees;
- Two seats for the federal government (Departments of Defense and Transportation);
- Three seats for the general public (air travelers); and
- One seat for the CEO.

The first 11 of these would select the three members from the general public, and those 14 would hire the CEO, who would become the 15th board member. Clearly, governance can be structured to represent all sectors of aviation. A board structure along these lines has worked quite well at NAV CANADA for the past 10 years.

Question #5: All of the overseas examples of ATC commercialization seem to be in small or developing countries that have much less air traffic than the United States. How can these examples be relevant to the much larger, more complex U.S. system?

Nearly all advanced Western countries have commercialized their ATC systems over the past 20 years—including Australia, Canada, France, Germany, Switzerland, the United Kingdom, the Benelux countries, and Scandinavia. What is relevant is not so much total air traffic but the complexity of that traffic. A recent international study that examined pairs of terminal-area airspace with equivalent traffic density (e.g., Philadelphia and Frankfurt, Washington and Toronto, San Diego and Auckland) found that the commercialized systems were more cost-effective as measured by cost per aircraft movement.³⁶ Obviously, the larger overall system and larger business aviation sector in the United States will require crafting a solution that best fits U.S. needs. That solution can draw on what has worked best in dozens of other countries.

Question #6: Europe and Canada charge fees to ATC users but have much smaller business aviation sectors than the United States has. Doesn't this prove that ATC user fees are harmful to business aviation?

Eurocontrol says that business aviation is “a prime contributor to the growth of air traffic on the continent,” growing faster than all other IFR (instrument flight rules) traffic. *Aviation Week* reports that the rapid growth of business aviation is one of the factors behind the drive for a next-generation Europe-wide ATC system. Warren Buffett told shareholders in February 2006 that NetJets increased its European business by 37 percent in 2005.³⁷ Likewise, the Canadian Business Aviation Association reports double-digit growth in business aviation and is positive about the impact of NAV CANADA.³⁸ It seems clear that ATC fees are not holding back the growth of business aviation in Canada and Europe.

Question #7: The ATC system was designed for airline use. Since business aviation is a marginal user, why should it pay for services that are designed to serve airline needs?

This may have been the case at one time, but today and in the coming decades, business aviation is and will be a major user of ATC services, flying in the same controlled airspace and using the same TRACONS and centers. In recognition of business aviation's key role in the ATC system, its trade association (the National Business Aviation Association) shares space in the FAA's nationwide ATC command center on

36. Federal Aviation Administration, “International Terminal Air Traffic Control Benchmark Pilot Study,” February 2005.

37. Robert Poole, “Business Aviation Prospers, Despite Higher Costs,” Reason Foundation *ATC Reform News* No. 34, May 2006, at www.reason.org/atcreform34.shtml (February 11, 2007).

38. Robert Poole, “Bizjet Sales Cut by Commercialization?” Reason Foundation *ATC Reform News* No. 31, January 2006, at www.reason.org/atcreform31.shtml (February 11, 2007).

an equal basis with the airline trade association. Likewise, it should be fully represented on the board of directors of a reformed ATC provider, making the critical decisions on modernizing and managing the next generation system.

Question #8: Wouldn't collecting ATC user fees be costly and cumbersome?

Nearly all countries except the United States charge user fees for ATC services. In Europe, en route charges are billed and collected by Eurocontrol. The annual cost of billing and collection is 0.3 percent of the amount billed. In Canada, the private, nonprofit NAV CANADA's billing costs are about 0.2 percent. Billing would be based on standard parameters, such as great circle distance between origin and destination, flight time, or gross takeoff weight—factors that are already part of the electronic flight plans.³⁹ Billing operations could be contracted out to commercial service providers, eliminating the need to develop in-house expertise.

Question #9: What about high-end piston planes that fly in controlled airspace only some of the time?

Nearly all current user-fee proposals call for no ATC fees for the vast majority of piston planes, which are used primarily for recreational flying and mostly under visual flight rules (VFR). These planes would continue to pay a fuel tax to support the Airport Improvement Program from which they benefit. NAV CANADA offers a workable approach for high-end piston planes that fly IFR (instrument flight rules) some of the time. They pay a modest annual fee on a sliding scale based on aircraft weight, that gives them access to the IFR system.

Question #10: Wouldn't switching from current aviation taxes to ATC user fees seriously harm business aviation?

This would depend on the user-fee formula and how the hourly cost of user fees compares with the hourly cost of current taxes. The hourly cost for fractional and charter users could even be lower than the current 7.5 percent tax plus segment fee. For example, under the NAV CANADA user-fee formula, fractional and charter jets would pay less than they do under the current U.S. aviation tax structure.⁴⁰ Even though corporate-owned jets would probably pay more under any likely user-fee formula, they would also benefit from the reduced delays under a next-generation ATC system.

Question #11: Won't union opposition doom any proposal to corporatize the ATO?

The National Air Traffic Controllers Association (NATCA), the principal FAA union, has long argued against privatizing the ATC system. It cites an alleged conflict between safety and profits as the reason, but the proposed reform of the ATO does not involve profits. In fact, NATCA is on record as supporting the Clinton Administration's proposal to divest ATC to a government corporation (USATS). USATS would have been funded by revenue bonds supported by user fees and entirely outside the FAA and DOT. Functionally, a corporatized ATO looks very much like USATS, except that it would have a stakeholder board of directors. In other words, this proposal offers NATCA the equivalent of "USATS plus a board seat." It could also include no-layoff guarantees for all current controllers and technicians while bringing in the

39. Robert Poole, "Would ATC User Fees Be Costly to Collect?" Reason Foundation *ATC Reform News* No. 30, November 2005, at www.reason.org/atcreform30.shtml (February 11, 2007).

40. Robert W. Poole, Jr., "Business Jets and User Fees: Taking a Closer Look," Reason Foundation *Policy Study* No. 347, August 2006, at www.reason.org/ps347_business_jets_atc.pdf (February 11, 2007).

best possible managers from the private sector, supplemented by those current FAA managers who can thrive in a corporatized environment.

Question #12: Wouldn't shifting the ATO away from the FAA reduce air safety?

On the contrary, an ATO at arm's length from the FAA would increase air safety for three reasons.

- As mandated by the International Civil Aeronautics Organization, this approach would separate the ATC services from government safety regulation. In the FAA, these functions are carried out by the same organization—an inherent conflict of interest. The more than 40 countries that have corporatized their ATC systems over the past two decades have deliberately separated ATC service provision from air-safety regulation to eliminate this conflict of interest.
- The best way to increase air safety is to use state-of-the-art technology, something the FAA has had difficulty doing. This is not simply a matter of making a long overdue one-time upgrade (such as FAA's recent replacement of controllers' radar displays). It is a matter of creating a corporate culture of continual improvement, making modernization an ongoing way of life.
- Overseas ATC corporations, such as those in Canada and Germany, are required to purchase liability insurance in the global aviation insurance market. This puts the insurance industry's funds at risk and gives the insurance industry a powerful incentive to oversee ATC operations. Requiring liability insurance will create this additional level of safety oversight for the corporatized ATO.