Airports and Air Traffic Control

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Overview

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. Air transportation is a hugely important part of the economy for business travel, tourism, and domestic and international trade.

The quality and cost efficiency of air travel relies critically on the nation's aviation infrastructure. That infrastructure includes commercial airports, which are virtually all owned and operated by state and local governments in the United States, and the air traffic control (ATC) system, which is operated by the Federal Aviation Administration (FAA).

In fiscal 2011, the FAA budget will be about $16.4 billion.[1] Of the total, $9.7 billion will go toward "operations," which includes $7.6 billion for air traffic control operations, $1.3 billion for safety regulation and certification, and $0.8 billion for other functions. In addition, the FAA will spend $3.3 billion in 2011 on capital investments in ATC facilities, equipment, and research. Most of the rest of FAA's budget, about $3.4 billion, will go toward grants to state and local governments for airport investments.

Many experts are predicting major problems with U.S. aviation infrastructure in coming years as large demand growth outstrips the capacity of available facilities. In addition to a rising number of airline passengers, the average size of planes has fallen, which increases the number of planes in the sky that the ATC system needs to handle. On the supply side of the aviation equation, the FAA has long had problems with capital funding, high labor costs, and an inability to efficiently implement new technologies. Major changes are needed because the increased air traffic will soon bump up against the limits of the current air traffic control system.

The United States should embrace the types of reforms adopted around the world to privatize airports and commercialize air traffic control services. Investor-owned airports and commercialized ATC companies can better respond to changing market conditions, and they can freely tap debt and equity markets for capital expansion to meet rising demand. Such enterprises also have greater management flexibility to deal with workforce issues and complex technology implementation.

There is vast foreign experience that can be drawn on in pursuing U.S. reforms, such as European airport privatization and Canadian air traffic control commercialization. The next section provides a brief history of federal involvement in airport funding and air traffic control. The subsequent sections describe the global trend toward airport privatization, the brewing crisis in air traffic control, and ways to reform the ATC system.

A Brief History of Federal Funding

Federal involvement in air traffic control has a long history. The 1926 Air Commerce Act tasked the Department of Commerce with issuing and enforcing air traffic rules, licensing pilots, certifying aircraft, establishing airways, and operating aids for air navigation.[2] In the mid-1930s, the federal Bureau of Air Commerce took over the initial air traffic control centers for en route tracking created by the airlines, which complemented the operation of local control towers by municipal authorities. During the 1940s, the federal government began taking over the operation of local control towers, and following World War II all aspects of air traffic control became federal.

Airport development took a different path. In the early years of commercial aviation, some private airports (e.g., Burbank, California) existed alongside those established by state and local governments. Today, virtually all U.S. commercial airports are owned by state and local governments. The federal government's role has been to regulate and subsidize those facilities. Federal financial aid to airports began with work relief programs in the 1930s, and was followed by the Federal Airport Act of 1946, which provided $500 million in airport grants to state and local governments over seven years.

The coming of jet aircraft and the large number of aviation accidents spurred Congress to pass the Federal Aviation Act of 1958, which created the Federal Aviation Administration. The new administration replaced previous federal agencies involved in air traffic control and airport development.

Congress started taxing the commercial aviation industry soon after it was established. It passed an excise tax on gasoline and aviation fuels in 1932 and an excise on airline passenger tickets in 1941. The revenue from these levies went into the federal government's general fund. That changed in 1970 when Congress passed legislation creating an Airport and Airway Trust Fund, which had dedicated streams of

revenue to be used for air traffic control and federal aid to airports. Trust Fund revenue sources included ticket taxes on domestic and international flights, taxes on fuels, and various fees.

The Airport and Airway Trust Fund currently raises more than $12 billion annually from a 7.5 percent tax on domestic airline tickets, a tax on each segment flown, taxes on gasoline and jet fuel, international departure and arrival taxes, and half a dozen other fees. Trust Fund revenues pay for almost four-fifths of the FAA's $16.4 billion budget, with the balance coming from general federal funds covering the FAA's safety regulatory and miscellaneous other activities.

While air traffic control is an increasingly technology-intensive industry, labor union issues have long played an important role in the ATC system. A period of labor unrest began in the late 1960s as FAA controllers pushed for job improvements and official status as an employee union. In 1969, about 500 members of the Professional Air Traffic Controllers Organization stayed home "sick" causing air service interruptions. The following year, 3,000 PATCO members took part in another "sickout" or illegal strike, which caused chaos for the nation's air traffic.[3]

Labor problems continued during the 1970s, with various work slowdowns and union protests over contract issues. Then in 1981, PATCO declared a major system-wide illegal strike after negotiations on a new contract broke down. That prompted President Ronald Reagan to order controllers to return to work within 48 hours or else face termination. More than 11,000 controllers refused to return to work and were fired by Reagan and initially banned from federal service. PATCO was dissolved and a new controllers union was created in 1987, the National Air Traffic Controllers Association.

Today, an important aspect of the federal ATC system is the high labor costs. In 2010, the operations portion of FAA had about 43,000 workers who earned a total of $6.5 billion in wages and benefits, or about $151,000 per worker.[4] Just looking at controllers, a 2005 FAA study found that compensation packages averaged $166,000 annually.[5] Labor costs account for two-thirds of the cost of FAA operations.[6]

While organized labor has created management challenges for the FAA, so has the implementation of new technologies. Delays and cost overruns on major technology projects have been common. For example, the Advanced Automation System project was launched in the early 1980s and was originally expected to cost $2.5 billion and be completed by 1996. But by 1994, estimated project costs had soared to $7.6 billion and the project was seven years behind schedule.[7] The FAA terminated some parts of the AAS program and restructured others, but $1.5 billion of spending ended up being completely wasted.

More recently, a 2005 study by the Department of Transportation's Office of Inspector General looked at 16 major air traffic control upgrade projects and found that the combined costs had risen from $8.9 billion to $14.5 billion.[8] The cost of the Standard Terminal Automation Replacement System project had jumped 194 percent to $2.7 billion and was seven years behind schedule. The OIG said that the STARS project was "facing obsolescence" even before it was completed.[9] Meanwhile, the cost of the Wide Area Augmentation System project had jumped 274 percent to $3.3 billion and was 12 years behind schedule. A Government Accountability Office analysis in 2005 found similar cost overruns and delays in these projects.[10]

Delays and cost overruns have not been uncommon in federally subsidized airport projects either. For example, Denver's new international airport finally opened in 1995 after many delays and huge cost overruns. The project was originally supposed to cost $1.7 billion but ended up costing almost three times as much at $4.9 billion, with $685 million coming from federal taxpayers.[11]

In sum, federal funding of airports and the operation of the nation's ATC system have not been models of efficiency over the decades. There is large room for improvement in the management of the nation's aviation infrastructure, and the following sections consider some major structural reforms.

Privatizing Airports

Virtually all commercial airports in the United States are owned by state and local governments.[12] But around the world, airports are becoming viewed more as business enterprises, and less as monopoly public services. Governments in both developed and developing countries are turning to the private sector for airport management and development.

The benefits of a more entrepreneurial approach to running airports include increased operating efficiency, improved amenities, and more rapid and efficient expansion in capacity to reduce congestion. Airlines, passengers, private-plane owners, and taxpayers can all benefit from this new commercial approach to airport management.

For existing state and local airports, the simplest form of privatization is to contract out management of the airport on a short-term basis. But long-term leases can shift much greater responsibility and entrepreneurial incentive to the airport company, while liberating much of the city's previous investment in the airport. To create new airport facilities, the private sector can be brought in as a partner and granted either a long-term or perpetual franchise to finance, design, own, and operate the new facility. Full private ownership and management of airports is also possible and is becoming fairly common in Europe.

Airports have been fully or partly privatized in many foreign cities, including Amsterdam, Athens, Auckland, Brussels, Copenhagen, Frankfurt, London, Melbourne, Naples, Rome, Sydney, and Vienna. Britain led the way with the 1987 privatization of British Airports Authority, which owns Heathrow and other airports. Other countries followed with a wide range of commercialization reforms under which private firms own or operate various aspects of airport facilities.

Since 1987, more than 100 airports have been partly or fully privatized worldwide. A recent survey found that there are about 100 companies around the world that own and operate airports, finance airport privatization, or participate in projects to finance, design, build and operate new airports or airport terminals.[13]

Here are some examples of airport privatization reforms in recent years:

- France's Aeroports de Paris, which owns Charles de Gaulle and Orly airports, was partially privatized in 2006.
- Most of Italy's larger airports have been privatized, including those in Rome, Florence, Naples, Parma, Pisa, and Venice.
- Greece plans to sell part of the remaining share of the Athens airport that it retains, and it may privatize some of its larger regional airports.
- Spain's government announced in 2008 that it will sell major stakes in the 47 airports operated by state agency AENA.
- Mexico has privatized numerous airports, and the country boosts three successful airport operators that plan to expand abroad.
- Brazil is planning to privatize Galeao International Airport in Rio de Janeiro.
- Most of Australia's major airports have been either privatized or contracted out to private operators under long-term leases.[14]

Why has the United States resisted these types of airport reforms occurring around the world?[15] One reason is that U.S. state and local airports have for decades received federal aid for development and construction. Federal law generally provides that governments that have received federal aid for an infrastructure facility have to repay previous federal grants if the facility is privatized. Moreover, the FAA has interpreted a legal provision requiring that all "airport revenues" be used solely for airport purposes to apply to any lease or sale proceeds, which prevents a city from selling its airport and using the proceeds for its general fund.

Another important factor is that state and local governments can issue tax-exempt bonds to finance airports because they are government-owned facilities. Thus, borrowing can be done at a lower cost than borrowing by private airport owners issuing taxable debt. However, this bias against private ownership can be overcome. The federal government could pursue tax reforms to reduce or eliminate the tax exemption on municipal bond interest. Alternatively, the government could permit private airport operators to make use of tax-exempt revenue bonds ("private activity bonds"), as it has done for companies involved in the toll road business.

A final hurdle to airport privatization in the United States has often been the airlines. For various structural reasons, they worry that their costs may be higher or they may face more airline competition if airports were privatized. Typically, major airlines are like an anchor tenant in a shopping mall. At U.S. airports, major airlines generally have long-term lease-and-use agreements, which often give them control over terminals or concourses and the right to approve or veto capital spending plans. That gives them the power to oppose airport expansion if it would mean more airline competition in that location.

In the 1990s, numerous state and local officials saw what Margaret Thatcher had done in Britain and were inspired to sell or lease their own airports. But the airlines and federal administrators objected for the reasons cited. So privatization proponents went to Congress, and it passed the very modest reform in 1996: the Airport Privatization Pilot Program. This program allows exemptions from the most onerous provisions of airport grant agreements for up to five U.S. airports. Cities whose airports are accepted for the pilot program do not have to repay previous grants and they are allowed to keep any airport sale or lease proceeds.[16] However, the airlines lobbied hard to include a provision specifying that to keep sale or lease proceeds a city had to get the approval of 65 percent of the airlines serving an airport, which created a substantial hurdle to reform.

As a result, progress toward privatization has been very slow over the last decade. The only airport privatized under the 1996 Pilot Program—Stewart International Airport north of New York City—did not get the local airline's approval. Therefore, New York State was required to use its lease revenues for improvements to Stewart and other state-owned airports. The airport operated under a 99-year lease to the U.S. subsidiary of the U.K.-based National Express Group.[17] But that lease was later terminated by mutual consent due to National Express's change in corporate strategy to focus on its intercity bus and rail business. The Port Authority of New York and New Jersey, a government agency, took over the remaining years of the lease. This change freed up that slot in the Pilot Program, making all five available as of 2010.

Some other airports where local officials have recently considered applying to the Pilot Program are Austin, Hartford, Jacksonville, Kansas City, Long Beach, Milwaukee, New Orleans, Ontario (California), and San Juan. Chicago has been close to a deal on privatizing Midway airport, but the financial crisis has put that plan on hold for now.[18]

One positive development is that a small but growing number of U.S. airports have management contracts with private companies. Indianapolis International Airport did a successful medium-term management contract with BAA Indianapolis LLC, a wholly owned subsidiary of the British BAA plc. Other contract-managed airports include Albany, Burbank, and White Plains/Westchester.

Another bright spot is that an entirely privately financed, built, and operated commercial airport opened near Branson, Missouri, in 2009.[19] A group of entrepreneurs created Branson Airport LLC, acquired a parcel of land, received airspace approvals from the FAA, and set about raising money. With $140 million in hand, they have created a one-runway airport with a contractor-operated control tower and a modest terminal building for commercial flights by Airtran and other carriers.

One more reason to privatize airports can be found by looking at the effects of airline deregulation. In 1978, President Jimmy Carter signed into law the Airline Deregulation Act, which removed government controls over airline fares, routes, entry, and mergers. Under deregulation, prices fell and the volume of air travel dramatically increased. Airlines reconfigured their routes and equipment and improved their capacity utilization. Many new airlines opened for business.[20] Consumers continue to save tens of billions of dollars a year from these reforms.

However, it is also true that today's airline service often leaves much to be desired, with frequent delays, overcrowded planes, and other inconveniences. If service by some airlines is so bad, why haven't airline entrepreneurs broken into such markets to offer better alternatives? It turns out that many are trying, but they often have difficulty obtaining gates at such airports. The reality is that airline deregulation is an unfinished revolution until it includes airport deregulation and privatization.

All too many U.S. airports are still run in an old-fashioned and bureaucratic manner typical of the pre-deregulation era. Their management style is more passive and risk-averse than that of the world's privatized airports. Investor-owned airports are run as businesses, trying to make profits by tailoring their services to meet the needs of different groups of customers, not just airlines. Detailed research by scholars at Oxford University has shown that the management approach of privatized airports is significantly more "passenger friendly" than that of traditional airports.[21]

Private airport managers are also more willing to take on the risks of new investments, such as the creation of new terminal space to

provide gates for new airlines. By contrast, under typical U.S. airport management practice, the major incumbent airlines have signed long-term exclusive-use gate-lease agreements. From the standpoint of risk-averse airport managers, these long-term agreements give them a guaranteed revenue stream. In exchange for this security, they give up substantial control to the major airlines. Usually, the long-term agreements give airlines what amounts to veto power over terminal expansions. That means that when new-entrant airlines want to start service to such an airport, there are often no gates available, which reduces competition.

By contrast, experience has shown that privatized airports generally do not cede de-facto control over their facilities to the large airlines. At most such airports, the gates remain under the control of the airport company, and they are allocated hour by hour to individual airlines, as needed. That is why at many European airports, and the more commercially run airports in Canada, you will observe that the airline signage at each gate is electronic, so that it can be changed in moments from one airline's name to another's.

In sum, airline competition would be expanded and consumers would benefit if we reformed the outmoded ownership and management structures of U.S. airports. Much of the world is moving to a new paradigm—the airport as a for-profit enterprise—that is more consistent with a dynamic, competitive airline market. In the end, all groups—airlines, passengers, and cities—would benefit from airports that were self-funded, more efficient, and more innovative than current U.S. airports following an old-fashioned bureaucratic approach.

The Crisis in Air Traffic Control

Many aviation experts predict serious trouble in coming years as air travel demand grows faster than the ability of the U.S. air traffic control system to expand capacity.[22] In the 2003 reauthorization of the FAA, Congress acknowledged the seriousness of the problem by creating the Joint Planning and Development Office to coordinate the transition to a Next Generation Air Transportation System (NextGen). NextGen will be a major redesign of the ATC infrastructure, as described by the Congressional Budget Office:

> The new system is designed to accommodate up to three times the volume of current air traffic by making more efficient use of both the national airspace and airport facilities. The new air traffic control system would be more decentralized than the one currently in place in the United States. Guidance systems on planes would work in conjunction with satellites of the Global Positioning System (GPS) to supplement direct supervision by ground-based controllers and radar stations. As a result, each plane would depend less on instructions from an air traffic controller and more on its own resources for maintaining a safe flight pattern and would be better able to adjust to the particular air traffic conditions in its vicinity.[23]

The JPDO has estimated that *not* expanding the ATC system's capacity will be costing the U.S. economy $40 billion per year by 2020 because the overburdened system will force significant rationing of flights. That rationing would increase prices and eliminate some trips entirely. To avoid this crisis, JPDO has called for restructuring the ATC system to safely and efficiently handle the heavier demand.

One problem is the mismatch between the growth in air traffic and the projected growth in FAA revenue. The FAA will need about $1 billion more per year over the next 20 years just to implement NextGen. In 2007 the FAA proposed a user-fee-based funding reform that could provide a more efficient and growing revenue source. The idea was to make each air transportation user's burden on the ATC system more closely match that entity's cost for using the system. That approach has thus far been ignored by Congress.

However, the challenge ahead for the ATC system is more complex than just financial. NextGen will be a major paradigm shift—from 20th-century (manual) air traffic control to 21st-century (semi-automated) air traffic management—and it will be more complex and riskier than any other challenge the FAA has previously attempted. Given the FAA's management and cost overrun problems in the past, simply fixing the funding problem for the ATC system without dramatically reforming its governance poses risks of larger and more dramatic failures and greater congestion down the road.

Here are three key problems with the current government-owned and operated system of air traffic control:

- **Inflexible Funding.** Government funding sources tend to be static and subject to political considerations, and they are decoupled from changing market demands. Changes in aviation over the past decade have hurt the FAA's funding base. A large part of the FAA budget comes from aviation excise taxes, especially the 7.5 percent tax on airline tickets. As average ticket prices have fallen over time, ATC funding has been squeezed. Payroll costs of the current labor-intensive ATC system consume most of the available budget, leaving less funding for capital investment.

  Making the transition to NextGen will require billions of dollars of new investments in advanced technologies. The FAA's capital budget is still focused mostly on patching up the existing system, such as replacing antiquated display consoles. Such investments are needed in the short-term, but won't add very much capacity to the system. But that is nearly all the FAA can afford under the current funding structure.

  Some people argue that Congress could solve the funding problem by appropriating a larger amount of general federal revenue for the ATC system. But given the giant federal budget deficit, federal discretionary spending is going to be severely squeezed in coming years. The solution, as discussed below, is to create a commercialized ATC system that can flexibly respond to changing conditions and access private capital markets for investment.

- **Technology Implementation Risks.** The FAA has been attempting to modernize its system, expand capacity, and increase its productivity for decades. But dozens of reports over the years from the Government Accountability Office and the Office of Inspector General in the Department of Transportation have faulted the FAA for poor management of major projects, which are often delayed and over budget.[24] The Advanced Automation System, Wide Area Augmentation System, and other major projects have had large cost overruns and been years behind schedule or cancelled, as discussed above.

  In 2005 two OIG researchers presented an overview of the FAA's failed efforts over the years to modernization the National Airspace System.[25] In reviewing what went wrong, they concluded that FAA modernization efforts had neither reduced costs nor increased productivity:

NAS modernization plans have been consistently subverted by requirements growth, development delays, cost escalations, and inadequate benefits management. All these things were symptomatic of the fact that FAA didn't think it needed to reduce operating costs.[26]

Many experts are greatly concerned that the FAA's institutional culture is poorly suited to implementing anything as dramatic as NextGen. In 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. 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."[27]

As a government agency, the FAA is not designed to judge risks, aim at the most efficient investments, manage people to produce results, reward excellence, or punish incompetence. It is therefore not equipped to fundamentally reform the ATC system. Thus, major institutional change is probably a prerequisite for implementing the advanced ATC system the nation needs to meet rising aviation demand.

- **Political Constraints.** A third impediment to ATC reform is political. The redesign of the ATC system foreseen in NextGen could potentially deliver major cost savings and greatly expand ATC capacity. However, realizing those gains would require retirement of large numbers of costly radars and other ground-based navigation aids and the consolidation of ATC facilities. One current proposal would replace 21 en route centers and 171 terminal radar approach control (TRACON) facilities with just 35 air traffic service hubs in a redesign of U.S. airspace.[28] Physical control towers located at many smaller airports would gradually be phased out as "virtual tower" functions are built into the new super-hubs.

  However, Congress tends to resist consolidating ATC facilities because of concerns about job losses and the like, which is similar to the political resistance to closing post offices and military bases. A major 1982 proposal for consolidating ATC facilities was quietly dropped after it became clear that getting it through Congress would be very difficult. Similarly, Congress came extremely close to forbidding the FAA's recent success in outsourcing its Flight Service Station system, which involved reducing the system from 58 facilities to 20. The prohibition was defeated only by a credible veto threat from the White House. In sum, as long as ATC remains government-owned and controlled, making the needed reforms to improve efficiency and implement NextGen will be very difficult.

Commercializing Air Traffic Control

The way to address all three of these organizational problems is to take the ATC system out of the federal budget process and make it a self-supporting entity, funded directly by its customers. Variants of this commercialization approach have been recommended by a series of federal studies and commissions over the past 15 years.

As part of Vice President Al Gore's efforts at "reinventing government" in the 1990s, for example, the Clinton administration proposed turning the ATC system into a separate, self-funded, nonprofit government corporation within the Department of Transportation. The 1997 National Civil Aviation Review Commission, which was chaired by Norman Mineta, similarly proposed moving toward a self-supporting air traffic control organization.[29]

Commercialization would entail shifting from aviation-related taxes paid to the U.S. Treasury to fees for ATC services paid directly by customers to a new self-supporting Air Traffic Organization. This change would allow fees to grow in proportion to the growth of flight activity, rather than being tied to a less-stable variable, such as fuel prices or airline ticket prices. Moreover, a predictable revenue stream that was not subject to the federal budget process would provide the basis for the ATO to issue long-term bonds for funding capital investments.

Commercialization would also address the management problems that have plagued the FAA's efforts to modernize. A non-civil-service ATO could attract the best private-sector managers and engineers skilled at implementing complex technology projects. Such an ATO could hire, fire, and compensate its employees as other high-tech businesses do. Private sector managers would have an incentive to ask tough questions about whether new investments offered real value for the money, a process that often doesn't occur at the FAA or in Congress.

In addition, a separate, self-supporting ATO—no longer part of the FAA—would be overseen at arm's length for aviation safety by the remaining FAA. Numerous studies have pointed out that the FAA's air-safety role is compromised when it comes to the ATC system, since that system is operated "in-house" by a different branch of the same FAA. All other players in aviation—pilots, mechanics, aircraft manufacturers, airlines, and so forth—are regulated at arm's length for safety by the FAA. This separation of ATC operations from safety regulation is especially critical given the major changes entailed by shifting to the semi-automated NextGen, where numerous safety versus capacity questions will need to be addressed in a rigorous and transparent manner.

Finally, a self-supporting ATO would address the political obstacles to improving system efficiency, such as making decisions to close facilities. By passing the enabling legislation for ATC reform, Congress would delegate such contentious issues to the customer-oriented ATO organization.

During the past two decades, nearly 50 governments have commercialized their air traffic control systems. That means they have separated their ATC activities from their transport ministries, removed them from the civil service, and made them self-supporting from fees charged to aircraft operators. These new air navigation service providers (ANSPs) are usually regulated at arm's length by their government's aviation safety agency.

Britain's ATC system has been commercialized by means of a "public-private partnership." National Air Traffic Services is a jointly owned company, with British airlines owning 42 percent, airport company BAA owning 4 percent, employees owning 5 percent, and the government owning the remaining minority stake. NATS is operated on a not-for-profit basis.

Canada's ATC system has been fully commercialized.[30] In 1996, Canada set up a private, nonprofit ATC corporation, Nav Canada, which is self-supporting from charges on aviation users. The Canadian system has been widely praised for its sound finances, solid management, and its investment in new technologies.[31] The Canadian system is a very good reform model for the United States to consider.

Nav Canada's corporate board is composed largely of aviation stakeholders.[32] It has 4 seats for the airlines, 3 for the government, 2 for employees, and 1 for the non-commercial aviation industry. Those 10 stakeholders select 4 directors from outside aviation, and then those 14 select the company president, who becomes the 15th board member. To further strengthen governance, neither elected officials nor anyone connected with suppliers to Nav Canada can serve on the board. Nav Canada also has a 20-member outside Advisory Committee.

A number of studies have found that ATC commercialization has generally resulted in improvements to service quality, better management, and reduced costs.[33] At the same time, air safety has remained the same or improved in the countries that have pursued reforms to set up independent ANSP organizations.

A thorough 2009 report by Glen McDougall and Alasdair Roberts compared the performance of 10 commercialized ATC systems and the FAA during the 1997 to 2004 period.[34] They looked at large amounts of performance and safety data from the systems in the various countries and conducted over 200 interviews with managers, workers, and users of the different systems. The researchers found:

> ANSP commercialization has generally achieved its objectives. Service quality has improved in most cases. Several ANSPs have successfully modernized workplace technologies. The safety records of ANSPs are not adversely affected by commercialization, and in some cases safety is improved. Costs are generally reduced, sometimes significantly. Other risks of commercialization—such as erosion of accountability to government, deterioration of labor relations, or worsened relationships between civil and military air traffic controllers—have not materialized.[35]

For the United States, a commercialized ATC organization would be more likely than the FAA to efficiently implement the major aviation infrastructure advances that the nation desperately needs. Air traffic control is more complex and dynamic than ever, and it needs to be managed in the sort of efficient and flexible manner that only a commercialized environment can offer. Countries like Canada have shown the way forward for air traffic control, and U.S. policymakers should adopt the proven organizational reforms that have been implemented abroad.

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4 *Budget of the U.S. Government, Fiscal Year 2011, Appendix* (Washington: Government Printing Office, 2010), p. 936.

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12 There are, however, thousands of small, private general aviation airports in the United States, which do not offer scheduled commercial flights.

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16 An FAA description of the program is at www.faa.gov/airports/airport_compliance/privatization. And see Robert W. Poole, Jr., "Airport Privatization Pilot Program," Reason Public Policy Institute, September 1997.

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[25] 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.

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[31] For example, see Joel Bagnole, "How Canada Gets Jets Across the Sea," *Wall Street Journal,* May 9, 2002, p. A12.

[32] Robert W. Poole, Jr., "Air Traffic Control Reform Newsletter #59," Reason Foundation, January 1, 2009.

[33] For example, see 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. For a discussion of other studies, see Robert W. Poole, "The Urgent Need to Reform the FAA's Air Traffic Control System," Reason Foundation, March 2007.

[34] Glen McDougall and Alasdair S. Roberts, "Commercializing Air Traffic Control: Have the Reforms Worked?" Suffolk University Law School, February 17, 2009.

[35] Glen McDougall and Alasdair S. Roberts, "Commercializing Air Traffic Control: Have the Reforms Worked?" Suffolk University Law School, February 17, 2009, p 3.