

**GAO**

Testimony

Before the Subcommittee on Aviation,  
House Committee on Transportation and  
Infrastructure

---

For Release on Delivery  
Expected at 10:00 a.m. EDT  
Wednesday, April 20, 2005

# AIR TRAFFIC CONTROL

## Preliminary Observations on Commercialized Air Navigation Service Providers

Statement of Gerald L. Dillingham, Ph.D.  
Director, Physical Infrastructure Issues





Highlights of [GAO-05-542T](#), a testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

### Why GAO Did This Study

In the past, governments worldwide owned, operated, and regulated air navigation services, viewing air traffic control as a governmental function. But as nations faced increasing financial strains, many governments decided to shift the responsibility to an independent air navigation service provider (ANSP) that operates along commercial lines. As of March 2005, 38 nations worldwide had commercialized their air navigation services, fundamentally shifting the operational and financial responsibility for providing these services from the national government to an independent commercial authority.

GAO selected five ANSPs—in Australia, Canada, Germany, New Zealand, and the United Kingdom—to examine characteristics and experiences of commercialized air navigation services. These ANSPs used different ownership structures and varied in terms of their size, amount of air traffic handled, and complexity of their airspace.

This testimony, which is based on ongoing work, addresses the following questions: (1) What are common characteristics of commercialized ANSPs? (2) What do available data show about how the safety, cost, and efficiency of air navigation services have changed since commercialization? (3) What are some initial observations that can be made about the commercialization of air navigation services?

[www.gao.gov/cgi-bin/getrpt?GAO-05-542T](http://www.gao.gov/cgi-bin/getrpt?GAO-05-542T).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gerald L. Dillingham, (202) 512-2834, [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov).

## AIR TRAFFIC CONTROL

# Preliminary Observations on Commercialized Air Navigation Service Providers

### What GAO Found

The five commercialized ANSPs that GAO selected for review have a number of common characteristics: Each operates as a business, making and carrying out its own strategic, operational, and financial decisions. Each generates and manages its own revenue to cover its costs, charging fees to users and borrowing funds from private markets instead of relying on annual governmental appropriations. Each has also put commercial financial and performance data systems in place. All five ANSPs have retained safety as their primary goal, and each is subject to some external safety regulation. Each ANSP is largely a monopoly provider of air navigation services and undergoes some form of economic review or follows some guidelines for setting prices.

The ANSPs report that, since commercialization, each has maintained safety, controlled costs, and improved efficiency. Data from all five indicate that safety has not eroded. For example, data from New Zealand and Canada show fewer incidents involving loss of separation (the required distance between an aircraft and another object). All five ANSPs have taken steps, such as consolidating facilities, to control their operating costs. Finally, all five ANSPs have invested in new technologies that the ANSPs say have lowered their costs by increasing controllers' productivity and produced operating efficiencies, such as fewer or shorter delays. Such measures have generally resulted in lower fees for major carriers, but some smaller, formerly subsidized users now pay new or higher fees and are concerned about future costs and service.

GAO's work to date suggests a number of observations about commercialized ANSPs: A contingency fund can help an ANSP cover its costs without greatly increasing user fees during an economic decline; economic regulation by an independent third party can ensure that an ANSP sets prices fairly; providing a forum for stakeholders gives attention to their needs; and special measures may be necessary to reconcile the inability of some users to pay the full costs of services at some small communities and the ANSP's need to recover its costs.

**Size and Scope of Five Commercialized ANSPs Reviewed**

Country	ANSP name	ANSP ownership	Employees	Movements handled (year)
Australia	Airservices Australia	Government corporation	2,900	2,723,828 (2004)
Canada	NAV CANADA	Private company	5,400	6,000,000 (2003)
Germany	Deutsche Flugsicherung GmbH	Government corporation	5,400	2,720,000 (2004)
New Zealand	Airways Corporation of New Zealand, Ltd.	Government corporation	680	1,004,161 (2004)
United Kingdom	National Air Traffic System, Ltd.	Public-private partnership	3,758	2,000,000 (2004)

Source: GAO presentation of data from ANSPs.

---

Mr. Chairman, Ranking Democratic Member, and Members of the Subcommittee:

Thank you for the opportunity to testify before you today on our work related to commercialized international air navigation service providers (ANSP). Since 1987, 38 nations have commercialized their air navigation services, fundamentally shifting the responsibility for providing air navigation services from the national government to an independent ANSP that operates as a performance-based organization along commercial lines.<sup>1</sup> In the United States, of course, the Federal Aviation Administration's Air Traffic Organization was created as a performance-based organization in 2000, but has not been commercialized and remains entirely within the federal government.

In the past, governments worldwide owned, operated, and regulated air navigation services, viewing them as a governmental function. But as air navigation technologies grew more complex and as nations faced increasing financial strains, many governments reevaluated existing structures for providing air navigation services, and some decided that shifting the responsibility for operating and, in some cases owning, the services to an independent commercial authority could produce efficiencies that would benefit both users and the government. In general, the responsibility for regulating the safety of the services is independent of the ANSP.

Today I will discuss how different countries have commercialized their air navigation services and how commercialization has affected those services. Specifically, my statement addresses the following questions:

- What are common characteristics of commercialized ANSPs?
- What do available data show about how the safety, cost, and efficiency of air navigation services have changed since commercialization?

---

<sup>1</sup>For additional information on performance-based organizations, see GAO, *Federal Student Aid: Additional Management Improvements Would Clarify Strategic Direction and Enhance Accountability*, [GAO-02-255](#) (Washington, D.C.: Apr. 30, 2002); *Performance-Based Organizations: Lessons From the British Next Steps Initiative*, [GAO/T-GGD-97-151](#) (Washington, D.C.: July 8, 1997); and *Performance-Based Organizations: Issues for the Saint Lawrence Seaway Development Corporation Proposal*, [GAO/GGD-97-74](#) (Washington, D.C.: May 15, 1997).

- 
- What are some initial observations about the commercialization of air navigation services?

To address these questions, we reviewed the characteristics and performance of five ANSPs, which we selected as illustrative of similarities and differences in the size and scope of commercialized ANSPs. These ANSPs—Australia’s Airservices Australia; Canada’s NAV CANADA; Germany’s Deutsche Flugsicherung GmbH (DFS); New Zealand’s Airways Corporation of New Zealand, Ltd.; and the United Kingdom’s (UK) National Air Traffic Services, Ltd. (NATS)—were commercialized between 1987 and 2001 and have been operating ever since as performance-based organizations along commercial lines. Because of the size of our sample, our results cannot be generalized to other commercialized ANSPs, and our purpose is not to assess or evaluate the selected commercialized organizations.

Comparisons of performance before and after commercialization are generally not feasible because data for assessing performance are typically unavailable for the time before commercialization, or the measures have changed in the years following commercialization. Furthermore, comparisons between or among ANSPs are difficult because each ANSP may define its measures of cost, safety, and performance differently. We did not verify the data gathered and reported by the five ANSPs; however, their financial information is subject to independent audits, and their safety and operating performance data are publicly reported. As a result, we considered the data sufficiently reliable for the purposes of our review. The information presented in this testimony is based on ongoing work and may be updated as additional information becomes available. At the request of the Senate Committee on Commerce, Science, and Transportation, its Subcommittee on Aviation, and Senators John McCain and Trent Lott, we are planning to issue a more detailed report later this year on the topics discussed in this testimony. We performed our work in accordance with generally accepted government auditing standards from August 2004 through April 2005.

Let me turn now to the results of our review. In summary:

The five commercialized ANSPs that we selected for review have a number of common characteristics: Each operates as a business rather than a government organization, making and carrying out its own strategic, operational, and financial decisions. Additionally, each generates and manages its own revenue to cover its operating and capital costs. Each assesses fees on users of air navigation services (e.g., major

---

commercial air carriers, regional air carriers, and in some cases general aviation operators) and is able to borrow funds from private markets, instead of relying on annual appropriations from the government. All five ANSPs have retained safety as their primary goal, and each is subject to some external safety regulation. Finally, each ANSP is largely a monopoly provider of air navigation services and undergoes some form of economic review or follows some guidelines for setting prices.

Available data from the five ANSPs we reviewed indicate that since commercialization, the safety of air navigation services has remained the same or improved, each has taken steps to control costs, and each has reportedly lowered costs and improved efficiency through modernization. Though some opponents have raised concerns that commercialization would compromise safety, data from all five indicate that safety has not eroded. For example, data from New Zealand and Canada show fewer incidents involving loss of separation (the required distance between an aircraft and another object). Additionally, anecdotal information suggests that safety regulation improved when the regulator was separated organizationally from the ANSP. All five ANSPs have taken steps to control their operating costs, whether by eliminating some administrative and middle management positions or by consolidating facilities. Furthermore, all five ANSPs have invested in and benefited from 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. As a result, some ANSPs have been able to lower the prices they charge the airlines for certain services. However, the ANSPs have also instituted or increased fees for general aviation operators. In Australia, a government subsidy for services to smaller airports is scheduled to expire later this year, raising concerns about the affordability and availability of services to those airports.

Our work to date suggests a number of initial observations about commercialized ANSPs. First, having a contingency fund or other mechanism to offset a revenue shortfall can help an ANSP weather a decline in air traffic such as the aviation industry experienced, particularly after September 11, 2001. Second, because the ANSPs are largely monopoly providers of air navigation services, economic monitoring or regulation by an independent third party can protect users and ensure a fair pricing process. Third, addressing the concerns of stakeholders, especially air traffic controllers, is essential to initiate and sustain commercial operations, and providing a forum for communication can ensure subsequent attention to their needs and priorities. Fourth, the conflict between the inability of some users (e.g., smaller air carriers or

---

general aviation operators) to pay the full costs of providing services to small communities and the ANSPs' need to recover their costs means that special measures may be necessary to protect service to some locations. Fifth, when a government sells its interest in an ANSP to private investors as part of the commercialization, the ANSP's assets have to be appropriately valued to protect taxpayer interests and create a basis for sound financial decision-making. Sixth, when operations are separated from regulation during commercialization, it is important to ensure that the regulator can attract and retain sufficient personnel with the skills and expertise needed to provide uninterrupted safety regulation. Finally, developing baseline safety, cost, and efficiency measures prior to commercialization will allow the ANSP and others to compare the performance of the ANSP before and after commercialization and over time.

---

## Background

Before commercialization, air navigation services under government control faced increasing strain. Many were underfunded, as evidenced by air traffic controller wage freezes and insufficient funds to replace aging technologies. In some instances, 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 such as rail, telecommunications, and electricity.

With commercialization, the government typically retains full or partial ownership of the air navigation system and continues to regulate operational safety,<sup>2</sup> but an independent ANSP is responsible for operating the system. The independent ANSP is subject to corporate financial and accounting rules and, in line with today's current management theories, is generally designed as a performance-based organization—that is, an organization that develops strategies, goals, and measures and gathers and reports data to demonstrate its performance. In the five countries whose air navigation services we reviewed, the ANSP continued to provide nationwide services after commercialization and, with certain exceptions, remained the sole provider of air navigation services.

Each ANSP offers en route, approach control, and terminal air traffic services. However, in some cases, an ANSP may not be the sole provider

---

<sup>2</sup>In the UK and Australia, safety and economic regulators are “statutorily independent of the government.”

---

of approach control and terminal services in a country. Although technical definitions may vary slightly among ANSPs, these services broadly correspond to the services provided in U.S. air traffic centers, approach control centers, and towers. All but Germany's DFS also offer oceanic air navigation services. All five ANSPs are responsible for providing air traffic services to both civil and military aviation. In addition, the ANSPs may offer other air-navigation-related services, such as meteorological services, fire and rescue, training, and consulting. The ANSPs also charge for these services.<sup>3</sup>

Discussions about the commercialization of air navigation services often use a number of terms interchangeably. Among these terms are restructuring, privatization, outsourcing, and corporatization, as well as commercialization. The Civil Air Navigation Services Organization (CANSO), which represents the interests of ANSPs worldwide, uses the term corporatization. Others, such as the International Civil Aviation Organization (ICAO), which establishes international civil aviation standards and recommends practices and procedures for ANSPs, use the term commercialization. Some note that an organization can be "commercialized" but not "corporatized" (i.e., established under prevailing company law). For this statement, we will use "commercialization."<sup>4</sup>

Two of the countries we examined—Germany and the UK—are members of the European Union and EUROCONTROL.<sup>5</sup> As parties to these international organizations, the two countries follow the policies and regulatory framework of the European Commission's "Single European

---

<sup>3</sup>NATS includes charges for meteorological services in the charges for en route services.

<sup>4</sup>According to ICAO, commercialization is the ability of an organization to operate like a commercial business, whether it is wholly or partly owned by the government or fully privatized. A commercialized organization should function as an autonomous body and, compared with a government organization, have greater freedom from the government in conducting its financial affairs and developing infrastructure funding. In addition, it should be self-financing, subject to the usual business taxes, and required to seek a return on capital. The safety of its operations should still be regulated by the government, and it should be encouraged to be as competitive, efficient, and cost-effective as any other commercial business.

<sup>5</sup>EUROCONTROL is a European organization responsible for regulating the safety of air navigation, monitoring the performance of air traffic management systems, and developing a seamless air traffic management system in Europe.

Sky” initiative.<sup>6</sup> Under this initiative, EUROCONTROL is mandated to develop implementing rules, one of which specifies that each member state is to develop an independent safety and economic regulatory authority to oversee the ANSP. To this end, Germany is planning to develop such an authority, and the UK has already established one. Table 1 summarizes information on the size and scope of the five ANSPs in our review:

**Table 1: Summary Information on Five Commercialized ANSPs Reviewed**

	<b>Australia</b>	<b>Canada</b>	<b>Germany</b>	<b>New Zealand</b>	<b>United Kingdom</b>
Agency	Airservices Australia	NAV CANADA	Deutsche Flugsicherung GmbH (DFS)	Airways Corporation of New Zealand, Ltd.	National Air Traffic Services, Ltd. (NATS)
Year of commercialization	1988	1996	1993	1987	2001
Type of ownership	Wholly government-owned	Privately owned company	Wholly government-owned	Wholly government-owned	Partially government-owned
Approximate number of employees (Number of controllers)	2,900 (1,100)	5,400 (2,300)	5,400 (2,098)	680 (340)	3,758 (1,380)
Approximate number of aircraft movements handled (Year)	2,723,828 (2004)	6,000,000 (2003)	2,720,000 (2004)	1,004,161 (2004)	2,000,000 (2004)

Source: GAO presentation of data from ANSPs.

<sup>6</sup>The “Single European Sky” initiative, approved by the European Parliament in January 2004, is a legislative package consisting of four regulations that address (1) the framework for the creation of a single European sky, (2) the provision of air navigation services in the single European sky, (3) the organization and use of the airspace in the single European sky, and (4) the interoperability of the European Air Traffic Management network.



---

## Common Characteristics of Five Commercialized ANSPs

The five commercialized ANSPs that we reviewed have a number of common characteristics: All operate as businesses rather than as government organizations, all focus on safety, and all are largely monopoly providers that are subject to some form of economic review or guidelines for setting prices.

---

## Five Commercialized ANSPs Operate as Businesses

All five commercialized ANSPs operate as businesses, although they differ somewhat in their ownership structures. (See table 1.) Three of the five—Airservices Australia, Airways Corporation of New Zealand, and DFS—are currently state-owned corporations—that is, companies wholly owned by the government. The UK’s National Air Traffic Services (NATS) is a public-private partnership, that is, a cooperative venture between the public and private sectors that is designed to meet defined public needs with the risks and rewards divided between both parties. The government holds the largest share of NATS (49 percent), and the remaining shares are divided among a consortium of seven UK airlines (42 percent), NATS staff (5 percent), and a private airport company<sup>7</sup> (4 percent). By 2006, Germany plans to change the ownership of DFS, selling 74.9 percent of its equity to private investors and reorganizing it as a public-private partnership, along the lines followed in the UK. NAV CANADA is a nonshare capital, private corporation—that is, it has “members” instead of shareholders. These members represent the airline industry, the government, and general and business aviation, and they also include employees such as air traffic controllers and engineers.

## ANSPs Make and Execute Their Decisions and Follow Corporate Practices

Each ANSP makes and carries out its own strategic, operating, and financial decisions. A supervisory board oversees policy making and operations and, when applicable, has fiduciary responsibilities to shareholders. The members of this board may represent key stakeholders, such as the airlines, employees, general aviation, and the national government. An executive officer implements the board’s policies and is in turn, accountable to the board. Individual business units within the ANSP report to the executive officer and are directly responsible for various aspects of the ANSP’s day-to-day operations.

As commercial organizations, the ANSPs follow corporate practices. Each ANSP has established performance measures and gathers and reports

---

<sup>7</sup>This private company, BAA, plc., owns seven UK airports, including London’s Heathrow, Gatwick, and Stansted, and has interests at 13 airports overseas.

---

financial and other performance data. Each ANSP also publishes an annual report, which makes financial information available to the public to ensure transparency. Financial statements are typically subject to third-party audit to ensure that adequate accounting records have been maintained and that internal controls have prevented and detected any fraud and error in the accounting policies and estimates. In addition, the UK and Germany report their data to EUROCONTROL's Performance Review Commission, which collects data for benchmarking and publishes comparative studies of members' performance.

Before commercialization, two of the five ANSPs "purchased" the ANSP assets from their government. NAV CANADA negotiated a selling price with the Canadian government, rather than going through a formal competitive bidding process, and purchased the air navigation system in 1996 for C\$1.5 billion.<sup>8</sup> In the UK, according to information from the National Audit Office, a collection of seven UK airlines known as "The Airline Group" provided £795 million of funds, partly from its own resources (£65 million) and from a loan taken out with a consortium led by four main banks. The group used these funds to acquire NATS and meet associated transaction costs, leaving £3.5 million of cash in the business. In total, the government received £758 million in cash proceeds from the transaction.<sup>9</sup>

## ANSPs Generate Revenue and Have Borrowing Authority

All five commercialized ANSPs rely on user charges as their primary source of revenue and on private capital markets for additional funding. Before commercialization, governments funded air traffic control services through annual appropriations from their national government.

All five ANSPs collect and manage their own revenues, charging fees for services. Their air navigation service fees are based on ICAO's cost recovery principles, which call for recovering the ANSP's operating costs.<sup>10</sup> Despite some variation across ANSPs, the fees are generally as follows:

---

<sup>8</sup>Unless otherwise noted, all financial amounts are expressed in local currencies. As of April 13, 2005, 1 U.S. dollar was equivalent to 0.78 euro, 1.29 Australian dollars, 0.53 UK pound sterling, 1.24 Canadian dollars, and 1.39 New Zealand dollars.

<sup>9</sup>National Audit Office, *The Public Private Partnership for National Air Traffic Services Ltd.*, Report by the Comptroller and Auditor General, HC 1096, Session 2001-2002, July 24, 2002.

<sup>10</sup>Fees for the European ANSPs also include a contribution to cover the expenses of EUROCONTROL.

- 
- The air navigation fees cover operating and capital costs associated with both en route and terminal services. These charges are based on a weight-distance formula.<sup>11</sup> If applicable, ANSPs also levy charges for oceanic control.
  - ANSPs may also charge for tower-related services. However, not all ANSPs are the sole providers of tower services. In the UK and Germany, for example, private firms may provide tower services. These tower charges are distinct from the landing fees typically charged by airports, which are usually weight-based.
  - ANSPs may charge general aviation operators a flat fee for services or additional fees in particular circumstances rather than charging the weight-distance fees typically assessed to larger air carriers.
  - ANSPs may also charge additional fees, as applicable, for other services, such as meteorological, aeronautical information, training, and consulting services.

The five ANSPs vary in their treatment of any operating profits or losses. If an ANSP generates revenues from charges in excess of its costs (i.e., operating profits), it may rebate them to the users, lower the charges for the next year, pay some form of dividend to shareholders, or retain them in reserve to protect against future losses. If costs exceed revenues, ANSPs use different strategies to meet those shortfalls. For example, NAV CANADA established a “rate stabilization fund,” which it used to store revenues when the aviation industry was healthy. The fund could then be used to cover costs and keep rates stabilized when the industry was ailing. The fund was capitalized by operating profits earned before September 11, 2001, but depleted following the economic downturn caused by the events of September 11 and the SARS outbreak of 2003.<sup>12</sup> In 2003, the rate stabilization fund had reached a cumulative deficit of C\$116 million. According to NAV Canada’s 2004 annual report, the C\$116 million deficit has been reduced to C\$32 million. In the UK, NATS, which experienced a

---

<sup>11</sup>The standard weight-distance formula is a single charge per flight for en route services based on the distance flown by the aircraft within a defined area and the aircraft’s weight. This formula is based on ICAO’s policies on charges for air navigation services.

<sup>12</sup>Concerns about the in-flight transmission of SARS (severe acute respiratory syndrome), a highly contagious respiratory disease that appears to be transmitted by close personal contact, affected passenger traffic on international flights to and from Asia, compounding the economic downturn in the aviation industry that began in 2000.

---

major decline in transatlantic traffic after September 11, first obtained a £60 million short-term loan from its lending banks and then refinanced, bringing in a new equity partner (BAA, plc.).<sup>13</sup>

To pay for capital projects, the five ANSPs can either use current operating revenues or borrow funds. Before commercialization, the ANSPs relied on annual appropriations for capital projects; now, all five can borrow funds through access to private capital and debt financing. For example, NAV CANADA can seek debt financing in private markets. NAV CANADA has a borrowing capacity of C\$2.9 billion. In Germany, DFS mainly finances its capital expenditures by drawing on a capital market program, which issues short-, medium-, or long-term notes (i.e., debt issuance and commercial paper) each amounting to € 500 million for a total of € 1 billion to private investors in the market. DFS can also draw on an annual credit line of €161 million from its bank.

#### ANSPs Have Mechanisms for Stakeholder Involvement and Communication

Stakeholders, including employees, as well as the airlines, general aviation operators, airports, the government, the public, and others, may be involved in their ANSP through a variety of mechanisms. In Europe, for example, the Single European Sky initiative directs member states to establish a consultation mechanism for involving stakeholders. Germany and the UK have followed this direction by including stakeholder representatives on their ANSP's board of directors. For example, in Germany, DFS employees, government ministries, and the private sector are represented on a supervisory board. In the UK, government appointees, the airlines, and BAA, plc. (the airport consortium) are represented on NATS's board. In Australia, the aviation community (e.g., the airports, airlines, safety authorities, and others) has a role in the air traffic procurement process through the Australian Strategic Air Traffic Management Group (ASTRA).

---

#### Common Focus on Safety Among the Five Commercialized ANSPs

For all five commercialized ANSPs, safety remains the primary goal. In some countries, government policy requires that the ANSP consider safety in any and all decisions affecting operations and service. For example, in Germany, legislation requires DFS to observe ICAO's standards and

---

<sup>13</sup>Total new investment made in NATS as part of the refinancing arrangement was £130 million—£65 million from BAA, plc., matched by an additional £65 million from the UK's Department for Transport.

---

recommended safety practices, as well as adhere to the objectives and policies of international organizations where the German government is represented, such as EUROCONTROL. Similarly, in Canada, legislation requires NAV CANADA to maintain a fixed level of safety. Under the Civil Air Navigation Services Commercialization Act, the Minister of Transport has the authority to direct NAV CANADA to maintain or increase levels of service in the interest of safety. Although it can alter operations in accordance with business principles, it must demonstrate that the changes meet the required level of safety through an aeronautical risk assessment.

All five ANSPs are subject to external safety regulation. A separate authority conducts safety regulation and issues relevant certifications or licenses to air traffic controllers and technicians. In New Zealand, for example, the Civil Aviation Authority (CAA) is an independent regulatory authority that establishes civil aviation safety and security standards and monitors adherence to those standards. CAA carries out accident and incident investigations and uses information from these investigations to establish an industrywide safety picture and develop safety initiatives ranging from education campaigns to increased monitoring and regulatory action.

All five selected ANSPs have established formal safety programs. For example, Airservices Australia employs a surveillance model, which includes incident investigation, trend analysis, system review, and internal audit. Similarly, DFS and NATS apply a systematic Safety Management System to all of its operational activities. The system forms the basis for risk assessment, safety assurance, safety control and safety monitoring through standards that comply with national and international obligations.

---

### Five Commercialized ANSPs Undergo Some Form of Economic Review or Follow Price-Setting Guidelines

Each of the five commercialized ANSPs is its country's sole provider of en route navigation services.<sup>14</sup> There is no opportunity for more than one organization to provide competing air navigation services. Thus, operators cannot choose alternative providers by changing routes. To forestall the abuse of monopoly position and address concerns about the level of prices or charges, the five ANSPs are subject to the following:

---

<sup>14</sup>Although the ANSP for each country is the only provider of en route air navigation services and thus functions as a monopoly, some other air navigation services may theoretically be open to competition. For example, in the UK, NATS provides tower services—won on a competitive basis against other service providers—for only 14 UK airports.

- 
- In the UK, the Civil Aviation Authority (CAA) exercises economic regulation over NATS. CAA's Economic Regulation Group sets price caps for 5-year periods, basing them generally on the retail price index<sup>15</sup> and the group's own analyses of allowances for NATS' estimated operating and capital costs.
  - The Australian Competition and Consumer Commission (ACCC), an independent commonwealth authority, monitors primarily monopolistic public and private service industries, including Airservices Australia. ACCC oversees Airservices Australia's process of setting user fees for air traffic services and decides to accept or reject price changes on the basis of public consultation and its own evaluation of Airservices' pricing proposals.
  - Airways Corporation of New Zealand operates under a memorandum of understanding with its airline users. Under this memorandum, Airways uses the principle of "Economic Value Added" (EVA) to self-regulate its pricing. EVA is the difference between net operating profit after taxes minus the cost of capital. EVA above a certain level is returned to users in the form of a rebate.
  - The German Transport Ministry reviews and approves any changes in user fees, but does not independently evaluate the price-setting process or pricing changes. According to the Transport Ministry, Germany plans to create an independent economic regulatory authority by next year to comply with the requirements of the forthcoming Single European Sky initiative.
  - The Canadian Transportation Agency (CTA) reviews the price-setting process against an established set of principles. However, CTA does not respond to user grievances about existing prices. NAV CANADA is legislatively required to place all revenues in excess of costs in its rate stabilization fund.

---

<sup>15</sup>The retail price index is the average measure of change in the prices of goods and services bought for consumption by the vast majority of households in the UK.

---

## Available Data Indicate That Since Commercialization, the Five ANSPs Have Maintained Safety, Controlled Costs, and Achieved Efficiencies

Based on information from each of the ANSPs we reviewed, following commercialization, air navigation safety has not declined, and all five ANSPs have taken steps to control costs. In addition, the ANSPs have improved the efficiency of their operations through the implementation of new technologies and equipment. According to the ANSPs, some of these outcomes would not have been feasible in a government organization.

---

## Since Commercialization, Safety Performance Has Not Been Compromised

At a minimum, safety has not eroded since commercialization, according to the available data from each of the five ANSPs. For example, data from Airways Corporation of New Zealand indicate a downward trend in incidents involving loss of separation<sup>16</sup> for the years following commercialization. Similarly, according to NAV CANADA's annual report for 2004, the rate of loss-of-separation incidents decreased from 1999/2000 through 2003/2004. Officials at Transport Canada, the safety regulator, confirm an overall decline in aviation incidents since commercialization.

Additionally, stakeholders have anecdotally reported that they believe the air navigation system is as safe as it was when the government provided air navigation services. According to some, the separation of operating and regulatory functions has strengthened safety regulation and diminished any potential conflict of interest between promoting the financial interests of aviation operators and protecting safety.

As improved technology and system upgrades have allowed individual controllers to handle increasing levels of air traffic, concerns have arisen about the potential for controllers' fatigue to compromise safety. Data are not available to assess this potential, but some ANSPs have taken steps to limit and monitor controllers' workload. For example, the UK's CAA has regulated the hours of civil air traffic controllers, and its Safety Regulation Group must be notified of any breach by NATS or by controllers. In New Zealand, as air traffic has increased, some airspace sectors have been subdivided so that controllers are responsible for a smaller piece of airspace.

---

<sup>16</sup>Loss of separation is an occurrence or operation that results in less than the prescribed separation between aircraft, vehicles, or objects.

---

## Five Commercialized ANSPs Have Taken Steps to Reduce Operating Costs

To lower their personnel costs, all five ANSPs have reduced their administrative staff or flattened their management organizations. For example, NAV CANADA closed most of its regional administrative offices and centralized corporate functions to its headquarters, reducing mostly administrative staff by 1,100 people (17 percent of the workforce). Airways Corporation of New Zealand also reportedly reduced its personnel costs by eliminating some middle management and administrative positions. In general, the ANSPs have not reduced their air traffic controller staffs.

To lower their facility operating costs, all five ANSPs have closed, relocated, or consolidated facilities. For example, Airways Corporation of New Zealand reported consolidating four radar centers into two over 8 years and is planning to consolidate these two into a single radar center by 2006. DFS has also integrated operations and consolidated facilities. Seventeen approach units have been integrated from the airports to the four air traffic control centers. It relocated the Dusseldorf control center to the Langen control center in 2002, a year earlier than planned, and transferred and consolidated its headquarters from Offenbach to Langen. DFS reports that, because its supervisory board now makes major investment decisions, rather than a parliamentary committee, it has been able to make key strategic decisions that would have been politically difficult when DFS was under government control.

In the UK, NATS reduced its net operating costs by almost £96 million during 2002 through 2004, in part through direct management actions. For example, it consolidated two operations into one at the new air navigation services center called the Swanwick Center. According to NATS, it reduced its staff costs by £12 million and its costs for services and materials by about £11 million between 2002 and 2003, after placing this new center in service. Between 2003 and 2004, NATS reported reducing its operating costs for air traffic services by another £13 million through cost control measures.

---

## Five ANSPs Say They Have Improved Efficiency through Modernization

All five ANSPs have purchased new equipment and technologies that they say have improved productivity. For example, Airservices Australia reported increases in controllers' productivity following the introduction of the Australian Advanced Air Traffic System (TAAATS). This system replaced conventional radar screens with more advanced computer screens that display data from a range of sources, including ground based surveillance equipment and satellite-linked navigational equipment on aircraft, among others. TAAATS replaced handwritten paper flight progress strips with screen-based information that is updated



---

automatically. DFS is also eliminating systems that depend on paper strips and anticipates productivity gains and cost savings as a result. In New Zealand, according to the union that represents air traffic controllers, individual controllers are now able to handle much more flight activity because of improved technology.

Besides improving productivity, modernization, together with airspace redesign, has produced operational efficiencies, including fewer and shorter delays, according to the ANSPs.

Access to Cash Flow and Borrowed Funds Has Facilitated Modernization

Commercialization has allowed the ANSPs to implement modernization projects more efficiently. Formerly, the uncertainty associated with the annual appropriations from national governments made it difficult to plan over multiple years. With access to cash flow and borrowed funds, the ANSPs report that they have been able to plan and execute projects more efficiently and have seen improvements in delivering projects on time, within budget, and to specification. For example, Airways Corporation of New Zealand deployed its new oceanic system, FANS1, in less than a year. The management of NAV CANADA estimates that it is producing new technology faster than the government once did and at half the cost.

Some of the commercialized ANSPs maintain that they have achieved the benefits of modernization faster and at less cost by purchasing commercially available systems and upgrades or by modifying off-the-shelf technologies to meet their needs, rather than developing their own systems from the ground up. NATS purchased its oceanic system and automated tower/terminal control system from NAV CANADA. To achieve further purchasing efficiencies, some commercialized European ANSPs have developed an alliance to procure systems. For instance, Germany has developed a strategic alliance with Switzerland and the Netherlands for the joint procurement of a new radar system.

Focus on Cost Control and Operational Efficiency Has Affected User Charges

Through their cost control initiatives and modernization efforts, some of the ANSPs have been able to lower their unit costs and, in turn, lower their charges to major commercial airlines, which pay the largest proportion of user fees and therefore are the primary users served by the ANSPs. Airservices Australia, for example, reported lower unit costs resulting from the increases in controllers' productivity that followed the introduction of TAAATS. NAV CANADA estimates that it is saving the airlines approximately C\$100 million annually in reduced aircraft

---

operating costs. According to NAV CANADA, the airlines are now paying 20 percent less in user fees than it formerly paid in ticket taxes when the government provided air navigation services.<sup>17</sup> In Germany, Lufthansa stated that except in business years 2001 through 2003, it has paid less in user fees than it paid during the initial commercialization of Germany's air navigation service. According to Airways Corporation of New Zealand, it reduced en route charges by 22 percent in 1995 and another 13 percent since 1997, resulting in an overall reduction of more than 30 percent.

However, for general aviation operators, commercialization has sometimes meant an increase in fees. Before commercialization, many only paid taxes on fuel. Some countries, such as Canada and New Zealand, have tried to make the fees affordable for small operators by charging a flat fee. NAV CANADA, for instance, charges general aviation operators a flat annual fee of C\$72. According to the Aircraft Owners and Pilots Association—New Zealand, Airways Corporation of New Zealand charges general aviation operators a fee of NZ\$100 for 50 landings. In addition, Airways eliminated the en-route charge for light aircraft.

Some governments have subsidized air navigation services at small, remote, general aviation, and regional airports, viewing such services as a public good. Australia, for instance, provides a subsidy for service to some remote areas under the Remote Air Subsidy Scheme. Similarly, to protect service to remote locations and ensure equity of service to smaller communities, Canada legislatively requires NAV CANADA to maintain service to such locations. For instance, service to the Northern region, which is designated as "remote," is guaranteed under the legislation. In addition, NAV CANADA is required to price services to remote locations on the same basis as service to the rest of the country.

---

## Initial Observations on Commercialized ANSPs

Through our research, we made a number of initial observations about the commercialization of air navigation services in the five countries we selected. The following paragraphs summarize these observations.

---

<sup>17</sup>While Australia, Canada, and New Zealand collect both en route and terminal fees themselves, Germany and the UK collect terminal fees themselves and receive en route fees collected for them by EUROCONTROL.

---

## Having a Contingency Fund Can Help, but May Not Be Sufficient, to Protect Against an Industry Downturn

Following commercialization, two changes—shifting the source of funding from appropriations to user fees and allowing the ANSPs to borrow money on the open market—have generally enabled commercialized ANSPs to cover their operating and capital costs. However, user fees and borrowing may not be sufficient to cover an ANSP's costs during an industry downturn. As a result, a contingency fund or other mechanism may help to offset the effects of a downturn, although it may not do so completely if the effects are severe.

When the economy began to stagnate in 2000 and air traffic began to decline, revenues from ANSP user fees began to fall. These revenue losses grew as transatlantic traffic declined after September 11, particularly affecting some ANSPs. In the UK, as a result of both these losses and the relatively high debt that it had assumed to commercialize, NATS's solvency was threatened. Ultimately, NATS refinanced its debt with the concurrence of the Department for Transport and other shareholders. In Germany, DFS also experienced revenue losses, but to a lesser degree. DFS reported a loss of more than €33 million in 2001, when air traffic declined by 0.9 percent over the previous year. In 2002, it sustained a loss of more than €21 million, when air traffic levels fell 2.9 percent below 2001 levels. To address these deficits, DFS modified investments, canceled projects, and ultimately raised fees, thereby increasing financial pressures on the airlines. However, when air traffic increased again in 2003, DFS recorded an operating profit of more than €80 million and reduced fees for 2005 en route by 19.5 percent and terminal charges by 28 percent. DFS has begun to consider the benefits of a reserve fund, but German legislation governing air navigation service charges must be changed before DFS will be allowed to develop such a reserve. NAV CANADA had banked up to C\$75 million in its rate stabilization fund before September 11 and the concerns about SARS. However, following the severe industry downturn resulting from these two events, the fund was quickly exhausted.

---

## Some Economic Review or Guidelines May Be Needed to Ensure Fairness in Pricing

Because the ANSP is typically the sole provider of en route and approach control services in a country, some mechanism may be necessary to keep prices in check. Since user fees constitute the ANSP's primary source of revenue, economic monitoring and regulation by an independent third party can protect users and ensure a fair pricing process. Such an entity can ensure that all parties' interests are taken into account and a variety of alternatives are considered. It can also provide assurance to users that price levels are appropriate, do not reflect overcharging, and are consistent with competitive practices.

---

ICAO recognizes the need for an independent mechanism to provide economic regulation of air navigation services. According to ICAO, the objectives of economic regulation should include the following:

- Ensure nondiscrimination in the application of charges.
- Ensure that there is no overcharging or other anticompetitive practice.
- Ensure the transparency and availability of all financial data used to determine the basis for charges.
- Assess and encourage efficiency and efficacy in the operation of providers.
- Establish standards for reviewing the quality and level of services.
- Monitor and encourage investments to meet future demand.
- Ensure user views are adequately taken into account.

Australia and Canada have taken different approaches to reviewing their ANSPs' user charges and price setting. In Australia, the Australian Competition and Consumer Commission (ACCC) oversees price changes. Airservices Australia must notify ACCC whenever it wants to raise fees. Following a formal notification and vetting process, ACCC decides to accept or reject the price change on the basis of its evaluation of Airservices' pricing proposal; and if they reject the proposed price, they can set a lower price. Recently, the ACCC rejected a proposal by Airservices for a temporary fee increase to address the revenue losses that followed September 11 and the SARS outbreak, as well as the collapse of Australia's second largest airline. In rejecting the proposal, ACCC considered the fact that the industry took exception to these increases, raising concerns about the need for longer-term price certainty. ACCC ruled in favor of the industry and rejected the temporary price increases, instead deciding that a longer-term arrangement be considered. ACCC directed Airservices to focus on 5-year pricing plans to encourage long-term planning, emphasizing that the robustness of the airlines should be taken into account when a price is set.

Canada has no formal regulation of fee setting. According to the Office of the Auditor General, the Canadian Transportation Agency (CTA), the formal appeal agency, can intervene only in matters concerning the price-setting process, not price levels or price changes. CTA was not given authority over price-setting issues to ensure that NAV CANADA could

---

maintain a good credit rating, thus making NAV CANADA appealing to financiers. (As of April 2005, NAV CANADA's bonds were rated AA—nearly as high as the government's AAA-rated bonds.) NAV CANADA's board of directors, which includes air carrier representatives, is the main venue for the industry to express any grievances over pricing issues. However, according to Air Canada, its input on the board is limited and, because the public has comparable representation on the board, the public and the industry cancel out each other's input. When NAV CANADA raised prices after its rate stabilization fund was exhausted during the economic downturn, air carriers argued that this move further disrupted their business cycle during a time of financial strain.

---

## Early and Continuous Stakeholder Involvement Is Key

CAA officials said they must ensure that society's broader interests are protected. In particular, GAO believes addressing the concerns of air traffic controllers was essential because they play a vital role in the air navigation system. For several of the ANSPs we reviewed, controllers' support of commercialization was crucial to move the process forward. In New Zealand, controllers supported commercialization when faced with an aging system and inadequate public funds to acquire new equipment. Controllers in Canada supported the transition following a 5-year salary freeze and hiring freezes. However, Canadian controllers' support for commercialization has diminished, mainly because of differences over collective bargaining issues such as wage increases, the right to strike and controller fatigue. The Canadian controllers have acknowledged that they were instrumental in pushing for change, but they have also noted that the results of commercialization have fallen short of their expectations.

ANSPs have also noted the importance of involving stakeholders in efforts to design, acquire, and deploy new technologies. According to Airservices Australia, its air traffic controllers have come to understand the commercial imperative to make a return on investment. Similarly, Airways Corporation of New Zealand notes that it is essential to involve the same controllers throughout the design process so that there is consistency in requirements and a thorough understanding of the project's ongoing specifications. In Airways' experience, it is essential for controllers, manufacturers, and the ANSP to reach agreement in order to establish realistic expectations for system design from the very beginning.

---

---

## Steps May Be Needed to Balance Public and Business Interests

Hypothetically, small or remote communities, that rely primarily on aviation for transportation, may be threatened by location-specific pricing. Under this pricing scheme, an ANSP charges a fee for service that matches the cost of providing that service to a specific location. As a result, some communities may be subject to higher charges than others. By contrast, two ANSPs have used network pricing, a scheme that charges the same fee for air navigation services to every airport, regardless of size or location, even though the costs of providing the services to some airports may be greater than to others. Under network pricing, the service to heavily used airports subsidizes the service to others.

Two of the ANSPs have adopted location-specific pricing for some air navigation services. (Airport services are provided by competition in the U.K., which may result in different prices.) Often, the minimum costs of service to small or remote communities are higher per plane than the costs of service to large communities because the cost of air navigation services must be spread among fewer operators, usually with smaller aircraft. If airlines decide that service to such communities is not commercially viable, they may ultimately discontinue service to these communities. Similarly, general aviation operators may be threatened if they are required to pay fees that cover the full costs of the air navigation services they receive. Continuing to serve small communities and operators may require special efforts to balance public service needs and business interests.

In addition to the Remote Air Subsidy Scheme mentioned earlier, Australia also provided a subsidy that allowed prices to be capped at most general aviation and regional airports. This subsidy was designed to ease the transition to location specific pricing for select airports and is scheduled to end in June 2005. Consequently, Airservices Australia reported that, in order to compensate, it will be increasing charges over the next 5 years at these locations and that these increases have been approved by the regulator. These increases have been moderated to balance the effect on aviation at airports frequently used by general aviation operators. As a result, concerns persist about the implications of further price increases and any future need to close or reduce services at these locations. Some fear that needed air services to remote bush locations will be lost while others fear that secondary services such as flight school training will be affected.

Hypothetically, the impact on small operators and remote communities is difficult to assess. Theoretically, costs may go up as a result of implementing user fees, but charges may not necessarily be prohibitive.

---

Where service to small communities is legislatively mandated, ANSPs may ultimately be forced to take a financial loss if they are not able to fully recover their costs. Airservices Australia is seeking to control costs at some of those locations by deploying new lower-cost technologies to serve small communities. For example, Airservices Australia is planning to install Automatic Dependent Surveillance Broadcast (ADS-B) ground stations, which will allow air traffic surveillance services over remote regions of Australia where radar is not a cost-effective solution.

---

### Appropriately Assessing the Value of Assets Is Essential for Sound Pricing and Cost Accounting

To protect taxpayers' interests, the countries that commercialized their air navigation services needed to have an appropriate valuation of their facilities and equipment before selling these assets to the newly established ANSP. According to the Office of the Auditor General (OAG) in Canada, Canada did not properly value its ANSP assets and infrastructures. The C\$1.5 billion value that the government negotiated with NAV CANADA in 1996 fell short of the C\$2.3 billion to 2.4 billion estimate developed in 1995 by a third party hired by the OAG. NAV CANADA reported, however, that both it and Transport Canada disagreed with the OAG's estimate and its underlying assumptions. In a study of the NATS reorganization, the National Audit Office (NAO) found that the UK government had raised some £758 million from the sale of the ANSP to a consortium of seven UK-based airlines. However, these proceeds were realized by increasing the level of NATS's bank debt. As a result of this debt, NATS was extremely vulnerable to the decline in air traffic after September 11. DFS is currently undergoing a valuation of its assets in preparation for selling 74.9 percent of its equity to private investors in a formal competitive bidding process.

---

### Maintaining Staff Levels and Expertise During Commercialization Can Prevent Disruptions in Regulatory Functions

Some countries experienced difficulties in retaining a sufficient number of staff to carry out safety regulation. For example, in Canada, many of the safety staff moved to the newly established NAV CANADA after commercialization, leaving the government regulator, Transport Canada, with insufficient staff to carry out timely safety inspections during the first 6 months after commercialization. Germany faces a similar challenge as the government prepares to develop a safety regulatory authority in accordance with the Single European Sky initiative by the end of this year. According to the Transport Ministry, it may be difficult for the government to recruit safety staff on a civil service salary and compete with the salaries of safety inspectors from the private sector.

---

**Developing Baseline  
Measures before  
Commercialization Will  
Enhance Performance  
Measurement**

Obtaining baseline measures before commercializing a country's air navigation services will allow the government and others to assess the new ANSP's safety, cost, and efficiency. Some of the countries whose ANSPs we reviewed did not collect baseline data or measure performance as extensively as the commercialized ANSPs have since done. As businesses, commercialized ANSPs must assess the progress they are making toward their goals to access private funding, and therefore they need extensive performance data. In addition, international organizations, such as CANSO and ICAO, support commercialized ANSPs and ICAO, for example, emphasizes the importance of having transparent financial data available for economic oversight.

---

Mr. Chairman, this concludes my prepared statement. I would be pleased to respond to any questions that you or the other Members of the Subcommittee may have.

---

**GAO Contacts and  
Staff  
Acknowledgements**

For further information about this testimony, please contact me at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov). Individuals making key contributions to this testimony included Bess Eisenstadt, Samantha Goodman, Hiroshi Ishikawa, Jennifer Kim, Steve Martin, and Richard Scott.



---

---

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

---

## GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

---

## Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site ([www.gao.gov](http://www.gao.gov)). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to [www.gao.gov](http://www.gao.gov) and select "Subscribe to Updates."

---

## Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office  
441 G Street NW, Room LM  
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000  
TDD: (202) 512-2537  
Fax: (202) 512-6061

---

## To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: [www.gao.gov/fraudnet/fraudnet.htm](http://www.gao.gov/fraudnet/fraudnet.htm)

E-mail: [fraudnet@gao.gov](mailto:fraudnet@gao.gov)

Automated answering system: (800) 424-5454 or (202) 512-7470

---

## Congressional Relations

Gloria Jarmon, Managing Director, [JarmonG@gao.gov](mailto:JarmonG@gao.gov) (202) 512-4400  
U.S. Government Accountability Office, 441 G Street NW, Room 7125  
Washington, D.C. 20548

---

## Public Affairs

Paul Anderson, Managing Director, [AndersonP1@gao.gov](mailto:AndersonP1@gao.gov) (202) 512-4800  
U.S. Government Accountability Office, 441 G Street NW, Room 7149  
Washington, D.C. 20548