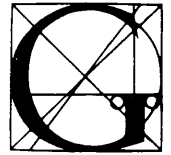


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Economic Counsel to the Transportation Industry



U.S. AND INTERNATIONAL  
PRECEDENTS FOR A  
GOVERNMENT CORPORATION

DRAFT REPORT

January 5, 1994

Prepared for:

Office of Aviation Policy, Plans and Management Analysis  
Federal Aviation Administration  
800 Independence Avenue, S.W.  
Washington, D.C. 20591

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## I. U.S. PRECEDENTS FOR A GOVERNMENT CORPORATION

## EXECUTIVE SUMMARY

The first section of this report examines various existing government corporations in the United States to determine how they are structured and managed and how effectively incorporation has allowed them to carry out their responsibilities. The major areas analyzed include: governance, financing, personnel, and procurement.

This paper broadly discusses the 45 entities identified by GAO in its 1988 *Report on Government Corporations*, and examines seven organizations in detail:

- St. Lawrence Seaway Development Corporation (SLSDC):  
Manages the transportation facilities of the U.S. portion of the St. Lawrence Seaway, in cooperation with its Canadian counterpart agency.
- Tennessee Valley Authority (TVA):  
Conducts a unified program of resource development for the advancement of economic growth in the Tennessee Valley region. Program of activities includes flood control, navigation development, electric power production, fertilizer development, recreation improvement, and forestry and wildlife development.
- U.S. (Uranium) Enrichment Corporation (USEC):  
Provides uranium enrichment services (not weapon-grade) to electrical utilities in the U.S. and abroad.
- National Railroad Passenger Corporation (Amtrak):  
Operates the nation's intercity rail passenger network of approximately 25,000 miles and 500 stations.
- United States Postal Service (USPS):  
Provides the nation with mail service. World's largest mail system, delivering 40 percent of the world's mail. Although not formally a government corporation, USPS is a public enterprise with most of the attributes of a government corporation.
- Federal Reserve System:  
Operates the payments mechanism, distributes coins and currency, examines banks, and conducts fiscal-agency functions for the Treasury which are implemented through the twelve Federal Reserve Banks. The

Reserve Banks also make advances to depository institutions to accommodate commerce, agriculture, and industry.

- Metropolitan Washington Airport Authority (MWAA):  
Administers, oversees and develops the two major Washington, D.C.-area airports: Washington Dulles and Washington National. Although not a government corporation, the MWAA can provide important lessons on transitioning away from FAA (and government agency) control.

In addition to the entities mentioned above, this discussion of U.S. precedents will describe Senate Bill 1159 which was developed in 1987. Although this bill never left committee, it provides a high level of detail of a proposed ATC-only government corporation.

Table ES-1 compares the seven entities in terms of ownership, profit status, type of governing and/or advisory board, financing, personnel and procurement. As can be seen from the table, no two government corporations are the same. However, certain generalizations can be made about this type of organizational form.

This paper finds that the establishment of a government corporation has a number of benefits and also some risks.

### Benefits of a government corporation

- Potential financial control and independence
- Ability to create efficiency incentives
- Ability to design procurement and personnel requirements
- Longer tenure of top management likely
- Reduced political interference

### Risks of a government corporation

- Ability to be sued
- Requirement to indemnify
- Potential loss of adequate oversight

The major conflict that arises when studying the potential benefits of a government corporation as compared with a federal agency is the following trade-off: greater flexibility versus perceived loss in accountability. In addition, there are limits on the lessons for FAA. Overall, with the exception of the Post Office, none of the government corporations in existence today were originally a large government agency. Thus, it is hard to prove (or disprove) that corporatization will solve the problems faced by a government agency. In addition, safety is of paramount concern

Table ES-1

## COMPARISON OF U.S. PRECEDENTS

Entity	Ownership	Profit Status	Board	Financing	Personnel	Procurement
St. Lawrence Seaway	Wholly	Non-profit	Advisory	Tolls and appropriations	Federal rules	Federal rules
TVA	Wholly	Non-profit	Directors	User fees and appropriations	Exempt	Exempt except Brooks
USEC	Wholly	For-profit	Directors	User fees	Exempt	Exempt
Amtrak	Mixed	For-profit	Directors	User fees and appropriations	Exempt	Exempt
USPS	Independent	Non-profit	Governors	User fees and appropriations	Exempt	Exempt
Federal Reserve	Independent	Non-profit	Directors 3 Advisory	User fees and interest income	Exempt	Exempt
MWAA	N/A	Non-profit	Directors	User fees and grants/bonds	Federal rules	Exempt
S.1159 (ATC Corp.)	Wholly	Non-profit	2 Advisory	User fees	Exempt	Exempt

for FAA but is of peripheral importance to most government corporations. As a result, the international precedents, as discussed in Section II of this report, may provide more relevant lessons for FAA.

Overall, government corporations are not a panacea. Many problems that exist in federal agencies (such as micromanagement, dependency on appropriations and the federal budget process, organizational culture problems) also can be found in government corporations. In general, a government corporation is most successful if the entity has a commercial function and can produce revenues and is least successful when fees are not related to costs. In addition, as has been pointed out by others, the corporation must have a clear understanding of what its mission and functions will be. The composition and wording of the enabling statute is critical to a successful transition; wording should be clear and simple but should allow flexibility.

## II. INTERNATIONAL ATC ORGANIZATION PRECEDENTS

## EXECUTIVE SUMMARY

The purpose of this part of the report is to provide insight into the corporatization experiences of the United Kingdom, Germany, New Zealand, Australia and Switzerland in the field of air traffic control and aviation regulatory services, as well as to review the current corporatization initiative in Canada and trends in Europe. Time constraints did not permit in-depth or on-site research. However tentative conclusions can be reached on the relevance of foreign models.

The main points of this paper include the following:

- Current practitioners of corporatized air traffic control services stress managerial independence and strong organizational morale among the chief benefits. All agree that air traffic services constitute a critical specialized field requiring a dedicated organization that can respond flexibly to customers as well as the general public interest.
- None of the countries whose actual experience was reviewed have considered reverting ATC back into the government and none express reservations from a safety perspective. Indeed, the U.K. and New Zealand feel that corporatization has improved technical oversight and accountability.
- With the qualified exception of the U.K., the countries examined have established fairly informal control over ATC monopoly power. They employ a quasi-public utility model without detailed economic regulation, except consulting users on the overall level of ATC charges. As long as the reorganized entities keep increases and charges below the level of inflation or reduce them, there are few questions on whether the entities are absolutely efficient. However, airlines worldwide continue to complain about the increasing level of airport and air traffic control related charges.
- No foreign country has privatized the provision of air traffic control services.
- All countries examined require consultation with users but with varying degrees of formality. Relations have been structured implicitly at arms-length, and users do not serve on boards. This may not be feasible in the legalistic environment in the U.S. which may choose to make whatever role users have explicit.

- While user charges have increased in the U.K. during the period to 1993, New Zealand and Australia have been able to significantly lower charges from what were high user fee levels. All three countries have experienced increases in efficiency, but the U.K. has not been able to translate efficiency gains into lower costs due to high labor expenses. Likewise, in Germany it is expected that fees may go up in the near future since personnel have been removed from the civil service, leading to higher labor costs.
- Being able to raise the funds needed for self-sufficient operations has not been a problem, even for the higher-cost operators. Ongoing concerns, however, include being able to reduce both costs and delays simultaneously.
- Investment now appears to take place on a more rational basis. But the increasing level of absolute investment may be compensating for deferred investment as well as providing for modernization.
- While the European cases contend with comparable or greater densities, all of the countries studied have much smaller systems than the U.S. in terms of overall aircraft movements. In addition, with the qualified exception of Canada and perhaps to a lesser degree Australia, these countries have nowhere near the level of general aviation activity either in absolute terms or as a proportion of total activity as exists in the U.S. today.
- In Western Europe, the separation of ATC into government corporations (i.e., not part of government agencies) may facilitate unifying the provision of ATC services.
- In all of the countries studied, controllers have been removed from civil service. While the scope of this research has not enabled careful study of the effects of this step, there is no evidence that morale suffered as a consequence. Despite the historic British record of industrial action, U.K. controllers appear to have experienced far fewer actions than French, Italian or even German controllers (while they were still in the Civil Service with no formal right to strike).
- There is not enough meaningful long-run experience to see the ultimate effects of moving ATC to a government corporation--most of the changes have taken place over the last few years. However, the principle of charging users directly for the air traffic services they consume is well-established in most parts of the world. The Eurocontrol Central Charges Organization has existed for a number of years and has



developed efficient accounting, billing and collection means for air traffic services in a number of countries.

Table ES-2 presents the organizational structures of the foreign corporatized ATC organizations reviewed in this study. This table shows that the structures of the ATC organizations are quite similar on a basic level. Although there is a split on the issue of dividend payments, there is a general consensus on most other issues.

Table ES-3 presents data on each country's ATC operations and the demands placed on ATC. As shown, there is a vast difference in the size of the U.S. ATC system as compared to foreign organizations. The U.S. employs nearly six times as many controllers as the next largest employer, the United Kingdom. Further, the U.S. has many more ATC facilities than any of the comparison countries.

In summation, although there are excellent examples of successful corporatization of ATC systems in several foreign countries, these examples must be compared with the U.S. ATC systems across great differences in size and requirements. However, while the situation in the U.S. may differ from that in other countries, many of the challenges faced are similar and therefore they merit analysis and appropriate consideration.

Table ES-2

## Organizational Structure of Foreign Corporatized ATC Organizations

	UK	New Zealand	Australia	Germany
<b>Ownership</b>	Government	Government	Government	Government
<b>For Profit Status</b>	Yes	Yes	Yes	Yes
<b>Appointment of CEO</b>	Term	Term	Term	Term
<b>Revenue Autonomy</b>	Yes*	Yes	Yes	Yes*
<b>Fee Structure</b>	Direct Fees	Direct Fees	Direct/Indirect Fees	Direct Fees
<b>Procurement Policies</b>	Ex Post Facto Review	Ex Post Facto Review	Ex Post Facto Review	Ex Post Facto Review
<b>Personnel Policies**</b>	Self-defined	Self-defined	Self-defined	Self-defined
<b>Borrowing Policies</b>	Government Credit Line	Private	Government/Private	Private
<b>Pays Dividends</b>	No***	Yes	Yes	No
<b>Insurance</b>	Private External	Private External	Private External	Private External
<b>Tax Liabilities</b>	Limited	Full	Full	Limited

\* Government must approve fee increases.

\*\* U.K., NZ and Germany use some military staff. In Germany they are paid civilian wages.

\*\*\* U.K. has put any positive cash, net of depreciation, in special sinking funds.

Table ES-3

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## COMPARISON OF INTERNATIONAL ATC FORMATS

Country	Sq. m.	Annual Enplanements	Airport Ops.*	GA Aircraft	GA Aircraft / 1,000,000 Population	Area Control Centers	Other Facilities	Total ATC Staff	Controllers
U.K.	94,214	49.5 M <sup>3</sup>	2.4 M <sup>4</sup>	7,855 <sup>3</sup>	143	5	11	5,200 <sup>5</sup>	3,100
Germany	137,725	44 M <sup>4</sup>	1.7 M <sup>4</sup>	Not Available	Not Available	7	7	5,000 <sup>5</sup>	2,000
New Zealand	103,736	2.7 M <sup>3</sup>	1.4 M FY 1993	2,466 <sup>2</sup>	725	3	28	656	450
Canada	3,850,000	34.1 M <sup>2</sup>	7.8 M	24,471 <sup>2</sup>	906	8	56	5,600	2,500
Australia	2,967,909	18.7 M	3.4 M	7,786 <sup>2</sup>	458	2	42	4,990 <sup>5</sup>	1,120
U.S.	3,618,770	428.3 M <sup>3</sup>	63.5 M	198,475 <sup>3</sup>	769	24	692	45,000 ATC only	25,293

\* Based on CY1990 data unless otherwise noted. Includes both itinerant and local operations at civil airports but omits overflights, which in case of Germany (24%) and UK (10%) of total operations is significant. UK and German numbers also are less complete with respect to local operations and understate the effect of military flying activity.

## I. U.S. PRECEDENTS

I.1 Introduction

This paper examines various existing government corporations to determine how they are structured and managed and how effectively incorporation has allowed them to carry out their responsibilities. The major areas analyzed include: governance, financing, personnel, and procurement.

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- Federal Reserve System:  
Operates the payments mechanism, distributes coins and currency, examines banks, sets monetary policy (via reserve requirements and approval of discount rates), and conducts fiscal-agency functions for the Treasury which are implemented through the twelve Federal Reserve Banks, including making advances to depository institutions to

accommodate commerce, agriculture, and industry. The two major components are the Board of Governors and the Federal Reserve Banks.

- Metropolitan Washington Airport Authority (MWAA):  
Administers, oversees and develops the two major Washington, D.C.-area airports: Washington Dulles and Washington National. Although not a government corporation, the MWAA can provide important lessons on transitioning away from FAA (and government agency) control.

In addition to the abovementioned entities, this discussion of U.S. precedents will describe Senate Bill 1159 which was developed in 1987. Although this bill never left committee, it provides a high level of detail of a proposed ATC-only government corporation.

The rest of this paper is organized as follows. The next section describes what a government corporation is, followed by a listing of the general benefits and risks of corporatization, and a comparison of magnitudes (i.e., size, income, and employees). The paper then discusses the following issue areas: Ownership, Governance and External Oversight; Methods of Funding; Personnel; and Procurement. The paper then discusses Senate Bill 1159 and concludes with a section on lessons to be learned by the FAA.

## I.2 Definition of a Government Corporation

Government corporations are federally chartered entities that produce revenues and conduct business-type activities that are of national importance. Users generally pay for the majority of the costs of the corporation and thus the focus of government corporations is usually on the ability to generate revenue from a commercial or business-type of activity.

While they have a number of common features, no two government corporations are the same. Some corporations are subject to Federal procurement and personnel regulations; others are exempt and have developed their own systems. Some are completely self-financing; others rely on appropriations. The majority of government corporations provide banking or insurance services. Two corporations provide transportation services: Amtrak and St. Lawrence Seaway Development Corporation.

The National Academy of Public Administration (NAPA) states in its *Report on Government Corporations* that a government corporation is:

A government entity created as a separate legal person by, or pursuant to, legislation. It can sue and be sued, use and reuse revenues, and own assets; its liability is distinct from that of its officers and directors. Each government corporation is created by an act of Congress setting forth its legal powers, obligations and mission. (p.13)

In the same report NAPA defines the justification for creating a government corporation:

A government corporation should be established only when the effective performance of a public function demands a significant number of the special financial, budgetary and operational authorities and distinctive legal identity accompanying incorporation. . . . It should be established when the corporate form is necessary for a business-type operation, not merely a convenient device to escape legitimate and proper Executive controls. (p. 19)

NAPA has identified specific attributes that could justify establishing a government corporation. For instance, a corporation may be warranted where the government is dealing with the public as a businessperson, not as a sovereign. It may be warranted where users, rather than taxpayers, are expected to pay the costs of providing goods and services and where income and expenditures fluctuate with market conditions and cannot be predicted accurately or be maintained within a predetermined annual range (without damaging or halting service). Other attributes include when increased expenditures to meet increased demand do not necessarily increase net budgetary appropriations or where services or goods are not adequately provided by private organizations. The services or goods must be of national importance. While ATC services appear to fit most of these criteria (within the constraints of national defense considerations), other FAA activities may not.

NAPA's report on *The Air Traffic Control System: Management by a Government Corporation* identified goals in developing government corporations:

- To provide authority to an organization to operate in the market-place in a business-like manner, so that the public institution can be competitive.
- To provide a public enterprise with a degree of operational flexibility not otherwise available to standard government agencies.
- To provide a system of financing and financial control specifically adapted to the requirements of business-type programs.

- To create organizations with special authority to conduct special kinds of financial, banking, or insuring operations that are inappropriate or difficult for traditional agencies.
- To extend the range of the public services that the government wishes to support or sponsor.
- To create an organization flexible enough to undertake rapid development of a new program or a new technology. (p. 8)

Overall, the primary goal of government corporations is to create a business-like operation that has the flexibility in financing, staffing and acquisition to efficiently provide a service that is of national importance and is not provided by the private sector.

### I.3 Benefits/Risks of a Government Corporation

The establishment of a government corporation can lead to a number of benefits and also some risks.

#### Benefits of a government corporation

- Potential financial control and independence: ability to be self-sufficient and free from federal budget constraints;
- Ability to create efficiency incentives;
- Ability to design procurement and personnel requirements and to be exempt from federal procurement regulations and federal civil service laws;
- Longer tenure of top management likely; and
- Reduced political interference and micromanagement: freedom from political control and bureaucratic layers of oversight.

#### Risks of a government corporation

- Ability to be sued;
- Requirement to indemnify; and
- Potential loss of adequate oversight and accountability.

However, there are major problems found in government corporations that can also be found in government agencies, including micromanagement, dependency on appropriations and the federal budget process, the inability to be self-sustaining and achieve efficiency objectives, and an organizational culture of complacency and inertia instead of innovation and initiative. Thus, the government corporation

organizational form does not necessarily solve the problems facing federal agencies.

#### I.4 Magnitudes of Government Corporations

The size of government corporations varies widely, as shown below in Tables I-1 and I-2. The Commodity Credit Corporation has expenditures of more than \$38 billion while the National Park Foundation spending is less than \$2 million. The Pension Benefit Guarantee Corporation has 700 employees while the U.S. Postal Service has about 750,000 employees. There is little consistency in size among government corporations.

TABLE I-1

<u>Organization</u>	<u>1987 Expenditures</u>	<u>1987 Net Income</u>	<u>1992 Employees</u>
St. Lawrence Seaway	\$12 million	(\$2.7) million	170
Tennessee Valley Authority (TVA)	\$4.9 billion	\$297 million	20,000
U.S. (Uranium) Enrichment Corp.	\$1.3 billion	\$200 million	4,560*
Amtrak	\$1.7 billion	(\$638) million	24,000
United States Postal Service	\$32.7 billion	(\$223) million	750,000
Federal Reserve Board	\$1.6 billion	\$18 billion	26,600
MWAA	\$56.5 million	\$13 million	700
<hr/>			
Federal Aviation Adm. (FY '93)	\$8.9 billion (budget)	\$0	52,248**

\* This includes 4,500 contractors

\*\* This number excludes contractors

Government corporation expenditures and net income are from the 1988 GAO report. These represent operating expenditures and revenues (and excludes appropriations). Net income is defined as operating revenues (plus any interest income) minus operating expenditures minus income taxes (if any). FAA's net income is \$0 since it is funded by appropriations from either the Trust Fund or the general fund.



## Magnitude of Government Corporations

	Operating Expenses	Net Income
National Park Foundation	\$1,417,922	(\$3,641)
National Credit Union Adm Central Liq	\$7,214,000	\$18,637,000
St. Lawrence Seaway Development Corporation	\$12,036,011	(\$2,678,418)
Pennsylvania Avenue Development Corporation	\$13,230,371	\$4,403,687
Overseas Private Invest Corporation	\$14,915,000	\$101,991,000
Pension Benefit Guarantee Corporation*	\$62,040,000	\$486,985,000
Rural Telephone Bank	\$77,004,389	\$42,418,597
Federal Prison Industry	\$306,547,388	\$967,663
Government National Mortgage Association	\$650,900,000	(\$110,000,000)
Central Bank for Coops	\$750,401,000	\$79,833,000
Federal Crop Insurance Corporation	\$771,722,000	(\$13,599,200)
Student Loan Marketing Association	\$1,487,088,000	\$181,017,000
Federal Reserve Banks	\$1,613,900,000	\$18,030,200,000
Amtrak	\$1,672,025,000	(\$638,515,000)
Export Import Bank	\$1,729,000,000	(\$460,900,000)
Federal Deposit Insurance Corporation	\$3,267,292,000	\$48,525,000
Tennessee Valley Authority	\$4,926,928,000	\$297,051,000
Farm Credit Banks	\$5,159,538,000	(\$127,801,000)
Federal Housing Admin Fund	\$6,525,982,000	(\$857,902,000)
Federal Home Loan Banks	\$8,478,016,000	\$882,122,000
Federal National Mortgage Association	\$9,702,000,000	\$376,000,000
Federal Financing Bank	\$17,529,436,000	\$202,623,000
U.S. Postal Service	\$32,727,984,000	(\$222,686,000)
Commodity Credit Corporation	\$38,307,529,000	\$1,056,047,000

\* Amount does not include infrequent event arising from plan restoration which led to a one time credit of \$1,814,514,000.  
Net income is defined as operatin revenues (plus any interest income) minus operatin expenditures minus income taxes (if any).

## I.5 Ownership of Government Corporations/Governance/External Oversight

### I.5.1 Ownership

Based on ownership of assets, government corporations can be broken down into two major categories: wholly-owned and mixed-ownership. According to the Aviation Safety Commission:

- Wholly-owned government corporations exhibit the closest relationship to the President and Congress. They have assets solely owned by the government and are managed by a board or administrator appointed by the President or a Cabinet secretary. They pursue a governmental mission and may be capitalized by appropriations. Wholly-owned government corporations generally try to operate on a self-sustaining basis and recover the costs of operations through user charges.
- Mixed-ownership government corporations are part private and part public. They have assets owned by both government and the private sector. The management structure is similar to a wholly-owned corporation but has more constituent representation and maintains more independence from the President and Congress.

Both types of entities could be either for-profit or not-for-profit. In a competitive firm, profits serve as a clear-cut incentive for efficient production. If it were determined that the public interest required the new entity to operate on a not-for-profit basis, the profit incentive would disappear, having implications for the proposed organization and its efficiency. In addition, both types of entities could either be an independent corporation or housed in a government agency.

The General Accounting Office profiled 45 entities in its December 1988 report, most of which are government corporations. Of the 45, 14 were wholly-owned government corporations, 7 were mixed-ownership government corporations, and 24 were placed in a private or other category, as listed in Table I-3. The Post Office is listed under the "other" category since it is not technically a government corporation. The private or other category also includes government-sponsored enterprises (GSEs) which have been defined as privately-owned, federally chartered financial institutions with nationwide scope and limited lending powers that benefit from an implicit federal guarantee to enhance its ability to borrow money.

Table I-3 also shows that out of the 45, nine are housed in government departments or agencies (three in Agriculture, two in Housing and Urban Development, and one each in Justice, Labor, Treasury and Transportation) and all of these nine are wholly-owned corporations. Thus, there are no examples today of a mixed ownership government corporation that has a parent agency.

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Table I-3

GOVERNMENT CORPORATIONS PROFILED IN GAO's  
"PROFILES OF EXISTING GOVERNMENT CORPORATIONS"  
DECEMBER 1988 \*

Wholly-Owned Corporations

Commodity Credit Corporation (Agriculture)  
Export-Import Bank of the United States (Independent Agency)  
Federal Asset Disposition Association (Federal Savings and Loan Insurance Corporation, now the Office of Thrift Savings)  
Federal Crop Insurance Corporation (Agriculture)  
Federal Housing Administration Fund (Housing and Urban Development)  
Federal Prison Industries, Inc. (Justice)  
Federal Savings and Loan Insurance Corporation (now Office of Thrift Savings within the Department of the Treasury)  
Government National Mortgage Association (Housing and Urban Development)  
Overseas Private Investment Corporation (Independent Agency)  
Pension Benefit Guaranty Corporation (Labor)  
Rural Telephone Bank (Agriculture)  
Saint Lawrence Seaway Development Corporation (Transportation)  
Tennessee Valley Authority (Independent Agency)

Mixed-Ownership Corporations

Central Bank for Cooperatives  
Federal Deposit Insurance Corporation  
Federal Home Loan Banks  
The Financing Corporation  
National Credit Union Administration Central Liquidity Facility (National Credit Union Administration)  
National Railroad Passenger Corporation (AMTRAK)  
Regional Banks for Cooperatives

Private and Other Corporations

Communications Satellite Corporation  
Consolidated Rail Corporation, CONRAIL (now private)  
Corporation for Public Broadcasting  
Farm Credit Banks  
Federal Agricultural Mortgage Corporation  
Federal Financing Bank  
Federal Home Loan Mortgage Association  
Federal Land Bank Associations  
Federal National Mortgage Association  
Federal Reserve Banks  
Gallaudet University  
Howard University  
Inter-American Foundation  
Legal Services Corporation  
National Consumer Cooperative Bank  
National Corporation for Housing Partnerships  
National Endowment for Democracy  
National Fish and Wildlife Foundation  
National Park Foundation  
Neighborhood Reinvestment Corporation  
Production Credit Associations  
Securities Investor Protection Corporation  
Student Loan Marketing Association  
United States Postal Service

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\* This list includes government-sponsored enterprises (GSES) and private and other entities that are not technically government corporations.

In addition, of the 45 entities, only six are explicitly for-profit organizations, five of which are classified as private or other corporations. The sixth is Amtrak, a mixed-ownership corporation. Although it is in Amtrak's charter to be a profit-making enterprise, Amtrak has yet to become self-sustaining. Hence, a second general finding is that GAO found no examples of a wholly-owned government corporation that was a for-profit entity.

It should be noted that few mixed-ownership government corporations, in which there is an actual mixture of equity ownership between the government and the private sector, exist in the United States. This organizational form has typically proved to be unstable with the entity either drifting toward being a wholly-owned government corporation in practice (i.e., Amtrak) or toward full privatization (i.e., USEC). This is discussed further below in the sections on Amtrak and USEC.

Of the six corporations studied in detail in this paper, three are wholly-owned government corporations -- St. Lawrence Seaway, TVA, and the U.S. Enrichment Corporation (this latter entity became a corporation as of July 1, 1993 and thus was not included in GAO's study). Of these three, one has a parent agency (St. Lawrence Seaway is part of the Department of Transportation). Thus, this analysis can compare the two different forms of wholly-owned government corporations to see whether the benefits of increased accountability from being in a government agency outweigh the potential problems of decreased flexibility.

St. Lawrence Seaway may be a good example of the conflict between flexibility and accountability since it was not always under the DOT. When the Seaway was created in 1954, it was established as an independent agency. Congress made the Seaway one of the components of DOT in 1966 and it did not make any organizational distinctions from the other modal administrations in the DOT. As a result, some claim that the St. Lawrence Seaway lost most of the operational flexibility it once had and is currently subject to fairly detailed oversight by DOT staff. Thus, if the FAA/ATC Corporation is to be part of DOT, it should have stipulations in the enabling statute that distinguish it from other components of DOT.

Another distinction to make among these three wholly-owned government corporations is that the Enrichment Corporation is for-profit, thus providing the single existing example of a wholly-owned government corporation that is also a for-profit entity. However, although the Treasury currently owns all of the stock, the Enrichment Corporation became a government corporation only as an incremental step toward full privatization. With a privatization plan due in Congress by October 1994, the wholly-owned status of this corporation is not a permanent situation. Another possibility in the near-future for a wholly-owned government corporation to become for-profit is the Naval Petroleum Reserves, which has earned \$17 billion since 1976, an amount greatly in excess of the monies needed for expenditures.

Amtrak is the only mixed ownership government corporation of the seven and, as mentioned above, is also for-profit. However, although Amtrak was created as a government corporation with both public and private shareholders, the private shareholders were the result not of market demand for shares, but rather a legal obligation on the part of the railroads to supply Amtrak with rail passenger cars and locomotives or cash. This obligation was in exchange for stock and for the railroads being relieved of their ICC regulated obligation to operate the nation's rail passenger service. As the result of financial difficulties in the 1970s and 1980s, the government now owns all of the shares in Amtrak, as with a wholly-owned corporation.

In addition, although Amtrak is a for-profit government corporation, Amtrak has missed its goal of profitability by a wide mark. Originally hoping to achieve profitability by 1975, the corporation is now aiming at self-sufficiency in its operating budget (not including capital costs) by the year 2000. Some progress has been made. Amtrak covered less than 30 percent of its operating costs in 1971 when it was incorporated, but covered 82 percent in 1992. Overall, however, it can be concluded that government corporations, either mixed or wholly-owned, are typically not-for-profit entities.

The United States Postal Service (USPS) is included in the "other" category because it was never actually incorporated as a government corporation. However, it behaves and has the characteristics of a wholly-owned independent government corporation. It also is the only government corporation in existence today that was originally a large government agency and thus may be the most relevant precedent for FAA. Although the USPS is not a for-profit entity per se, the Postal Service has accomplished the breakeven objective Congress gave it: over the ten-year period from 1978 to 1987, its revenues and expenditures were essentially in balance.

The Federal Reserve System is also included in the "other" category because it is chartered by the Comptroller of Currency but is not officially a government corporation and does not have a parent agency.

One additional category of corporations worth noting is the Government-Sponsored Enterprises (GSEs) that facilitate secondary markets for certain types of loans and mortgages, as defined above. These include the Federal National Mortgage Association (FNMA), the Government National Mortgage Association (GNMA), and the Student Loan Marketing Association (SLMA), among others. Despite their similar purposes -- to increase the liquidity of selected investments -- these GSEs show a fair amount of diversity in the ways they are structured.

The FNMA is a government-sponsored private corporation, exempt from the Government Corporation Control Act (GCCA). GNMA is a wholly-owned government corporation, while SLMA is classified as a private corporation and as an agency of the United States, though it is off-budget. At the same time even the GSEs

set up as private corporations manifest a significant amount of government control. For example, FNMA has five members who are presidentially-appointed (out of 13) and is subject to extensive oversight by both the Treasury Department and Housing and Urban Development.

### I.5.2 Governance

For all types of government corporations, the enabling statutes provide for either a single administrator or a board of directors, usually appointed by the President of the United States or a Cabinet Secretary. Proponents of government corporations believe that Presidential appointment protects the public interest. The following describes the governance structure for each of the entities studied in this paper in detail.

The St. Lawrence Seaway Development Corporation (SLSDC) has an Administrator who is appointed by the President, with the consent of the Senate, for a term of seven years. The SLSDC is one of the few government corporations that does not have a Board of Directors and is also one of the few that does have an Advisory Board. The Advisory Board is comprised of five members chosen by the President. Not more than three members can belong to the same political party. The Board meets at least quarterly at the discretion of the Administrator. The function of the Advisory Board is to review general corporate policies including rules of vessel/cargo measurement, rates and tolls, and to advise the Administrator on these activities.

The Tennessee Valley Authority (TVA) has a three-member Board of Directors, appointed by the President and confirmed by the Senate, including the Chair. The three Directors hold staggered nine year terms and are full-time positions. TVA does not have an Advisory Board and has been subject to claims of lack of sufficient oversight. Congress has recently criticized the TVA for the lack of input in decision making and has subsequently proposed a nine member board.

The U.S. (Uranium) Enrichment Corporation (USEC) will soon have a five member Board of Directors appointed by the President and approved by the Senate, with staggered five year terms. The President will also select the Chairman of the Board. Currently, USEC has a presidentially-appointed interim CEO and no Board. The enabling legislation of USEC has no provisions for an Advisory Board.

The National Railroad Passenger Corporation (Amtrak) has a President and Chairman appointed by the President of the United States. There is a nine member Board of Directors. Overall, the Board consists of the Secretary of Transportation as an ex officio member, the President of Amtrak, two members selected by the President of the United States from a list of persons nominated by commuter authorities that operate over Amtrak-owned rail properties, two selected by the

preferred stockholders, and three selected by the President and confirmed by the Senate. Of these latter three, one must be from a list recommended by the Railway Labor Executive Association, one a Governor of a state interested in rail transport, and one a representative of business with an interest in rail transport. The Board meets ten times per year; the frequency of meetings has resulted in claims of micromanagement and excessive oversight. There is no Advisory Board.

The United States Postal Service (USPS) is headed by an eleven member Board of Governors. Nine of the Board's members (no more than five can be from any single political party) are appointed for staggered nine-year terms by the President with the consent of the Senate. These nine appoint the postmaster general and deputy postmaster general, who are the chief executive officers and who comprise the tenth and eleventh members of the Board. There is no Advisory Board.

The Federal Reserve System has a complex organization. The apex of the Federal Reserve's organization is the seven member Board of Governors in Washington. The Board's prime function is the formulation of monetary policy and it also has responsibilities in the area of the nation's payment mechanisms and supervisory authority over the operations of the twelve Federal Reserve Banks. Its members are appointed by the President and confirmed by the Senate. The full term of a Board member is fourteen years, and the seven terms are arranged so that one expires in every even-numbered year. A member cannot be reappointed after having served a full term. The Chairman and the Vice Chairman of the Board are named for four-year terms by the President from among the Board members.

Each of the twelve Reserve Banks has its own nine member Board of Directors, none of whom are presidential appointees. The members of the Board hold office for three years. The Board is divided into Classes A, B, and C. Each class consists of three Board members. Class A members are chosen by and are representative of the stockholding banks. Class B and C members represent the public and consider the interests of agriculture, commerce, industry, services, labor, and consumers. Class B members are designated by the stockholding banks while Class C members are designated by the seven member Board of Governors of the Federal Reserve System. The Board of Governors designates one of the three Class C directors as chairman and another as deputy chairman of each Bank's board. No Class B or Class C director may be an officer, director, or employee of a bank, nor may Class C directors be stockholders of a bank. Each Branch of a Reserve Bank has its own board of directors, comprised of five to seven members, with the majority appointed by the head-office directors, and the others by the Board of Governors.

There are three major advisory committees as well. The Federal Advisory Council, consisting of one member from each Federal Reserve District, meets in Washington at least four times a year to confer with the Board of Governors. The Consumer Advisory Council meets with the Board of Governors four times a year

and has thirty members who represent the interests of the financial industry and consumers. The Thrift Institutions Advisory Council, mandated by the Depository Institutions Deregulation and Monetary Control Act of 1980, provides information on the needs and problems of thrift institutions and is comprised of representatives of savings banks, savings and loan associations, and credit unions.

Finally, the Metropolitan Washington Airports Authority (MWAA) has a Board of Directors with its eleven members appointed to staggered six year terms. Its distribution is based on political compromise: five are chosen by the Virginia governor, three by the mayor of D.C., two by the Maryland governor, and one by the President of the United States. All Board members (except the presidentially-appointed one) must live in the Washington D.C. metropolitan area. Again, although the MWAA is not a government corporation, it can provide important lessons on how an entity that was removed from the FAA is currently structured.

### I.5.3 External Oversight

A final governance issue is the level of external oversight, by Congress and/or the Executive Branch, that exists in each entity. One of the major reasons for setting up a government corporation for all or part of FAA is to reduce the level of detailed oversight by its parent agency, DOT, by the OMB and OPM, and by various Congressional committees. On the other hand, a lack of accountability can be a problem in government corporations.

Overall, the relationship between a corporation and Congress is largely dependent on the method of financing. Corporations funded by appropriations generally have more oversight. Even without appropriated funds, Congress exercises control through specific statutory language. The General Accounting Office (GAO) audits most government corporations and comments on their financial condition, as specified in enabling legislation. The following describes the oversight and reporting status of each of the seven entities.

The St. Lawrence Seaway Development Corporation is subject to the direction and supervision of the Secretary of Transportation. The SLSDC is treated by DOT just like any of the other entities under DOT, including FAA. Thus, the SLSDC model may not provide any changes in oversight or micromanagement from what FAA currently faces. The SLSDC must submit an annual report on operations to the President and Congress.

The Tennessee Valley Authority is under the regulatory authority of Congress and the U.S. Nuclear Regulatory Commission. However, while subject to continuous Congressional oversight (and legislative change should Congress so decide), TVA has the statutory authority to conduct its own finances and to set its own rates for the electrical power it produces and sells. Its independent status leads to freedom from



political control and bureaucratic layers but there are claims of too little oversight and accountability. Each March TVA must file with the President and Congress a financial statement and a complete business report.

The U.S. (Uranium) Enrichment Corporation was once part of the Department of Energy and is still subject to some oversight by DOE. However, the government corporation structure was chosen strictly as an incremental step toward full privatization and thus questions about future accountability may arise. The USEC is set up to be subject to the same regulatory oversight as private companies, with environmental regulations being the most important. USEC's enabling legislation requires the Secretary of Energy to report to Congress at least once every three years on USEC's progress. The fifth report submitted under this requirement will contain recommendations for the reauthorization of the program.

The National Railroad Passenger Corporation depends on the appropriations process to cover approximately 20 percent of its operating costs and 100 percent of its capital costs. Since Amtrak is dependent on Congress to appropriate and the President to approve funds for its year-to-year survival, the President and Congress display a high level of involvement in the company's affairs. In addition, the Federal Railroad Administration (FRA) regulates compliance with safety related operating rules and maintenance standards on equipment and track. As a common carrier by railroad, Amtrak is also subject to limited specified regulations of the Interstate Commerce Commission.

Amtrak must submit annually a comprehensive and detailed report of operations, activities, and accomplishments to the President and Congress. Every six months Amtrak must also submit a report of activities and performance recommendations to committees of both houses of the Congress and to the Secretary of DOT. In addition, an annual report evaluating each route in the system must be transmitted to Congress and the DOT Secretary and monthly reports of revenues and expenses, average passengers per day, and train on-time performance is to be sent to the Congress and released to the public.

The United States Postal Service is required by law to submit to Congress both an annual report and a detailed statement on operations, plans, procedures, and finances. The Postmaster General and the Deputy Postmaster General have primary operating authority and are responsible only to the Board of Governors. While the Board has the power to set and change postal policy, Congress retains significant policymaking power through its ability to alter postal legislation as well as the level of postal subsidies. Congress primarily makes its influence felt by means of Congressional policy directives. The USPS is also subject to overview by the Postal Rate Commission (PRC). The PRC submits recommended decisions to the USPS's Board of Governors on rate and fee changes and mail classification schedule changes, holds hearings on certain rate and service complaints, and hears appeals from USPS

determinations to close or consolidate small post offices. The USPS must submit an annual budget program to OMB. The Postmaster General must submit an annual report to the Board, and upon the Board's approval, the report is sent to the President and the Congress.

The Federal Reserve System and the Federal Reserve Banks do not report to Congress. However, the Board of Governors of the Federal Reserve System is required to provide an annual report to Congress. The Board of Governors is required to order an examination of each Federal Reserve Bank at least once a year. Under the Humphrey-Hawkins Act, the Board is required to transmit to Congress in February and July of each year reports on the System's monetary policies and to consult on these policies with Congress.

Finally, the Metropolitan Washington Airports Authority has a nine member Congressional review board which can veto MWAA's regulations and expansion and financial plans. Properties cannot be transferred without Congressional approval. MWAA must submit financial statements to the state of Virginia and the District of Columbia and make them public.

## I.6 Methods of Funding

The major problems government agencies face is the unstable and unpredictable budget process through which an agency must compete for general treasury revenues. The continuing federal deficit also serves to constrain future plans and programs. In contrast, a variety of financing mechanisms are available to a government corporation. The corporation may:

- Receive money from Congress through the appropriations process;
- Earn revenues from fees;
- Borrow from the Treasury; and/or
- Borrow funds directly, based on the guarantee of future revenue streams.

The method of financing government corporations varies among corporations with respect to the degree of self-sufficiency, level of appropriations, ability to bond, and profit motive. Users generally pay the majority of the costs of a government corporation while appropriations are generally provided for nonrevenue-producing activities or losses. A limited number of corporations are chartered to be profit making, as described above in the governance section.

Based on the Government Corporation Control Act, wholly-owned corporations identified in the Act must submit a business-type budget as prescribed by the President. That budget is submitted to Congress by the President as part of

the budget. The budget contains estimates and a statement of financial condition. A majority of wholly-owned government corporations are on-budget.

The St. Lawrence Seaway Development Corporation charges tolls in accordance with established rates for users of the Seaway that it negotiates with the St. Lawrence Seaway Authority of Canada. However, the tolls have not been sufficient to allow SLSDC to be self-sustaining. Since 1987, tolls from commercial vessels have been rebated and appropriations from the Harbor Maintenance Trust Fund basically make up for the rebated funds. Appropriations total about \$10 million. In addition, SLSDC collects about \$1.5 million from pleasure vessels, tolls, concessions, and interest on an \$11 million savings account. The SLSDC budget is on-budget.

SLSDC prepares a budget and submits it annually to the President. The budget is approved by OMB and submitted by the President to the Congress. SLSDC has no bonding authority.

The Tennessee Valley Authority relies on user fees and appropriations. The TVA's electric power division is, by law, self-sufficient, relying on user fees (\$5.1 billion in 1992) from the region it serves and interest income (\$22 million). The remainder of the TVA is funded by a combination of fees including fertilizer, timber and land sales (\$10 million) and annual appropriations (\$135 million). Appropriations are sought for nonrevenue-producing activities including regional development activities, non-power programs such as wetlands research and development, research into alternative fuels, and gauging the health of the nation's forests.

The TVA prepares a budget. It is approved by OMB and submitted with the President's budget to Congress. The TVA has a broad discretion over the use of appropriated funds, and funds are generally available until spent rather than having a time limit on expenditures. The TVA is on-budget and has bonding authority.

The U.S. (Uranium) Enrichment Corporation is intended to be self-sufficient and for profit. The Corporation lost money in 1991 but made money in 1992. The source of fees is contracts to provide enrichment services. Although USEC has no immediate plans for any new capital projects (due to excess capacity), USEC does have the authority to issue bonds. Until 1996 all bond issues must be approved in an appropriations bill. Bonds are not guaranteed by the U.S. government. The USEC is among the first government restructurings couched in "reinventing" terms; objectives such as efficiency, deficit reduction, and international competitiveness are prominent.

The National Railroad Passenger Corporation generally sets its own fees for its services and the fees are based on market demand and modern airline-style yield management techniques to maximize revenues. The total revenue generated by fees

are not sufficient to cover total costs, and Amtrak relies on annual appropriations for 20 percent of its operating costs and 100 percent of its capital costs. It is the intention of Amtrak to eliminate its operating subsidy by the year 2000, but capital subsidies would still be required. Amtrak is chartered as a for-profit organization. Depending entirely on the federal budget appropriations process for capital investment in a time of high deficits makes Amtrak's self-sufficiency objective difficult and technology modernization unrealistic.

The United States Postal Service is funded almost completely (99%) by user fees. Its budget is close to \$50 billion per year. The postal rates are regulated by the Postal Rate Commission which consists of five commissioners appointed by the president.

The U.S. Postal Service receives about one percent of its budget through annual appropriations. The appropriation is about \$500 million and supports reimbursement for providing postal services nationwide, transitional funding for workers' compensation and annual leave liabilities of the former Post Office Department, and revenue foregone from reduced rates for nonprofits, library rate mail and free mail for the blind and visually handicapped. This appropriation will be reduced to about \$100 million by 1996. The Postal Service by law is to be revenue-neutral. However, they have an accumulated multi-billion dollar net loss. With each rate increase, they pay back a percentage of this loss. They have bonding authority and borrowing authority up to \$18 billion. Treasury has the first right of refusal on all loans and generally makes the loans. Thus, the Postal Service has not needed to use its bonding authority.

The Federal Reserve System spent an estimated \$1.7 billion in 1992 and earned an estimated \$947 million in operating revenue from priced services, reimbursements, and other income, for a total of \$778 million net operating expenses. The major source of Federal Reserve income is earnings on the portfolio of U.S. government securities in the Systems Open Market Account, estimated at \$17.3 billion in 1992. Revenues are also derived from other services such as currency and coin services, check clearing and collection services, wire transfer services, automated clearinghouse services, settlement services, and securities safekeeping services.

Included in the services offered by the Federal Reserve System to depository institutions are the distribution of currency and coin, check processing, wire transfer, and the operations of automated clearinghouses. The Monetary Control Act of 1980 altered the terms under which the Federal Reserve System produces services. Prior to the 1980 Act, it offered these services without charge to member banks (at the end of 1983, about 5,700 commercial banks -- out of a total of nearly 15,000 in the country -- were members of the Federal Reserve System). The Act extended direct access to Federal Reserve services to all depository institutions, but it required the Federal Reserve System to charge fees that cover full costs, including taxes and the capital

costs the Federal Reserve would incur if it were a private firm. The purpose of the fees is to encourage efficient use of the services and to enable private institutions to compete in their provision where appropriate.

In 1992, income from these priced services totaled \$938.6 million while costs totaled \$892.7 million, resulting in a net income of \$44.8 million and a recovery rate (defined as income/costs) of 105.1 percent. In 1991, the Federal Reserve System recovered 102.9 percent of the priced services' costs. Although the introduction of service fees in 1980 initially reduced the number of checks presented to the Federal Reserve for processing, by 1985 the number increased 4.8 percent to approximately 15.5 billion. The Federal Reserve reports that it has achieved an inflation-adjusted productivity improvement of 26 percent since moving to user charges to fund the payments system.<sup>1</sup>

The Federal Reserve Board reviews all major issues involving the pricing and level of services and submits proposed changes for public comments. Decisions concerning priced services are made independently of those related to the Federal Reserve's role as regulator, supervisor, and lender of last resort. Pricing procedures are aimed at being fair to users and to other providers of similar services, and promoting the public interest.

The Metropolitan Washington Airport Authority is self-sustaining. It is financed through the normal landing fees, concession fees, etc. that airports charge users. It also receives Federal airport grants through the Airport Improvement Program and issues revenue bonds. The airport and its bonds are tax exempt.

## I.7 Personnel

The employees of wholly-owned government corporations are usually considered to be employees of the United States and are subject to civil service rules. Corporations are generally exempted from government personnel regulations depending on the similarity of the corporation's mission to other government agencies. If the work is comparable, employees are likely to be under civil service rules. Examples of government corporations that are subject to Federal personnel rules include the Commodity Credit Corporation, Overseas Private Investment Corporation, and the Export Import Bank. There are exceptions: TVA is wholly-owned and has its own personnel system. Employees of mixed-ownership and other types of government corporations generally are not subject to civil service rules and have developed their own personnel systems. Examples include Comsat (now a

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<sup>1</sup> Comments from Sandra Pianalto, First Vice-President and Chief Operating Officer, Federal Reserve Bank of Cleveland, to the Executive Oversight Committee, December 20, 1993.

private corporation) and the Farm Credit Banks.

The primary goal in developing any personnel system is to have the ability to attract and retain qualified employees. The major problem that federal agencies often face is the existence of arbitrary personnel ceilings, civil service requirements and procedures, and the lack of competitive pay that make it difficult to attract a talented and technically sophisticated work force. The following is a discussion of the personnel systems in place for the seven organizations.

The St. Lawrence Seaway Development Corporation's 170 employees are under Federal personnel rules. Wage grade employee salaries and working conditions are negotiated. All other employees are subject to regular pay scales and benefits.

The Tennessee Valley Authority, with nearly 20,000 employees, has an independent personnel system with the Board of Directors having authority over duties and salaries of employees. In the event any dispute arises as to the prevailing rates of wages, the issue is referred to the Secretary of Labor for determination and his/her decision is final. In determining rates, due regard is given to rates which have been secured through collective agreement by representatives of employers and employees. New TVA employees from the Federal sector have the option of continuing under the civil service retirement system and life insurance programs or opting for an alternative offered by TVA.

In 1981 TVA employed 56,500 employees, considerably more than exists today. TVA experienced a major transformation in 1988 to overcome safety and operational problems. This transformation, among other things, downsized the bureaucracy incredibly. Thirteen layers of management were initially reduced to seven layers, and ultimately to five layers.

U.S. (Uranium) Enrichment Corporation employees are not covered by civil service laws. The USEC has developed its own pay scale on par with the private sector. It employs 60 direct and 4,500 contractor employees at its two plants and expects to expand the 60-person direct workforce to 150 during 1994.

The National Railroad Passenger Corporation is not covered by Federal personnel rules. About 89 percent of Amtrak's 24,000 employees are unionized, belonging to 14 different labor organizations with 26 separate agreements. Most of the employees are involved in train operation, on-board passenger service, equipment maintenance, and track related maintenance. Employees do have the right to strike and have exercised this right in the past. Due to the nature of the Railway Labor Act governing all railroad and airline organized labor, Amtrak operations have also been subject to temporary stoppages in sympathy with striking freight railroads.

Since beginning an aggressive drive to reduce its operating subsidy in the early 1980s, Amtrak's esprit de corps has suffered. Reduced or frozen wage rates, staff reductions, and the on-going lack of capital resources to replace antiquated equipment have combined to demoralize some Amtrak employees.

The United States Postal Service is the nation's largest civilian employer (750,000) and is exempted from Federal personnel rules. Postal management and labor are required by law to participate in collective bargaining with regard to wages, fringe benefits, and working conditions. In situations where there is an impasse, issues will be settled by compulsory arbitration. The law prohibits the right of postal employees to strike. Over 87 percent of postal employees belong to one or more labor organization. Collective bargaining requires the Postal Service to pay wages comparable to those in the private sector. Legislation also allow employees to receive federal government inflation-adjusted benefits and health care.

Permanent full-time employees comprise approximately 70 percent of postal employees. Hourly rate regulars and substitutes comprise 15 percent and temporary employees (hired primarily to process Christmas mail) comprise 15 percent. The major craft categories are carrier, distribution clerk, mail handler, maintenance man and garage man. Workers seldom change crafts because it would result in a loss of seniority. Despite a recent restructuring in which 47,828 employees took early retirement (with the eventual goal of reducing the number of employees to 691,000), the Postal Service still expects to lose over a billion dollars in fiscal year 1994.

Promotions are based on merit. There is a traditional policy that requires a postal employee to serve for four to five years before becoming eligible to take the examination for supervisor. This, in effect, prevents most college graduates from moving directly into middle-management positions and in most instances, these individuals are generally unwilling to start as clerks, carriers or mail handlers. Such a policy makes it difficult to improve the quality and training of Postal Service supervisors. There is a pay cap on top executive salaries of about \$100,000. This has also been a deterrent to attracting highly qualified managers.

A major problem is that the incentive and motivational system within the Postal Service does not adequately reward employees and/or managers for improving the efficiency of their operations. The General Accounting Office claims that labor relations is one of the top three problem areas in the Postal Service that needs improvement (ratemaking and revenue protection are the other two).

The Federal Reserve Board itself employs 1,600 people in Washington while the entire Federal Reserve System (the 12 Federal Reserve Banks and their 25 branches, the Federal Advisory Council, the Consumer Advisory Council, the Thrift Institutions Council, the Thrift Institutions Advisory Council) employs 25,000 people.

The Metropolitan Washington Airport Authority is exempt from regulations applicable to Federal agencies. During the transition, employees remaining with the Authority continued to have civil service retirement benefits but were no longer employed under civil service laws. (Currently this constitutes about 40 percent of the work force). MWAA was required to make a one-time payment to cover unfunded retirement benefits. Its 700 employees do not have the right to strike. In general, new hires do not need to comply with any unusual restrictions, except for state laws.

### I.8 Procurement

The cumbersome Federal procurement system is designed to prevent fraud but instead often leads to barriers to the timely and efficient acquisition of sophisticated and rapidly evolving high technology goods and services. Enabling legislation determines whether Federal procurement regulations must be observed in a government corporation. Even if a corporation is not required to follow them, it is usually wise to follow competitive contracting practices.

The St. Lawrence Seaway Development Corporation is subject to Federal procurement regulations. Annual contracts total about \$2.5 million.

The Tennessee Valley Authority is exempt from most government procurement statutes except the Brooks Act and the Buy American Act. TVA procurements are negotiated on the open market and unless purchased with appropriated funds (non-power related), there is no formal posting of requirements.

The U.S. (Uranium) Enrichment Corporation is exempt from the Federal Procurement and Administrative Services Act. Its biggest contract is for electricity (worth \$500 million per year) but does not follow any systematic method of negotiating this contract. The second biggest contract is with Martin Marietta which runs both of USEC's plants, hires personnel, buys equipment. This contract is worth \$5 to \$15 million a year and may be opened up to competition in 1996.

The National Railroad Passenger Corporation is technically exempt from Federal procurement regulations. The reality of the appropriations "bargaining" process is that Amtrak must voluntarily comply if it is to survive politically. The most significant rules involve Buy American. Otherwise, by law, procurement is up to Amtrak's board of directors. Amtrak believes that the effect of voluntarily complying with government regulations has led to slower technology modernization than otherwise would have occurred.

The United States Postal Service is exempt from Federal procurement laws and regulations. Specifically, the Postal Service is not restricted by the Brooks Bill or other Federal Acquisition Regulations. They have developed their own procurement



requirements but these are currently being revised since some claim they are as cumbersome as Federal regulations. Contracts for 1992 totalled \$2.4 billion for buildings, vehicles, and equipment. The total budget was nearly \$50 billion.

As of January 1, 1993, local buying authority is granted for purchases under \$10,000, or below the non-competitive threshold. The total value of purchases acquired through local buying authority is approximately \$16 million for the year 1993. Purchases over \$10,000 are dealt with either through Postal Service headquarters in Washington, DC or through one of ten purchasing service centers located throughout the country. Purchases under \$100,000 do not go through a standard solicitation process but do need a purchase order. Purchases over \$100,000 go through a standard solicitation process but do not go through "full and open" competition. Rather, the Postal System uses what it refers to as "adequate competition". Further, the Postal Service does not award contracts, except in the case of off the shelf purchases, on the basis of lowest price. Instead, the Postal Services awards contracts on the basis of "best value", i.e., it takes into account the reputation of the company and the quality of support among other things.

Some changes are being made in the organization of the procurement process at the Postal Service as a result of the NPR report. Previously, procurement was overseen by three separate vice-presidents in the Postal Service. The Vice Presidents of Facilities, Transportation, and Purchasing divided procurement into three segments, each controlling the procurement of related equipment. In an attempt to streamline the procurement system, the Vice President of Purchasing, with the aid of the ten purchasing service centers under his or her direction, will now oversee all procurement, rather than procurement being divided and under the control of three directors.

The Federal Reserve Board and the Metropolitan Washington Airports Authority are both exempt from Federal procurement laws and regulations. However, as an airport grant recipient, MWAA faces an array of regulations relevant to AIP requirements.

#### I.9 Senate Bill 1159 (1987)

Senate Bill 1159, which proposed establishing an independent user-fee supported government ATC corporation (to be called the National Aviation Authority), never made it out of committee in 1987. However, this bill does provide specifics on what this type of corporation would look like. The ATC corporation would have the following powers (among others):

- To enter into contracts, execute leases, and create a budget;
- To establish a schedule of rates for user fees;

- To retain all revenue without fiscal year limits;
- To determine its own system of accounts;
- To sue and be sued;
- To acquire, use and dispose of property;
- To establish and amend bylaws; and
- To have all powers necessary to carry out functions and exercise specific powers.

The Director of this ATC-only corporation would be appointed by the President and approved by the Senate and would hold a ten year non-renewable term. The Director, in turn, would have the authority to appoint the Deputy Director. As an independent corporation, it would not be part of DOT.

Instead of a Board of Directors there would be two Advisory Boards. The Policy Advisory Board would contain the Secretary of Defense, the Secretary of Commerce, the Secretary of Transportation, and the Chairmen and ranking minority members of the Senate and House Aviation Subcommittees. This Board would meet twice a year to review operations and discuss future plans and policies.

The second Board would be a ten member Technical Advisory Board. Its members would be appointed by the President and would include two representatives of the following five groups: the military, the public, air carriers, general aviation, and airport operators. The members would hold staggered four year terms.

The Bill also spelled out the corporation's relations with the military. The Department of Defense would determine the full cost of providing civilian ATC while the corporation would determine the full cost of providing the military with ATC. The difference between these two amounts would then be reimbursed to whomever has the higher costs.

The following elements describe the procurement policy of the proposed ATC corporation:

- Competitive acquisition to provide services regarding the development, operation, and maintenance of the air traffic control system;
- The establishment, by the Director, of procedures that will allow for competition;
- Procedures designed to acquire the best technology and equipment available;
- Open and fair procurement procedures;

- Use of private sector contractors when necessary; and
- No formal procedures to be required for emergency delivery or for purchases less than \$50,000.

The bill also outlines proposed personnel policies:

- All conditions of employment in effect under the FAA shall also remain in effect until the Corporation changes them.
- Employees will remain under civil service until the Corporation enacts their own personnel management system.
- Employees cannot have their pay reduced for two years after the new system is enacted.
- Employees may transfer to other civil service positions for two years after the transfer.
- Appointments shall be made without regard to civil service laws.
- The Corporation may use employment contracts.
- All prohibitions on employment discrimination still would apply.
- Prohibition on strikes and collective bargaining.

The bill also describes various human resource policies concerning retirement and accrued sick time and vacation time.

#### I.10 Lessons Learned

Table I-4 summarizes the seven organizations discussed in detail in this paper and compares these entities in term of ownership, governance, external oversight, financing, personnel and procurement. One clear point made from this table and from the above discussion is that no two government corporations are the same. In addition, with the exception of the Post Office, none of the government corporations in existence today were originally a large government agency. Thus, it is hard to prove (or disprove) that corporatization will solve the problems faced by a government agency. In addition, the physical safety of the public is of paramount concern for FAA but is of peripheral importance to most government corporations.

With these caveats in mind, it can be concluded that government corporations

are not a panacea. Many problems that exist in federal agencies (such as micromanagement, dependency on appropriations and the federal budget process, organizational culture deficiencies) also can be found in government corporations. Likewise, some of the benefits of government corporations can also be found in federal agencies. For example, as shown in Table I-5, the CIA, NASA, FBI and GAO are all exempt from federal personnel statutes without being government corporations.

In general, a government corporation is most successful if the entity has a commercial function and can produce revenues and is least successful when fees are not related to costs. The potential benefits of increased flexibility also must be weighed against a potential loss in public accountability. In all cases, the composition and wording of the enabling statute is critical to a successful transition.

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TABLE I-4  
COMPARISON OF U.S. PRECEDENTS

Entity	Ownership	Parent Agency	Profit Status	Board	Financing	Personnel	Procurement
St. Lawrence Seaway	Wholly	DOT	Non-profit	Advisory	Tolls and appropriations	Federal rules	Federal rules
TVA	Wholly	None	Non-profit	Directors	User fees and appropriations	Exempt	Exempt except Brooks
USEC	Wholly	None	For-profit	Directors	User fees	Exempt	Exempt
Amtrak	Mixed	None	For-profit	Directors	User fees and appropriations	Exempt	Exempt
USPS	Indep.	None	Non-profit	Governors	User fees and appropriations	Exempt	Exempt
Federal Reserve	Indep.	None	Non-profit	Directors 3 Advisory	User fees and interest income	Exempt	Exempt
MWAA	N/A	N/A	Non-profit	Directors	User fees and grants/bonds	Federal rules	Exempt
S. 1159 (ATC Corp.)	Wholly	None	Non-profit	2 Advisory	User fees	Exempt	Exempt

Table I-5

## EXEMPTIONS FROM SELECTED MANAGEMENT STATUTES

Agency	Statutes		
	Personnel <sup>a</sup>	Procurement	Appropriations <sup>b</sup>
<b>Independent</b>			
CIA	x		
Federal Reserve Board	x	x	x
GAO	x		
Nuclear Regulatory Commission	(some)		
Smithsonian Institution	(some)	x	
NASA et al.	None	None	None
<b>Within departments</b>			
FBI	x		
Foreign Service	x		
Military intelligence	x		
Power Administrations (DOE)	x		
Public Health Service	x		
U.S. Attorneys	x		
Veterans Affairs	(some)		
<b>Corporations</b>			
Commodity Credit Corp.		x	x
Ex-Im Bank			x
FCIC	x	x	x
FDIC	x	x	x
FHA			x
Federal Prison Industries			x
GNMA		x	x
OPIC		x	x
Seaway Corporation			x
TVA	x	x	x
Postal Service	x	x	x

<sup>a</sup>Exemptions may be from pay or classification laws, or both. Some have separate systems prescribed by law.

<sup>b</sup>Some receive appropriations for non-revenue-producing activities, or to cover losses.

Source: Winds of Change: Domestic Air Transport Since Deregulation.

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## II. INTERNATIONAL ATC ORGANIZATION PRECEDENTS: Selected Cases of Actual and Planned Corporatization of Air Traffic Control Services

### II.1 Introduction

This paper reports on developments in the international environment related to the actual or planned corporatization of air traffic control (ATC) services. This paper reviews how the U.K., Germany, New Zealand, Australia and Switzerland have reorganized the provision of ATC services. It includes commentary on general trends of ATC in Europe, and discusses the Canadian analysis of proposed changes to its ATC system. It also describes the method of economic regulation of the British Airport Authorities (BAA). The paper seeks to identify common themes and the degree to which issues central to the U.S. debate have arisen in foreign contexts.

A number of international ATC organizations have made presentations as part of the FAA Reorganization Study. This paper, in part, synthesizes information gained at these briefings, as well as comparing and contrasting the international ATC experience. Research is based on Washington briefings, telephone interviews, desk materials and past experience; time constraints have not permitted in-depth analysis or on-site research of each country's changes in the provision of ATC services.

Each national system of air traffic management is asserted by the countries in question to be unique. Even among those who would like to be seen as international models, there is a reluctance to make comparisons to other countries. Thus, there is almost no literature comparing, for example: controller or systems productivity; efficiency of investment; and the fairness and adequacy of cost allocation policies and cost controls. It can be said, however, that highly similar challenges exist across systems. Problems identified in the provision of ATC services in the U.S. by the National Performance Review and the Airline Commission have arisen in very similar forms under quite different systems in a number of foreign countries.

### II.2 The Problems Which Have Driven Change

Broadly speaking, six major themes characterize the policy debate with varying degrees of emphasis in each national corporatization case. These are:

- Safety and the Public Interest;
- Modernization Strategy;
- Management and Human Resources Issues;

- Political and Bureaucratic Separation;
- Financial Autonomy and Self Sufficiency; and
- User Satisfaction.

Before reviewing these, it may be important first to note briefly three issues that generally have not arisen as central questions in most of the debate in the countries examined. These are:

- Private ownership;
- Non-profit vs. profit forms of organization; and
- Competition as an organizing principle.

In all cases examined, ownership of the corporation or authority is or would be vested in the government; it has neither general private (i.e., publicly-traded) stockholding, nor user (e.g., the airlines) or employee shareholders.

In all cases, the ATC organization is not only permitted but **expected to earn a nominal profit** (e.g., a rate of return on the capital investment). In all cases en route ATC services are regarded as a natural monopoly. While there are trends, such as in the U.K., to strengthen competition in the provision of terminal control services, it can be argued that the service ethic (how to provide a better, more professional service) has played a far stronger role as an organizing principle than the idea of providing a commercially competitive product.

### II.2.1 Safety and the Public Interest

Governments conducting or contemplating ATC corporatization seem to have viewed safety less as an area of risk and more as an area of opportunity for improvement. Two considerations have been cited:

- (1) Corporatization may professionalize both ATC and aviation regulation by locating it and/or them in independent, accountable organizations; and,
- (2) It may also be wise to separate the air traffic services provider and the regulator, even when the regulator is also corporatized.

Concern that corporatization or even commercialization might degrade safety has (except with general aviation) hardly been an issue. In the late 1960's, when the

U.K. debated whether to take aviation regulation (then spread out in several departments of regular government) and create a corporatized Civil Aviation Authority (Act of Parliament 1971), the winning argument reportedly was that aviation, as a leading edge industry, is vital to the future of the British economy. Aviation requires an expert, integrated policy and regulatory approach which only an authority that pulled together all aspects of aviation regulation together in one place could provide. The concomitant insulation of aviation from the general political environment was seen as a **pro-safety move** rather than as a risk.

Philosophically, the British assumed that safety was a critical positive element for the development of a competitive civil aviation industry. Therefore, a Civil Aviation Authority (CAA) would render indirect services to industrial development (for whose costs it could also be reasonably compensated by the beneficiaries of its expertise).

Safety regulation, by this theory, is not seen as punitive enforcement on behalf of the public, on an industry that might otherwise be disposed to act unsafely. Rather, it is seen as providing a positive value to industry by making its products and services more acceptable (akin to a "seal of approval"). The public interest and corporatization were thus seen as consistent, indeed reinforcing. What has, however, evolved in the U.K., New Zealand and Germany has been the view that a distinction should be made between those providing direct services and those regulating them. (In many countries, the national carriers are, or have been, state-owned.)

The National Air Traffic Service (NATS) in the U.K. (which is a subsidiary of the CAA and the Ministry of Defence) has, since 1988, had its operations regulated by the CAA's Safety Regulation Group. Thus an informal wall has been erected between the regulator and the regulatee. New Zealand and Germany have formalized the distinction, and Canada also contemplates retaining formal safety regulation within government. Australia, however, takes the view that oversight and operations can be jointly practiced and that oversight is best performed by experienced controllers who will return to active controlling. (ATC is a part of CAA.) In the U.K., there is also staff rotation between the safety regulation group and the NATS. In the case of New Zealand, controllers get rotated into analytical functions, e.g., into positions as instructors at the air traffic control academy.

However, even where there is a strong philosophy, such as in New Zealand, to separate regulation from operation, interactive elements are recognized. For example, the government believes that the Airways Corporation of New Zealand (ACNZ) should do systems design based on its needs as an operator, just as the NZ CAA should write the formal regulations which govern operational procedures. The observation has been made that organizations which regulate themselves leave accountabilities less clear.

The observation has also been made that users, i.e., the airlines, can act as more useful and qualified interlocutors if they can deal with the ATC systems operator as a provider and not also as general regulator.

II.2.1.1 The General Aviation Case--In the case of general aviation, there is widespread acknowledgement that full cost recovery from private pilots (which occurs in Australia and Germany where private operators pay gas taxes equivalent to \$0.60 to \$2.00 per gallon) will either depress the level of GA flying and/or create disincentives to use fee-based services that may appear costly, thereby diminishing safety. Basing en route fees on distance and weight (as is typically done) provides some level of subsidization to lighter, slower aircraft.

### II.2.2 Modernization Strategy

The difficulties faced by governments in the implementation of a cost-effective modernization strategy have been a recurrent and dominant theme which has motivated change in some countries. It may even be deemed **the primary driver** in decisions to corporatize.

For New Zealand, fear that its last government plan for systems modernization could not be successfully implemented by the civil service was the catalyst in the decision to turn the project over to the new corporation. In Germany, slowness and inefficiency of needed investment was cited as a principal cause of airways congestion and a key reason for scrapping the normal governmental budgeting and procurement process in favor of a corporate organization more free to respond to market demand.

In Europe in particular, cost-ineffective modernization points to the major issue of inefficiency of investment. Even the corporatized U.K. seems to have essentially failed to translate, as yet, costly capital investment into a net lowering of total factor costs, notwithstanding respectable labor productivity growth.<sup>1</sup>

The costs of automating the fixed route system, combined with the desire to maximize local content and customize systems to catch the latest wave of technology, has created compatibility issues with countries next door as well as far higher procurement costs. These costs have also been a prime contributor to user dissatisfaction and has strengthened the readiness for new institutional approaches.

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<sup>1</sup> U.K. en route Eurocontrol charges (which unlike some states, e.g., Germany, do not include terminal area charges which are billed separately through U.K. airports) are the highest in Europe. Between 1989 and 1993, the U.K. charging unit rate more than doubled (in nominal terms) from 32.74 to 68.63 pounds sterling. In 1994, however, the U.K. proposes to cut its charge by some 6% in real terms (2.1 percent nominal). In 1993, U.K. charges were, for example, equivalent to 406% of those charged by Ireland. For discussion of the role of capital expense, see also the Section on the U.K.

### II.2.3 Management and Human Resources Issues

The ability to manage more effectively--with greater flexibility, accountability, professional independence and responsiveness to customer rather than bureaucratic needs--is cited as a primary motive for exiting the formal government structure. Many countries believe they achieved this outcome. U.K. CAA managers say that they enjoy the autonomy they have in managing.

Having greater control over decisions and the ability to apply greater weight to professional, as opposed to political, criteria is seen as a major benefit of being an independent, financially self-sufficient institution. Aviation fees fund aviation. The need to compete for resources in the bureaucratic and political arena is reduced.

The ability to provide competitive rates of compensation at operating, technical, and managerial levels was also a key factor in Germany's decision to break the link between ATC and civil service status. This factor was strongly endorsed by the Controllers' union as well. The ability to restructure pay scales, especially to reflect local costs, and to locate new facilities based on economic rather than political considerations is a strong element in Canada's plan to corporatize.

Improved managerial morale seems to have been a clear outcome of Australia's reforms, which have featured local accountability for program execution and budget use, and a flattening of institutional hierarchies. Formerly there were 13 to 15 layers of authority between controllers or technicians and the top boss; the number of layers has been reduced to about five. (In contrast, the U.S. has about seven levels between controllers and top management.) Managers in the Australian and New Zealand systems, for example, are free to purchase lower cost items as long as they stay within budgets, which also tend to be general rather than divided into rigid sub-categories. Unspent funds can also be carried over.

### II.2.4 Political and Bureaucratic Separation

Canada's Air Navigation Service suffers from social and political pressure under the present system to make non-economic decisions, e.g., keep unneeded facilities open, and to locate other facilities in high cost areas. In Australia, the previous organization clearly suffered from bureaucratic status building leading both to excessive layering and to regional power centers which added positions to gain influence.

While political factors are still present in the naming of boards, most chief executives seem to enjoy informal if not formal protection against arbitrary processes. Hiring of senior managers based on professional merit seems to be at least one characteristic of corporatized systems. Procurement decisions made by corporate

ATC executives seem under no more, perhaps even less, pressure than are airline executives to buy capital equipment from domestic manufacturers.

Institutional trends thus far also reflect concern that ATC organizations be free from special interests or user demands as well as from political and bureaucratic pressure. In Australia and New Zealand, active aviation persons, whether from airports, airlines, or corporate aviation, have as a matter of policy, been kept off boards of the ATC entities. In Germany, the idea of user participation on Boards was not accepted. Relations with users are governed in all cases by arms-length consultation mechanisms, with varying degrees of formality. (This is somewhat analogous to the public utility regulatory scheme, but without detailed economic regulation.)

New Zealand deliberately decided to separate technical from financial oversight and accord primacy to the latter. Thus the parent department for the Airways Corporation is not the Transport Department but the Treasury Department. This placed formal emphasis on businesslike decisionmaking.

II.2.4.1 Parliamentary Relations--Information obtained thus far suggests that, while day to day interventions, particularly from Ministries, have been greatly reduced, Parliaments, usually through the format of "Select" Committees, have continued actively to monitor air traffic management. The Corporations regularly appear before Parliament, and relationships seem to operate directly rather than through Ministries.

It is never possible nor even advisable to separate air safety totally from the political process. In countries where there is an independent regulatory authority for ATC, the political lines to parliament and government are quite clear. In countries where the ATC entity also has responsibility for safety regulation, there must be linkages to political decisionmakers. The high public concern and visibility of aviation and aviation safety mandate that ministers will be held accountable for any lapses in safety. Thus, they will always assert some degree of oversight.

#### II.2.5 Financial Autonomy and Self-Sufficiency

A central objective of every case examined has been to put the overall operation on a pay-as-you-go basis and to eliminate subsidies to the air traffic control system. Even in instances where hefty user fees already existed, operations of air traffic control by government typically led to operating the system on a deficit basis. A strong motive in the cases of New Zealand and Australia was to end red ink. Canada's current analysis also focuses strongly on this consideration.

In some cases, one source of operating on a deficit basis had been the cost of providing services to remote areas. However, where economically unsustainable

service is deemed essential for political or social reasons, the government can also compensate the corporation in a businesslike way, i.e., by underwriting the costs of specific services. Indeed, a corporation has no incentive to provide services at a deficit and requires a source of funding for these "public interest" services.

In the case of governmental users (e.g., the military), some countries bill other departments or levels of government for use of the en route system. These billings, however, may be offset by services that the military bills back--i.e., local area ATC; radar information; collaborative staffing of centers, etc. Except in Australia, procedures exist to carefully calculate tradeoffs and balance accounts.

Each of the systems studied is **expected to make a normal profit**, i.e., a return on capital that will at least fund new and replacement investment and perhaps even contribute taxes and dividends to the Treasury. The level of overall return has already become a sore point in the airline community which wants profits plowed back into the system or returned to users in the form of lower fees.

The degree and level of financial oversight varies considerably. In the U.K., the CAA and the NATS are subject to oversight by the Monopolies and Mergers Commission (MMC) as well as by the Transport Ministry and by Parliament. Moreover, in the U.K. case both rate changes and borrowing are either approved or formally reviewed. By contrast, in the two latest cases of corporatization, New Zealand and Germany, controls are either quite informal (New Zealand) or essentially pro-forma (Germany). In the German case, the process of rate review will involve little active external oversight as long as the Corporation meets expectations. While things are still formative, the German system, in its *de facto* setup, seems, if anything, less subject to oversight than the national airline. However, both the German and New Zealand systems have been corporatized fairly recently.

One issue that a self-sufficiency mandate for a monopoly provider raises is: What happens when the business experiences a downturn? Will the Corporation then react as a competitive business would by cutting costs? Or will it raise rates on decreased volume in order to avoid painful measures such as firing or furloughing workers? During its 1990 pilots' strike, Australia's CAA confronted such a situation by floating loans, which could be paid back without too much pain as rapid traffic recovery exceeded expectations. For Eurocontrol providers, where billing is now done in ECU's (formerly U.S. dollars) based on projected exchange rates, deficits or windfalls at year end as the result of foreign exchange translation have been a common occurrence. The policy has been that users bear the benefit or penalty of such outcomes through rate adjustments in the following year. This implies a need to establish reserves in the good years to offset losses in the bad years.

### II.2.6 User Satisfaction

Users seem to support corporatization in the countries where it has been established as well as where it is being considered.

In New Zealand and Australia there have been substantial fee reductions for en route charges. In Germany, perhaps also for other reasons, delays have decreased during the past year. In Canada, the industry apparently anticipates service improvements and cost reductions and therefore supports the corporatization project.

IATA and other general industry observers, however, are quite concerned by the policies followed by New Zealand and Australia with respect to taxation and returns to shareholders' capital. Not only does the ATC Corporation generate transactional tax revenues, but it also pays corporate taxes (on profits) and dividends. In 1993, the Government of New Zealand obtained a 23 percent return, in taxes, dividends and increased equity. In the first five years, the Government seems to have taken out more cash than it originally put in. For airlines, who note that the "equity" the government originally contributed are facilities the airlines previously paid for, this causes resentment. On the other hand, operators in New Zealand airspace enjoy substantially lowered airways fees and can look forward to low costs in the years to come because of New Zealand's efficient modernization program. The national carrier estimates that its domestic en route charges (per available seat kilometer), which as recently as 1988-89 were 3.6 times higher than what it then paid on average for operating internationally, are now almost the same. New Zealand charges fell by nearly half, just as average international charges nearly doubled in the five year period.

## II.3 National Case Studies

### II.3.1 United Kingdom

The relevant ATC institutions in the United Kingdom are the Civil Aviation Authority and National Air Traffic Service. External oversight is provided by the Ministries of Transport, Finance, and Defence; the Monopolies and Mergers Commission (MMC); the Transport Accident Investigations Branch (MOT); and Parliament.

II.3.1.1 Institutional Structure--Air Traffic Management and ATC services are provided by the National Air Traffic Service (NATS), a joint subsidiary of the Civil Aviation Authority (CAA) and the Ministry of Defence (MOD). The CAA itself is a public, limited liability corporation, 100 percent owned by the government, subject to public utility-type regulation, i.e., expected to earn a return on investment of about



7.5 percent (now based on expensing capital using current cost accounting, which creates reserves for investment on a current replacement basis).

The CAA is headed by a Chairman appointed by the Government who serves a four year renewable term, and by a Board of up to 16 members (whose choice the Chairman reportedly usually controls). Thus the U.K. CAA's board bears no political resemblance to that of the former U.S. Civil Aeronautics Board whose appointees served for fixed terms that transcended Administrations and thus typically represented both U.S. political parties.

The CAA in its present form was established by an Act of Parliament in 1971 under the theory that a leading edge, specialized industry like aviation required a coherent, coordinated body to provide direct and indirect public sector services and that the cost of these should be recovered from users. Previously, aviation oversight in the U.K. had been spread among a number of bodies. In addition to technical regulation, the CAA also provides economic regulation, e.g., licensing all U.K. carriers. CAA and NATS executives seem to enjoy significant authority and responsibility. The CAA sets its own pay scales. Its investment programs, pay policies and employee productivity are, however, scrutinized both by Parliament and the MMC as well as by users and have been subject to several formal analyses or inquiries.

Tasked to achieve financial self-sufficiency, the CAA resembles corporations operating in the private sector; however, its profits, at least recently, have been mostly retained through the working of so-called income equalization provisions (IEP)--which defer income tax payment by the creation of reserve funds that can offset losses in subsequent years. Given the volatility of income coming from charges on international services (which are levied in ECU's), this may be a necessary provision. It also cushions the Authority and users against downturns. While the CAA is apparently not permitted to obtain rebates on Value Added Tax (VAT) charges passed through by suppliers, it has not levied VAT on its users, at least for en route services (a large portion of which are part of international itineraries).

The CAA relies on user fees for operating and capital expenses, and in the 1993 fiscal year had an income of \$860 million. The organization enjoys a statutory borrowing authorization level comparable to a line of credit; however, its activity must also fit this within the Transport Ministry's overall borrowing ceilings. Air traffic services are both the biggest generator of revenue and the biggest source of operating costs and investment, accounting for 80 to 85 percent of expenditure. About 70 percent of CAA staff serve in NATS. Total CAA employment currently is about 7,300. (Total FAA employment is about 52,000.)

NATS has about 5,200 employees, civil and military. A serving general officer of the Royal Air Force (Air Marshal) has alternated as CEO. About half the staff

(2,700) act as controllers or controller assistants. Airways facilities personnel number close to 1,200. NATS employed 5,872 in 1979 (when workload was approximately half of today's level). In addition to the NATS staff, some 80 persons within CAA--assigned to the Safety Regulation Group (SRG)--provide oversight to ATC services, both for NATS personnel and for some 400 other controllers who work in towers, a substantial number of which are served by airport staff or private contractors. These oversight functions were performed within NATS prior to 1988.

While terminal control areas can be operated by private sector contractors pursuant to competitive bid, NATS operates the en route system as a monopoly.<sup>2</sup> There are three Area Control Centers (plus two subcenters). In addition to purely national airspace, the U.K. administers significant areas over the Atlantic and North Sea pursuant to ICAO regional agreements.

II.3.1.2 Relations with the Military--The Royal Air Force both receives and provides services and resources as part of its relationship in and with NATS. When flying en route, military aircraft generally operate in the civilian IFR regime. As far as can be determined, the costs of this are calculated and offset independently, i.e., not billed through an industrial funding system or through Eurocontrol.

II.3.1.3 Significant Recent Developments--Growth of air traffic, particularly commercial movements, has been much more dynamic in Europe since the early 1980's, than in the U.S. There is great pressure to expand capacity and efficiency, especially to create harmonized, simpler, shorter cross-border routings. NATS has embarked upon a significant, multi-year modernization program that will require increased earnings to cover depreciation. Annual capital requirements have expanded **more than 500 percent** in nominal terms since 1987/1988. This has put strong pressure on the organization to become even more businesslike. There is growing sentiment within the senior management to further extend (or perhaps even sever) the "arms-length" relationship with CAA as its regulator to permit NATS (among other things) to be able to compete more aggressively for terminal control services.

II.3.1.4 Basic System Parameters--The territory of the United Kingdom covers 94,214 square miles, while the U.K. European FIR airspace covers 354,000 square miles.

In 1992, using a counting system similar to that employed by the FAA, controllers at the U.K. centers and subcenters "handled" some 2.6 million controlled en route movements (including military), up from some 1.7 million in 1985.

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<sup>2</sup> The local airport has the option as to whether it will provide or contract out tower services, or have these services provided by NATS.

Landings and takeoffs, including local operations, at airports amounted to some 2.3 million.

The U.K. system probably administers more overflights than the U.S. as a share of total activity (10%). Overall, it may be fair to say that the U.K. handles a workload 5 to 7 percent that of the U.S.--i.e., the pressure, as measured by movements per square mile, on much of the airspace may be nearly double that experienced in the U.S.. On the other hand, busy regions in the U.S. (New York/Chicago) are undoubtedly comparable to the London area, which handles roughly half of the U.K.'s en route activity and a third of its airport operations.

The London Area Control Center (ACC), which in 1990 handled some 1.2 million movements (New York Center handled 1.9 million in FY 1992), had a staff of 1,136 persons in January, 1990. In addition, some 675 NATS staff were assigned to London airports, including those providing Aeronautical Information Services (AIS).

II.3.1.5 Cost and Service Competitiveness--The NATS works closely with its users; however, its services are the most costly in Europe and expensive by international standards. CAA ERG is now modelling a formula for regulating en route charges, however there is not upper-end fee level regulation in place presently. In 1993, a 737-300 pays about \$1.80 per statute mile for en route services, i.e., roughly equivalent (maybe a bit more) than the cost of fuel. Because of these charging levels, some trans-Atlantic aircraft, e.g., from the Scandinavian countries, reportedly file circuitous flight plans to avoid U.K. airspace.

II.3.1.6 Provider and User Satisfaction--NATS seems to be a well-motivated, well-led organization able to recruit and retain highly skilled professionals and capable managers. Its safety record is excellent, as is its system for developing and maintaining staff proficiency through a sophisticated and extensive educational and training system that enjoys international respect. In the context of recent British history and compared to countries on the Continent, it seems to have enjoyed a positive record in terms of minimizing industrial action.

On the other hand, official reports on the NATS by the Monopolies and Mergers Commission (MMC) suggest that operations have not been totally without featherbedding. It would appear that on an annual basis, it takes or took some eight controllers to maintain one 24-hour year-round position in a busy ACC (based on data on average hours worked, stand-down time, annual and sick leave, and training).<sup>3</sup>

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<sup>3</sup> See CAP 537, *Air Traffic Management in the United Kingdom*, Memorandum to the House of Commons Transport Committee, p. C1.

If one simply scaled up the NATS organization on the assumption that its activity amounts to 1/15th of that of the U.S., it would imply staffing in excess of 75,000 and annual budget levels for the ATC function on the order of \$10 billion. Such comparisons are of course difficult, since each system possesses unique characteristics. However, given the pressure on costs, the issue of best practice productivity is becoming an increasing concern of users of the U.K. system.

Airlines remain concerned about the cost of public sector services in the U.K. and the cash flow requirements associated with current cost accounting. Airport charges have been the cause of major protest and have led to U.S./U.K. arbitration (recently won by the U.S.). ATC delays as well as high charges have been a major problem as well. The U.K. has seemed to solve some of the structural problems in the provision of ATC services; however, the question remains whether the NATS has sufficient incentives to become productively efficient.

II.3.1.7 Special Factors and Broader Relevance--The U.K. system deserves high marks for its emphasis on professionalism and its integrated approach to the theory and practice of aviation. Emphasis on safety and a service ethic have run with, not against, the trend to:

- Corporatize the CAA as a whole;
- Put technical oversight of NATS outside NATS (i.e., with the CAA);
- Actively consider making NATS a separate corporation.

The U.K. (far more than Switzerland which corporatized back in 1921) enjoys broad importance as a model of ATC organizational reform. Commonwealth countries have begun to follow its example, however, with substantially differing outcomes.

## II.3.2 Germany

The relevant ATC Institution in Germany is Deutsche Flugsicherungs GmbH. Oversight is provided by the Ministry of Transport and Parliament.

II.3.2.1 Institutional Structure--The Deutsche Flugsicherungs GmbH (DFS) is a brand new institution, created by an Act of Parliament (and constitutional amendment) in 1992. It replaced the Bundesanstalt fuer Flugsicherung (BFS), which had been an autonomous government authority under the control of the Ministry of Transport. Since the change has been very recent, it is necessary to discuss the historical background that brought the change.

The German aviation regulatory system was organized in three parts led by the Aviation Department of the Ministry of Transport (headed by an official at the Assistant Secretary level with the two titles of Bureau Director and Director General of Civil Aviation). The primary function of the Aviation Department is policy, in the economic, legal and technical areas. This Department is much smaller than the U.K. CAA; it is very tightly organized into ten offices with total professional staff of roughly 40 persons, with 20 to 22 officials at GS-15 equivalent or above and a like number in the GS-12 to 14 equivalent range. These officials are responsible for all policy and regulations, and for some operational oversight. For expertise and analysis, they relied heavily on two key regulatory operating arms: the BFS (covering air navigation) headquartered in Frankfurt; and the Luftfahrtsbundesamt (LBA), which covers flight standards, airworthiness, crew licensing and has a somewhat broader mandate for enforcement actions, headquartered in Braunschweig. In terms of personnel size, both the BFS (with some 5,500 staff) and the LBA (about 400) dwarfed the Aviation Department.

With strong military demand coupled with considerable overflights and very strong commercial movement growth, Germany suffers from congested airspace that is complex to manage. A badly needed teamwork approach to respond to the challenge, however, did not evolve. Parochial interests conducted the debate. NATO and German military resisted delegation of useable authority over large sections of reserved airspace. Civil controllers also resisted the use of flexible procedures. The BFS developed a capital intensive system, with unique specifications involving complex teaming of manufacturers and six ACC's (now seven) covering a territory the size of Oregon, and with total traffic perhaps just now approaching that of the Atlanta Center.

The requirement of annual budgeting also meant that the complex investment program was implemented in sporadic stages. Support for aviation development at the Transport Ministry always tended to be subordinated to the massive funding demands for highways and especially railways, where huge annual operating and capital deficits needed to be covered.

Meanwhile, controller morale also suffered because of early plateauing (in terms of civil service rank and compensation) resulting in work-to-rule manifestations, even in the absence of strike authority. Delays in the late 1980's became unbearable for the airlines and led to massive demands to change the structure of the system.

II.3.2.2 The Change in Air Traffic Control--The German Constitution was amended to make it possible for the government to delegate authority for operating the ATC system (essentially in a manner consistent with ICAO principles). The DFS was established as a limited liability company (GmbH) under German law, with a single shareholder, the Government--represented by the Federal Minister of Transport

who staffs the so-called "Owners Assembly." The new Chief Executive has a contract for a fixed term; however, he/she could be given early notice if the internal oversight bodies voted lack of satisfaction with performance. There is also a Management Board of senior executives and an "Advisory Committee" with parity participation from the work force, in accordance with German co-determination law applying to larger enterprises.

Provision was also made to end the duplicative civil/military parallel system and create an integrated system. (The military retains full air defense authority and will still operate local ATC for military airfields). Moreover, Air Force personnel (funded by MOD) will be seconded to the DFS but paid comparably to civilian colleagues.

The establishment of the DFS has also brought a massive pay hike for about 1,600 of the 2,000 controllers in the system (who accepted conversion to private status). Full proficiency licensed controllers now receive about DM 175,000 annually (just over \$100,000 U.S.), nearly double what they received formerly as civil servants in the BFS. Part of the added compensation was conceived of as an offset for lost civil service benefits (such as tenured employment and 100 percent-paid lifetime health insurance). Engineering and other professionally certified technical personnel have also done well, with salaries in the DM 120,000 to 140,000 range.

The 400 controllers who stayed in civil service have been assigned to the LBA and seconded to DFS. The new private controllers also gained the right to strike; however, apparently side agreements have been entered into that provide for maintaining "emergency" services for non-commercial, public interest flights.

The DFS is charged by law to recover its full costs from users. It has responsibility for its own investment program and can borrow in the capital market. Its actions are subject to the review of its owner and regulator (the Government) which also has retained rate making authority. The DFS is also required to consult formally with industry before changing its fees, after which it files its requested rates with the government, much in the manner of the national carrier with respect to the prices it wishes to charge domestic airline travelers.<sup>4</sup>

Upon establishment, the DFS was given start-up equity of DM 1.3 billion, consisting of DM 450 million as basic capital, DM 80 million to cover accounts payable at time of transfer and the balance as pension fund equity. Its annual facilities & equipment requirements in the near term are estimated at DM 400 to 600

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<sup>4</sup> So far, however, the Ministry of Transport seems not to have established a professional auditing or rate review mechanism, and it lacks qualified staff to perform such a function. If this condition remains, the Ministry will either rely on the data given it by the DFS or act on the basis of political concerns, e.g., seek to prevent rate increases from exceeding inflation.

million, with expenditures likely to be at the bottom of that range. Reportedly, it is currently subjecting the multi-year investment plan it inherited from the BFS to intensive and fundamental review. Significant changes should not come as a surprise. German ATC user fees (which recover approach, terminal, and en route charges and have been surcharged to cover the cost of regulation) are among the highest in Europe (though perhaps still 20 percent below the U.K., with terminal charges taken into account).

II.3.2.3 Role of the Regulator--Despite its very tight resources, the Government retains a central role in oversight and coordination. It will issue all regulations, approve procedures, provide licenses (probably by delegating authority), review all rate changes prior to their coming into force, conduct all formal international coordination, and investigate all incidents or accidents. One area of regulation reportedly will fall away--regulatory oversight over equipment choice, installation and maintenance. It is felt that the corporation, subject to direct legal liability and commercial disciplines, can and should be made accountable for the safety of the equipment it procures and maintains. Reportedly there is no German national certification process for groundside equipment.

The staff of Air Traffic Policy Oversight office is actually shrinking incident to the creation of the DFS, from 10 to 8 or 9 officials. It will have to confront an increased workload in the form of international meetings. It will have less control over equipment oversight, and the official who formerly was responsible for scrutinizing financial submissions from the former BFS has now shifted to the DFS as a chief financial officer.

Reportedly, the DFS would be happier if it did not need to get affirmative approval from the government for its fees, because it is aware the German government tends to resist any monopoly fee increase that exceeds rates of inflation. Its 1994 Eurocontrol rates, for example, will rise 4.6 percent in DM terms over 1993. The airlines fear that adequate mechanisms for cost review and control have not been established.

II.3.2.4 Parameters of the German System--The territory covered by the German system is 137,725 square miles. There were 1.8 million civilian IFR flights in German airspace (including overflights but not counting multiple handles by individual centers) in 1992, up from 1.0 million in 1985--reflecting strong growth of commercial aviation, including expansion among commuters and new entrants.<sup>5</sup>

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<sup>5</sup> While data comparisons are hazardous, IATA and Eurocontrol data suggest that Germany handles roughly 20 percent more en route commercial volume than the U.K. with an estimated 1.8 million movements in national airspace (1.5 million U.K.) reflecting 560.6m aircraft kilometers (446.3m U.K.). General aviation flying is undoubtedly at least somewhat heavier in the U.K.; though military flying may still be heavier in Germany. Best estimates are that Germany employs some 2,000 en route

There were about 1.7 million landings and takeoffs at Germany's twelve principal airports. While there is considerable (though falling) military activity, general aviation flying is more infrequent than in the U.S..

En route ATC is provided in Germany by seven centers, one of which, Maastricht (in The Netherlands at the German border) is a "Eurocontrol" facility, and in conjunction with Karlsruhe, provides upper airspace services for Luxembourg and The Netherlands as well as Germany. Centers at Bremen, Duesseldorf, Frankfurt, Munich and Berlin control the lower airspace. In the context of the so-called "Four States" project, establishment of automated linkage to create a seamless transition in Benelux/German airspace is near implementation at this time.

II.3.2.5 Cost and Service Competitiveness--As suggested above, massive user dissatisfaction and significant provider unhappiness with the previous system led to the creation of the DFS, whose ability to perform and address past deficiencies in real terms remains to be tested. Airline observers are hopeful though not yet fully convinced, by the organization's first moves, though delay rates in 1992-1993 have eased from the very high levels of the late 1980's (e.g., 37 percent at Frankfurt in 1989).

II.3.2.6 Special Factors and Broader Relevance--Germany is a microcosm of the larger European problem. Success or failure of the DFS will expose the limits of local national action in addressing what is a larger issue, i.e., the lack of a European system--an issue of organization that transcends the question of corporatization at the national level.

### II.3.3 New Zealand

The relevant institution involved with New Zealand's ATC system is the Airways Corporation of New Zealand (ACNZ). Oversight is provided by the Civil Aviation Authority (CAA); Ministries of Transport and Treasury, Transport Accident Investigation Commission; Crown Company Monitoring Unit; External Advisors SOE Steering Committee; and Parliamentary Committees.

II.3.3.1 Institutional Structure--The NZ CAA, like the UK CAA, is a public corporation whose five member Board and Chief Executive are named by the Minister of Transport. NZ CAA relies on indirect user and various registration fees for its income. Previously the CAA also provided ATC services based on direct user fees. In the mid 1980's, however, the decision was reached to establish an independent state owned enterprise (SOE), the **Airways Corporation**, both to provide

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and terminal controllers vs. circa 3,000 U.K. (those controllers who handle oceanic movements are not included in the above operating numbers). Source: *IATA Performance/Productivity Indicators - Summary 1993*, based on En Route User Charges Data Base - Eurocontrol, Geneva, November 5, 1993.



ATC services and to design and implement a major modernization program.<sup>6</sup> Formal safety oversight responsibilities were kept with the CAA and are carried out by its Aviation Safety Monitoring Branch. The CAA also drafts basic safety regulations. However, the Airways Corporation is responsible for developing, publishing and updating procedures for compliance with ICAO Standards and Recommended Practices (SARPS), and it participates in international coordination. The CAA has become a smaller organization with a staff of about 120.

The Corporation, with a total staff of 656 as of April 1, 1993 (down from 1055 in 1987) provides en route, approach and terminal ATC at nearly 20 airports. Nearly 70 percent of the staff are controllers. The Corporation is responsible for airways facilities and provides its own maintenance, though the number of middle management positions in engineering and elsewhere seem to have been reduced. ACNZ maintains its own formal quality assurance program. In the case of incidents, it both notifies the CAA and conducts its own internal investigation, reporting findings and planned remedies to the CAA.

ACNZ is a limited liability company wholly owned by the Government. The Ministry of Finance (Treasury) and not Transport is the parent Ministry. Its Chairman and Board are appointed by the Finance Minister for terms of three years. The Board in turn names a Chief Executive Officer (currently appointed to a three year term) who is the chief operating officer of the corporation. ACNZ determines its own levels of compensation. It can and has (in the last two cases) recruited its CEO from outside New Zealand. It is also essentially free to procure goods and services based on its perceptions of value for money (though it may have to defend its decisions against subsequent Parliamentary inquiry). It can borrow on the open market, and is not eligible for government financing or loan guarantees. The corporation is commercially insured.

ACNZ pays all New Zealand taxes including tax on its net value added (12 percent) and on its net income (33 percent) as well as dividends to its public shareholders. Its rate of profit is not subject to formal regulation. It enjoys a monopoly on en route services; however, terminal control services can now be operated by airports if they wish. The corporation is required to publish (usually in the Annual Report) a Statement of Corporate Intent that is likely to project the perceived needed rate of return. This is scrutinized in Parliament. Users in New Zealand, while they lack any direct controls, do enjoy strongly articulated formal rights of consultation.

The corporation is a civilian body; however, it pays for military controllers, just as it provides services to military and governmental users who reportedly pay

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<sup>6</sup> ACNZ was also established incident to a general restructuring of the role of government in the New Zealand economy.

for service but with special negotiated rates. General aviation users are also charged and provide about five percent of the revenue.

Employees enjoy collective bargaining rights and the right to strike, though they are now represented by the NZ Airline Pilots Association. As a result of the turnkey modernization program carried out by Thomson CSF, the number of civilian ACC's has been reduced from three to two. The Met (weather) Service, also formerly part of the CAA, has been set up as a separate profit center.

NZ does not operate a formal R&D program, relying on work done in other countries and preferring to buy tested, off-the-shelf technology. Contractors, however, are rigorously held to output-based guarantees. Eliminating the development of detailed in-house specifications has led to sharp scaling back of some 200 positions previously devoted to engineering analysis.

II.3.3.2 Basic System Parameters--The territory covered by New Zealand's ATC system is 103,736 square miles. The total area of ATC responsibility also includes operations over oceanic sectors. A total of 1.4 million movements per year (VFR as well as IFR) in New Zealand airspace are handled in some fashion by ACNZ. Total movements have been quite stable over the past five years. A "movement" is defined as "a landing and a takeoff or missed approach," which excludes territorial overflights (which are probably near zero given NZ's geographical position).<sup>7</sup> Scheduled commercial movements are approximately 336,000 per year; these equate to one to two percent of the traffic load in the U.S..

Congestion does not seem to be a problem in New Zealand, though, at 150,000 annual movements, Wellington's single runway airport (with fairly rigorous curfew limitations) now operates beyond 80 percent of maximum capacity.

II.3.3.3 Cost and Service Competitiveness--Almost uniquely in the world, ACNZ is highly focused on productivity issues. The number of ATM's per employee (not just per controller) has gone from 1,200 in 1988 to about 1,900 in 1993 (close to ten percent annual compound growth). Indications are that the AIRCAT 2000 Thomson-CSF system, capable of 5 NM separation standards with automated data transfer between centers, is performing very well. (Safety authorities reportedly have been contemplating authorizing three NM separation on approach beginning next year.) Other savings have come from reducing the ranks of middle managers and paring down marginal areas of activity.

Charges to users have fallen dramatically and are reportedly more than 60 percent under 1987 levels in real terms; a further ten percent discount is

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<sup>7</sup> NZ data does record oceanic overflights.

contemplated for FY94. Meanwhile profitability has been strong. In 1992-1993, ACNZ generated cash flow equivalent to 28 percent of revenues (apparently better than anticipated). It is building equity, has most of its capital expansion completed (on time and under cost) and is paying taxes and dividends. Its return on shareholder equity has frequently exceeded 20 percent. The Government's "take," net of various accounting offsets thus seems to have been at least on the order of NZ\$11 million in FY 93, or some 12 percent of ACNZ's total income; meanwhile the value of its equity as shareholder also increased some \$2 million. Data provided by ACNZ suggest that the Government has now seen the value of its original equity stake more than double (from \$21 million to \$55 million) in seven years and the government has taken out about \$50 million in dividends and taxes. Users reportedly have expressed some concern about this rate and/or treatment of profits. As a result, the Corporation's statement of intention for the coming three years seems to contemplate a modest lowering of its rate of profitability.

New Zealand is a small country. Certain fundamentals of providing the safety setting and operating environment are comparable to countries with more traffic. New Zealand, for example, probably needs to do as much weather analysis as the U.K. Its needs for nav aids, given the remoteness of some of the regions controlled, also should be proportionately higher. There are a number of such costs that must be spread among fewer users than in other countries.

Territorially, NZ, has geographical ATC responsibilities not greatly smaller than the U.K., albeit with a fraction of the traffic. Compared to a country like the U.K., its operating costs and its ratio of capital costs seem dramatically lower.

II.3.3.4 Special Factors and Broader Relevance--It is significant that the Airways Corporation took what had been, prior to 1988, an operation with chronic deficits, and turned it around--simultaneously lowering charges, improving profitability and completing a cost effective modernization process. Thus the real New Zealand story may be efficiency of investment.

This is in contrast to Europe and even the U.S., where the modernization process has been notoriously inefficient. Unlike European states, who are behind the curve on capacity and suffer from congestion, New Zealand is now well ahead on the curve and can accommodate about 50 percent more traffic without significant equipment additions. Thus, growth, if it comes, should serve to reduce average costs even further. Thus, it may be the investment story that makes New Zealand distinctive, even from Australia which achieved great savings in personnel, although perhaps starting from an inflated base. Compared to Australia, where charges have also been lowered significantly, New Zealand now charges half as much for air traffic services. ACNZ's productivity per employee appears to be much higher than the U.K. NATS, perhaps more than double.

### II.3.4 Australia

The primary relevant institution in Australia's ATC system is the Civil Aviation Authority. Oversight is provided by the Ministry of Transport and Parliament.

II.3.4.1 Institutional Structure--In Australia, air traffic control and aviation safety regulation resided in the Department of Transportation until 1988, after which a Civil Aviation Authority (CAA) was established. It was based on the British model, which concentrated all aviation regulatory functions--economic as well as technical (including accident investigation)--under the roof of one government business enterprise (GBE) established in its present form in 1990. The Department of Transport has retained broad policy oversight functions. The CAA's Board, however, is substantially drawn from the private sector, and its members may not represent public or private aviation interests. Businesslike decisionmaking in the furtherance of safety is the objective.

Prior to reorganization, Australia already had a policy of direct user fee charges aimed at recovering most, if not all, costs of civil aviation regulation. User payments, however, went to general revenues, while operations and investment were budgeted through the conventional appropriations process. The inability to plan and procure cost-effectively as well the perception that operations were inefficient and not fully responsive to user and market demands led to the corporatization initiative.

An important collateral factor to the CAA's establishment was the decision to place Australia's airports in a separate Federal Airports Corporation. This created precedents of channeling user fees directly to organizations providing the services and of putting airport staffs into business-type environments.

At start up, the CAA received both equity and loans from the Government. It also may borrow in private markets. As a GBE, it faces the same tax exposure as a privately owned corporation. That means it is liable for various local taxes (e.g., on property), the Australian version of VAT, and a profits tax. It is also expected to pay dividends to its stockholder (the government) as well prevailing rates of interest on its debt. The CAA also is insured privately.

While it has a number of sources of revenue to cover its various functions including a substantial gas tax on general aviation and some inspection and audit fees (increases of which are currently a matter of controversial debate), air traffic services generate most of the CAA's revenue.<sup>8</sup> In its profit and loss statement for the current fiscal year, the CAA estimates that will take in some A\$407 million (US \$271

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<sup>8</sup> Domestic air traffic costs are recovered by gas taxes on kerosene ("avtur") and avgas.

million) from en route and terminal ATC charges, covering 77 percent of estimated costs and about 90 percent of cash flow of the CAA as a whole.

The CAA's costs have fallen 18 percent in nominal terms in the last three years. Since 1990, it has reduced its staff 32 percent from 7,332 to 4,992 on June 30, 1993.<sup>9</sup> While ACC's were also reduced from five to two, these reductions were affected primarily by three structural reforms:

- Redundancies of several hundred managers from the former airports branch, who could not be accommodated in the Airports Corporation, were allowed to phase out inside the CAA;
- Severe scaling back of regional bureaucracies that had established microcosms of federal organization at the state level; and
- Flattening of the hierarchy across the organization; 14 management layers above the working controllers--now reduced to five.

This reduction gave local managers more authority. For example, procurements and other economic actions (e.g., leasing of facilities) that formerly required staffing out to the Australian version of the GSA were now done in-house, substantially based on decentralized operating budgets. Staffing up in financial management was, however, also required as was the adding of expertise on managing tax liabilities. Procurement policy, except for projects involving substantial civil works, was basically freed from historic public sector operating restraints.

Beginning from a position of what would appear to have been substantial over-staffing, the CAA has been able to achieve tangible economies that have been passed on to customers in the form of reduced ATC charges, which, however, still appear to be high by regional standards.

II.3.4.2 Basic System Parameters--The territory covered by the Australian ATC is 2,967,909 square miles. Australian civil aviation operates roughly four times the number of commercial movements as New Zealand and roughly half that of Canada. Except on the Eastern Coast of Australia, traffic densities (given its continental size) are quite thin. General aviation seems to play somewhat less of a role than in Canada with a total of 7,786 GA aircraft registrations (excluding ultralights) at year end 1990 (Canada has 24,471 GA aircraft). Overall system demand equates to approximately five percent of that in the U.S.

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<sup>9</sup> Despite this record, reductions appear not to have kept pace with earlier estimates. Australian plans, as reported in January 1992, called for the July 1, 1993 manning level to have fallen to 4,436 (with an eventual goal of 3,641 by July 1996).

II.3.4.3 Cost and Service Competitiveness--Australian data show that ATC charges have fallen 37 percent in real terms since the CAA was established in 1988. This appears to have been from a fairly high base, however. Australian charges are well above New Zealand's charges.

In its current fiscal year, the CAA expects to earn a profit after interest and before taxes of A\$40.8 million from which it expects to pay some \$29.4 million back to the Government in the form of corporate profits, taxes and dividends. It will also have taken depreciation of \$50.9 million, equivalent to more than 10 percent of its gross income from ATC charges and rescue and fire fighting premiums.

II.3.4.4 Provider and User Satisfaction--The Australian Government and the CAA seem gratified by the results that have created net income for the government, better working conditions and compensation for the staff and lowered costs to users. Users welcome the lowered costs; however, they may expect further reductions that may or may not be realized. Given its demand and airspace structure, Australia would seem to be a natural place to phase in satellite-based services progressively while continuing to rationalize ground-based services.

### II.3.5 Switzerland

The primary institution in Switzerland's ATC system is Swisscontrol, a mixed-ownership, non-profit company.

II.3.5.1 Institutional Structure--In the summer of 1986, the Swiss Government decided to remove the air navigation services from Radio Suisse. This decision was based on a legal requirement to diversify the three main activities of Radio Suisse (ATC, telecommunications, and electronic data processing), in order to comply with the federal constitution. Air traffic control has been managed by Swisscontrol since its founding in January 1988. At that point the Air Navigation Services Department became a limited company; the Telecommunications Department was taken over by Swiss Post, Telephone, Telegraph Company (PTT), and the Database Service was sold to a private company.

Generally, when Swisscontrol was formed, only minor changes to organization, finance, and personnel had to be made. As with the other countries previously examined, privatization is not the aim of Swisscontrol.

Since Swisscontrol is a company with mixed-ownership, the staff of Swisscontrol (an estimated 820 people), including air traffic controllers (approximately 300 of the aforementioned estimate), are not civil servants, and, although unionization is the norm, employees are prohibited from striking.

The company is managed by an 11 member Board of Directors headed by the chairman of the Federal Office of Civil Aviation (FOCA). Members of the board

include six employees of the Swiss Government and five private sector members, including representatives of the contracting unions and airspace users. By law, the Swiss Government must retain at least two-thirds stock ownership of Swisscontrol (currently it retains 71 percent of the shares). The remaining stock is controlled by the three main airports (twelve percent), the airlines (seven percent), and various aviation employee and user groups (ten percent).

Swisscontrol is financed by the Swiss Confederation through compensation, i.e., the company's total operating costs (just over \$60 million) are paid for out of the federal budget. Hence, Swisscontrol is not financially independent from the federal government. Also, Swisscontrol may send out bills for services to third parties. However, the receivables from this billing only account for five percent of the company's income. There is a system of user fees; however, these fees, which are charged through Eurocontrol, go directly to the federal government rather than to Swisscontrol, hence Swisscontrol's dependency on the federal budget for income. This system not only complicates the funding system, but also diminishes the financial autonomy and responsibility of Swisscontrol.

### II.3.6 Regional Issues: Corporatization and the Eurocontrol Debate

Eurocontrol, an organization that seemed to be dying five years ago, has taken on new life and vitality as European governments have finally begun to move to end costly, anachronistic and nationalistic policies of airspace management. The question of corporatization has arisen in this context, both in the form of proposals to corporatize Eurocontrol itself and in defining how a governmental Eurocontrol relates to corporatized operations within segments of European airspace. While the likelihood of corporatization for Eurocontrol in the near term is slight, the second issue may become increasingly typical. In addition to the U.K., Germany, and Switzerland, other European countries may contemplate taking ATC corporate. In addition, these moves may occur in Eastern Europe and the C.I.S. sooner rather than later, motivated less by laissez-faire economics and more by the attraction of securing committed revenue streams for the development of aviation as a vital infrastructure resource.

Presently, the cost base of Eurocontrol charges is comprised of the operating costs of the states participating in the system, plus depreciation and interest on capital expenditures. The costs of the Eurocontrol organization are included in the national cost bases. The service unit rate is established for each state and is comprised of the national service unit rate and the regional administrative unit rate. The national service rate is obtained by dividing the en route facility cost base of the state concerned for the reference year by the number of chargeable service units generated in the airspace of that State during the same year. To recover the costs associated with the Central Route Charges Office (CRCO), the regional administrative unit rate is obtained by dividing the cost of collecting route charges by

the number of service units generated in the charging area as a whole. CRCO's collection costs for 1992 (19,453,000 ECU) were estimated to be less than one percent of overall costs for the 15 Contracting States (2,153,038,000 ECU).

The service unit rates are determined on January 1 of each year and are expressed in ECU's (European Currency Unit). To reduce the effects of exchange rate fluctuations on the system, the service unit rates are adjusted monthly in line with the exchange rate of the ECU against the national currencies concerned.

Using a collection mechanism like the Eurocontrol Central Charges Organization and perhaps also making use of Eurocontrol planning and coordination capabilities, cash-strapped governments may find a method that permits them to collateralize fairly secure future revenue streams. Lenders will be more likely to support such projects if they do not have to channel revenues through central bureaucracies. Moreover, the high level of charges that European carriers have gotten used to creates revenue presumptions that make such investments even more attractive.

### II.3.7 The Canadian Situation

Transport Canada has developed a well organized initiative to corporatize the provision of air traffic control services on a self-sustaining basis funded by direct user fees. Presently these services operate at a substantial deficit. The new Canadian Government may act on this initiative as early as January, 1994. If adopted, the new system might take effect as early as September, 1995, though some form of phasing-in is quite likely. Given the history of excellent cooperation between Transport Canada and FAA as well as the obvious demands for efficient and harmonious cross border integration stemming from North American Free Trade Agreement (NAFTA), Canada is interested in closely following U.S. reform efforts and maintaining exchange of information in the formative stage.

A shift by Canada to a direct user fee system, while the U.S. continues to charge a fairly substantial ticket tax, could have a distorting effect on airline operations. Airlines on east/west and international routings now flying great circle mileage over Canada might accept distance penalties and burn more fuel to minimize use of Canadian airspace, putting added pressure on airspace across the U.S. northern tier.

Today Canada organizes the provision of air traffic control services similarly to the United States. ATC is provided by the Air Navigation Service of Transport Canada as a public service, with indirect user fee recovery in essentially the same form as the U.S., e.g., the ticket tax on domestic and North American aviation and a gas tax on general aviation. This revenue usually covers government-defined



operating costs but falls roughly C\$250 million short of covering investment expenditures.

Though it has about one-ninth of the U.S. population, Canada's reliance on aviation and the productivity of its services seem comparable to the U.S.. Canada would seem to have at least equivalent emphasis on general aviation and air taxi flying. There are proportionately more overflights, especially in western Canada, because of the great circle routings to East Asia both from Europe and the U.S. while there is probably less military flying. With a territory about five percent larger and air traffic data suggesting perhaps 14 percent of the U.S. demand for en route services, it may be appropriate to think of Canada as perhaps confronting roughly 1/8th of the workload of the U.S.<sup>10</sup> Canada has 2,500 controllers; U.S. about 17,500. Total staff of the Air Navigation Services (including maintenance, weather and relevant Aviation Standards and R&D personnel) for the ATM system is roughly 5,600, with a current budget approaching C\$750 million (US \$575 million) about 35 percent of which is F&E spending. The ANS staffs six en route centers, two Tracon-type facilities, 56 towered airports and 75 Flight Service Stations. Scaled up, Canada's overall costs and staffing do not compare unfavorably to those of the U.S..

Whether there is a baseline comparability between the output and structure of the two systems is relevant insofar as the Canadian Study Team for ATC Reorganization (which has been working on this subject for two years) believes that a move by Canada in the direction of a corporatized system drawing lessons from other British Commonwealth countries could result in efficiency gains of perhaps 20 percent over current practice. Both the commercial users and the work force in Canada support reform, but general aviation is wary.

Within the broad goal of achieving long term savings, the problems that Canada wants to address include:

- Intrusion of politics and non-professional criteria in decisionmaking;
- Inefficient and wasteful procurement practices;
- Performance and financial costs imposed by annual budgeting procedures and having to compete for shrinking resources even though users might be prepared to pay higher fees for an improved system;

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<sup>10</sup> In 1990, Canada had 6.1 million operations at its towered airports; 1.1 million at its FSS Airports; and 621,125 at other airports; totalling 7.8 million (of which 2.9 million were associated with local as opposed to itinerant operations). In addition, there were some 375,000 overflights in Canadian airspace.

- Work force morale and motivation problems and the inability to locate, organize and flexibly staff facilities.

The reform model that Transport Canada appears to favor includes the following features:

- Establishment of a Crown Corporation, wholly government-owned, but free to set its own pay scales, make decisions to open or close facilities, invest, borrow, procure and bill its customers in a manner comparable to public utilities (subject to rate of return regulation);
- The corporation would work with an "Advisory Council" of users. It would design and set fees on its own authority subject to a consultation and an appeals process.
- With the Government (Transport Canada) would remain:
  - Safety regulation;
  - Accident and incident investigation;
  - National airspace policy (including operational decisions like frequency allocation);
  - International policy coordination;
  - R&D (probably); and
  - Responsibility to pay for any services required in the national interest that would not be self sufficient (e.g., essential air service-type activities).

Preliminary thinking is that shifting to en route charges (probably similar in structure but much lower in level than the weight-based formulas used by Eurocontrol) could lead to abolition of the ticket tax. Canadian experts believe Canada's charging level would be substantially below the European average, perhaps as low as one-third of Eurocontrol rates. Some cross-subsidization for general aviation may be necessary, and/or a fee structure that does not act as a disincentive for private pilots to use safety-enhancing services may be designed. A gas tax for these operators might be retained.

Because Canada has also recently moved to privatize (or defederalize) its airports, the need for indirect fee or tax revenue to support airports is not an issue in

Canada. Thus introduction of direct charges for air navigation services would essentially eliminate the need for the ticket tax.

#### II.4 Economic Regulation of British Airports Authority (BAA)

All seven BAA plc airports are separately regulated by CAA. The three southeast airports--Heathrow, Gatwick and Stansted--are subject to certain mandatory conditions imposed on their permissions regarding the level of airport charges and the information to be published in their annual accounts.

There are four general categories of economic regulation imposed by CAA:

- Price conditions with respect to airport charges;
- Other conditions regarding airport charges and operational activities;
- Conditions with respect to aviation-related activities;
- Accounting conditions.

The permissions for Heathrow, Gatwick and Stansted include conditions limiting the maximum amounts of airport charges, defined as landing fees, aircraft parking fees, and per passenger charges. Increases in these fees are limited by a price formula, which in turn is based upon the level of charges as of April 1, 1987.

At the end of the five years from this date, and at the end of each succeeding five year period, the CAA can adjust the maximum rate formula after having received a set of recommendations from the Monopolies and Mergers Commission (MMC).

The price formula places limits on the maximum annual average revenue per passenger for the southeast airports as a group, and for Heathrow and Gatwick Airports individually. The limits are established by the application of the RPI-1 formula. The formula is applied using forecasted increases in average revenue per passenger arising from airport charges. These charges should not exceed the rate of inflation as measured by the percentage increase in the retail price index minus one percentage point.

The price formula currently in effect is in the following form:

$$M_t = \left[ 1 + \frac{RPI_t - 1}{100} \right] \times Y_{t-1} - K_t$$

where:

t corresponds to the relevant financial year;  
RPI is the forecast retail price index for time t;  
M is the maximum average revenue per passenger allowed in year t;  
 $Y_{t-1}$  is the specified average revenue per passenger in the prior financial year;  
K is the correction factor per passenger to be made in year t in order to adjust for forecast errors.

The correctional factor (K) in any one year represents the difference between the actual average revenue per passenger and the maximum average revenue per passenger calculated according to the price formula, adjusted for interest. If the actual average revenue per passenger turns out to be less than the maximum permitted, the shortfall can be recovered together with two years of interest on the amount of the difference at an average interest rate attributable to treasury bills. If instead the average revenue per passenger is greater than the maximum permitted by the formula, the permitted maximum is reduced by this amount together with two years of interest charges at three percentage points above an average interest rate attributable to treasury bills. The correction factor therefore provides BAA with incentives to include conservative forecasts of price inflation in the price formula.

This type of price regulation is less administratively cumbersome and leaves more discretion to the corporation than does rate-of-return regulation, since the latter invariably involves detailed reviews of user charges and investments. There are also stronger incentives to be productively efficient under price caps.

The maximum price regulation (RPI - X) applies to most commercial activities on the air-side of the airport. Every five years, these maximum rates are reviewed, together with virtually all land-side commercial activities. The latter set of activities are viewed in the broader context of whether BAA's rate of return and other indicia (as yet undefined by CAA) are consistent with the objectives stated in the Act. These objectives are:

- To take account of the reasonable interests of the users of the airports;
- To promote the efficient, economic and profitable operation of the airport;
- To encourage investment in the facilities at airports in time to satisfy anticipated demands by the users of such airports;
- To impose the minimum restrictions that are consistent with the performance by the CAA of its economic regulatory functions.

Commercial activities on the air-side of the airport are also subject to review by the CAA either on its own initiative, or in response to complaints by others. In both circumstances, CAA will refer the matter to the Monopolies and Mergers Commission of its recommendation before implementing any changes in BAA's regulations. After its first five-year review in 1992, CAA proposed a new price-cap formula of RPI-8 due to productivity improvements that had occurred and the belief that BAA was earning excessive profits. After BAA responded by stating that such a formula would not permit the development of a new terminal at Heathrow, a compromise was implemented in 1993 which entailed an RPI-4 formula and the continuation of Heathrow's new terminal.

## II.5 Conclusions

The main conclusions of this paper include the following:

### II.5.1 Relevance of Foreign Models

While great differences exist with respect to geographic size or the economic and social role of aviation, each of the countries examined has confronted:

- The concern for strong leadership focused on aviation quality and technical professionalism as well as better economic service;
- The need to hold executives accountable, motivate managers and employees and flatten hierarchies;
- The inadequacy of civil service management and compensation structure; and
- The need to invest and maintain facilities, modernize in a cost-effective way, and simplify procurement practices, especially by empowering managers and by removing micromanagement by special or political interests.

### II.5.2 Absence of "Back-to-Government" Trends

This study did not uncover evidence of political or social concerns that corporatization had been a mistake. The effect on safety is generally deemed positive, since political interference in safety decisionmaking tended to be reduced. Moreover:

- In Europe, at a time of growing fiscal constraint and (in the case of Eastern Europe) crisis, corporatizations that take aviation infrastructure off-budget will become increasingly attractive.
- In North America, Canada (after intensive study) could decide next year to implement corporatization and direct fees. Mexico, which is not analyzed in this study, is already structured with separate airport and ATC organizations and uses direct fees.

### II.5.3 Inconclusiveness with Respect to Economic Performance

The three corporatized systems in Europe have the highest charging rates: the UK, Switzerland, and Germany. Lack of scale economies is not sufficient to explain away the lower (relative to U.S.) productivity of these systems or the contrasting results with the more efficient systems of Australia and New Zealand. Dominant in Europe may be overall systems problems that undercut the ability to create best practice economics at the national level.

- Perhaps only New Zealand can be said to have conscious and effective policies to increase staff productivity and efficiency of investment.
- This report has not found that any country has solved the issue of ATC monopoly power. Most employ a quasi-public utility model but with regulation that is either informal or ineffective. Users enjoy consultation rights but rights of appeal are limited or nonexistent. Government is the 100 percent owner in all cases examined.
- While corporatization seems to have satisfied the providers and has contributed to performance or cost improvements which enjoy industry and public support, systems do not yet exist that question whether corporations are absolutely efficient.

### II.5.4 Comparison Charts

Table II-1 presents physical data on each country's ATC structure and the demands placed on ATC in each country. Most obviously shown in the tables is the vast difference in the size of the U.S. ATC system as compared to foreign corporatized ATC organizations. The U.S. employs nearly six times as many controllers as the next largest employer-the U.K.. Further, the U.S. has many more ATC facilities than any of the comparison countries. As can be clearly identified in this table, the U.S. experiences nearly nine times as many enplanements as the U.K.. Further, the U.S. reports over eight times the number of airport operations as Canada. These primary differences in figures lead to large differences in requirements of an ATC system. Comparison of the present U.S. ATC system with

foreign corporatized ATC organizations must be viewed in light of these dramatic differences. Further, the large number of GA aircraft in the U.S. should also be considered in any comparison of the U.S. ATC system with foreign corporatized ATC organizations. If economies of scale occur, the U.S. should be even more productive than New Zealand, although the empirical evidence does not exist to support this assertion.

Table II-2 summarizes the performance of foreign corporatized ATC organizations. Each country is rated on a scale from A to F, A being excellent - F being a failure, over several measures of success. Overall New Zealand is given the highest grades, however the U.K. system is rated the best for Civilian/Military Relations and Safety Systems. It should be noted, however, that these ratings reflect only preliminary analyses.

Table II-3 recounts the organizational structure of foreign corporatized ATC organizations reviewed in this study. This table shows that the structures of the ATC organizations reviewed are quite similar on a basic level. Although there is a split on the issue of dividend payments, there is a general consensus on most other issues.

Table II-4 illustrates the cost advantages of a single unified system by comparing the cost of an optimized en-route facility with comparably sized centers which exist in Europe today. In 1988 it cost approximately \$1.6 billion to produce en-route ATC services in the ECAC countries. In comparison the U.S. en-route system costs about the same, but handled over three times the number of IFR flights. It is, however, necessary to recognize that there are operational differences in how ATC services are produced in the U.S. and Europe as well as significant differences in general economic conditions. To allow for these precisely is difficult.

In summation, although there are excellent examples of successful corporatization of ATC systems in several foreign countries and interest in this form of organization in several others, these examples must be compared with the U.S. ATC system in the light of great differences in size and requirements. While their situations are different, many of the challenges they have sought to address are strikingly similar. Their experience therefore merits analysis and appropriate consideration.

Table II-1

## COMPARISON OF INTERNATIONAL ATC FORMATS

Country	Sq. m.	Population	GDP	Enplanements	Airport Ops.*	GA Aircraft	GA Aircraft / 1,000,000 Population	GA Aircraft/ Square Mile	ACC's	Other Facilities
U.K.	94,214	55 M	\$912.7 B <sup>3</sup>	49.5 M <sup>3</sup>	2.4 M <sup>4</sup>	7,855 <sup>3</sup>	143	0.083	5	11
Germany	137,725	81.5 M	\$1.8 T	44 M <sup>4</sup>	1.7 M <sup>4</sup>	Not Available	Not Available	Not Available	7	7
New Zealand	103,736	3.4 M	\$42 B	2.7 M <sup>3</sup>	1.4 M FY 1993	2,466 <sup>2</sup>	725	0.024	3	28
Canada	3,850,000	27 M	\$519.4 B <sup>3</sup>	34.1 M <sup>2</sup>	7.8 M	24,471 <sup>2</sup>	906	0.006	8	56
Australia	2,967,909	17 M	\$316 B (91 - 92)	18.7 M	3.4 M	7,786 <sup>2</sup>	458	0.003	2	42
U.S.	3,618,770	258 M	\$5.7 T <sup>3</sup>	428.3 M <sup>3</sup>	63.5 M	198,475 <sup>3</sup>	769	0.055	24	692

\* Based on CY1990 data unless otherwise noted. Includes both intinerant and local operations at civil airports but omits overflights, which in case of Germany (24%) and UK (10% ) of total operations is significant. UK and German numbers also are less complete with respect to local operations and understate the effect of military flying activity.



Table II-1

**COMPARISON OF INTERNATIONAL ATC FORMATS**  
(Continued)

Country	En Route Workload	Overflights (%)	Total Staff	FSS	ATC Budget	Capital Budget	R&D Budget	Controllers	ATC Revenue	En Route Fees
U.K.	423 M <sup>4</sup> aircraft km.	10%	<sup>5</sup> 5200	Not Available	240 M <sup>1</sup> GBP	705 B GBP over 5 years	<sup>1</sup> 5 M GBP	3,100	508.2 M GBP (92 - 93)	<sup>6</sup> ECU 86.84 per unit
Germany	537 M <sup>4</sup> aircraft km.	24%	<sup>5</sup> 5000	Not Available	Not Available	\$235 M	Handled by other institutions	2,000	Not Available	<sup>6</sup> ECU 77.6 per unit
New Zealand	104 M <sup>4</sup> aircraft km.	<1%	656	Not Available	\$42.3 M	\$8.9 M	Negligible	450	\$50.3 M	\$47.3 M total
Canada	Not Available	5%	5600	75	\$344 M	\$203 M	Not Available	2,500	Not Available	Slight
Australia	Not Available	Not Available	<sup>5</sup> 4990	Not Available	N/A, 60% of CAA	Unknown	Not Available	1,120	377 M	\$271 M total (includes terminal charges)
U.S.	8.4 B aircraft km 1992-93	Not Available	45,000 ATC only	<sup>3</sup> 175	\$6.4 B	\$2.35 B F&E	\$156 M - non-safety \$230 M - total	25,293	Not Available	Not Available

Table II-2

### Performance of Foreign Corporatized ATC Organizations

	UK	New Zealand	Australia	Germany
<b>Efficiency (Productive/Economic)</b>	B-/C	A/A+	B/B	-
<b>Modernity</b>	B+	A	B	B+
<b>Low Fixed Costs</b>	C-	A+	B-	C-
<b>Safety Systems</b>	A	B+	B+	B-
<b>Civilian/Military Relations</b>	A	B+	B+	A-
<b>Balance Sheet Strength</b>	B+	A+	A-	A
<b>Labor Productivity</b>	C+	A	A-	B
<b>Managerial Initiative</b>	B+	A+	A	-

(These reflect preliminary analyses)

Table II-4

# PAN-EUROPEAN ENROUTE ATC COST FUNCTION

MILL. US \$

TOTAL COST vs IFR FLIGHTS IN 1988

