BUILDING A SAFER AND MORE EFFECTIVE AIR TRAFFIC CONTROL SYSTEM

by
Robert W. Poole, Jr.

EXECUTIVE SUMMARY

The U.S. air traffic control (ATC) system is failing to keep pace with the needs of commercial aviation. Airline traffic has increased by 68% since deregulation. But the workforce is one-third smaller in relation to traffic levels than before the 1981 controllers' strike. And the computers, radars, and other equipment are generally outdated and unreliable.

One result is extensive delays. According to the Department of Transportation, these delays cost airlines and passengers some $5 billion a year. Another result is decreased safety; two recent airport collisions resulted from ATC deficiencies.

The problem is not simply a lack of money--though that, indeed, is part of the problem. The fundamental problem is that the ATC organization is crippled by being part of a governmental agency (the Federal Aviation Administration). Civil service rules prevent the FAA from paying enough to attract sufficient experienced controllers to high-stress points like O'Hare, LaGuardia, and Los Angeles. Federal procurement regulations delay needed equipment upgrades for many years. And the FAA operates with a built-in conflict of interest: to both promote aviation and regulate its safety.

Spinning off ATC to a user-funded corporation would solve these structural problems. The British, Swiss, and New Zealand ATC systems use this model, and it has recently been proposed for restructuring the entire European ATC system. Direct user fees would make funds available quickly and efficiently to upgrade the system to state-of-the-art technology. And the corporation could pay whatever was needed to attract sufficient numbers of experienced personnel to its critical facilities.

The result would be a safer, more efficient ATC system, able to keep pace with a growing, competitive aviation industry.

I. Air Traffic Control: A System in Crisis

Ten years after the 1981 controllers' strike, the air traffic control (ATC) system remains a major impediment to the growth of commercial aviation in the United States. Since the airlines were deregulated, air traffic has increased from 2.5 billion airline miles flown in 1978 to 4.2 billion in 1989--a 68 percent increase.[1] Yet the ATC system,owned and operated by the Federal Aviation Administration (FAA) has failed to keep pace.

The controller workforce has been slowly rebuilt, to the point where its gross numbers finally exceeded pre-strike levels by 1988 (see Table 1). But the fraction of that workforce rated as full-performance level (FPL) is only 61 percent as of 1989, compared with 81 percent before the strike. And this less-capable workforce is handling 68 percent more traffic than in 1978. Hence, as Figure 1 illustrates, controllers are still stretched more thinly than prior to deregulation.

Table 1

Air Traffic Controllers and Air Traffic

Fiscal Year	FPL Controllers	Total Controllers	Percent FPL	Airliner Miles (millions)
1980	13,170	16,234	81	2,816
1981	4,745	6,474	72	2,703
1982	5,493	12,117	45	2,699
1983	6,746	12,118	51	2,808
1984	7,580	13,714	55	3,114
1985	8,315	13,998	59	3,320
1986	9,528	14,803	64	3,728
1987	9,798	15,433	63	3,988
1988	9,858	16,436	60	4,141
1989	10,232	16,832	61	4,193

Nor has automation yet come to the rescue, as had been hoped. The Federal Aviation Administration's $12 billion, 10-year National Airspace System Plan (NAS Plan) is six or seven years behind schedule and has now grown to a $27 billion collection of programs. Though launched in 1982 as a 10-year plan, it is now targeted for completion in 1998, and has suffered numerous modifications along the way.

As a result, air travelers are experiencing serious problems. The most notable is the problem of delays. In 1987 the Air Transport Association reported that delays cost

FIGURE 1
CONTROLLER WORKFORCE
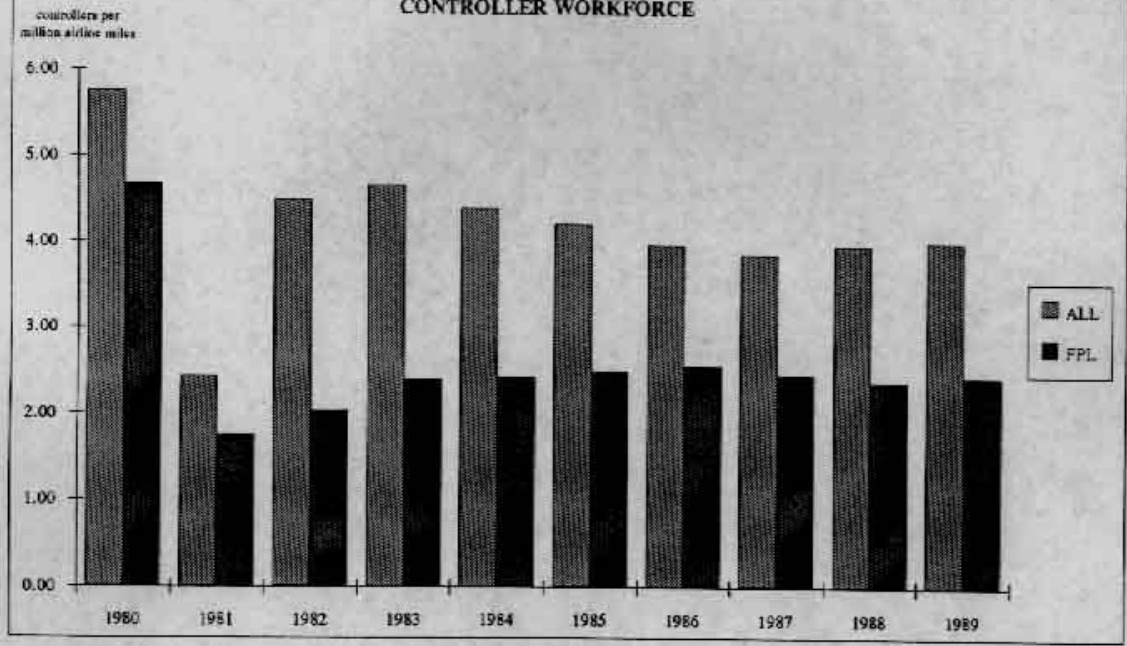
airlines some $2 billion--wasted fuel, additional crew hours, etc. That figure was more than the combined profits of U.S. airlines in any single year in history.[2] While delays eased slightly in 1988, they increased by 16 percent in 1989 (and soared by 111 percent at LaGuardia and 52 percent at Kennedy), with further increases in 1990.[3] Adding in the value of passengers' lost time, as well as increased airline costs, the Department of Transportation puts the total cost of airline delays at $5 billion per year.[4]

As with Soviet agriculture, the FAA tries to put most of the blame on bad weather. But U.S. weather has not appreciably worsened over the past decade. And today's avionics technology can keep traffic moving in much bad weather--but only if that technology is in place where it is needed. Far too often, that is not the case in the ATC system.

Safety is another serious concern of air travelers. The mid-1980s witnessed an alarming rise in near-midair collisions, and while the trend seems to have been reversed by the end of the decade (Figure 2), the level of near mid-airs is still nearly twice as high as a decade ago. Investigations of such incidents by the National Transportation Safety Board frequently cited serious lapses in the ATC system. For example, in Southern California in 1989, NTSB found that serious deficiencies and problems were documented by the FAA at the Coast Terminal Approach Control (TRACON) facility over a three-year period, yet the agency "failed to address and correct the problems." Among the problems cited were "inadequate controller staffing, excessive use of overtime . . . and inadequate size and poor physical condition of the operational quarters,"--including the use of obsolete rotary phone equipment.[5]

A 1989 FAA review of the ATC system in the northeast corridor (resulting from a 1988 near-collision of a commuter aircraft and Air Force One) documented numerous deficiencies. These included:

- Difficulty in recruiting experienced controllers to New York;
- Poorly designed airspace boundaries, that increase workload and stress on controllers;
- A lack of experienced maintenance technicians;
- Inadequate controller training;
- Poor working relationships among ATC facilities;
- Poor communications between pilots and controllers.[6]

This last item figured in the January 25, 1990 crash of an Avianca 707 on Long Island, in which the pilot was unable to make controllers understand that the plane was about to run out of fuel. On the evening in question, the New York TRACON had a shortage of controllers, according to the NTSB investigation.[7]

FIGURE 2
NEAR MID-AIR COLLISIONS
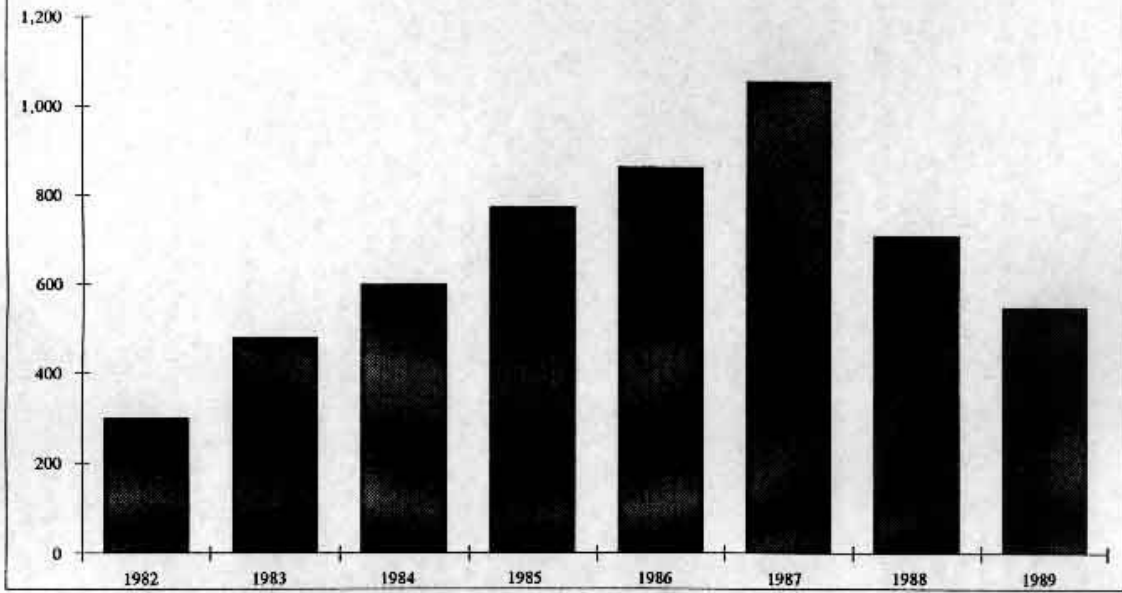
Twice in recent months airliners have collided on the runways of busy airports. On December 3, 1990, two Northwest Airlines jetliners collided on a fog-shrouded runway at Detroit Metro Airport. Despite the airport's high traffic levels, the FAA has failed to install a ground radar system there, forcing controllers to rely on verbal clearances and visual tracking.[8] Only 14 U.S. airports have such radars. And on February 1, 1991, a USAir 737 collided with a commuter aircraft on landing at Los Angeles International Airport. The ground radar there was defective, and the harried controller had mistakenly cleared both planes to be on the runway at the same time.

Numerous General Accounting Office reports over the past decade have documented the serious, ongoing problems of a controller work force stretched too thin, and trying to make do with obsolete, unreliable equipment. Air traffic continues to grow at least as fast as the FAA's ability to make improvements, leading to continuing concern about the system's margin of safety.

In short, today's ATC system is short of qualified controllers and plagued with obsolete equipment. Those problems lead to massive, costly delays and diminished margins of safety for air travelers. There has to be a better way to provide ATC services.

II. ATC Shortcomings: A Structural Problem

Flight delays and safety problems are symptoms of basic, structural problems in the way ATC services are provided. To begin with, the ATC system is chronically underfunded. The majority of the FAA's funding comes from aviation "user taxes"--primarily the 8 percent tax on airline tickets. Revenues from these user taxes are earmarked for the Aviation Trust Fund, which can only be spent on aviation purposes. But because of the unified federal budget, both revenues and expenditures from the Trust Fund directly affect the size of each year's federal budget deficit. Consequently, although the Administration and Congress each blames the other, both suffer from the same desire to maximize Trust Fund revenues while minimizing Trust Fund expenditures. The result is a growing accumulation of unspent, unobligated balances in the Fund, at a time of massive unmet needs for people and equipment.

But lack of funding is only a part of the problem. Another is the complex, time-consuming federal procurement regulations which FAA, as a government agency, must follow. To acquire an upgraded radar system from the FAA, for example, would take an airport from four to seven years under current procurement practices.

And it is not simply the nature of the procurement process, but FAA's own systems-acquisition capabilities that are in question. In April 1990 the General

Accounting Office testified before the House appropriations subcommittee on this subject. GAO cited several major examples of "inadequately justified general-purpose procurements," including the $5 billion Advanced Automation System (the core NAS Plan program, which will replace the 1960s-era ATC computers and software), the $1.7 billion Mode-S transponder program, and the $1.5 billion Computer Resources Nucleus (CORN) program.[9]

As a federal agency, FAA is also governed by federal civil-service regulations. Consequently, there is a general pattern of overstaffing in some locations and understaffing in many others, difficulties in terminating unsatisfactory employees, and rigid, military-type systems of personnel management.

For example, controller and technician compensation is uniform nationwide, despite the much higher workloads and higher costs of living in such areas as New York, Chicago, and Southern California. To address this problem, Congress finally enacted a measure (in May 1989) to permit 20 percent pay differentials for controllers at 11 ATC facilities. Unfortunately, since the differential applied to en-route centers and TRACONs but not to control towers, many of those taking advantage of the program have been airport tower personnel in those same high-stress regions--which has exacerbated the controller shortage at such airports as Los Angeles, O'Hare, LaGuardia and Kennedy.[10]

The GAO in 1988 also criticized the FAA's recruitment and training efforts.[11, 12] The FAA is a passive recruiter, with inconsistencies in policy among its various regions. Overall, the agency was found to be attracting fewer high-quality candidates than in earlier years. And it tends to assign controller school graduates to ATC facilities inappropriate to their performance in school. Some 41 percent of low-scoring graduates were assigned to busy en-route centers in the two most recent fiscal years, rather than to less-demanding posts. Likewise, the FAA cites funding limits as the reason for not moving experienced controllers from small towers to busier towers. Instead, brand-new graduates of the FAA Academy are sent directly to busy towers, which many of them are not equipped to handle.

Yet another problem is that of micromanagement. FAA operates in a fishbowl, with numerous supervisory bodies looking over its managers' shoulders, often giving contradictory directives. Several congressional oversight committees, the Office of Personnel Management, the Office of Management & Budget, the White House, and the Office of the Secretary of Transportation are all in some sense the "boss" of the FAA, as it attempts to run the demanding, high-tech business of air traffic control. In a 1986 report, the National Academy of Public Administration identified this well-intentioned but dysfunctional oversight as a major barrier to effective management and decision-making.[13]

A final problem is that of conflict of interest. The Federal Aviation Act of 1958 gives the agency the missions of both promoting civil aviation <u>and</u> regulating air safety. FAA is thus the only federal safety regulatory agency which is also charged with promoting the economic interests of the industries it regulates (much like the former Atomic Energy Commission, whose conflict of interest was removed when its functions were separated in 1975 with the creation of a separate Nuclear Regulatory Commission). Former DOT Secretary Jim Burnley and former NTSB chairman James Burnett both cited the FAA's conflict of interest as a potential safety problem.

In short, the ATC problem cannot be solved by tinkering with the system, or by increasing the so-called user taxes. Meeting the needs of a fast-growing, high-tech service business simply cannot be done within the constraints of a government bureaucracy, hobbled by civil-service and federal procurement regulations. And the revenues needed to rebuild and operate the system must not be held hostage to the vicissitudes of the federal budget process.

* * *

Many knowledgeable observers have concluded that the ATC system's major problems are structural in nature. The first major proposal for restructuring the system was proposed in 1975 by aviation consultant Glen A. Gilbert. His study proposed spinning off the entire FAA from DOT and converting it into a government corporation, funded 50 percent by user taxes and 50 percent by general tax revenues.[14] Presumably exempt from federal civil-service and procurement regulations, it would have still been as much a part of the federal government as the Postal Service, Amtrak, and the TVA. It would also have retained FAA's safety-regulatory functions and the inherent conflict of interest.

In 1985 the Air Transport Association proposed spinning off the ATC functions, the Aviation Trust Fund, and the airport grant program to a National Aviation Authority (NAA).[15] Safety regulation would have been retained in a redefined FAA, thereby resolving the conflict-of-interest problem. The NAA would have been a federal corporation, but unlike the Gilbert proposal, it would have been fully funded by user fees. It would also have been exempt from civil-service and procurement regulations, but not from congressional oversight. Legislation to implement the NAA was introduced, but made little headway.

The National Academy of Public Administration reviewed the NAA plan in 1986 and recommended major changes. NAPA favored spinning off the entire FAA (including safety regulation) into a user-funded federal corporation, with an administrator reporting to the DOT secretary.[16] A similar "independent FAA" plan was recommended by the 1988 Aviation Safety Commission.[17] Legislation along these lines was introduced in 1988 by Sen. Wendell Ford (D.-KY) and passed by the Senate, but was not acted upon by the House.

The Reason Foundation in 1986 recommended spinning off ATC as a nonprofit, user-owned and user-funded corporation.[18] "Airways Corporation" would be federally chartered (like Comsat) and federally regulated as to safety by the redefined FAA. Its nonprofit status was proposed because of the natural-monopoly nature of ATC services, and its user ownership provision was inspired by Aeronautical Radio, Inc. (ARINC), a not-for-profit corporation owned by airlines and other aviation users to provide communications services. Proposed owners (see Table 2) included airlines, general aviation groups, airline pilots, controllers, and the federal government (whose 15 percent share would reflect military and other federal usage of the civilian ATC system). The Reason Foundation's proposal was endorsed by then-DOT Secretary Jim Burnley, and legislation to implement it was introduced by Rep. Joe Barton (R., TX), but made little headway.

Table 2

Proposed Shareholding in Airways Corp.

Airlines	40%
Private pilots	20%
Airline pilots and air traffic controllers	15%
Business aircraft owners	10%
Federal government	15%
TOTAL:	100%

The President's Commission on Privatization heard extensive testimony on various proposals to privatize airports and air traffic control. A spokesman for ARINC testified that a user-owned not-for-profit corporation analogous to ARINC was a feasible approach, and OMB testimony was generally supportive of privatizing ATC. A commercial firm, Air Transport Holdings, proposed that FAA sell the entire ATC system, to be run as a for-profit business (presumably with some form of regulation to guard against monopoly abuses). In the end, the Commission recommended only privatizing airport control towers and flight service stations, and possibly contracting out some activities at en-route centers.[19]

III. Creating ATC Corporations

A. North America

The idea of ATC services being provided by some sort of corporate entity is neither new nor unprecedented. In fact, the very first ATC services in this country were originated by ARINC, which was created in 1929 to provide joint communications and navigation services for several airlines. In 1935 and 1936, ARINC created the first ATC centers, with those services (like its

communications services) paid for on the basis of transaction fees by the users.[20] But in mid-1936, in a bid to help the struggling airlines, the federal Bureau of Air Commerce took over responsibility for ATC services, which were subsequently provided without charge.

ARINC continued and expanded its communications functions, and today it provides extensive air-to-ground communications services, telecommunications linking airline computer systems, and standard-setting for avionics activities. It also contracts with the FAA to provide ATC communications for international flights. After World War II, ARINC helped to set up Radio Aeronautica de Mexico, S.A. (RAMSA), as a private, non-profit corporation to provide ATC and communications services to Mexican airlines. And it set up a similar company, RACSA, in Cuba. The latter was nationalized by the Castro government, and the former was nationalized in 1978 by the Mexican government. But for several decades, both Cuba and Mexico had private, user-funded ATC systems.

B. Great Britain

Britain has moved gradually in the direction of ATC privatization. In 1972 the British equivalent of the FAA--the Civil Aviation Authority--was made into a Crown corporation and required to become self-supporting from user fees. CAA has a board of directors appointed by the government. Three-fourths of its personnel work for its ATC division, National Air Traffic Services (NATS), while another 10 percent staff CAA's safety-regulation function. NATS operates the en-route ATC system, charging user fees which cover the full costs of operation. Because NATS is structured as a joint civil/military partnership (its chief reports to both CAA and the Defence Ministry), it has not been considered a candidate for full privatization.[21]

In general, airport control towers in Britain are the responsibility of each airport, rather than the CAA. Airports may operate the towers themselves (as does Luton, near London) or contract out this function. The two principal competitors for tower operations contracts are NATS and the private firm International Airadio Ltd. (IAL). Controllers working for the private contractors (or for municipal airports which operate their own towers) are licensed by the CAA and must meet the same standards as NATS controllers. Both the CAA and IAL operate controller training schools. The CAA regulates all control towers for safety; in some cases, obviously, it is regulating its own personnel, but because NATS is organizationally a separate division of CAA, that conflict of interest has not been considered a serious problem in Britain.

C. New Zealand

New Zealand has recently taken the British model several steps further. In 1987 it corporatized its ATC system, spinning it off from the Civil Aviation Division of the Transport Ministry. But unlike Britain, where safety regulation remains part of the corporatized operation, in New Zealand safety regulatory functions remained with the CAD, at arms-length from the new Airways Corporation. Thus, Airways Corporation relates to the safety regulator in the same way as the airlines and airports.

Airways Corporation has a commercial-type board of directors, follows normal business accounting practices, and is expected to be self-supporting from user charges. To date, the government has held 100 percent of the company's stock, but the sale of some or all of the shares remains a future possibility (with airlines, airports, and employees mentioned as possible shareholders). In July 1988 Airways Corporation introduced a new system of user fees, which required payment for ATC services for the first time from some private, corporate, and small commercial operators.

Airports in New Zealand have also been corporatized. And at the time of Airways Corporation's creation, the airports became free to contract out for control tower and fire-protection services. Thus far, the major airports have contracted with Airways Corp. for control tower operations, but it is not clear if Auckland, Christchurch, and Wellington airports will continue to do so when they are privatized within the next few years.

Under the new user-pays principles, military aircraft are charged for using civilian ATC services, and this innovation has also gone smoothly. At one New Zealand Air Force base (Ohakea), all ATC personnel are Airways Corporation employees, providing services under contract.[22]

D. Switzerland

For decades, ATC in Switzerland was provided by one branch of a nonprofit, government-chartered corporation called RadioSchweiz. The company's principal function was (nonaeronautical) telecommunications, which led to some concerns that it would not keep pace with the growth of air traffic in Switzerland. Hence, in 1988 the Swiss congress (Bundesrat) spun off the ATC company and partially privatized it by permitting part-ownership by aviation users. The breakdown of ownership of the new company, SwissControl, is given in Table 3. As can be seen, minority owners include the two largest airlines, the two largest airports, air traffic controllers, and general aviation interests.

Table 3

Shareholding in SwissControl

	Number of Shares	Percent
Swiss government	142	71.0
Swissair (airline)	10	5.0
Crossair (airline)	4	2.0
Canton Geneva (airport)	10	5.0
Canton Zurich (airport)	10	5.0
City of Lugano (airport)	4	2.0
Aero Club of Switzerland	4	2.0
AOPA-Switzerland	4	2.0
Aerosuisse	4	2.0
Alpar AG	4	2.0
Assn. of Swiss Flight Safety	2	1.0
Aerocontrol Switzerland	1	0.5
Swiss ATCA	1	0.5

As the majority owner, the Swiss government provides at least six of the eleven members of the company's administration committee, its governing body. During the initial two-year probationary period, ownership of the facilities and equipment remained with the government, and the government covered all operating costs out of ATC user charges, as had been the case prior to 1988. Thus, the company bore no entrepreneurial risk.

Two government agencies played a significant role during SwissControl's first two years. The Department of Traffic & Energy appointed the six government members of the administrative committee, while the Office of Civil Aviation (OCA) provided safety regulation. But in addition, OCA's director served as president of SwissControl's administrative committee and two of OCA's department heads (for ground services and legal services) were appointed as two of the other six committee members. Thus, a conflict of interest between safety regulation and ATC services was built into the initial structure.

Several studies of the initial two years of operation noted that user representation—in particular, of the major airlines and airports—provided incentives for efficiency which had been lacking in the previous (RadioSchweitz) organization. But the conflict of interest between OCA and SwissControl was recognized as a problem. In addition, labor relations remained an area of uncertainty. SwissControl is supposed to guarantee that ATC operations are not interrupted by strikes, lockouts, or other labor disputes, but strikes are not forbidden by law. In addition, some have

questioned the constitutionality of the government delegating the ATC function to a private organization.[23] As of the end of 1990, SwissControl was researching possible changes in organizational structure and governance.

E. European ATC Privatization

During the past several years, the inadequacies of the European ATC system have been documented by several studies.[24] The "system" comprises 22 national ATC entities, operating 42 en-route centers. These systems use different, often incompatible, equipment and because some (e.g., Greece's) are technically quite primitive, the standards for separation between aircraft under radar control vary from 5-10 nautical miles (nm) to as much as 60 nm. Inefficient routing, due to extensive areas of restricted airspace, old-fashioned point-to-point navigation, and national boundaries add seven percent extra to the average European route mileage, wasting an average of 320,000 flight hours per year. [25] Delays, due to inadequate ATC capacity, have increased each year during the past decade and are forecast to get much worse as European air traffic doubles over the next 10 to 15 years. Altogether, the added costs of inefficiency and delays were estimated by a 1989 study commissioned by the Association of European Airlines as $4.2 billion per year. A subsequent study by SRI International projected this cost to increase to $10 billion a year by the turn of the century.[26]

To solve the problem, the AEA study rejected partial remedies in favor of a solution based on fundamentally restructuring the system. It proposed the creation of a single European ATC system, to be managed by a Central Holding Corporation, a non-profit, user-owned public-private company, operating on a commercial (user-funded) basis. The CHC would initially contract with the existing 22 national ATC entities, but over time these entities, and their en-route centers, would be rationalized into a smaller number of geographically appropriate centers, independent of national boundaries.

As proposed by AEA, the CHC would have a board of directors composed of two members from each participating country: one representing the existing national ATC entity (whether public or private) and the other representing the country's airlines. This large board would set overall policy, but would delegate day-to-day management to a small executive board. The CHC would set the system's performance standards, harmonize controller training standards, establish the budget and user charges, raise the needed funds in the capital markets, and direct investments to those points in the system needing it. Member countries would collect the user fees (through the existing

Eurocontrol organization) and turn them over to CHC. This assured revenue stream would be the basis for raising funds in the capital market.

The national ATC entities would operate with budgets set by CHC, hiring and compensating their own staffs on a commercial (non-civil-service) basis. They would provide day-to-day management of the en-route centers, purchase equipment not critical to the integrity of the overall ATC system, and propose long-term investment proposals for CHC's approval.

The AEA report stresses that CHC should operate as a normal private-sector company. But because not all users could be directly represented on its board (e.g., smaller European airlines and non-European airlines), and because the ATC system would be a monopoly, the report recommends that CHC be operated on a not-for-profit basis.

Steps in the direction of implementing these proposals began in 1990. The International Air Transport Association (IATA) issued a report reaching similar conclusions, and British Airways endorsed the idea of restructuring ATC in this way. And in June the European Civil Aviation Conference (ECAC) set up a task force to determine how to harmonize the ATC systems of its 25 member countries.

F. Contract Towers in the United States

The only extent to which ATC functions have been privatized in the United States is the private contracting of (VFR) control tower operations at some two dozen small airports.

The first private control-tower firm, Barton ATC, began operations in 1969, offering its services to airports unable to obtain an FAA control tower. The 1981 air traffic controllers (PATCO) strike led FAA to shut down 80 of its smallest (Level 1) towers, leading to much dissatisfaction in the affected communities. By 1982, although the FAA had reopened a number of those towers, seven private firms had expanded their operations to 17 airports.[27] The operating cost of the typical contract tower was about one-third that of an FAA tower at a comparable-sized airport. All controllers in the private towers, of course, held FAA licenses.

The existence and cost-effectiveness of the private control towers led Sen. Pete Domenici (R., NM) to write legislation amending the Airport & Airway Improvement Act of 1982 to permit the FAA to contract out the operation of ATC facilities. That measure led to creation of the FAA's contract tower program.

An initial 1983 pilot project contracted out the operation of towers in Farmington, New Mexico and Owensboro, Kentucky. After a 1984 FAA study concluded that contract towers could be operated for about half the cost of direct FAA operation, the agency announced a 10-year "phase II" program that could involve as many as 200 towers. But after awarding only 14 contracts in 1985, the FAA put the program on hold for several years. Two factors had intervened to cause problems. First, the mid-1980s liability insurance crisis put the cost of premiums at very high levels for certain airports during those years. Second, the Department of Labor ruled that larger contractors would have to pay their controllers the same wages the FAA paid--thereby reducing the potential cost savings from contracting out.[28]

In 1987, the program was reactivated, with new national guidelines on insurance and liability protection, and a revised phase II expansion plan. As of January 1, 1990, there were 22 FAA contract towers (in addition to several dozen other airports with either city-operated or contractor-operated towers not paid for by FAA). The FAA plans to add 7 to 10 more towers per year, until all 125 Level I VFR towers are contracted out, as well as some non-FAA towers at small airports. [29] There are no current plans to expand the program to the 157 Level II towers (which are equipped for some degree of IFR operations) or to the more complex Level III and Level IV towers.

IV. Spinning Off the U.S. Air Traffic Control System

The review of ATC privatization activity in the previous section makes several trends apparent. All the recent examples of privatization, as well as the proposed European ATC restructuring, are based on direct user payments for ATC services, rather than tax funding. All also feature a corporate form of organization, in which normal business procedures are followed with respect to personnel (as opposed to civil service status) and procurement (as opposed to government procurement procedures). In addition, a number of these cases, as well as the proposed European CHC, feature at least partial user ownership on a nonprofit basis, as a way of making sure that the ATC entity serves the needs of users despite its monopoly status. Also evident is the feasibility of two features sometimes derided by U.S. opponents of privatization as impractical: decentralization of control towers to airport operators and separation of safety regulation from ATC operations.

Table 4 summarizes the actual and proposed ATC organizations discussed in this paper. As can be seen, most of the proposals for restructuring the U.S. ATC system have failed to include elements common to most of the successful privatized systems.

Table 4

Features of ATC Organizations

	User Pays	Corporate Form	User Ownership	Decentral-ized Towers	Separate Safety Reg
Actual Systems					
ARINC (pre-CAA)	x	x	x		
RAMSA (Mexico)	x	x	x		x
RACSA (Cuba)	x	x	x		x
CAA/NATS (U.K.)	x	x		x	(x)
Airways Corp.(N.Z.)	x	x		x	x
SwissControl	x	x	(x)	x	
Proposed Systems					
USATC Corp(Gilbert)	(x)	x			
Nat.Av.Auth. (ATA)	x	x			x
Fed.Av.Auth. (NAPA)	x	x			
Pres.Comm.on Priv.	x			x	
Airways Corp	x	x	x	x	x
CHC (AEA)	x	x	x	x	x

(x) = partial

There is a near-consensus among those that have studied ATC problems that shifting primary responsibility for air traffic control from a government agency—dependent on tax funds and hobbled by civil-service and federal procurement constraints—to a user-funded corporate entity is essential to resolving the fundamental structural problems plaguing ATC.

It also seems evident that ATC is inherently a monopoly. No instance of ATC being provided on a for-profit basis has been identified (except for a few cases in which airports or national governments have contracted with private firms to provide ATC services for limited periods of time). Given that a corporate ATC entity will be a not-for-profit monopoly, there is a strong case for user representation on its governing body, in order to make sure that the corporation is responsive to the needs of its users.

It is also clear that airport control towers need not be part of the same corporate organization that provides ATC services. Such centralization is not the case in Britain, New Zealand, or Switzerland, nor would it be part of the proposed Central Holding Company in Europe. If spinning off some or all of the control tower responsibilities to airports (under common FAA safety certification and regulation)

makes the resulting restructuring more feasible (see below), then this provision should be included.

Finally, there are good reasons for taking advantage of the restructuring of ATC services to eliminate the current conflict of interest between safety regulation and ATC operations, as has been done in New Zealand and in parts of Europe. A commercial ATC corporation ought to be regulated at arms-length by an independent safety regulator, just as the corporations which manufacture the planes and the airlines which fly them are so regulated. Likewise, air traffic controllers should be licensed by the FAA as employees of corporate ATC providers, just as pilots and mechanics are licensed.

Moving toward a restructured ATC system like that outlined above could take place in four steps.

- Accelerate the FAA's Current Contract Tower Program

  The ATC system is still woefully short of fully qualified controllers. Accelerating the conversion of Level I towers to contract operation would permit a portion of those 795 FAA controllers (those who do not choose to go to work for the contractors) to be transferred upward to other facilities.

- Extend the Contract Tower Program to Level II Towers

  As noted earlier, there are 157 Level II control towers. They employ approximately 1,777 controllers. Were the contract tower program to include these additional towers, another large number of controllers would potentially be made available for transfer to other parts of the ATC system. In addition, operating the more demanding Level II towers would enable the private contractors to develop increased levels of skill and expertise. The private firms would be able to draw on a large pool of trained personnel, primarily current and retired military controllers (whom the FAA will not hire), as well as some portion of the former PATCO work force.

- Permit Large Airports to Take Over their Towers

  Under the 1982 Domenici amendment, the FAA is permitted to contract out the provision of ATC services. Under this authority, the agency could choose to contract with municipal airport operators to provide the control-tower services at their airports. A number of major airports, such as Chicago's O'Hare and New York's Kennedy and LaGuardia, are seriously short of tower personnel--primarily because the FAA pay scale is too low to attract sufficient people to work in those high-stress positions in cities with a high cost of living. The FAA could offer to pay those airport operators a lump sum annual

payment for tower services, which the airport operator would then supplement with its own funds (e.g., from passenger facility charges) to permit it to pay competitive wages.

- Corporatize the National ATC System

The most dramatic and far-reaching step would be to spin off the FAA's ATC operations to a user-funded corporation, regulated at arms-length by a reorganized FAA. Models for such a corporation include Britain's NATS, New Zealand's Airways Corp., and the proposed Central Holding Company in Europe. In each case, the funding consists of direct payments by users for services rendered—i.e., airways use charges, rather than indirect user taxes such as the present U.S. tax on airline tickets and general aviation gasoline tax.

A U.S. ATC corporation should also be funded on this true user-pays basis (as endorsed by DOT's National Transportation Policy.[30] The nation's ATC needs are too critical to be held hostage to the federal budget process. Aviation users are willing to pay for a state-of-the-art ATC system; they should be permitted to do so. And those general-aviation users who do not use the system should not be forced to pay for it.

Some form of indirect user tax may be deemed necessary to fund a continued program of airport-improvement grants for small-town and reliever airports. This program should be entirely separate from the ATC corporation's funding and operations. A commercial ATC corporation should not be in the business of awarding projects to favored congressional districts. This is strictly a governmental function and should remain within the government.

The federal government should be at least a part-owner of the ATC corporation, since about 15% of the traffic using the system is government-operated. Whether the federal government should own 100% (as is the case currently with NATS and Airways Corp. of New Zealand) or some smaller percentage (71% for SwissControl, 50% for CHC, 15% for the Reason Foundation's proposed Airways Corp.) is a matter for further debate and discussion. This is a detail, however, not a fundamental problem. The important priority is to remove this vitally needed commercial service from being part of a government agency and transform it into a user-friendly service business.

To sum up, the advantages of privatizing air traffic control would be several. There would be a rapid increase of qualified air traffic controllers, relieving today's critical shortage. There would also be a much-improved ability to finance and carry out the large-scale technological modernization which the FAA has failed to accomplish, at great cost. These changes would lead to a major reduction in air travel delays and

to significant improvements in the margins of air safety. Those are powerful reasons for restructuring the system.

NOTES AND REFERENCES

1. Data provided by the Air Transport Association.
2. "Airline Group Reports ATC Delays Cost Carriers $2 Billion in 1987," *Aviation Week & Space Technology*, May 30, 1988, p. 124.
3. "ATC Delays," ibid, February 12, 1990, p. 23.
4. Labich, Kenneth, "Airport 2000--A Horror Story?" *Fortune*, June 18, 1990, p. 104.
5. Malnic, Eric, "Jets' Narrow Miss Blamed on FAA Laxity," *Los Angeles Times*, May 25, 1989.
6. McKenna, James T., "Crash Renews Questions About ATC System's Safety," *Aviation Week & Space Technology*, February 5, 1990, p. 80.
7. Ibid.
8. "Northwest 727, DC-9 Crash in Detroit Renews Ground Safety Issue," Christopher P. Fotos, *Aviation Week & Space Technology*, December 10, 1990,p. 33.
9. "GAO Faults FAA systems Acquisition, Recommends Blocking some Programs," Ibid., April 30, 1990, p. 62.
10. McFadden, Robert D., "New York Air-Traffic Control: Pressure and Gains," *New York Times*, February 4, 1990.
11. Proctor, Paul, "GAO Cites Deficiencies in FAA's Traffic Controller Recruitment," *Aviation Week & Space Technology*, October 10, 1988, p. 112.
12. Gilmartin, Patricia, "GAO Criticizes FAA for Poor Oversight of Training Programs," Ibid., June 11, 1990, p. 69.
13. *The Air Traffic Control System: Management by a Government Corporation*, Washington, DC: National Academy of Public Administration, March 1986.
14. Gilbert, Glen A., *The United States Air Traffic Services Corporation*, Executive Summary, Washington, DC: Glen A. Gilbert & Associates, October 1, 1975.
15. *Federal Corporation Approach to the Management and Funding of the Air Traffic Control System*, Washington, DC: Air Transport Association, September 1985.
16. op cit., note 12.
17. *Aviation Safety Commission, Vol. I: Final Report and Recommendations*, Washington, DC: Government Printing Office, April 1988.
18. Poole, Robert W., Jr., "Privatizing the Air Traffic Control System," Santa Monica, CA: Reason Foundation, November 14, 1986.
19. Linowes, David F., *Privatization: Toward More Effective Government*, Report of the President's Commission on Privatization, March 1988.
20. Goldsborough, Paul, "A History of Aeronautical Radio, Inc. from 1929 to 1942," July 2, 1951 (unpublished ARINC manuscript).

21. "Britain's Civil Aviation Authority," in Crawford, Carol T., "The Federal Aviation Administration and Opportunities for Privatization," Washington, DC: Office of Management & Budget, December 1, 1987.

22. Annual Report 1989, Airways Corporation of New Zealand, Wellington, NZ: Airways Corporation, undated.

23. "Report on the Inspection of the Federal Office for Civil Aviation," in *Auszug aus dem Bundesblatt*, Number 22, Band 11, June 6, 1989, pp. 354-378 (provided by SwissControl, translated by Harold Weilnbock).

24. Two recent studies, in addition to that cited at 25 (below) are "The Crisis of European Air Traffic Control: Costs and solutions," by Germany's Planungsburo Luftraumnutzer, and the ongoing studies by SRI International commissioned by the International Air Transport Association.

25. *Towards A Single System for Air Traffic Control in Europe*, Brussels: Association of European Airlines, August 1989, p. 18.

26. "Resolving Europe's ATC Tangle," *Aviation Week & Space Technology*, June 25, 1990, p. 9.

27. Doherty, John, "Towering Entrepreneurs," *Reason*, May 1983, pp. 23-29.

28. Burnham, Frank, "Contract-Tower Program Hurt by Insurance, Funding Shortages," *Airport Services Management*, October 1986, pp. 46-50.

29. "Status of the Low Activity (Level I) VFR Control Tower Program," Washington, DC: Federal Aviation Administration, April 2, 1990.

30. *Moving America: New Directions, New Opportunities*, Washington, DC: U.S. Department of Transportation, February 1990, p. 56.

ABOUT THE AUTHOR

Robert W. Poole, Jr. holds B.S. and M.S. degrees in engineering from MIT. He worked in aerospace and for several other think tanks before starting the Reason Foundation, of which he is president, in 1978. He is the author or editor of four books and numerous policy papers and articles on privatization and transportation policy. His chapter in *Instead of Regulation* (1979), "Toward Safer Skies," was one of the first proposals for privatizing the air traffic control system.

An earlier version of this paper was written for the National Chamber Foundation and will be included in a forthcoming book published jointly with the Heritage Foundation.