Privatizing Air Traffic Control

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The 1981 strike by members of the Professional Air Traffic Controllers' Organization was not an isolated incident. It was merely the latest crisis in the troubled history of the U.S. air traffic control (ATC) system. A reading of the system's history reveals an ongoing pattern of technological lag, lack of cost-effectiveness, unresponsiveness to user needs, absence of long-range planning, political interference, and labor problems. Analysis of these problems suggests that they are not the fault of particular people, such as FAA administrators; nor are they the fault of the ATC system's congressional overseers per se. Rather, the cause of the problem is systemic, stemming from the way the ATC system has been organized and operated—as a government bureaucracy. Evidence at home and abroad suggests that there are alternative ways of providing ATC services. In several countries, ATC is provided by private, not-for-profit corporations that are funded by user fees. In other cases, the service is provided by a profit-making firm under contract. In this country, several profit-making firms operate airport control towers under contract, and a not-for-profit firm provides nationwide computer and communications services to airlines and other airspace users. The current ATC system could be replaced by a two-level system, which consists of a not-for-profit ATC system corporation that contracts out the operation of individual control centers to profit-making ATC operating companies. In this way there would be both (a) uniform nationwide operating procedures and (b) the benefits of competition in the provision of the services. There is good reason to expect a system so structured to be less subject to the problems inherent in today's ATC system.

The air traffic control (ATC) system is a complex assemblage of people, equipment, facilities, and procedures. The ATC system is owned and operated by the FAA, a government bureaucracy whose duties include setting and attempting to enforce safety standards that affect the design and testing of aircraft, the operation and maintenance of aircraft, and the licensing of pilots and mechanics. Being a government operation means that the ATC system is (a) operated as a monopoly, with no competition; (b) paid for through taxes (both user taxes and general taxes); (c) governed by civil service rules; and (d) subject to political control.

THE PROBLEM

A large body of literature has been produced over the past two decades that addresses the costs and effectiveness of government bureaucracies, i.e., entities characterized by the four features listed above (1-8). In contrast to organizations that operate in the private sector (i.e., those facing competition, selling services directly to users, setting their own personnel policies, and free of political control), bureaucratic entities suffer from inherent problems. Lack of competition removes strong incentives for economic efficiency. Obtaining revenue through taxation removes the direct feedback from users inherent in buyer-seller relations in the marketplace. Civil service regulations significantly restrict the efficient use of personnel, and political control makes long-range planning difficult. Thus, it is not surprising to find such problems in the ATC system.

In fact, the history of the ATC system provides evidence of all of these problems. One of the most serious indicators is the historical pattern of technological lag. Few people outside the aviation industry realize that most of the fundamental advances in air navigation technology have been developed outside the FAA. During the 1930s, airborne very-high-frequency (VHF) radio, omnidirectional navigation beacons (VOR), and blind-landing systems (ILS) were developed by electronics firms under the leadership of Aeronautical Radio, Inc. (ARINC), a not-for-profit company set up in 1929 that had the airlines as its stockholders. (Note that the data on ARINC are from a July 1951 unpublished account by P. Goldsborough entitled "A History of Aeronautical Radio, Inc., from 1929 to 1942.") These developments were pushed by ARINC despite the reluctance and conservatism of the FAA's predecessor agencies: the Bureau of Air Commerce and the Civil Aeronautics Authority (CAA). ARINC also set up the first ATC centers in 1935 and 1936. In addition, after World War II, ARINC pioneered the replacement of radiotelegraph communication with voice radio for overseas flights--again over the opposition of CAA (9).

During the 1950s the CAA resisted the implementation of radar separation of air traffic--the so-called positive control of airspace--to reduce the likelihood of midair collisions. The gradual introduction of positive control came about only in response to a series of midair collisions in 1956, 1958, 1960, and 1965. Outside advisory committees (the Radio Technical Committee for Aeronautics in 1948, the Huff Committee in the 1950s, and the Alexander Committee in the 1960s) laid out evolutionary plans for making full use of state-of-the-art electronics and communications technology, but their recommendations were not systematically followed by the CAA or the FAA.

In the 1960s and 1970s, the FAA began using computers for ATC. Its initial automation plan was based on IBM 7090 computers, which even IBM protested would be obsolete by the time they were installed. The second-generation computer system (using IBM 9020s) installed in the 1970s has been the subject of ongoing controversy, especially over the frequency of system outages and the inadequacy of back-up equipment and procedures (10).

In addition, today's primary navigation aid remains the old-fashioned network of VOR stations. Aircraft flying under instrument flight rules (IFR)--all commercial flights and many private planes as well--must generally fly along radial paths from one VOR to another in a zigzag fashion. The modern alternative is to use an on-board computer to plot a straight-line course from origin to destination and use the VOR signals merely as references. Widespread use of this technique, known as area navigation, has been possible for more than a decade and it would greatly expand the capacity of the airways. But the FAA's ATC system is still not equipped to handle large numbers of pilots who set their own courses.

Knowledgeable observers have long faulted the FAA management. In 1970 Aviation Week Editor Hotz criticized the FAA's lack of meaningful progress on ATC automation, citing the "technical incompetence and slothful leadership of the FAA and its predecessor agencies" (11). The House Government Activities Subcommittee, which studied ATC problems in 1970, stated that "the FAA simply does not move forward. All too often in the past, progress has been the result of tragedy" (12). In 1975 the FAA's bureaucracy was termed "large and unwieldy and may serve as a detriment to FAA's performance of its safety mission" by a task force appointed by Transportation Secretary Claude Brinegar (13). Furthermore, the task force termed the agency's advanced technology program "relatively immediate and short-term in outlook." Serious FAA planning and management problems--such as a lack of cost-effectiveness analysis--were also identified by the General Accounting

Office (GAO) in a 1976 report on ATC system improvements (14).

One of the most serious indictments of the ATC system was made by the Special Air Safety Advisory Group (SASAG)--six retired airline pilots appointed by the FAA in 1975. They concluded that the ATC system itself is "too dependent on the human element...[and] has grown from old concepts with complex fixes applied to it in an attempt to accomodate its inadequacies" (15). This, in turn, has created "a monster of procedures, rules, methods" that has actually "created hazards, slowed traffic, restricted productive flight...and used energy in frightening amounts."

The important question to ask at this point is: Why? Why this history of a lack of effective long-range planning, technological lag, unconcern with cost-effectiveness, and unresponsiveness to user needs? To what extent are these problems inherent in the nature of ATC and to what extent are they a function of the ATC system as a government bureaucracy? Would the same problems exist were ATC being provided by, for example, ARINC or Bendix Field Services?

Inadequate Long-Term Planning

Why is it that the FAA cannot make and carry out long-term plans for ATC that provide the services airspace users need? First, there is a lack of continuity in top management. Between 1961 and 1981 the FAA had seven administrators who served an average term of 35 months (plus a number of short-term acting administrators). Each sought to put his own stamp on the agency, which resulted in frequent shifts of emphasis and direction. But none of them had any real long-term commitment to the ATC system, because the position is a political appointment and not a career position. Real reform is blunted because each new administrator can blame his predecessors while assuring Congress that this time things are finally under control. No one suggests that it may the system itself that prevents continuity of management.

A second cause of planning failures is congressional oversight. Unlike a private business, where feedback from the users is expressed directly, user (and employee) dissatisfaction gets filtered through the political system. The result is continual interference from members of Congress. Much of this criticism may be in response to genuine problems, as the many GAO and congressional committee reports attest. Unfortunately, politics does not always produce a climate conducive to rational, long-term system planning and management. Instead it produces an atmosphere of crisis response and bureaucratic self-preservation.

Such constraints would be virtually nonexistent were ATC services provided in the private sector. Complex, continuously operating systems such as the telephone system, gas and oil pipelines, chemical processing plants, and airline communications and computer systems are all managed successfully by private-sector firms that engage in routine long-term planning for system improvements. There is no reason to think that similar planning would be any less successful in an ATC corporation.

Technological Lag

Why has the FAA historically failed to develop and resisted the implementation of new technologies? One reason may be simply the bureaucracy itself. An organization that is insulated from the marketplace simply has no strong incentives to seek out new and better ways of doing things. Instead, the internal incentives of preserving the status quo and protecting bureaucratic fiefdoms may become dominant. This tendency is reinforced by the civil service system, which makes it extremely difficult to fire incompetent employees. "The FAA as an organization has more independent empires than medieval Europe," concluded the House Government Activities Subcommittee in 1970, and there is little reason to believe that the situation has changed materially in the years since then (12).

A second reason for technological lag is political. There are inherent conflicts among the interests of different airspace users. The most fundamental of these conflicts is between private pilots of light aircraft (referred to as general aviation) and the airlines. Historically, the general-aviation community has often opposed advances in air safety (such as positive control, airborne transponders, collision-avoidance systems) because they would restrict the amount of airspace usable by light aircraft whose owners could not or would not spend the money needed to add new safety equipment. In a marketplace setting, the large economic interests of airline and business-jet users would be served effectively by an ATC system that readily took advantage of new safety technology. Members of the general-aviation community would find that they would either have to pay the price of flying in the controlled airspace or be willing to fly only in the remaining areas where they would not pose a hazard to properly equipped aircraft.

But with ATC provided in a political setting, the 328 000 general-aviation pilots, who are located in every congressional district, are able to exert considerable pressure on the FAA, through Congress, to compromise on such safety requirements. The most recent instance concerned the FAA's decision to reject the Honeywell-developed Airborne Collision-Avoidance System (ACAS) in favor of a much more costly FAA-developed system called TCAS, to be available many years later. The principal reason for the FAA's decision, according to former FAA official James Pope, was the opposition to ACAS by general-aviation interests. To be effective, ACAS would have required restrictions on the operation of non-ACAS-equipped aircraft, a requirement not present with the five-times-more-costly TCAS (16). Thus, the implementation of a nationwide collision-avoidance system has been delayed 5 to 10 years and its cost substantially increased due to the pressures inherent in the ATC system's current political nature.

Lack of Cost-Effectiveness

According to the GAO report previously cited, the FAA, as of 1976, did not know "whether programs to develop the [ATC] system are cost effective;" the FAA's development plans for the system "do not use savings techniques such as life-cycle costing and design-to-cost goals;" and, furthermore, "cost-benefit analyses were not done to anticipate the needs of decision-makers" but only after the fact (14). Once again the FAA's insulation from the marketplace is at fault. With no stockholders to satisfy, no financial markets to deal with, and no customers to risk losing, the FAA simply does not have the same incentives for cost-effectiveness that exist in corporate entities.

One of the strongest indications of the lack of concern with cost-effectiveness is the ATC system's man versus machine trade-offs. The FAA's monopoly status and the presence (until recently) of a strong union have led to the retention of an overly large work force of highly paid people, much of whose work could have been automated at less cost. Transporta-

tion economists have noted a similar phenomenon in municipal transit systems over the past two decades. With a near monopoly on the transit market, nearly unlimited access to federal funds, and strong unions, increased labor costs accounted for 71 percent of the increase in transit system costs between 1967 and 1976 (17). Thus, for institutional reasons pertaining to its bureaucratic, monopolistic, and nonmarketplace structure, the FAA has poured resources into labor that could have gone into advanced technology.

Unresponsiveness to User Needs

As noted earlier, the results of political voting differ significantly from the results of voting with dollars in the marketplace. Much of the FAA's behavior in resisting both technology and procedures that could enhance safety stems from its responsiveness to political constraints. In economic terms, the interests of the millions of airline passengers and corporate aircraft fliers are often subordinated to the much less valuable (in economic terms) interests of politically influential general-aviation fliers.

The same issue is at the root of conflicts over peak-hour access to airports. Historically, the FAA has resisted any efforts to price this scarce, and therefore economically valuable, commodity. Naturally, at a price of zero, especially in the case of highly desirable hours at popular airports, demand tends to exceed supply. A private-system operator facing this problem would solve it by means of peak-hour pricing; i.e., testing out various prices until one was found at which demand and supply at each airport were in balance. (The telephone system charges higher rates during business hours than for evenings and weekends; even movie theaters charge more at busy times such as Saturday nights.)

Instead, the FAA has attempted to solve the problem arbitrarily by a rationing system called flow control. As of July 1982, Air Transport Association (ATA) and Regional Airline Association officials were expressing concern that the FAA was planning to make its temporary flow-control procedures (adopted during the controller's strike) permanent as a way of saving money. "Right now the FAA can limit access to any airport for any reason based on their subjective judgment," Gary Church of ATA told Aviation Week. "We don't want some supervisor at La Guardia making the decisions unilaterally. The FAA must involve users on a day-by-day and even hour-by-hour basis" (18). But such user involvement appears unlikely from such an insulated system.

Poor Labor Relations

A common view of the Professional Air Traffic Controllers' Organization (PATCO) strike is that it was the result of union militants exploiting their monopoly position. In fact, according to an independent task force appointed by Transportation Secretary Drew Lewis after the strike, FAA's labor relations have been poor for 15 years--and still are. "Morale within the air traffic and airway services divisions of the FAA is not good. It is, in fact, very poor" (19). The task force concluded that the problems that caused the strike are resurfacing and could again cause trouble and disruption.

Once again, the culprit appears to be the FAA bureaucracy. FAA's ATC managers have never been selected on the basis of management talent or trained in modern management techniques. They tend to be "autocratic, impersonal, 'by-the-task'" types (19). And because of civil service constraints, such ineffective managers cannot be fired as they could be in a private organization. Moreover, superfluous layers of management--a consequence of a lack of cost-consciousness--tend to alienate regional FAA managers and insulate top managers from controller's problems.

As with the other problems cited here, there are no guarantees that private-sector organizations would be immune from morale problems. But once the link between FAA's institutional nature--its bureaucratic, civil service structure; its monopoly-provider status; its funding by taxes rather than by direct user payments; and its subordination to political constraints--is understood, the reasons for its problems are clear. It is also clear that there would be less likelihood of such problems if ATC services were provided by marketplace institutions.

PRIVATIZED ATC SYSTEM

The idea that ATC can and should be turned over to private enterprise is not new. As pointed out earlier, the first three ATC centers in the United States were created and operated by ARINC, which had been set up as a not-for-profit firm in 1929 with three airlines as its original stockholders. Initially, ARINC provided only air-to-ground radio communication, but in 1935 it set up the first ATC center in Newark, with costs shared among participating airlines in proportion to airport use. A second and third center followed in 1936 at Chicago and Cleveland. Each center controlled traffic within a 50-mile radius of the airport.

But those were Depression years, and when the Bureau of Air Commerce, in mid-1936, asserted federal responsibility to establish "a uniform centralized system of airway traffic control" (20), ARINC and its airline owners were pleased to have the government (i.e., the taxpayers) take over the burden.

Yet ARINC continued to develop airline communications services. Today it operates the world's largest private-line intercity communications network and serves more than 135 airline users. Its message-switching system interconnects 52 airline reservation computer systems. ARINC provides all airline-to-aircraft communications services and contracts with the FAA to provide ATC communications for all international flights out of New York, Miami, San Juan, San Francisco, and Honolulu.

Overseas, ATC is sometimes provided by private-sector organizations. In Switzerland, the provider is Radio Suisse, a private nonprofit corporation. Although its start-up costs were underwritten by the Swiss government, its operations are paid for entirely by user fees. A similar nonprofit corporation was set up in Mexico after World War II with assistance from ARINC. Called Radio Aeronautica de Mexico, S.A. (RAMSA), it followed the ARINC model; Mexican airlines were the stockholders. In 1978 it was nationalized, but continues to operate as an independent ATC services corporation by charging user fees for its services. ARINC also helped set up a similar company, called RACSA, in Cuba. The company, and its airline owners, were nationalized by the Castro government.

A subsidiary of British Airways--International Aeradio--provides ATC services in Commonwealth countries in the Caribbean and in large portions of the Persian Gulf. These too are paid for by user charges.

In Saudi Arabia a different form of privatization exists. There the government contracts out the service to a private firm for 5 years at a time. In 1980 the contract was awarded to Bendix Field Engi-

neering Corporation; the previous contractor had been Lockheed Aircraft Corporation.

There is even a small amount of private ATC in the United States. Since 1968 several companies have been building and operating control towers at airports whose overall traffic does not qualify them for an FAA tower. The local airport operator contracts with the company for the services, which must be provided by controllers licensed by the FAA and in conformity with FAA procedures. But whereas the average level 1 FAA tower costs $1.4 million to install and $294 000/year to operate, the private towers average just $96 000/year (1981 data). Not being bound by civil service regulation or union work rules, the private controllers themselves handle clerical tasks during light traffic periods. The private firms' radios cost one-third as much as FAA-installed radios, and they often use modular, prefabricated building components to keep down construction costs (21).

In the aftermath of the controllers' strike, as a result of which 66 smaller towers were shut down, new firms have entered the tower business. A group on nonstriking FAA controllers set up Air Traffic Control Services, Inc., and won a contract to reopen the tower at Owensboro-Davis County Airport in Kentucky. The most aggressive of the newcomers is Midwest ATC Services of Olathe, Kansas, which has won a number of tower contracts. Its contract to run the Farmington, New Mexico, tower is for $99 000/year, where previously the cost of FAA operation had been $287 000 (22). Also in the business are Barton ATC and, significantly, Pan American World Services, Inc., a subsidiary of the international airline, which has operated military control towers on contract overseas.

The idea of privatizing the entire ATC system was first suggested in 1968 by aviation consultant Gilbert (who was the Bureau of Air Commerce's first controller back in 1936). To free ATC from the problems of bureaucracy and politics, he proposed setting up a Comsat-like corporation funded by user fees (50 percent) and by taxes (50 percent) (23). But with any tax funding would come congressional oversight and thereby the political constraints discussed earlier.

Nevertheless, a variation on Gilbert's proposal was endorsed by the controllers' union in 1969. The idea was for the controllers to resign en masse, set up a public-service corporation, and contract with the government to operate the ATC system (24). The 1975 SASAG report recommended that a study be done "to determine whether the air traffic system would be operated more efficiently with advanced technology as an independent public company" (15). Two years later The Futures Group also suggested a "Comsat-like quasi-government authority" to operate the ATC system instead of the FAA (25).

It should be clear that there has been no dearth of proposals for some form of ATC privatization. Recognition of the high costs of bureaucratic operation of the ATC system is widespread. It is also clear that there is no lack of models of various forms of private-sector participation in ATC. The challenge is to configure a privatized system so that it solves as many of the current system's problems as possible without creating new ones.

The three basic issues that must be resolved in any privatization model are discussed below.

Who Pays What

The two issues that involve costs are (a) the overall allocation of costs among classes of users, and (b) the specific structure of user charges.

The cost-allocation issue has long been a political football. In 1973 the U.S. Department of Transportation analyzed total airport and airway costs, allocated them to each class of users, and compared those data with the revenues collected from each class (26). The results showed that the airlines were covering 95 percent of its allocated costs whereas general aviation covered less than 20 percent. (One problem with this analysis, however, is that many general-aviation fliers never use the ATC system, yet all must pay today's fuel taxes.) Several times since then the executive branch attempted to obtain legislation to increase user-cost recovery, ultimately to 100 percent. Until 1982 all such efforts failed due to political opposition from general-aviation interests. As of 1978, the taxpayers in general were still paying 54 percent of the FAA's budget whereas the aviation user community paid just 46 percent (27). Not until the Airport and Airway Improvement Act of 1982 were user taxes raised to cover 100 percent of ATC costs.

But a privatized ATC system should be paid for by true user fees, not today's so-called user taxes. Not only does this make economic sense, but it would also insulate the ATC system from the political control that must accompany the use of tax money. Today's aviation user taxes are a poor substitute for true user fees. To be sure, some of them do reflect ATC system use: cents-per-gallon fuel taxes (except that many general-aviation aircraft must pay the tax even though they do not make use of ATC), domestic passenger ticket taxes, and cargo waybill taxes all vary in crude proportion to system use. Aircraft registration fees and weight taxes, however, are paid once a year, regardless of use.

But economists raise a more fundamental objection to the fuel and ticket taxes (which are the principal sources of revenue among these taxes). Even when they are roughly proportional to use, the taxes are not proportional to the true cost of the service. To safely guide a Learjet carrying two or three people between Newark and O'Hare airports costs just as much in the way of air controller manpower and equipment as it does to guide a DC-10. Yet the Learjet pays a fraction of what the DC-10 must pay. Moreover, the Learjet's presence in the system displaces another aircraft from that particular space-and-time segment of the airway, thereby imposing costs on DC-10s, 727s, and all other potential users of that segment.

Access to a controlled airway, or a takeoff or landing slot at a busy time, is a valuable service. Unless users face the true cost of that service, they will tend to demand more than is available or can be provided. A privatized ATC system must be left free to establish prices for its services on the basis of supply and demand. That means direct payments for specific services over specific route segments, at specific locations, and at specific times of day. It does not mean indirect fees such as fuel taxes.

Military users, too, should pay user fees. The military must pay market-determined prices for all of the other valuable resources it uses: clothing, jeeps, fuel, aircraft, and so on. Once it is agreed that use of a particular airway at a particular time is an economic good whose value can be determined in the marketplace, there is no more reason to make airways available to the military at no charge than there is to make boots or kerosene available at no charge. Bringing the military into the ATC system as an economic participant is likely to lead to a more integrated ATC operation than today's system.

Type of Organizational Structure

As has been discussed, current practice provides

several different models of private ATC operation. There are not-for-profit corporations that operate essentially in perpetuity as monopolies, such as Radio Suisse and RAMSA. And there are also for-profit companies that operate under relatively short-term contract with either a national government (as in Saudi Arabia) or a local airport authority. There is no example of a for-profit firm being allowed a permanent monopoly, presumably due to the danger of monopoly pricing. The not-for-profit structure and a company having to bid periodically for service contracts are alternate means of avoiding the monopoly-pricing problem.

Thus, at first glance, there are perhaps three alternatives for a country as large as the United States. The federal government could retain ownership of the ATC system but contract out its operation, following the Saudi Arabia model. Alternatively, a nationwide Comsat-like corporation could be set up, perhaps on the model of ARINC, with airlines and other airspace users (including general-aviation interests such as the Aircraft Owners and Pilots Association and the military services) as stockholders. Or, considering the geographical expanse of the United States and the beneficial effects of competition and decentralization, regional not-for-profit corporations could be created that have contiguous, nonoverlapping territories.

Although geographically overlapping (competing ATC companies are conceivable), such an arrangement is unlikely to be acceptable to airspace users on safety grounds. It was dual, overlapping ATC systems (civilian and military) that were blamed for a series of military-civil midair collisions in the 1950s, which led to the creation of the FAA and a unified ATC system in 1958.

Type of Ownership

The third issue to be resolved is related to the second. Who should be the owner(s) of the ATC system? For those services that are to be provided by profit-making entities, conventional stockholder ownership would be wise. Economists have found that stockholders are highly sensitive to the performance of a firm and provide strong feedback to its managers. Even in the case of aircraft manufacturers, stockholders respond sharply to any news that indicates that a particular firm's practices may have been the cause of a crash (28).

If the choice is a not-for-profit firm, the ARINC model of user organizations as stockholders has much to recommend it. There are conflicts among the interests of various airspace users, especially between general aviation and airlines, but also to a lesser extent between business-jet operators and airlines and between civil and military operators. Representing all such user groups as stockholders would at least provide a framework for working out fee structures and operating procedures that are responsive to the needs of all, even if not wholly satisfactory to any.

Another ownership option that ought not be overlooked is employee ownership. Already one of the new contract control tower firms is employee owned. Given the long history of controller dissatisfaction with the FAA, it is likely that many controllers have valid ideas on how to operate and manage, for example, an en route control center. To the extent that the organizational structure permits, employee ownership would be an option worth pursuing.

DESIGNING THE SYSTEM

From the foregoing discussion, three essential design criteria for a privatized ATC system emerge. First, it must be 100 percent user-charge funded. This is necessary both to insulate the system from political control and to provide proper economic incentives for user-provider interactions. And those user fees ought to be set in the marketplace by supply and demand rather than by government fiat.

Second, to maximize safety there must be a single, unified ATC system throughout the country, regardless of how many entities (single or decentralized) are involved as providers. A unified system means common procedures, terminology, and technical standards but not necessarily identical equipment or person-machine trade-offs. The example of private control tower operators is a reminder that when alternate ways of meeting a common technical requirement are allowed, some operators will develop more cost-effective solutions than others.

Finally, there should be some form of competition and diversity in the system structure. A structure that would lead to monopoly pricing would be unfair to the users and would waste resources. A structure based on a single work force would likely end up unionized by a single union, thereby recreating the possibility of a nationwide strike (which would not be illegal if the employer were a private firm). Moreover, as discussed above, cost-saving innovations are more likely to be developed in a competitive atmosphere.

These seemingly contradictory design requirements can all be met. The key to the solution is a two-level ATC organization. The top level would be an ATC system corporation with overall system design and coordination responsibility. The system corporation would contract out the operation of the individual en route and approach and departure control centers to ATC operating companies. The operating companies would be profit-making firms, perhaps including the existing U.S. control tower contractors and such aerospace firms as Bendix and Lockheed, which have ATC experience. The ATC system corporation would be a not-for-profit firm analogous to ARINC, where user organizations are stockholders.

The enabling legislation that sets up the system corporation would transfer ownership of the existing facilities and equipment of the ATC system from the FAA to the system corporation. Contracts for operation of the various centers would initially be let for differing time periods so that they would not all come up for rebidding at the same time. In addition, no operating company would be allowed to have more than three center contracts in effect at any given time. In this way, a diversity of operators would be achieved, and the threat of a nationwide strike would be minimized. Initial center contracts should pass title of ownership of much of the equipment to the contractor, and contracts would run for a period long enough to make ongoing investment in new equipment a rational expense for the contracting firms (i.e., perhaps 6 to 10 years).

The not-for-profit system corporation would define and collect the user charges for all en route ATC services. This would simplify matters for the user, who would have only one billing organization to deal with no matter how many centers a particular flight was served by. Operations data required for computation of billings would be collected in real time as ATC services are rendered and would be stored in computer files as a by-product of routine system operations.

The system corporation would be responsible for long-term ATC research and development, systems planning and design, and certain aspects of hardware and software procurement. The overall ATC system manager would coordinate the activities of the various operating companies.

This two-level structure provides complete inde-

pendence from political control due to market-determined prices and the absence of tax funding. It provides competition among suppliers to maximize cost-effective innovations. Yet it maintains the safety advantage of a single nationwide ATC system. The not-for-profit, user-owned, top-level structure provides safeguards against monopoly pricing. And the decentralized structure provides safeguards against nationwide strikes while permitting unionization of individual center work forces if the employees so desire. Yet the need for each operating company to remain competitive would serve to restrain any union demands for remuneration that are out of line.

The proposed system provides incentives for long-term planning, for using state-of-the-art technology, for being cost effective, and for being responsive to user needs. With a diversity of operating companies, some of them possibly employee owned, individual controllers would have a choice of work environments and would likely have much higher morale than at present.

Overall, privatization of the ATC system in the two-level manner suggested would solve the problems that plague today's ATC system by radically changing the incentives of all the participants.

PROSPECTS

What are the political prospects for privatizing ATC? There are two primary sources of institutional resistance: the FAA bureaucracy and the general-aviation community. FAA management will resist any reduction in the scope of its jurisdiction; it has already expressed opposition to privatization proposals. General-aviation organizations have a long history of opposing aviation user taxes. But because privatization involves a shift from user taxes to user fees, it is likely that general-aviation interests will be divided. Those who are now being heavily subsidized (i.e., business aircraft operators who use ATC services regularly) would probably be paying more. But recreation fliers, who do not use ATC, would be relieved of paying fuel taxes. Indeed, the possible receptiveness of the general-aviation community to ATC privatization is indicated by the highly favorable treatment accorded by AOPA Pilot to O'Neill's proposed Triad ATC system (29). As described by O'Neill, that satellite-based, advanced-technology system could be operated as "a private venture independent of government, like ARINC or Comsat," with "pay-by-service [i.e., user charge] financing."

What is surprising is the extent of possible support for ATC privatization. Many airline managements are disturbed about "backdoor" regulation of the industry by the FAA in the guise of landing and takeoff slot restrictions and flow-control procedures. Airlines with the most to lose from inadequate slots are the new entrants to the industry--carriers like Jet America, Muse Air, and New York Air. These entrepreneurial airlines have captured the public's imagination and could be powerful advocates of a privatized system that would prevent the impairment of deregulation's promised new competition. But even the establishment ATA has been sounding the alarm about the prospect of the FAA making flow control permanent. Thus, airline interests might be mobilized in favor of ATC privatization.

Because it would restore the controller's right to strike, privatization has already been endorsed by organized labor. In an interview on Cable News Network on August 19, 1981, AFL-CIO president Lane Kirkland said: "There's no reason why it [ATC] could not be a service maintained collectively by these private, profit-making companies [the airlines] and carried out in that way." Similarly, in September 1981, International Association of Machinists' president William Winpisinger told Pat Buchanan on a Washington, D.C., television program that ATC should be turned over to the private sector.

Privatization of government services is consistent with the general thrust of the Reagan Administration's objective of reducing the scale and scope of the federal government. Moreover, shifting ATC services to the private sector on a user-paid basis would reduce federal spending by some $2 billion/year (although the loss of aviation user taxes would reduce federal revenues by a comparable amount). Thus, conservatives could be expected to support the move.

Liberals, too, should support privatization. Not only would the right to strike of air traffic controllers by restored, but 100 percent user-charge financing would end the current subsidies of general aviation by the great majority of less-affluent working taxpayers. Such organizations as the Aviation Consumer Action Project and Common Cause are reasonable prospects as ATC privatization supporters.

Initial media reaction to the idea has been positive. Both the New York Times ["Indeed, an experiment with more private controllers could be broadly useful. If they can do the job as well, it is hard to see why the Government should be in the business at all" (editorial, October 23, 1981)] and the Wall Street Journal ["There is no good reason why the government could not turn over the bulk of the traffic control system to private enterprise" (Lindley Clark column, December 29, 1981)] have spoken favorably of the idea, which indicates its acceptability to the media.

Moreover, the Airport and Airway Improvement Act of 1982 contains a provision that authorizes the FAA to contract out the operation of any and all ATC facilities. Thus far, the agency has made use of that authority to contract out operation of only two level 1 towers. But contracting out all level 1 towers would save approximately $25 million/year while freeing up FAA controllers to relieve current shortages elsewhere. Extending the practice to level 2 towers would save another $35 million (16). Such a program would allow the private control tower industry to expand to the point where there would be many more firms qualified to bid on contracts to operate en route centers.

In short, then, privatization of ATC may well be an idea whose time has come. The only interest groups that might oppose it are parts of general aviation and the FAA bureaucracy itself. But a proposal that unites the support of labor, conservatives, and liberals; improves transportation efficiency; reduces delays and fuel waste; improves air safety; and simultaneously cuts the federal budget would appear to be a winner.

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Abridgment

Theories of Highway Safety

WALTER BLOCK

The highway safety record in the United States is unfortunate, where some 50 000 people lose their lives every year and some 2 000 000 more are involved in serious accidents. This phenomenon has evoked a response from the social science community: try to and find the causes and hence the cures. The difficulty, however, is that all such attempts have been marred by a major flaw: the belief that whatever else is the cause of the problem, one thing is not responsible—the current institutional arrangements, whereby road and street safety is the responsibility of the public sector. This view is challenged, and an alternative scenario of private road ownership is presented. Based on this model, several attempted explanations of, and implicit cures for, highway fatalities and accidents are discussed. Specifically, an analysis is undertaken of the claim that a major portion of the responsibility can be leveled at the manufacturers of road vehicles. One fallacy committed by this argument includes ignoring the fact that the private highway inspection industry has been in effect nationalized. The criticisms by the Naderites of the NHTSA are considered, and the policy recommendations based on this analysis are rejected.

Current interest in deregulation and privatization is being manifested in the social sciences. So far, this interest has pertained to airline deregulation and to the replacement of municipal sanitation services with private alternatives.

A more ambitious undertaking in this direction involves the substitution of private or marketplace-oriented road and highway ownership and management for the current institutional arrangements under which such tasks, rights, and responsibilities are accorded to the public sector.

[Note: The substitution of private for public road ownership and management should be distinguished from another theoretical position--one that advocates that the current public-sector highway managers introduce peak-load or other pricing schemes usually associated with the marketplace. There is a vast difference between these two proposals. In the former case, the highways would be turned over to private entrepreneurs, and the new owners would themselves decide what kind of charging mechanism to institute (1,2). In the latter case, the various road authorities would continue their overall management but would merely introduce some type of marginal-cost pricing system for road use (3).]

In this paper, only one argument in favor of such a change is implicitly considered: that such a substitution would improve the safety standards under which the system of roads and streets currently operates. [See Block (1,2) for other arguments and for a defense of the proposition that this scheme