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BY THE COMPTROLLER GENERAL 110301

Report To The Congress

OF THE UNITED STATES

Aircraft Delays At Major U.S. Airports Can Be Reduced

In 1977, aircraft delays cost US airlines over \$800 million, detained the traveling public over 60 million hours, and caused the airlines to use an additional 700 million gallons of fuel, over 8 percent of their total consumption

Generally, aircraft delays result from excessive air traffic and bad weather. Many major US airports have peak, congested periods when air traffic exceeds runway capacity and aircraft delays occur

To reduce delays at major airports, the Congress and Secretary of Transportation should take actions to shift traffic from peak to off peak periods or to other airports



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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses actions the Congress and the
Secretary of Transportation can take to help reduce air-
craft delays at major U.S. airports.

We made our review pursuant to the Budget and
Accounting Act, 1921 (31 U.S.C. 53), and the Accounting
and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the
Director, Office of Management and Budget; the Secretary
of Transportation; the Chairman of the Civil Aeronautics
Board; interested congressional committees; and other
parties.

A handwritten signature in black ink, reading "Thomas B. Staats".

Comptroller General
of the United States

D I G E S T

Generally, aircraft delays result from excessive air traffic and bad weather. Many major U.S. airports have peak, congested periods when air traffic exceeds runway capacity and aircraft delays occur. In 1977, delays caused U.S. airlines to use an additional 700 million gallons of fuel--over 8 percent of their total consumption. Delays inconvenienced travelers, detaining them some 60 million hours, and cost the airlines over \$800 million. (See pp. 4 and 5.)

These delays can be reduced if runway capacity at major airports is used more efficiently--shifting air traffic from peak to off-peak periods or to other airports.

HOW PEAK HOUR PRICING AND
QUOTAS WOULD REDUCE DELAYS

"Peak hour pricing" requires aircraft to pay a premium to land or take off during peak periods. The two basic forms are peak operating (landing and takeoff) fees and peak surcharges. Currently, airport operators assess landing (not takeoff) fees to recover costs. These fees are based on aircraft weight and do not vary by time of use; runway use is first-come, first-served.

Peak operating fees would replace existing landing fees. Airport operators would both recover costs and penalize runway use during peak periods. Peak surcharges would be separate from any landing fees and designed solely to penalize runway use during peak periods.

Economists assert that

--peak hour pricing will reduce delays, because some aircraft will not pay the premium to land or take off;

--peak hour pricing is more economically rational than the current system; and

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Air transportation operations
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Airports
Federal aid for
Transportation*

--general aviation flights, mostly private business and pleasure aircraft, should pay more to land or take off at major airports during congested periods. (See p. 7.)

Peak hour pricing should reduce delays; however, passengers on general aviation aircraft and aircraft serving small communities will have to pay much more to use major airports during congested periods. (See pp. 8 to 10.)

Airport operators and airlines have multiyear agreements which set the fees for runway use. Unless the Congress abrogates these contracts, airport operators could not institute peak operating fees and may not be able to use peak surcharges. If the Federal Government institutes peak surcharges, the multiyear agreements would remain intact. (See p. 10.)

"Quotas" reduce delays by limiting the number of aircraft operations during congested periods. The Federal Aviation Administration (FAA) imposes quotas on four airports, specifying how many operating "slots" go to each type of aircraft per hour.

By restricting traffic, a quota

--raises the difficult problem of how to best allocate the limited number of slots,

--changes the air transportation service provided a community, and

--does not give planners accurate information on the need for additional runway capacity.

Exactly how effective quotas have been in reducing aircraft delays has not been determined, but Federal officials and airport users agree that quotas have worked well to reduce delays.

RECOMMENDATIONS

The Congress should direct the Secretary of Transportation to decrease air traffic during congested periods at major U.S. airports. The Secretary of Transportation should use peak surcharges and quotas to reduce aircraft delays. (See p. 15.)

THE ROLE OF RELIEVER
AIRPORTS IN REDUCING DELAYS

"Reliever airports," general aviation facilities which relieve congestion at major airports, can help reduce aircraft delays.

During peak hours, general aviation traffic is a significant percentage of total traffic at major airports. (See pp. 17 and 18.)

Reliever airports will become particularly important if general aviation use of major airports is limited through quotas or peak hour pricing.

The ability of relievers to accommodate general aviation from congested major airports is limited by

- inadequate runway length,
- lack of instrument landing system aids for poor weather conditions, and
- inadequate runway capacity.

The Airport and Airway Development Act provides a separate funding category under the Airport Development Aid Program for the development needs of publicly owned relievers; from 1971 to 1978, FAA obligated over \$116 million for these needs. Privately owned relievers, some of which may close down, also reduce congestion at major airports, but they are not eligible for funding under this program. (See p. 19.)

In establishing separate funding for relievers, the Congress recognized the need to relieve congestion at major airports. Yet FAA does not know to what extent a Federal investment to build, expand, or upgrade a reliever will relieve congestion and reduce delays. With such information, FAA could better determine (1) how effective the reliever airport program is and (2) which proposed projects should be given funding priority. (See p. 20.)

RECOMMENDATIONS

To help in the development and continued operation of privately owned reliever airports, the Congress should make them eligible for Airport Development Aid Program funding. (See p. 21.)

The Secretary of Transportation should develop a method which will enable reliever airport operators to determine to what extent their proposed improvements will help reduce congestion and delay at major airports. (See p. 21.)

AGENCY COMMENTS

FAA officials generally concurred with GAO's conclusions and recommendations. The Civil Aeronautics Board stressed the advantages of peak hour pricing over quotas. The Board supported GAO's conclusion that reliever airports are important and suggested that some portion of the revenues derived from peak hour pricing could be used to help develop relievers. (See pp. 15, 16, and 22.)

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ABBREVIATIONS

ADAP	Airport Development Aid Program
CAB	Civil Aeronautics Board
FAA	Federal Aviation Administration
GAO	General Accounting Office

CHAPTER 1

INTRODUCTION

Air travel is an increasingly popular and important transportation mode. Since 1960, only air transportation has increased its share of all intercity passenger travel, while the auto, bus, and rail modes have steadily lost ground. From 1960 to 1977, intercity air passenger miles rose from 4.4 percent to 12.1 percent of the total for all modes. In 1978, an estimated 270 million passengers traveled by air--34 percent more than in 1973. Steady growth should continue. According to the Department of Transportation's Federal Aviation Administration (FAA) forecasts, the number of passengers will increase to 470 million by 1990--74 percent more than in 1978. (See app. I.)

Air travel has become more popular, largely because its cost to the passenger has continually decreased compared to other transportation modes. This trend is now being reinforced by airline deregulation. By promoting more competition through changes in regulatory practices and law 1/, the Federal Government has permitted the airlines to lower their fares, causing air travel to grow at an above average rate in 1978. As President Carter remarked when signing the Airline Deregulation Act of 1978, air travel has now been opened to millions of Americans who would not otherwise be able to afford it.

More aircraft operations--landings and takeoffs--will be necessary to accommodate the increasing number of passengers. FAA projects that from 1978 to 1990, the number of air carrier (airline) operations will rise from 10.1 million to 12.9 million, nearly 28 percent. Air taxi (including commuter) 2/ operations will rise dramatically, from 3.5 million to 8.4 million, or 140 percent. FAA officials predict that air taxis will become more important under airline deregulation. They believe air carriers will abandon some routes to smaller communities and air taxis will begin providing more of this service.

1/The Airline Deregulation Act of 1978, Public Law 95-504, 92 Stat. 1705.

2/Air taxis are aircraft which seat no more than 30 passengers. Commuters are scheduled air taxis.

Overall, air taxi and air carrier operations are expected to increase by about 57 percent. (See app. I.)

RUNWAY CAPACITY LIMITATIONS

The growth of air travel is creating pressure on the runway or "airfield" capacities 1/ of large metropolitan areas' major airports. The demand for air transportation service is not evenly distributed throughout the United States. The airport system is commonly referred to as a "hub and spoke" network, with most passengers and aircraft efficiently routed through major hub airports. Sixty-five percent of all passengers board airplanes at just 25 U.S. airports. (See app. II.) According to FAA, a growing number of these 25 airports are becoming "saturated." During busy periods of the day, their runway capacities are not sufficient to accommodate demand and operations are increasingly delayed. 2/ When an airport nears saturation, each takeoff or landing is delayed an average 7 to 8 minutes with flights during busy, peak hours delayed to a greater extent. FAA now predicts that 13 of these 25 major airports will be approaching saturation by 1989.

Additional capacity is not being built

Runway capacity is growing slowly. Additional runway capacity can be created by constructing additional airports in areas of high forecasted demand and expanding existing airports that are approaching saturation. These high cost (multimillion dollar) capital improvements have been the traditional way to meet a community's growing demand for air transportation. In large metropolitan hubs, however, two new major airports--Dallas-Ft. Worth and Kansas City--have been completed since 1970 and just one--Los Angeles Palmdale--may be built in the next decade. Of the existing major airports, Detroit Metropolitan has recently added a runway, but only a few others, such as Atlanta Hartsfield and Los Angeles Ontario, may expand.

1/Runway or "airfield" capacity is defined as the maximum number of aircraft which can be processed in a period of time through a given set of runways under continuous demand.

2/Delay is defined as the difference between an aircraft's actual flight time and the time the flight would take with no interference from other aircraft.

In a 1977 report to the Congress, the Department of Transportation concluded that high cost capital improvements are constrained mostly by land-related problems. ^{1/} For example, an existing airport has no room to build an extra runway; an airport's landside (terminal, parking areas, access roads) cannot handle more passengers; or no affordable, suitable, and close-in location can be acquired for a new airport. A lesser problem, the Department reported, is meeting Federal environmental requirements.

In a densely populated metropolitan area, acquiring large parcels of land for a 10,000-foot runway, let alone a new airport, can be prohibitively expensive. That is why the planned Palmdale airport is 60 miles from downtown Los Angeles, and a new Atlanta airport, which may be built by the 1990s, will probably be at least 45 miles from the city's center.

✓ Various airport operators, airline officials, and Federal officials contend that Federal environmental restrictions, specifically requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), greatly discourage the building of additional runway capacity. They cite examples such as the Detroit, Charlotte, and Los Angeles (Ontario) airports, where new runway construction projects were delayed for years while airport sponsors sought FAA and court approval for their environmental impact statements.

Federal environmental laws do add to the leadtime necessary for any high cost capital improvement, but they do not "greatly discourage" expansions. In the early 1970s local airport sponsors, such as Charlotte and Detroit, did not know what to include in their environmental impact statements and this was the source of their problems. By 1977, more complete FAA guidance was developed and distributed. Also, the U.S. Council on Environmental Quality has issued final regulations, effective July 30, 1979, to establish uniform, Government-wide procedures for implementing the National Environmental Policy Act. Now that Federal rules are being more clearly spelled out, local sponsors should not run into the above difficulties.

New technology may help

Technological advances may provide some additional runway capacity. In studying the effects of an upgraded air

^{1/}Secretary of Transportation. "Establishment of New Major Public Airports in the United States." Aug. 1977, pp. 6-3 through 6-14.

traffic control system, FAA estimated the runway capacity benefits of fully implementing the system elements which affect aircraft separation and control near airports. FAA concluded that by the year 2000, the new technology could increase average runway capacity some 23 percent in good weather (visual flight rules or VFR) conditions and 39 percent in poor weather (instrument flight rules or IFR) conditions. 1/

AIRCRAFT DELAYS ARE COSTLY

Aircraft delays occur at an airport when air traffic demand is greater than what the runways can accommodate and one flight must wait for another. A 1974 FAA study on airport capacity at eight major airports concluded that nearly all delays were attributable to weather problems and most severe delays were weather-related and largely unavoidable. However, a 1976 report by Chicago O'Hare's Delay Task Force, comprised of FAA, airport, and airline officials questioned whether delays were largely unavoidable. According to the study, delays may result from a series of controllable factors, such as air traffic control procedures and excessive demand, which can cause severe system delays when compounded by weather problems. Data gathered by Atlanta Hartsfield's Delay Task Force in 1978 supports this conclusion. The data indicates that weather is significant, but does not cause the majority of aircraft delays. Sixty percent of total annual aircraft delays at Hartsfield occurred during good weather conditions. Forty percent of total annual delays occurred during poor weather conditions, which were 12 percent of the time.

Aircraft delays inconvenience passengers and cause missed connections and longer travel times. Delays are particularly costly to airlines, which must pay for extra crew time and for the fuel their aircraft burn while waiting on the taxiways or in the air.

According to Chicago O'Hare's Delay Task Force, delays at O'Hare alone annually cost the airlines \$44.3 million, burn an additional 67 million gallons of fuel, and delay passengers 4.6 million hours. FAA and three air carriers--Eastern, United, and American--are currently developing a standard method for air carriers to report delays. Figures

1/Federal Aviation Administration. "Policy Analysis of the Upgraded Third Generation Air Traffic Control System." FAA-AVP-77-3. Jan. 1977, pp. 40-43

from the three represent about one-third of all airline delays in the United States. Projecting these figures to the entire system, FAA estimates that delays in 1977 detained the traveling public over 60 million hours. ^{1/} The cost of delays to the airlines--mostly extra crew time and fuel--was over \$800 million. Because of delays, airlines used an additional 700 million gallons of fuel--over 8 percent of their total consumption for that year.

AIRCRAFT DELAYS: A CONTINUING PROBLEM

In the next 10 years, the demand for air travel is expected to steadily increase. Large metropolitan areas will find their major airports becoming more congested and will be unable to build additional capacity. Aircraft delays are already a severe problem and will likely get worse. The 25 busiest major airports, where 75 percent of all delays now occur, will be particularly congested.

To accommodate the expected growth of air travel and reduce aircraft delays, certain steps will have to be taken at major U.S. airports. Using existing runway capacity more efficiently--shifting air traffic from congested hours to uncongested hours or to other airports--will be necessary.

SCOPE OF REVIEW

We evaluated the potential of three ways to better use the existing runway capacity of major U.S. airports. These solutions are so-called "low capital" alternatives--peak hour pricing, quotas, and reliever airports.

We interviewed officials and reviewed documents of Federal, State, and local governments, various U.S. airlines, major and reliever airports, and aviation associations. Our review was conducted at the headquarters offices of FAA and the Civil Aeronautics Board (CAB) and at FAA's Southern, Great Lakes, Rocky Mountain, and Western regional offices. We also visited the major air transportation hubs of Atlanta, Chicago, Denver, and Los Angeles.

^{1/}In 1977, the Department of Transportation valued passenger delay at \$12.50 per hour. Based on FAA and airline data, aircraft delays cost passengers over \$750 million in 1977.

CHAPTER 2

HOW PEAK HOUR PRICING AND QUOTAS

WOULD REDUCE DELAYS

Many major U.S. airports have peak periods, such as mid-morning and late afternoon, when they are particularly busy and congested, and off-peak periods when they are not. Aircraft delays occur during peak times when the air traffic demand is greater than the runway capacity can accommodate. If operations were shifted to off-peak periods or to other airports, delays would be reduced. Peak hour pricing and quotas are alternative ways of achieving this end.

PEAK HOUR PRICING: THEORY AND PRACTICE

Peak hour pricing requires airport users to pay a premium to land or take off during congested hours. The two basic forms of peak hour pricing are peak operating (landing and takeoff) fees and peak surcharges.

With peak operating fees, airport operators would assess a higher fee for runway use during peak than off-peak hours. Currently, to use a major airport's runways, aircraft pay landing (not takeoff) fees, which are mostly set on a cost recovery basis whereby the airport's cost of constructing, operating, and maintaining the runways and taxiways is recouped. Landing fees are determined on the basis of aircraft weight and do not vary by time of use; runway use is first-come, first-served. Peak operating fees would replace existing landing fees. In 1978 the fees at various major airports by aircraft type were.

ATL LAX LGA DCA DEN

----- (notes a and b) -----

Aircraft

DC-10-30 (Air carrier)	\$169	\$81	\$669	\$(c)	\$111
B-727-200 (Air carrier)	63	30	249	47	41
B-737-200 (Air carrier)	43	21	171	33	28
Swearingen Metro (Air taxi)	7	3	27	5	5
Learjet 25B (General aviation) (note d)	6	3	25	5	3

a/Landing fees are rounded to the nearest dollar

b/ATL-Atlanta Hartsfield, LAX-Los Angeles International, LGA-New York LaGuardia, DCA-Washington National, DEN-Denver Stapleton

c/DC-10s do not operate at National Airport

d/General aviation is mostly private business and pleasure aircraft

Unlike fees, peak surcharges are not designed to recover costs. They would be separate from any landing fees and added solely to penalize the use of runway capacity during peak periods. The revenues derived from peak surcharges could be used for any purpose, perhaps even paying airport users to operate during off-peak periods.

Economists contend that peak hour pricing is preferable to the current system of landing fees for the following reasons. 1/

- Peak hour pricing will reduce delays, because only those aircraft attaching a high value to landing or taking off during peak times will pay the premium; others will shift their operations to off-peak times or to other airports.
- Peak hour pricing is more economically rational than making runways available on the current fixed landing fee and first-come, first-served basis, which creates and perpetuates shortages, promotes unused capacity, and possibly leads to unnecessary investments.
- General aviation flights should pay more to operate at major airports during congested hours. General aviation users argue that they should pay much less than air carriers, because the airlines need long, wide, and reinforced runways and they do not. Economists argue that runway use fees or charges should reflect not only the cost of constructing, operating, and maintaining the runways and taxiways, but also the delay costs to aircraft and passengers. Since a general aviation flight uses as much, if not more, scarce runway time as an air carrier flight during congested periods, it should pay more to operate during peak hours than the \$3 to \$5 they generally pay.

1/For a more detailed discussion of the economic theory on peak hour pricing, see: Ross D. Eckert, "Airports and Congestion A Problem of Misplaced Subsidies," American Enterprise Institute for Public Policy Research, 1972; M.E. Levine, "Landing Fees and the Airport Congestion Problem" in the Journal of Law and Economics, vol. 12, Apr. 1969; and Federal Aviation Administration, "Airport Quotas and Peak Hour Pricing: Theory and Practice," FAA-AVP-77-5, May 1976

Experience with any form of peak hour pricing at airports has been very limited and the results have been mixed. In 1972, London's Heathrow Airport instituted a surcharge on peak period aircraft operations. This surcharge greatly increased the airport use cost for cargo, general aviation, and small domestic operations but had little effect on the cost for the larger commercial airlines. In its analysis of the Heathrow peak surcharge, FAA concluded that the experiment may have shifted overall demand slightly but did not cause any significant decreases in peak demand. On the other hand, in 1968, New York's three major airports--Kennedy, LaGuardia, and Newark--assessed small aircraft operations \$25 during peak hours. In a few months, general aviation activity in the peak periods had declined nearly 40 percent at LaGuardia and 30 percent at the three airports combined.

MAJOR ISSUES REGARDING PEAK HOUR PRICING

The three key issues often raised in the debate over whether peak hour pricing can and should be implemented are:

- To what degree will peak hour pricing cause aircraft to shift from peak to off-peak hours or to other airports?
- How will peak hour pricing at major airports affect air transportation service in small communities?
- Do the long-term contracts between airports and airlines that set landing fees at fixed levels prevent airport operators from using peak hour pricing?

Will peak hour pricing cause aircraft to shift from peak periods?

General aviation and air taxis should be more susceptible than air carriers to being shifted by peak hour pricing. Using Denver Stapleton as an example, a \$150 peak operating fee or surcharge is a substantial increase from the current \$3 and \$5 (landing only) fee for general aviation and air taxis, respectively. The \$150 would also represent an increase for a B-727 air carrier, which now pays \$41 to land, but \$150 would be a much smaller percent of its total operating expenses than that of the general aviation or air taxi flights. Many economists and airline officials agree that, even if airlines had to pay more to operate at major airports during peak periods, they would probably not shift their flights to off-peak hours. Passengers prefer flying during peak periods and will accept

higher air fares caused by peak hour pricing. (Even a \$400 fee or surcharge would still be only a few dollars per passenger for a B-727 with 150 passengers.) Another reason why air carriers would probably not shift their schedules much is that they are restricted by connecting patterns and aircraft and crew positioning.

Any shift from peak hours should have a clear impact, because, when demand is near capacity, aircraft delays are very sensitive to small changes in the number of operations. For example, Chicago O'Hare's Delay Task Force estimated that, during peak hours, just a 7 percent decrease in operations would decrease delays by 40 percent. At 23 of the 25 busiest major U.S. airports, general aviation and air taxi aircraft comprise over 20 percent of total operations. They are also a significant percentage of peak period operations. Peak hour pricing should discourage some of them from using the runways during congested periods and, given the findings of O'Hare's Delay Task Force, should do much to reduce delays.

In a 1977 report, FAA also speculated that peak hour pricing should effectively reduce delays by causing general aviation and air taxi traffic to shift their demand from peak to off-peak hours or to other airports. By projecting capacity and demand at major airports and simulating what would happen if various policies were employed, FAA concluded that peak hour pricing, combined with air traffic control improvements, could "eliminate almost 80 percent of the cost of air carrier delays anticipated at the 25 largest airports for the next 25 years." 1/

Air transportation service
in small communities

Small communities tend to be served by air carrier flights with limited seating or air taxis, while large urban areas are typically served by large jets such as B-727s and DC-10s. With peak hour pricing, a 15 passenger air taxi from a small community such as Bloomington, Illinois, will have to pay more per person than a 150 passenger air carrier from Cleveland, Ohio, to land during peak hours at O'Hare. If the runway use fee or surcharge is \$150, the air taxi

1/Federal Aviation Administration. "Policy Analysis of the Upgraded Third Generation Air Traffic Control System." FAA-AVP-77-3. Jan. 1977, p. 71

will pay \$10 per passenger and the air carrier \$1 per passenger. Airline officials told us they believe that peak hour pricing, by discouraging peak hour air taxi operations, will make it more difficult for passengers flying to and from small communities to connect with peak hour air carrier flights at major airports.

Can airport operators institute peak hour pricing?

Multiyear agreements--some as long as 25 or 30 years--between airport operators and airlines establish landing fees which are determined on the basis of aircraft weight and do not vary by time of use. These contracts prevent airport operators from using peak operating fees and also may prevent them from using peak surcharges. The Congress, however, has the power to abrogate contracts which interfere with its function under the Constitution to regulate interstate commerce, and it could, through legislation, permit airport operators to use peak hour pricing.

The agreements between airports and airlines establish the landing fees that help pay off airport construction bonds. Some airport operators fear that the Congress, by abrogating such agreements in order to permit peak hour pricing, may make it more difficult for them to attract investors when they issue these bonds. Others, who believe that the airlines will always need their facilities, do not have this fear.

Some airline officials believe that airport operators, if not bound by contracts basing landing fees on facility costs, may recognize that their airports are monopolies and charge much higher landing fees. They point to what has occurred in other countries. The airport in Sydney, Australia, for example, assesses a B-747 aircraft over \$3000 to use the runway. Tokyo's Narita Airport charges landing fees that are roughly 5 times Dallas-Ft. Worth's fees for the same aircraft. Department of Transportation officials told us, however, that when receiving Federal grant assistance airport operators have to assure the Government that their runway use fees are fair and reasonable and do not unjustly discriminate against their users. These officials contend that such assurances prevent airports from charging exorbitant landing fees.

The Congress could direct the Secretary of Transportation, rather than airport operators, to implement peak surcharges. With this approach, the Congress would leave intact contracts between airport operators and airlines.

QUOTAS KEEP DEMAND WITHIN CAPACITY

A quota limits air traffic at congested airports; it can apply selectively to certain categories of aviation (air carrier, air taxi, or general aviation), it can be in force only for certain hours of the day, and it can apply to some or all airport runways. Limiting general aviation flights to 5 percent of total operations during certain peak hours is an example of a quota. Establishing a limited number of operating "slots" for all users is perhaps the most familiar form of a quota. A quota can keep demand within capacity indefinitely, thereby keeping aircraft delays at a minimum.

A quota does have drawbacks. By restricting traffic, it changes the air transportation service provided a community and does not give planners accurate information on the need for additional runway capacity. Also, the difficult problem arises of how to best allocate the limited runway time among the airport users. Economists argue that a quota can lead to economically irrational runway use. If operating slots are allocated by administrative means rather than pricing, users who most value the runway time will not always get it.

FAA began using quotas in 1969 to force demand in line with capacity at certain congested airports. Federal regulations now designate four airports as "High Density Traffic Airports" 1/ and allocate the total operations per hour as follows: 2/

✓

1/See 14 C.F.R. 93.121 et seq. Subpart K for Federal regulations on high density traffic airports.

2/Allocations are based on instrument flight rules or poor weather conditions. Under visual flight rules or good weather conditions, additional operations can usually be accommodated. Nonscheduled flights, such as general aviation, would be the only ones able to make last minute additions.

<u>Class of user</u>	John F. Kennedy Airport (note a)	LaGuardia Airport	O'Hare Airport (note a)	Washington National Airport
Air carriers except air taxis	b/ 70	48	115	40
Scheduled air taxis	5	6	10	8
Other	<u>5</u>	<u>6</u>	<u>10</u>	<u>12</u>
Total	<u>80</u>	<u>60</u>	<u>135</u>	<u>60</u>

a/Quotas apply at Kennedy and O'Hare only between 3 p.m. and 8 p.m. local time.

b/Between 5 p.m. and 8 p.m., 80 slots are reserved for air carriers, 5 for air taxis, and 5 for "other."

Each class of user has its own method of allocating its operating slots. "Other" users, basically general aviation, make reservations on a first-come, first-served basis. Air carriers, granted antitrust immunity by CAB, periodically form scheduling committees and decide among themselves how slots will be divided. Air taxis have a seniority system, under which incumbent users can hold their slots indefinitely. CAB is concerned that, as deregulation increases the demand to use quota airports, new entrants will have difficulty obtaining landing and takeoff slots. It is now evaluating whether the current methods of allocating slots should be continued.

Exactly how effective quotas have been in reducing aircraft delays has not been determined. First, FAA delay information since 1969 is not accurate enough for meaningful analysis. Second, as we reported in our 1977 report on aviation fuel conservation, FAA has not always enforced the quotas. 1/ Federal officials and airport users, however, agree that quotas have worked well to reduce delays.

Legal issues surrounding quotas

When FAA first instituted quotas in 1969, the Aircraft Owners and Pilots Association, a general aviation interest

1/"Effective Fuel Conservation Programs Could Save Millions of Gallons of Aviation Fuel" (CED-77-98, Aug. 15, 1977).

group, sued to have the rules withdrawn, 1/ arguing that quotas favored the airlines and violated the "freedom-to-air-space" principle stated in the Federal Aviation Act of 1958 (49 U.S.C. 1301, 1304). FAA argued that

"* * * the concept of 'first come-first served' remains as the fundamental policy governing the use of airspace so long as capacity is adequate to meet the demands of all users without immeasurable delay or inconvenience. When capacity limitations compel a choice, however, the public service offered by the common carrier [airlines] must be preferred * * *." 2/

The court sided with the Federal Government and found that quotas properly balanced general aviation, air carrier, and public interests.

Airport operators have the legal authority to set their own quotas. Because operators are responsible for the consequences of the operation of their airports, they have been given the power to control airport use. Operators may determine what type of air service to provide and what type of aircraft will use their facilities. The Federal Aviation Act (49 U.S.C. 1348a) provides the FAA Administrator with broad authority to regulate the use of the navigable airspace "in order to insure the safety of aircraft and the efficient utilization of such airspace." This provision is general in nature and the courts have not interpreted it to preclude municipal airport safety and efficiency regulations which do not conflict with Federal laws and regulations.

The question of Federal versus local authority to insure the "efficient utilization" of airspace and landing areas was raised in 1968 when the Port Authority of New York began assessing small aircraft operations \$25 during peak hours. The Aircraft Owners and Pilots Association sued to have the new fee rescinded, 3/ claiming that air traffic regulation is strictly a Federal, not local, matter and that

1/Aircraft Owners and Pilots Association v. Volpe, No. 927-69 (D.D.C., May 14, 1969).

2/Federal Aviation Administration. "Airport Quotas and Peak Hour Pricing: Theory and Practice." FAA-AVP-77-5. May 1976, p. 71.

3/Aircraft Owners and Pilots Association v. Port Authority of New York, 305 F. Supp. 93 (E D.N.Y. 1969).

this fee discriminated against general aviation. The court disagreed. It held that the fee had the same purpose as Federal quota regulations and was not unduly discriminatory on efficiency grounds:

"One aircraft approach may represent the right of over 150 passengers to have access to the navigable airways and landing areas. The next plane may represent the right of one or two persons to have access to the airways and landing areas. To treat them all alike in allocating scarce landing and take-off time and space is to ignore and not to recognize the basic right of equal access to airways and landing areas."

DEPARTMENT OF TRANSPORTATION
REVIEWS AIRPORT ACCESS QUESTION

In a November 16, 1978, letter to the Secretary of Transportation, the Civil Aeronautics Board Chairman expressed his view that with the deregulated, more competitive air transportation system, new air carriers will want access to airport runways. He advocated market pricing as a rational, competitive way to allocate landing and takeoff slots and possibly encourage traffic to move to off-peak periods. He asked the Secretary to consider proposed amendments to the Airport and Airway Development Act of 1970 (49 U.S.C. 1701 et seq.) which would give airport operators the authority to implement peak hour pricing. Responding to this letter, the Secretary set up an Airport Access Task Force, chaired by the FAA Administrator, to explore the question of airport access including the allocation of slots at the four high density airports.

In section 302(b) of his recently submitted "Airport and Airway Improvement Act of 1979" (H.R. 3745), the Secretary of Transportation has proposed amending section 307 of the Federal Aviation Act. He has asked the Congress to explicitly recognize his authority to limit aircraft operations for the purposes of safety, efficient use of airspace, or control of congestion. (Since 1969, the Secretary has imposed quotas at the four airports without any specific direction in Federal law.) The proposed legislation would not explicitly authorize or direct the Secretary to implement peak surcharges.

CONCLUSIONS

When aircraft can land and take off without delays, access to runways can reasonably be first-come, first-served. During peak periods at many major U.S. airports,

however, air traffic exceeds runway capacity. This congestion, which is already causing costly delays, could worsen as the increasing demand for air travel creates additional pressures on runway capacities. When congestion occurs, access should be restricted, rather than first-come, first-served; peak surcharges and quotas should be used to shift operations from peak to off-peak periods or to other airports.

RECOMMENDATION TO THE CONGRESS

To reduce aircraft delays, we recommend that the Congress direct the Secretary of Transportation to decrease air traffic during congested periods at major U.S. airports. This could be accomplished by adding a new subsection to section 307 of the Federal Aviation Act of 1958 (49 U.S.C. 1348) as follows:

"(g) In the exercise of authority under subsections (a), (b), and (c) of this section, the Secretary of Transportation is authorized and directed to implement procedures, including the imposition of reasonable charges, which will decrease air traffic in the airspace or at or in the vicinity of any airport at which the Secretary determines that such procedures are necessary to reduce congestion."

RECOMMENDATION TO THE SECRETARY OF TRANSPORTATION

We recommend that the Secretary use peak surcharges and/or quotas to implement the above statute.

The Secretary can combine a peak surcharge with a quota. For example, he can allot each class of user a limited number of operating slots. Users would pay a peak surcharge to reserve a slot. If demand exceeds the number of slots, then the Secretary can hold a lottery to determine which applicants will receive the slots.

AGENCY COMMENTS AND OUR EVALUATION

FAA officials concurred with our conclusions and recommendations, considering them generally consistent with the Secretary's proposed legislation.

The FAA officials emphasized that actions to reduce delays must be tailored to specific airports; an appropriate solution at one may not work elsewhere. We agree. Our

recommendations would give the Secretary of Transportation flexibility to use a peak surcharge and/or quota, whichever is most appropriate and effective for decreasing air traffic congestion at each airport.

CAB stated that quotas raise very difficult policy, economic, and technical problems and may make it more difficult to achieve the goals of the Airline Deregulation Act. (See app. III.) CAB believed these goals, such as free airline entry and exit and competitive pricing, will be better served if scarce airport resources, such as peak hour landing rights, are allocated by pricing methods. If quotas must be used to limit air traffic, CAB favored market-type allocations among the limited number of users.

We recognize the problems associated with quotas, despite their effectiveness in reducing delays. This is why we have recommended that peak surcharges, a pricing method, also be used.

CAB suggested that the Secretary be authorized to give airport operators the first opportunity to reduce congestion; if operators can not develop an acceptable congestion reduction plan, the Secretary could act directly.

We are concerned that, with CAB's suggested approach, airport operators may only have the authority to use quotas. Unless the Congress abrogates their multiyear agreements with airlines, airport operators may not be able to institute peak surcharges.

CHAPTER 3

THE ROLE OF RELIEVER AIRPORTS

IN REDUCING DELAYS

The Airport and Airway Development Act (49 U.S.C. 1711) defines a reliever airport as:

"A general aviation airport designated by the Secretary [of Transportation] as having the primary function of relieving congestion at an air carrier airport by diverting from such airport general aviation traffic."

One hundred and forty-six U.S. airports are designated as relievers.

We found that peak period general aviation traffic at major airports is significant. If reliever airports could accommodate some of this traffic, they would help reduce delays considerably. Relievers will become particularly important if peak hour pricing or quotas are used to discourage general aviation. At this time, however, relievers have a limited ability to accommodate this traffic.

GENERAL AVIATION DEMAND
AT MAJOR AIRPORTS

Peak period general aviation traffic at major airports is considerable. We observed the level of such activity for 14 weekdays in both September 1977 and July 1978 at selected major airports. We found that during the busiest peak hours of the day, general aviation ranged from slightly less than 10 percent of total aircraft operations at Dallas-Ft. Worth and Chicago to over 30 percent at Washington National and St. Louis. (See below.)

	<u>September 1977</u>	<u>July 1978</u>
	----- (Percent) -----	
Dallas-Ft. Worth	6	8
Chicago O'Hare	8	9
Atlanta Hartsfield	8	8
Los Angeles International	14	15
New York LaGuardia	25	19
Washington National	34	32
Denver Stapleton	33	26
St. Louis Lambert	37	34

From 1972 to 1978, general aviation traffic held constant or increased slightly as a percentage of total operations at nearly all of the 25 busiest major U.S. airports. FAA predicts a mixed future; through 1990, it expects general aviation traffic to stay a fairly constant percentage of total operations at 11 of those major airports, decrease at 11 others, and increase at the remaining three.

POTENTIAL OF RELIEVER AIRPORTS

Peak hour pricing or quotas can divert general aviation from major to reliever airports. Also, relievers can attract general aviation from major airports. In a survey of its general aviation users, Atlanta Hartsfield found that only half had to use Hartsfield, principally for passenger connections to air carrier flights. The rest could use other Atlanta airports if those facilities were conveniently located to the downtown area or Hartsfield and offered a high level of facilities and services.

The ability of relievers to accommodate general aviation from congested major airports is limited by

- inadequate runway length,
- a lack of instrument landing system aids for poor weather conditions, and
- inadequate runway capacity.

Many general aviation jets need 5,000- to 5,500-foot runways to operate safely. Of the 29 relievers to the 9 busiest major airports, 17 have 5,000-foot runways. In its above-mentioned survey, Atlanta Hartsfield found 60 to 70 percent of their general aviation users could be accommodated on a 4,000-foot runway; 22 of the same 29 relievers have this runway length. Regarding instrument landing system aids, 28 of the 73 relievers to the major 25 airports will have such equipment by 1981 and, according to an Aircraft Owners and Pilots Association survey, another 11 need these aids.

Relievers, like major airports, are also developing a runway capacity shortfall. FAA predicts that 28 of the 146 relievers will be saturated by 1988. Although FAA believes that 53 relievers must be added within the next 10 years, only about 1 per year is being built.

The growing runway capacity problems will be made more severe if reliever airports close. Privately owned relievers are the most vulnerable to closure. In a 1978 report to the Congress, the Secretary of Transportation stated that 10 of the 26 privately owned relievers could close; he said that financial, social, and personal reasons pressure private airport owners to sell. ^{1/} One airport mentioned by the Secretary--Chicagoland, a reliever to O'Hare--has already shut down. It was a valuable property and its owner decided there was more to gain financially by selling than by continuing to operate the airport.

FEDERAL AID TO RELIEVER AIRPORTS

The Airport and Airway Development Act provides a separate funding category under the Airport Development Aid Program (ADAP) specifically for reliever airports. From 1971 to 1978, FAA obligated over \$116 million for their development.

In its 1978 National Airport System Plan, FAA identified over \$900 million of reliever airport development needs for the 1978-88 period. Forty-five percent of this amount is for increasing capacity and 16 percent for upgrading existing relievers (extending and strengthening their runways to accommodate larger aircraft). Reliever airports can spend ADAP funds on safety-related items, such as instrument landing system aids. Federal officials told us, however, that relievers prefer to have FAA install these aids through its facilities and equipment program. ADAP requires that relievers match Federal funds (80 percent Federal share, 20 percent sponsoring agency) and maintain the instrument landing system aids. The facilities and equipment program, however, is 100 percent federally funded, and FAA maintains the equipment.

Only the 121 publicly owned relievers are eligible for ADAP funding. Although the 25 privately owned relievers also help relieve congestion at major airports, they are not eligible for ADAP funds.

While the Federal Government does not help develop privately owned relievers, it does help State and local governments acquire them. Since 1973, FAA has obligated over \$23 million in ADAP funds to help purchase five privately owned relievers.

^{1/}Secretary of Transportation. "Potential Closure of Airports " January, 1978.

In establishing a separate ADAP funding category for reliever airports, the Congress recognized the need to relieve congestion at major airports. Yet FAA does not know and does not have a procedure to determine to what extent building, expanding, or upgrading a reliever will reduce congestion and delay. It also does not require grant applicants to justify how their proposed improvements will help reduce congestion at major airports. With such information, FAA could better determine (1) how effective the reliever airport program is and (2) which proposed projects should be given priority for ADAP funding.

DEPARTMENT OF TRANSPORTATION PROPOSES CHANGES TO RELIEVER AIRPORT PROGRAM

In the recently proposed Airport and Airway Improvement Act of 1979, the Secretary of Transportation recommends increasing ADAP funding for reliever airport development to help reduce congestion and delays at the largest airports. He also recommends making privately owned reliever airports eligible for ADAP. The purpose is to recognize that these airports provide a public service, and, in some cases, their development may be in the national interest. Without Federal funding, some may be closed and consequently lost to the national aviation system.

On August 7, 1979, FAA announced a 4-year, \$100 million program to improve capacity and install instrument landing system aids at reliever and other nonmajor airports in 56 metropolitan areas. By making alternative airports more attractive to general aviation, FAA expects to relieve congestion and reduce the mix of air carrier and general aviation aircraft at major airports.

CONCLUSIONS

As discussed in chapter 2, small changes in the number of peak hour operations can reduce aircraft delays considerably. Peak hour general aviation demand at major airports is significant. If reliever airports could accommodate some of this traffic, they could do much to reduce the increased fuel use and costs which result from delays.

The ability of relievers to accommodate general aviation traffic diverted from major airports, however, is limited by

- closures of privately owned relievers and
- unmet development needs, such as upgraded runways, increased capacity, and instrument landing aids for both publicly and privately owned relievers.

We agree with the Secretary of Transportation's proposal that privately owned relievers should be eligible for Federal aid. Many privately owned reliever airports are important in relieving congestion at major airports. If peak surcharges or quotas are used to divert general aviation from major airports, the development and continued operation of privately owned relievers will be even more necessary.

Each year, the Federal Government spends millions of dollars to develop reliever airports. However, FAA has no method for determining to what extent ADAP-funded improvements help reduce delays at major airports.

RECOMMENDATION TO THE CONGRESS

To help in the development and continued operation of privately owned reliever airports, we recommend that the Congress make them eligible for ADAP. This could be accomplished by amending

--section 14(a) of title 1 of the Airport and Airway Development Act of 1970, 49 U.S.C. 1714a, to read "public-use" in lieu of "public" in the first sentence; and

--the last sentence of section 15(a) of the Airport and Airway Development Act of 1970, 49 U.S.C. 1715(a)(4) to read

"\$18,750,000 of the amount made available for fiscal year 1976, including such period, and \$15,000,000 of the amount made available for each of the other fiscal years shall be distributed at the discretion of the Secretary to reliever airports including privately owned reliever airports."

RECOMMENDATION TO THE SECRETARY OF TRANSPORTATION

To better evaluate the effectiveness of ADAP funding and to help set priorities, we recommend that the Secretary develop a method which will enable reliever airport operators to determine to what extent their proposed improvements will help reduce congestion and delay at major airports.

AGENCY COMMENTS

FAA officials generally concurred with our conclusions and recommendations.

CAB supported our finding and conclusion that reliever airports are important. (See app. III.) CAB suggested that some portion of the revenues derived from peak hour pricing could be used to help develop relievers.

AVIATION ACTIVITY FORECAST

	<u>1978</u> <u>estimate</u>	<u>1990</u> <u>forecast</u>	<u>Average annual</u> <u>Growth rates</u> (percent)	<u>Growth</u> (percent)
AIR CARRIERS				
Revenue Passenger Enplanements (Millions)	262 4	453 9	4 7	73 0
Revenue Passenger Miles (Billions)	212 5	394 1	5 3	85 5
AIR TAXI (COMMUTER) CARRIERS (Millions)				
Operations	3 1	5 6	5 1	80 6
Revenue Passenger Enplanements	8 2	16 5	6 0	101 2
Revenue Passenger Miles	941 6	2,081 5	6 8	121 1
AIRCRAFT OPERATIONS (Millions)				
Air Carrier	10 1	12 9	2 1	27 7
Air Taxi (Commuter)	3 5	8 4	7 6	140 0
General Aviation	50 6	76 4	3 5	51 0
Military	2 5	2 5	-	-
Total	<u>66 7</u>	<u>100 2</u>	<u>3 5</u>	<u>50 2</u>

Source FAA Aviation Forecasts Fiscal Years 1979-1990, p 10

RANKING OF MAJOR AIRPORTS BY NUMBEROF PASSENGERS BOARDING AIRPLANES

<u>Rank</u>	<u>City</u>	<u>Location identifier</u>	<u>1977 est. passengers</u>
			(000 omitted)
1	Chicago O'Hare	ORD	20,137
2	Atlanta Hartsfield	ATL	14,850
3	Los Angeles International	LAX	13,433
4	New York John F. Kennedy	JFK	11,273
5	San Francisco International	SFO	9,907
6	Dallas-Ft. Worth Regional	DFW	8,650
7	New York LaGuardia	LGA	7,543
8	Denver Stapleton	DEN	6,965
9	Miami International	MIA	6,291
10	Honolulu International	HNL	6,199
11	Washington National	DCA	6,180
12	Boston Logan	BOS	6,071
13	Detroit Metropolitan Wayne Co.	DTW	4,361
14	Pittsburgh International	PIT	4,229
15	St. Louis Lambert	STL	4,098
16	Minneapolis-St. Paul International	MSP	3,983
17	Philadelphia International	PHL	3,967
18	Seattle-Tacoma International	SEA	3,817
19	Houston Intercontinental	IAH	3,781
20	Las Vegas McCarran	LAS	3,715
21	Newark International	EWR	3,585
22	Cleveland Hopkins	CLE	3,124
23	Tampa International	TPA	2,776
24	New Orleans Moisant	MSY	2,566
25	Kansas City International	MCI	2,540

Source: FAA Terminal Area Forecasts 1979-1990, p. 13.



CIVIL AERONAUTICS BOARD

WASHINGTON D C 20428

IN REPLY REFER TO B-1

July 24, 1979

Mr Henry Eschwege
Director
General Accounting Office
441 G Street, N.W
Washington, D C 20548

RE Comments Relating to Draft Report Entitled
"Aircraft Delays Can Be Reduced at Major
United States' Airports"

Dear Mr Eschwege

The Board's staff has given considerable attention to the proposed report accompanying your correspondence of May 23, 1979, and the amendments submitted on June 18, 1979. Our specific comments and response to various proposals or recommendations in the draft report follow

1 In recent months, the Board has given extensive thought to the concept of pricing and its potential for relieving airport congestion and environment concerns at airports throughout the country. Enactment of the Airline Deregulation Act in October 1978 has resulted in an increase in airline operations at virtually all large hubs and most medium and small hub airports. This increase in airline activity has placed renewed pressure upon airport operators, airline officials, and various federal agencies to formulate policy for controlling aircraft congestion and maintaining environmental goals and objectives that have been established at the local/state level.

Our analyses to date favor pricing or auction schemes for allocating scarce resources (airspace rights, limited landside facilities and environmental impacts) at expanding airports. The principal alternative to these schemes is the imposition of governmental quotas. In our view, quotas raise very difficult policy, economic, and technical problems and, in the end, may make it more difficult to achieve the goals set forth in the Deregulation Act. We think that the objective of free airline entry and exit and competitive pricing will be better served, and the transition to a deregulated air transportation system made easier if the allocation of peak-hour landing rights and other scarce airport resources is accomplished, insofar as possible, by pricing rather than regulatory or other alternative nonmarket methods. Similarly, to the extent that governmentally imposed limits on overall airport use are necessary, we strongly favor market-type allocations among users within the imposed limits.

We are presently studying various ways in which landing and takeoff opportunities might be allocated at congested airports and have not yet reached a final conclusion. In particular, we are examining the effect of various allocation schemes on small community service.

Mr Henry Eschwege (2)

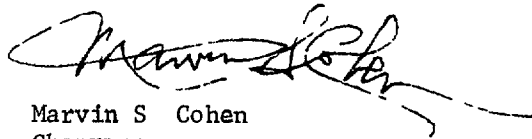
2 We support the report's finding and conclusion on the importance of reliever general aviation airports. When the subject of congestion at major U S airports is studied, the importance of reliever airports is often overlooked.

The GAO report could reenforce the importance of this finding by recommending that at least some portion of the users' charges derived from peak-hour or congestion pricing be dedicated to a special trust fund available solely for the development of general aviation reliever airports to mitigate congestion at existing large and medium hub airports.

3 We think that your final report should recognize the role of airport proprietors in implementing congestion reduction programs and their responsibility for assessing the impact of these programs on airport proprietary responsibilities and duties. A more acceptable approach would recognize the proprietary interests of airport operators and authorize the Secretary of Transportation to give airport operators the first opportunity to develop congestion abatement plans and submit these plans to the Secretary of Transportation for final approval. If airport officials failed to develop and implement acceptable congestion reduction programs within a reasonable time, the Secretary of Transportation could then act directly to implement such programs.

The Board appreciates this opportunity to review the draft GAO report on aircraft delays at U S airports, as well as our recent exchange with you of ideas on potential measures for reducing air traffic congestion. Please feel free to contact Mrs Ruth Bell at your convenience, if you wish elaboration of our comments. As we mentioned when we met, we are, with the FAA, funding the work of an economic consultant to study some of the problems raised by quotas. When this report is completed, we would be happy to forward it to you and to meet with you to discuss it.

Sincerely,



Marvin S Cohen
Chairman

(341013)

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