

**AIR FREIGHT:  
THE PROBLEMS OF  
AIRPORT RESTRICTIONS**

**Raymond A. Ausrotas and  
Nawal K. Taneja,  
Editors**

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OF  
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**FLIGHT TRANSPORTATION  
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AIR FREIGHT:  
THE PROBLEMS OF AIRPORT RESTRICTIONS

Final Report on the Conference  
of Air Cargo Industry Considerations  
of Airport Curfews

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## EXECUTIVE SUMMARY

### The Conference

Noise due to aircraft was considered to be a potential problem as far back as 1952, when the Doolittle Commission established by President Truman urged that a major effort be made to reduce aircraft noise. With the advent of the jet age in the late 1950's and the concomitant spread of suburbs towards airports in major cities such as New York, Denver, and Minneapolis-St. Paul, many more people became exposed to noise, and concern and anger intensified. Although only a small percentage (estimated at about 2-3%) of the total population of the U.S. is affected by high noise levels, these people and their representatives have been quite vocal about their dissatisfaction with noise abatement progress, even though technological advances have reduced the noise emanating from aircraft engines. As a result, the airports, the communities, and the federal government are seeking additional measures that will further diminish the noise impact of aircraft and airport operations.

The dilemma is to decrease noise with the minimum economic disruptions to commerce, the community, and the aviation industry. Since very few people like to travel during the night hours (approximately 10 p.m. - 7 a.m.), and indeed very few aircraft operations take place (less than 5% of total operations at most airports), an environmentally and politically appealing option to diminish the effect of aircraft noise is to ban airplane operations during nighttime hours. However, a disproportionate number of operations at night are dedicated to cargo (about 50% of scheduled domestic all-cargo flights), and it is upon the air cargo industry and those users dependent upon nighttime flights

that the major burden of a curfew would fall. The benefits of curfews are apparent; the economic penalties associated with them are not.

To address this issue, the Flight Transportation Laboratory of the Massachusetts Institute of Technology hosted a week-long conference at Jupiter, Florida, in January, 1979, on the impact of airport use restrictions on air freight. This conference was sponsored by the Federal Aviation Administration and the Port Authority of New York and New Jersey. More than 70 participants, including some 50 panelists and speakers, represented various viewpoints of the air cargo industry: the users, the airlines, the airports, the communities, and various governmental agencies.

#### Summary of Findings

Certain dominant themes emerged early in the proceedings and were repeated, with some important variations, as the conference unfolded.

Curfews were generally identified as a local, rather than national, sub-issue of the noise problem, although some arguments were advanced that the federal government should disallow the imposition of curfews at any U.S. airport. Curfews come in many variations, some of which are perceived as being more onerous than others. Absolute curfews on scheduled operations during a specific time interval falling between 10 p.m. and 7 a.m. were considered the least acceptable, because they provide the least flexibility to the users of the system. There are voluntary curfews (Minneapolis-St. Paul) and formal curfews (Toronto). Some airports have developed curfews which distinguish between aircraft which do or do not comply with FAR 36; some bar jets only; some allow operations on certain runways; and some limit the overall number of flights during nighttime hours. Finally, some airports have imposed

combinations of these options.

The question of curfews, pro and con, was rapidly identified as a social benefit versus economic cost argument. The social benefits to people impacted by noise were obvious, although some questioned why noise had not been a conscious consideration in their initial decision to locate or continue to live near airports. Indeed, a telling argument against curfews was that an immediate economic penalty to the communities around airports would be that jobs currently associated with the nighttime activities would either be eliminated or curtailed. The longer term economic disruptions to the metropolitan area due to nighttime restrictions, and subsequent secondary effects upon the airport communities, were also identified as probable consequences. Finally, the likely addition to the number of operations occurring near the curfew deadlines could in turn lead to a substantial increase in annoyance during those periods.

Air freight has grown because it has filled a need for a fast and reliable transportation service, going beyond the emergency shipments of medical supplies and other urgently needed goods. Users are willing to pay a premium because they perceive that this service allows them to increase their overall business (by selling perishable or dated goods in areas beyond the reach of a cheaper but slower mode), to decrease their overall distribution costs (by reducing inventory and warehousing needs and capital costs), or both.

Curfews are anathema to these service goals because of the temporal nature of the businesses which have come to rely on airfreight, be they manufacturing, retail, perishable or dated goods industries. The air

freight forwarding industry, which handles about 50% of the total domestic tonnage shipped by air, and 70% of the tonnage shipped during the nighttime hours, equally opposes the curfew concept. (Internationally, nighttime traffic tendered by forwarders rises to about 85%.)

The air freight forwarder cycle is as follows: pick up goods at the close of business at various locations, consolidate them, and truck them to the airport, reversing the process in the morning hours. Thus goods arrive at the airport late (after 8 p.m., generally): a decrease in this time cycle means an increase in the manpower and vehicles required to handle the same overall volume, leading to higher costs through decreased utilization and efficiency. The air freight forwarders expect to get the goods to the airlines on the same night, not only to insure speedy delivery, but also to avoid the costs associated with warehousing. Without structural changes in the air freight forwarding industry, overnight delivery is essential for forwarders, even if not for the shippers themselves.

Representing the shipper's point of view, a radioisotope manufacturer is a perfect example of how curfews would affect business on all possible levels:

- (1) The shipper needs fast service; radioisotopes have a half-life of two-and-one-half days and a curfew would reduce the useful life of this product.
- (2) The shipper needs highly reliable service; excessive delays would render radioisotopes useless.
- (3) The shipper has centralized his manufacturing and distribution facilities because of availability of air freight; a curfew would limit the radioisotope manufacturer's market potential.



Shippers in different industries and areas depend on air freight because of one or more of the above considerations: the cut flower industry uses air because overnight shipment eliminates the need to refrigerate flowers; retailers use it because it prolongs the sales life of high-fashion garments, minimizing inventory and shortening the period that capital is tied up in stock; manufacturers of high value items use it to eliminate many regional manufacturing and distribution facilities while still not incurring a service disadvantage with respect to local suppliers and manufacturers. Curfews would affect all industries dependent on air freight; the degree of impact depends on how critical overnight delivery is to their operation.

Additionally, airline revenues would be decreased by the amount of revenue diverted to other modes (if indeed diversion, rather than outright elimination of shipments, took place). Curfews could add as much as twenty-four hours to the delivery time of most shipments, bringing the speed of air down to that of surface modes up to distances of about one thousand miles.

The curfew sensitive operations are basically the all-cargo flights; some 50% would be affected by nighttime curfews, compared to only about 10% of the cargo capacity available from passenger operations. These percentages are based on the assumption that curfews would be imposed at all U.S. airports; closing down only specific airports at night would naturally have widely differing impacts on the industry. For example, if Chicago were subject to a curfew and no alternative airport were open, Flying Tiger operations in the midwest would essentially cease. Some 70% of Federal Express' capacity would be lost to a curfew at Memphis.

The international cargo carriers (Pan Am, Seaboard, and Flying Tiger) are able to cope with curfews in other parts of the world because the U.S. gateways do not impose curfews.

Airlines would have several options if restrictions were enforced. These include such immediate steps as rescheduling flights at curfew affected airports and diverting flights to close-by airports without curfews (if available). Weather and operational delays would now become more economically severe if they cause flights to be delayed into the curfew hours. Longer term solutions include purchasing additional aircraft (if the airline's strategy is to maintain the same overall lift capacity), or reducing frequency and eliminating markets. Pan Am estimates that a 15% increase in its international cargo fleet would be required to cope with U.S. curfews; Flying Tigers estimates a 10% increase in its domestic direct operating costs, given curfews at Los Angeles, New York and Chicago (with Chicago operations moved).

The impact on airports of curfews would be both operational and economic. A negative economic impact would result from the under-utilization of the infrastructure even if all flights were rescheduled and no revenue was lost from airlines. Operational problems could arise because of the likelihood of a great number of operations scheduled around the curfew deadlines, as well as more peaking of landside cargo traffic.

The final theme that emerged from the conference was that ultimately the consumer would pay for all the increased costs that curfews would bring about. The growth in the air freight industry that has taken place to date would stop and major changes in its structure would have to take place before it commenced to grow again, if at all.

## INTRODUCTION

### Conference Purpose

The purpose of the conference was to investigate, quantify (where possible) and document the attitude of the air freight industry toward airport restrictions, and to gauge the potential overall economic impact of such restrictions. Topics that were addressed included: the magnitude of diversion or abandonment of air shipments; cost impacts; changing attitudes of shippers; changes in the industry, such as relocation; changes in airport usage; and other collateral effects such as "energy" utilization changes.

Participants in the conference were invited from the ranks of air freight shippers, carriers, airports, government agencies, and the academic community. The basic structure of the conference was that of panel sessions in the morning and afternoon, followed by discussion periods. Keynote speeches began each day's proceedings. A list of keynote speakers, panelists, participants, and selected papers are contained in Appendices A-D.

### Background Information

In the last 20 years, aircraft noise has become a major problem around the world. Environmental groups, in general, and people from neighborhoods surrounding the airports, in particular, have expressed serious concern about the impact of aircraft noise on their lives. Among the possible noise abatement options available, these groups have focused on the establishment of nighttime curfews to avoid the disruption of sleep. The airlines, the shippers, and the airport operators understand

and respect the communities' concern about this problem, but they are also concerned about the economic impact of curfews. There is no question that aircraft noise is a recognized problem and that it is a shared responsibility to effectively deal with the issue; the question is whether curfews represent an equitable and effective solution in each case, given the associated economic penalties.

Although procedural attempts were made as early as the mid-fifties to bar jet aircraft operations at urban airports, there was no specific reference to noise in the Federal Aviation Act of 1958. The New York Port Authority (now the Port Authority of New York and New Jersey) was one of the first to adopt a policy disallowing jet aircraft into its airports until they could operate within certain noise level standards; the noise levels could not exceed those of the largest propeller aircraft (1).

At the federal government level, the Office of Noise Abatement was established within the Department of Transportation in 1967. The 1958 Act was amended in 1968 to allow the FAA to prescribe and amend standards for the measurement, control, and abatement of aircraft noise (2). As a result, in 1969 the FAA prescribed noise standards for new aircraft (Public Law 90-411). In December 1976, the FAA issued a regulation requiring all turbojet aircraft of more than 75,000 pounds (gross weight) to comply with the established noise standards by January 1, 1985.

At about the same time, the Department of Transportation published a comprehensive Aviation Noise Abatement Policy which had as its underlying philosophy that the fight against aviation noise was a joint responsibility of government, air carriers, airport proprietors, and citizens. Additionally, the federal government focused on aircraft landing

and takeoff procedures to promote noise abatement.

Local airport operators were encouraged to consider actions such as curfews, quotas, landing fees, preferential runway use, and acquisition of land adjacent to the airport boundary to reduce noise. However, in taking these actions, the airport operators were not to discriminate unjustly against users, impede safety, or unduly burden interstate or foreign commerce or Federal treaty obligations (3). It therefore becomes exceedingly important to be able to judge when these factors come into play. Determination of "undue burdens" is perhaps the most difficult of these to make.

At the present time a number of airports around the world either have in use or have planned for the immediate future a number of types of airport restrictions. In a recently conducted world-wide survey with 139 respondents, the Airport Operators Council International (AOCI) reported the following information:

- Of the 24 U.S. large hub airports responding, 15 reported noise abatement programs, including two with night curfews;
- Of 40 major non-U.S. airports, 35 reported noise abatement programs, including 17 with night curfews;
- Of 21 U.S. medium hub airports, 12 reported noise abatement programs, including 3 with night curfews;
- Of 33 U.S. small hub airports, 14 reported noise abatement programs including 5 with night curfews; and
- Of 7 U.S. reliever-type airports, 5 reported noise abatement programs, including 3 with night curfews.

The individual airports and their curfew hours are shown in Table 1.

Common types of airport restrictions include noise abatement takeoff and landing procedures which may provide: (1) assignment of

Table 1

## AIRPORT HOURS OF NIGHT CURFEW (BASED ON GREENWICH MEAN TIME)

NOVEMBER 1978

+/- GMT	AIRPORT	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100		
+12:00	Auckland	X	X	X	X	X	X																				
+11:00	Brisbane		X	X	X	X	X	X	X																		
+10:00	Melbourne		X	X	X	X	X	X	X																		
	Sydney		X	X	X	X	X	X	X																		
+ 9:30	Adelaide		X	X	X	X	X	X	X																		
+ 9:00	Tokyo	X	X	X	X	X	X	X	X	X												X	X	X	X		
+ 8:00	Perth			X	X	X	X	X	X																		
	Hong Kong		X	X	X	X	X	X	X	X																	
+ 7:00																											
+ 6:00																											
+ 5:00																											
+ 4:00																											
+ 3:00																											
+ 2:00																											
+ 1:00	Copenhagen*1												X	X	X	X	X	X									
	Zurich										X	X	X	X	X	X	X	X									
	Hamburg										X	X	X	X	X	X	X	X									
	Munich										X	X	X	X	X	X	X	X									
	Nannover										X	X	X	X	X	X	X	X									
+ 0:00	Aberdeen										X	X	X	X	X	X	X	X									
	Edinburg										X	X	X	X	X	X	X	X	X								
- 1:00													X	X	X	X	X	X									
- 2:00																											
- 3:00																											
- 4:00																											
- 5:00	Baltimore*2																										
	Washington																X	X	X	X	X	X	X	X	X	X	
	(National)																X	X	X	X	X	X	X	X	X	X	
- 6:00	Kalamazoo, MI																	X	X	X	X	X	X	X	X	X	
	Wiley Post, OK																	X	X	X	X	X	X	X	X	X	
	Minneapolis, MN																	X	X	X	X	X	X	X	X	X	
	Edmonton																	X	X	X	X	X	X	X	X	X	
- 7:00																											
- 8:00	Sacramento, CA	X	X	X														X	X	X	X	X	X	X	X	X	
	Orange Co., CA	X	X	X														X	X	X	X	X	X	X	X	X	
	Palm Springs, CA	X	X	X														X	X	X	X	X	X	X	X	X	
	San Jose, CA	X	X	X														X	X	X	X	X	X	X	X	X	
	San Diego, CA	X	X	X														X	X	X	X	X	X	X	X	X	
- 9:00																											
-10:00	Hilo, HI	X	X	X	X																						
-11:00																											
+ 1:00	Frankfurt											X	X	X	X	X	X	X	X								
- 5:00	Montreal/Dorval											X	X	X	X	X	X	X	X								

All times are in Greenwich Mean Time (GMT) (Zulu)

\*1 Being Planned

\*2 (L) Baltimore only has a curfew on multi-engine operations on Runway 4/22

SOURCE: Survey of Airport Noise Reduction and Operating Restrictions

arrival/departure headings to keep aircraft from flying over populated areas, (2) establishment of minimum altitudes, (3) use of segmented approaches and steep climbouts, and (4) use of preferential/rotational runway-user programs. The latter programs assign runways that keep the aircraft away from the critical areas, or rotate aircraft operations to disperse noise equally over populated areas.

Nighttime curfews are more common at non-U.S. airports. For example, in a recent survey of 61 countries, the International Civil Aviation Organization (ICAO) found that 22 countries have implemented curfews: 14 in Europe, 1 in the Caribbean/South America region, 4 in the Middle East/Southwest Asia, and 3 in the North America/Pacific region; these 22 countries report 52 airports having nighttime curfews.

## CONFERENCE REPORT

### USERS

#### Direct Shippers

Shippers pay a premium to be able to tender their consignments at night and have them transported during the night for next morning delivery. At the close of the business day, these shippers need time to collect, process, and transport their goods to the airports. It was evident from the information presented by the Massachusetts Port Authority that the real success of late night departures was related precisely to the lateness of the departure. Although carriers offer substantial rate incentives to transport freight on their passenger flights during the daylight hours, many shippers choose the option of paying a premium for late night departures.

Time-sensitive air freight commodities are best served by overnight delivery, perishables being the most obvious. For example, cut flowers have consistently ranked in the top ten commodities shipped by air freight. California and Florida rank one and two, respectively, in the production of cut flowers in the United States. In Florida, these ornamental crops are produced, primarily, from the first of October through the end of June, at various farming locations scattered throughout the state. The growers and shippers of these flowers market them to wholesalers and retailers located throughout the United States and Canada.

Since this is a very perishable commodity, the crop is shipped either by air freight or refrigerated trucks. Shipments that proceed on air freight are not refrigerated; therefore, time is of the essence.



The crop is harvested during the early morning hours, transported to the packinghouses where it is graded and packed into shipping containers. It is then transported to the truck terminal or air freight terminal for shipment. By the time this is accomplished, it is late afternoon or early evening. Historically, these flowers are put on flights departing after 6:00 p.m., to arrive, in most cases, at their northern and western destinations during the night and early morning hours for sale by wholesalers to retailers at the start of each day for that day's market and use. Obtaining frequent fresh supplies of flowers is preferable to buying a whole week's supply at one time, since they are highly perishable.

If airports were forced to close at night, the flowers would be held at the terminals overnight and then moved the following morning. Even if these morning departures were in the early daylight hours, the arrival time at northern markets would still be too late for that day's business and would necessitate holding the flowers over for another twenty-four hour period. Curfews would have a drastic impact on this industry.

An example of dated commodities exists in the printed-matter industry which requires the availability of both scheduled and non-scheduled air carriers throughout any 24-hour period. The needs of Time, Inc. vary from the individual minimum 5-pound package containing fast-breaking news film to 40,000 pounds of printed pages, loaded on pallets. The company is so concerned about the potential delay to film-packet shipments due to factors such as curfews that it is developing an electronic page transmission system between New York and other printing plants. Time, Inc. emphasized that publication of news cannot work

around curfews; news events around the world obviously occur regardless of the time of day in New York.

U.S. News and World Report tenders over 30,000 pounds of airfreight per week; 97% of this is tendered during the weekend hours and about 13% is intended for departures and/or arrivals during proposed curfew hours. Magazine production begins at midnight each Friday and continues through 0800 each Sunday. In the event of curfews, the magazine would not be able to utilize airfreight services for 16 of the 32 production hours. Furthermore, the company could not rely on daytime airfreight service because of probable lack of sufficient capacity. First, cancellation of nighttime flights would have an impact on some daytime flights due to rescheduling. Second, the U.S. Post Office, which takes about 20% of the volume at night, would utilize much of the cargo space available on daytime combination flights. Third, the baggage of shifted passenger traffic would utilize much of the space on the combination flights.

Another example of time sensitive shipments is National Airlines Flight 97 which departs New York's JFK airport at 1:30 a.m. and arrives in Miami at 0345 a.m. This flight typically carries some 12,000 pounds of newspapers, including the New York Times, the Daily News, the Racing Form and the Jewish Floridian, which must be distributed early in the morning to the many hotels catering to the important tourist trade along the south Florida Gold Coast. These papers cannot arrive at JFK prior to midnight due to printing schedules. In fact, on Flight 97, the First Class seats are not sold but covered over so that the newspapers can be placed on them.

In addition to the above examples, there are a significant number of businesses that depend on rapid response and overnight delivery. The aviation industry, for example, depends upon 24-hour air freight for parts replacement programs. Planes which are grounded pending arrival of parts require an immediate response--or air schedules cannot be met. In the research and development industry, critical items for equipment undergoing test programs must be moved expeditiously or critical time schedules cannot be met and costs will soar. In the drug industry, providing drugs for treatment requires rapid response whether the reason is the comfort of the patient, preventing possible complications which can be caused by delay, or in numerous emergency situations, preventing death itself. Despite the higher costs of air freight, compared to surface modes, total distribution cost analysis has made a case for air freight by providing higher profits. The flexible use of air freight can eliminate warehousing, increase sales, decrease handling costs, decrease insurance costs, and reduce the time during which goods are tied up in transit. Although the average shipper may not be familiar with distribution cost analysis, shipper surveys show a certain amount of understanding of this concept.

As an example of the decision to use air freight based on distribution cost analysis, consider the case of American Optical, a major manufacturer of optical products such as eyeglass frames; the major product line produces approximately 20,000 stock-keeping items. The manufacturing and distribution point for the company is located in Southbridge, Massachusetts; 65 miles from Boston's Logan, 45 miles from Hartford's Bradley, and 160 miles from the major New York and New Jersey airports.

American Optical uses air freight as a distribution tool because of the relatively high value of its products and the wide range of its

stock-keeping items. The latter characteristic makes it financially unsound to maintain a complete product line at all branch and distributor locations. The company, therefore, relies heavily upon the speed and dependability of air freight for planned shipments as well as emergency stock outs.

The daily shipping orders are received by the company by mid to late afternoon, due to its geographic location (Eastern Time Zone). The orders are processed and ready for shipment in the late afternoon or early evening when arrangements are made (for example, with air freight forwarders) for pickup. By the time the shipments reach the airport of departure, it is usually 9 p.m. to midnight; in time for late night and very early morning departures. Goods can therefore be recovered at the destination airports early enough to provide same-day delivery to the company's branches and customers.

In the event of nighttime curfews, next-day delivery will no longer be possible, placing a company like American Optical at a definite disadvantage compared to local suppliers and manufacturers. Carrying more inventory at the branch and distributor level to compensate for the increased delivery time, on the other hand, would drastically increase carrying costs which would eventually have to be passed on to the public. The imposition of curfews would, therefore, make the use of air freight service less attractive to shippers such as American Optical. This is true for many companies which have located their manufacturing facilities in or near certain metropolitan areas primarily because of the excellent air freight schedules available at nearby airports which facilitate national and even international distribution. A number of companies have centralized manufacturing facilities rather

than establish satellite plants in a number of different locations because of the availability of air freight services. Centralization of manufacturing facilities results in savings which can be shared by the consumer and the manufacturer. These companies have found that replacing redundant manufacturing facilities with a distribution system served by air transportation provides distinct advantages and real savings to the consumer.

Companies which have made this decision and have already constructed both manufacturing and distribution facilities based upon the availability of air freight services would be in a disastrous situation if they were to lose a significant portion of this service. Untold millions and probably billions of dollars in facilities would have to be revamped, replaced or abandoned.

As another example, in 1967 it became evident to Hoechst-Roussel Pharmaceutical that it could not develop the pharmaceutical markets located in the western states without the benefit of air transportation to overcome the distance between its manufacturing plant and the ultimate consumer. Hoechst-Roussel recognized the fact that as a small company, with a relatively new product, it could not justify nor afford remote distribution centers to expand successfully in these distant markets. With the introduction of containerized methods of handling air freight, Hoechst-Roussel immediately took advantage of this concept and used it as the primary means of not only transportation but of bringing its markets within a reasonable and competitive delivery time from its plant in Ohio.

Utilizing air transportation Hoechst-Roussel was able to nearly equalize the time in transit to all of its customers located at distances of over 750 miles with those located less than 750 miles from their plants.

Today, Hoechst-Roussel is among the top twenty ethical pharmaceutical manufacturers and distributes the fifth most frequently prescribed drug in the nation. Air transportation is still a key factor in its ability to service its customers' needs, from the routine daily containerized shipments for distribution to the west and southwest, to the life and death emergency shipments that require same day delivery. Hoechst-Roussel utilizes air transportation as the primary means of distribution to over thirty-five per cent of its markets.

For Hoeschst-Roussel, curtailment of air traffic would translate into accelerated plans for additional remote distribution centers, and could quite possibly curtail seriously the company's ability to service the public in cases of life and death situations.

However, Hoeschst-Roussel feels that even if it were feasible to redirect air freight traffic, the entire system would have to be revamped. Warehouses would have to be built to hold expanded inventories necessitated by a slower distribution system; and the entire business cycle would have to be drastically revamped. The net result would be that the consumer would either receive less responsive service or would have to pay a higher price for commodities purchased.

Federated Department Stores, a company with annual revenues of \$5 billion in retail outlets across the country, has adopted the total distribution concept. Air freight has become an integral part of Federated's profit plan; 60¢ of its transportation dollar is for air. Air freight is viewed as a business tool to be wielded positively in minimizing inventory and warehousing, shortening the period that capital

is tied up in stock, and protecting the company against obsolescence of its merchandise, some of which, like high fashion garments, has an average shelf-life of 16 days.

Over the years, the air freight industry has persuaded Federated Department Stores, American Optical, Hoechst-Roussel and many other corporations to depend upon air freight and to build it into the fabric of their business strategy. Adoption of curfews is seen by those users as a dangerous policy which will threaten their normal way of doing business.

### Forwarders

Air freight forwarders derive their revenue from the spread between the higher small shipment rates paid to them by shippers and the lower volume shipment rates that they in turn, pay to airlines.\* The forwarders therefore need time to collect, process, consolidate, and deliver large shipments to the carriers. Nighttime departures, freighter or otherwise, are of prime concern to this segment of the industry which accounts for about 50% of the domestic airfreight revenues. In one survey, 83% of the forwarders were willing to pay higher rates to maintain overnight service (5). The desirability of nighttime service (primetime lift) is echoed by the Emery Air Freight Company which chartered aircraft to serve its short- and intermediate-haul markets. This forwarder, the largest in the industry, moves almost

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\*There are, of course, other services provided by the air freight forwarders in addition to consolidation. These may include, for instance, pick-up and delivery, packing, storage, insurance, and paperwork (4).

two-thirds of its traffic between 2300 and 0300. The forwarders are therefore concerned about the impact of curfews since they consider overnight delivery as the key selling point of their service (6).

#### U.S. Post Office

Another impact of airport curfews would be the delay in the movement of air mail. At the present time, approximately 25% of the total number of pieces of all types of mail shipped (including international) is transported by airlines and one fifth of the air mail, or 4.9 billion pieces per year, moves in aircraft departing during the hours 2200 and 0700.

Mail originating in a specific local area is usually received in post offices at 5:00 p.m. or later. The collection and processing of that mail generally requires three to four hours, with additional time needed for transportation to the airport. Therefore, again, depending on the local situation, this mail is often not available for flights departing before 9:00 p.m. In such situations, the Postal Service is dependent upon late evening and early morning air flights to meet its current service standards. In locations where curfews have been established or where they might be established, the Postal Service would be forced to hold much of this mail over for the departing morning flights, usually in combination aircraft. There could be some problems with lift capacity on early morning flights if most of this mail was held over. The net effect would probably be a lengthening of the required service time to certain areas of the country depending again on flight availability in the early part of the day. Under



the Post Office's current service standards, it generally tries to deliver preferential mail within the second delivery day to destinations between 150 and 600 miles from the origin point. Some of these destinations would probably fall back to a three-day service standard with the imposition of an airport curfew (7).

### The Banking Industry

The banking industry uses the airline industry to transport checks, drafts and other financial documents. Airport curfews would have a significant impact on this industry in terms of implicit losses of funds tied up in transportation, resulting in reduced investment potential. For example, the Boston banking community estimated that about four million cancelled checks, drawn on banks outside New England, pass through the Federal Reserve Bank every night. More than \$300 billion in checks intended for clearing move by air, at night, between New York City banks and other banks in the nation. It is estimated that a 24-hour delay would result in more than \$35 million a year loss in interest charges (8).

## AIRLINES

During 1978, the U.S. scheduled airlines generated approximately seven billion cargo-ton miles. Although all of the 14,000 flights operated daily by the U.S. airlines carry some type of cargo, a disproportionate share of cargo is hauled at night for delivery the next morning. As noted, this includes time-sensitive commodities such as perishable produce, pharmaceuticals, cancelled checks, fashion goods and mail. In this growing air freight industry, the imposition of nighttime airport curfews would be detrimental to the airlines causing substantial impacts on the volumes shipped and serious scheduling problems resulting in increased operating costs and reduced fleet utilization.

The Airline Deregulation Act of 1978 has produced a new regulatory environment for the U.S. airlines. With lower passenger fares and new cargo service in many markets, air traffic has been increasing significantly in recent months. Airport curfews would act counter to the current deregulation philosophy and would restrict the airlines in their efforts to provide full air transportation services to meet the public need.

A good many of the shippers (particularly from the manufacturing industry) tender their goods at the end of the business day for transportation during the night. If the aircraft leaves earlier in the night, the carrier would lose potential revenue. For example, Heathrow Airport in London restricts arrivals and departures between 2330 and 0630. Pan American would prefer to schedule one of its flights from New York through Brussels to London, arriving at London at midnight and departing for New York at 0300, the earliest time at which most of the freight

out of London is available for departure.\* The existence of the curfew forces Pan Am to fly the schedule as New York-London-Brussels-New York; the flight arrives and departs London before 2330. The carrier estimates a loss of \$3 million per year due to the premature departure.

At the time a curfew was being considered at Boston's Logan Airport, an analysis indicated that 20% of all scheduled commercial arrivals and departures could be adjusted to comply with the curfew period; about 30% could be adjusted with difficulty; and about 50% would have to be cancelled. The air carriers employ about 6700 people in Boston; about 14% of these employees work the night shift and about 64% of these in turn work in the areas of maintenance and freight handling. The Massport study estimated that a 2300-0700 curfew could eliminate 468 jobs; about 50% of which would result from reductions in flight crews and maintenance workers.

Surveys have consistently shown that the shippers using air freight have almost invariably made their decision based on a desire to optimize their delivery schedule. According to the recent survey conducted by the Boeing Company, freight rates (price) ranks third in the listing of shipper air transport requirements. Given, then, the importance of delivery schedule, it is easy to see the impact of nighttime curfews which would virtually eliminate one-third of the 24 hours available for air cargo scheduling. Furthermore, given the stress

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\* Not all of the outbound freight comes from London itself. A large part of the shipments for this flight is trucked or flown from the surrounding cities to meet this flight. Thus, an earlier departure would prevent the trucking connection; an important consideration for a major airport which serves as a collecting point.

on the overnight delivery concept, these particular eight hours of curfew become even more important.

As of September 1978, about 45% of the U.S. domestic freighter capacity was scheduled between 2400 and 0700, and about 7% of the belly cargo capacity of passenger aircraft move during this period. Using these numbers it is estimated that in 1977 about 628,000 tons of cargo moved between 2400 and 0700 in the United States; this amount would potentially be influenced by the imposition of curfews. The 1976 Massport study indicated that about 20% of the late-night schedules can be adjusted to comply with the curfews. Applying a yield of \$457 per ton on freighter cargo, and \$354 per ton on passenger lower hold, it is estimated that \$214 million would have been lost to the U.S. air carriers had curfews existed during 1977.

The imposition of airport curfews at U.S. domestic airports could extend delivery to the second day instead of next-day, resulting in some diversion to the surface modes (truckers). The extent of diversion would depend on the distance the shipment is being hauled and the number of airports having curfews. As the number of airports with curfews increases, the alternative of using motor carriers becomes more viable. Curfews would restrict the number of hours during which freighter flights could be scheduled. On the other hand, trucks can be dispatched almost any time of day or night.

In addition to potential diversion to the surface mode, airport curfews would cause enormous problems for the airline scheduler. Consider, as an example, Pan American's all-cargo operation. The carrier operates a fleet of six B-747 freighters on a route pattern that radiates from New York to: (1) London, Brussels, Frankfurt, Tehran, and

New Delhi in the Atlantic Division; (2) Port of Spain, Caracas, Maracaibo, Guatemala, Rio de Janeiro and Sao Paulo in Latin America ; (3) Sydney, Auckland, and Samoa in the South Pacific; (4) Guam, Tokyo, Hong Kong, Kuala Lumpur, and Singapore in the Orient; and (5) Chicago, Miami, Houston, San Francisco, Los Angeles and Honolulu in the United States. The scheduling process attempts to strike a balance between internal constraints (crew work limits and domiciles, maintenance, ground handling equipment and personnel) and external constraints (arrival and departure times dictated by market considerations, time zones, airport congestion and quotas, connections, load factors, and of course curfews) while attempting to provide maximum frequency and capacity.

Out of the 26 cities served by Pan American's freighters, seven have curfew restrictions. These include Auckland, Frankfurt, Hong Kong, London, Maracaibo, Sydney, and Tokyo. With the exception of the London curfew discussed earlier, Pan American has been able to provide a reasonable schedule without incurring severe penalties, partly because the U.S. gateways served by Pan American have not established curfews. However, if curfews were to be imposed at New York, Miami, Chicago, Houston, Los Angeles, and San Francisco from, say, 2300 to 0600, Pan American's freighter operations could be seriously jeopardized. The current schedule calls for a total of 107 weekly arrivals and departures at these airports, 42% of which occur between 2300 and 0600. Due to the shrinkage of the operating "windows", fleet utilization would be reduced by about 20% and Pan American would be forced to acquire an additional B-747 freighter to maintain its current level of service.

The costs of acquiring this aircraft at about \$60 million would have to be passed on to the shippers initially in the form of higher cargo rates. Eventually, the consumers would have to bear these costs in the form of higher prices charged for the goods transported by air.

Like Pan American, Seaboard World has so far managed to work around the present curfew situation in Europe, due primarily to the absence of nighttime restrictions at New York, the carrier's hub. However, a curfew at JFK would have a severe effect on Seaboard's trans-Atlantic operations. Currently the carrier achieves a better than 13-hour utilization on its B-747 fleet. Any delay due to curfews would reduce this utilization; a 10% reduction would mean a loss of approximately \$80,000 a month on a B-747 aircraft, not counting the impact of reduced load factors and loss of business.

It is clear that the scheduling process would be severely disrupted by the imposition of curfews. It should be kept in mind that aircraft scheduling is closely tied to crew scheduling and in turn to flight crew working rules. Any deviation from the enforcement of these work rules can increase operating expenses significantly. Pan Am, for instance, states that a five-minute delay in departure of its round-the-world flight could result in "dead-heading" an entire crew, with concomitant pay and hotel accommodation expenses (9).

Delta Airlines presently operates 1600 daily flights and 400, or 25 percent of these, are in the 6 p.m. - 6 a.m. period. Delta carries more mail than any other carrier (10 million pieces per day) because of its extensive night coach operation, even though it does not operate any pure freighters. The lower belly of the 26 aircraft L-1011 fleet serves as Delta's "Freighter", but only 40 percent of the available

lift is utilized, since there is little or no demand for cargo on daytime flights. Among the principal kinds of shippers using Delta are NASA, the Department of Defense, the Federal Reserve Bank, auto assembly plants, and textile manufacturers. Surgical and various types of radioactive materials for medical use are also among nighttime commodities. On some of Delta's night flights, notably the DC-8-61 operations, the passenger load factor is only 15 percent, but the revenue from the belly cargo makes the flight profitable.

## AIRPORTS

The air freight market is highly concentrated among a few airports. For example, almost 80% of the commercial all-cargo service is between four cities (Chicago, Los Angeles, New York and San Francisco) and only some two dozen airports in the U.S. receive daily freighter service. The consequences of a curfew would be critical at any one of these four major airports by itself; the situation would be devastating if all four were to have a curfew imposed.

According to one estimate, the U.S. system of airports served by the scheduled airlines represents an investment of about \$25 billion. The imposition of nighttime curfews would mean that these large investments would be less productive. Consider the imposition of a 2300 to 0700 curfew at Boston. A non-stop flight from Los Angeles cannot take-off after 1500; thus, a nighttime curfew at Boston has become a daytime curfew at Los Angeles. If there is a 2300-0700 curfew at Los Angeles as well, then flights non-stop eastbound flights can only depart during 8 of the 24 hours in a day. The problem is even more serious for multi-stop flights. Therefore airport facilities, not to mention aircraft, would be underutilized.

One direct impact of an airport curfew would be the rescheduling of as many flights as possible (both passenger and cargo) just prior to and after the designated curfew hours. This action would increase congestion and delay due to the "bunching" of flights at the boundaries of the curfew. Thus there may be an increase in noise exposure prior to the curfew at a time when the annoyance is already at a high level. The additional strain on airport facilities during the non-curfew



hours may require a premature expansion of these facilities, including the related infrastructure such as air traffic control systems and airport access roads. Thus curfews may cause chain reactions in several airport areas.

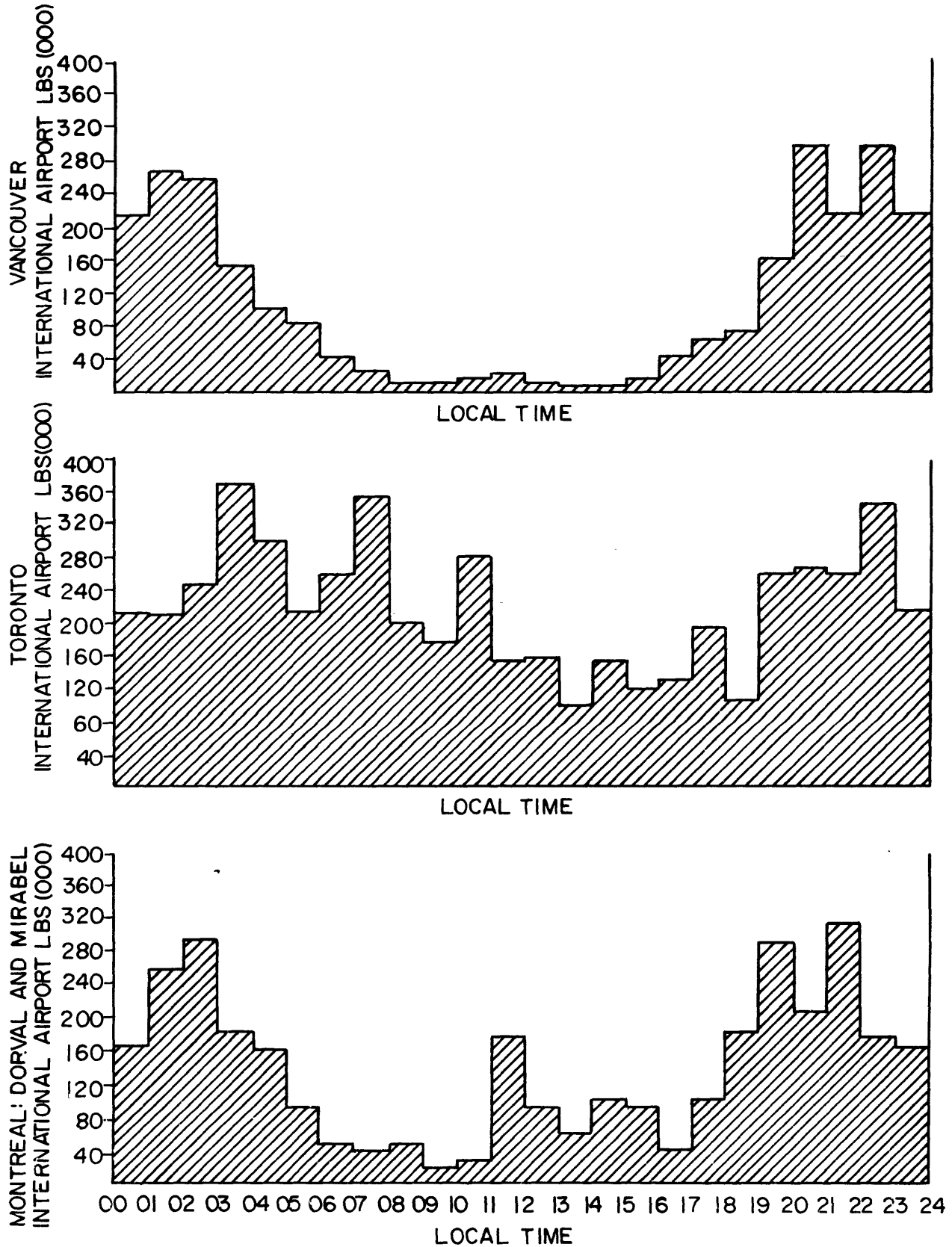
Cost considerations are important in rescheduling flights; however, in some cases rescheduling may not be possible. Consider the airports with hourly flight quotas. Rescheduling outside the curfew hours and meeting the quota system may produce a schedule that cannot be marketed, in which case it may become necessary to cancel the flight altogether.

Air Canada examined the air freight acceptance times at the three major Canadian airports of Vancouver, Toronto, and Montreal for the months of October and November 1978 (Figure 1). Acceptance time is defined as the time at which the shipper tenders his cargo for transport by the air carrier. These statistics, while biased, are better pattern indicators of when the cargo would like to move, as opposed to when it in fact physically moves. They are biased because shippers tailor, to an extent, their offering of cargo according to the carrier's published timetable.

The amount of cargo tendered for shipment after the end of the business day increases dramatically over the noon and early afternoon period. At the two non-curfew airport cities of Vancouver and Montreal, this late-night peaking phenomenon continues until early morning. Toronto, on the other hand, with its midnight to seven a.m. curfew, displays a more uniform distribution throughout the entire day.

For comparison purposes, the average daily cargo for the three airports was summarized into three time blocks: five in the afternoon

Figure 1  
 AIR FREIGHT ACCEPTANCE TIMES: GOODS TENDERED FOR SHIPMENT  
 AVERAGE MONTH (OCT & NOV)



Source: AC report 23 October/November 1978

to ten o'clock at night; ten at night to five in the morning; and, finally, five in the morning to five in the afternoon. The rationale for these divisions is as follows. The late afternoon peaking begins about the closing of the business day, that is five o'clock. A curfew at midnight implies a cut-off time of 10 o'clock for traffic moving the same day. Traffic tendered after ten p.m. could not move until the end of the curfew in the morning. Similarly, the five a.m. division is due to traffic being tendered to go on the first morning flight after the lifting of the seven o'clock curfew.

A comparison of the airports shows that in the first time period (5 p.m. to 10 p.m.), Vancouver and Montreal have 31% and 33% of the daily volume (by weight) tendered, respectively, while Toronto has 21%. Similarly, for the 10 p.m. to the 5 a.m. block, Vancouver and Montreal show 58% and 42% of the day's traffic tendered, while Toronto shows 36%. The 5 a.m. to 5 p.m. period has Toronto showing an astounding 43% traffic offering to Vancouver's 11% and Montreal's 25%.

Two items can be inferred from this. First, some overnight traffic is not being tendered for air transport and, second, some overnight traffic is tendered in the morning for transport during the day.

To predict what the traffic pattern and volume at Toronto would have been without a curfew is indeed difficult. A very simplistic method is to make the 10 p.m. to 5 a.m. period resemble that of Vancouver or Montreal. Such a projection works out to 750,000 lbs. per month, or 14% of the total Toronto airport volume. This makes the overnight time period equal to 50% of the day's demand--which is the average of Montreal and Vancouver. This 750,000 lbs. can be considered as lost traffic which probably moves by surface mode.

## COMMUNITY

The greatest impact of aircraft noise is felt by communities adjacent to the airport. However, these communities must evaluate the benefits of a curfew (noise relief) with the associated costs of curfews (potential loss of jobs). For example, the number of employees working at Boston's Logan and living in the noise-impacted communities is well over 2,000, which represents about 20% of Logan employment and about 4% of the labor force of these communities.

Although the noise problem exists all day, it is particularly irritating at night partly because of the low ambient noise and partly because of the disruption of social activities and sleep. It is true that only a small fraction of the aircraft operations take place late at night (for example, about 5% for Boston's Logan airport) but a substantial portion of the cargo tends to be hauled on these late night departures. It is also true that a number of cargo carriers operate older jet aircraft (B-707 and DC-8) which are noisier than the majority of other aircraft types.

It has always been difficult to quantify the effect of aircraft noise, partially due to the variability of human response to noise. However, attempts have been made to estimate the cost of noise through surrogate measures such as the impact on neighborhood property values, the cost of insulating homes, court settlements for property damage, outstanding liability of airport operators, purchases of easements, and the cost of replacing or retrofitting existing aircraft. In 1976, AOCI estimated that the noise damages pending nationwide against airport

operators by local communities were on the order of \$960 million. This amount would exceed a billion dollars if costs of land acquisition to preclude the possibility of noise damages were included. It is interesting to note that the cost of retrofitting all non-FAR Part 36 air carrier airplanes was also estimated to be about one billion dollars.

Moving from the national view to a specific case, the Massport study estimated that reduced property values for homes in noise-impacted communities were in a range from \$31 million to \$133 million.\* Additionally, the cost of replacing homes ranged from \$318 million to \$557 million and the cost of soundproofing varied from \$60 million to \$482 million.

There is no question that the quantity as well as the quality of air service, particularly air freight service, will deteriorate with the imposition of nighttime airport curfews. In some cases it may be possible to maintain the service but at an added cost. Depending on the specific region, there may be users who feel that they cannot compete with shippers elsewhere who have access to better service due to the absence of airport curfews. Depending on how strongly these shippers feel about this situation, they may decide to reduce their workforce or relocate their businesses. Either choice on the part of the shipper could have a significant economic impact on the community. This type of reasoning led the Massachusetts Port Authority to reconsider its curfew proposal at Logan Airport.

The following figures illustrate the economic impact of curfews

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\* Homes included were in the NEF (Noise Exposure Forecast) 30 contour and above. NEF measures areas of consistent noise levels and maps them over the geographic area affected by the aircraft operations. Noise level above NEF 30 (about 65 decibels) is usually considered unsuitable for residential use.

on a typical U.S. industrial city such as Philadelphia, Cleveland or Minneapolis-St. Paul. Boeing estimates that this typical city airport handles 50,000 tons of cargo per year. If 17% of the cargo is curfew sensitive and 10% of this curfew-sensitive cargo were to be lost, the value of this loss equals \$17 million, assuming the value of air-shipped commodities to be \$10 per pound. Further, applying a multiplier effect factor of 1.8, the impact of a curfew would add up to a \$31 million loss to the economy of the typical industrial city.

In order to obtain a more complete picture of the potential effects of nighttime curfews on the users of the system, it is necessary to compute the indirect as well as the direct effects, the latter being the additional costs required to maintain the business activity at pre-curfew levels. The indirect effects, on the other hand, reflect the long-run costs associated with curtailment of nighttime curfew operations. In addition, there are multiplier effects, since changes in one sector of the economy affect other sectors. The Massport study used an average wage multiplier of 1.775 and an employment multiplier of 1.875; the implication being that as a result of a curfew, a \$100 loss would generate another \$78 loss and that a loss of 100 direct or indirect jobs could result in another 88 jobs being lost. In the case of Boston's Logan Airport the direct job loss was estimated at 1114; the indirect at 5830, and the multiplier effect at 6094. The total possible employment loss due to a curfew being imposed from 2300 to 0700 was estimated to be 13058.

Another local economic impact study conducted by the airlines serving Chicago's O'Hare International Airport was occasioned by the so-called "noise reduction" proposals by the State of Illinois.

If instituted, these proposals could result, ultimately, in the elimination of all flights at O'Hare between 10 p.m. and 7 a.m. and in the cutback of flights in the remaining daylight hours by 32 per cent.

The report shows that as a result of such restrictions:

---The airlines would have to cancel 577 flights in a typical 24 hour period. This would deprive service to, or seriously inconvenience, 40,600 passengers.

---The airport would be closed from 10 p.m. to 7 a.m. thus eliminating 113 flight arrivals and departures daily, depriving 6,900 passengers of night flight opportunities and ending night transport of 875,000 tons of cargo annually.

---The movement of mail would be delayed seriously.

---Employment at the airport would be reduced by about 30 per cent, causing some 8,000 people to lose their jobs.

Clearly, night curfews and other restrictions on operations at airports will be costly, and, in the short term at least, will produce an economic penalty which will be imposed, in part, on the communities whose concern and well being fostered the imposition of such actions in the first place.

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Appendix A  
Keynote Speakers

Monday, January 15, 1979

Richard M. Jackson, Chairman of the Board, Seaboard World Airlines  
Morris Sloane, Deputy Director of Aviation, Port Authority of New York  
and New Jersey  
John E. Wesler, Acting Director, Office of Environment and Energy,  
Federal Aviation Administration

Tuesday, January 16, 1979

Clifton F. von Kann, Senior Vice President-Operations and Airports,  
Air Transport Association of America

Wednesday, January 17, 1979

Albert Bienn, Manager, Cargo Analysis, The Boeing Company

Thursday, January 18, 1979

Herb Lev, Managing Editor/Assistant Publisher, Air Cargo Magazine

**APPENDIX B**

**SELECTED PAPERS**

1. John E. Wesler, Keynote Speech, January 15, 1979
2. Morris Sloane, Keynote Speech, January 15, 1979
3. Clifton F. von Kann, Keynote Speech, January 16, 1979
4. Albert Bienn, Keynote Speech, January 17, 1979

Keynote Speech  
January 15, 1979

John E. Wesler

Opening Remarks

Good morning and thank you very much for being here, ladies and gentlemen. My name is John Wesler, Acting Director of the FAA Office of Environment and Energy.

This conference is being sponsored by the Federal Aviation Administration in conjunction with the Port Authority of New York and New Jersey, and the Massachusetts Institute of Technology.

The purpose of this conference is to gain as much insight as possible from you -- the shippers and receivers of goods -- to be able to better understand the nature of air freight and the potential impacts that airport use restrictions could have on that industry.

General

A number of local government and airport authorities throughout the United States are considering or have indeed already imposed nighttime airport restrictions on aircraft activity in order to mitigate the sleep disruption caused by aviation noise. The Secretary of Transportation and the Administrator of the Federal Aviation Administration have recognized the responsibility of local agencies to protect residents against the adverse environmental impacts of aircraft operations. In the DOT/FAA Aviation Noise Abatement Policy, of November 18, 1976, it was stated that,

"...the FAA will encourage a noise abatement plan from airport proprietors in conjunction with both applications for major airport development grants and proposals to establish use restrictions, such as curfews or scheduling and equipment restrictions. The FAA will advise airport operators whether proposed use restrictions are unjustly discriminatory or place an undue burden on interstate or foreign commerce because of their impact on the national air transportation system." One component of the national air transportation system which is potentially impacted by nighttime use restrictions is air freight. Serious disruption to the distribution of air freight would occur mainly because the movement of air freight is to a very large extent a nocturnal activity in the nation's major air cargo markets. Over the years, certain shippers have come to regard "next-day delivery" as essential. Accordingly, the use of air transit has played an important role to those shippers.

#### Magnitude of the Problem

Although the potential danger to the air freight industry is recognized, there are unfortunately little data available anywhere with which to study not only the magnitude of the direct impacts of nighttime restrictions on the air freight industry, but also the indirect impacts on other industries that make significant use of air freight (for example, the garment industry). Additionally, we know little about potential impacts of such restrictions on regions of the country that are major origins and destinations of freight (for example, the NY/NJ region and the Los Angeles/San Francisco area) or on the overall impact of the U.S. economy itself that might result from a significant change in the transportation patterns of the nation.

There is, therefore, an urgent need to develop basic air freight industry data so that FAA can better understand the potential problems that may arise if nighttime restrictions are imposed at several of our major airports. This understanding will aid FAA in making determinations of when "undue burdens" on interstate or foreign commerce" will occur as a result of use restrictions.

#### The Port Authority of New York & New Jersey Air Cargo Waybill Survey

Most of the specific shipper and consignee oriented information that we do have today on the air freight industry was obtained from an air cargo waybill survey conducted by the Port Authority of New York and New Jersey in 1973 and 1974.

That survey was conducted at Kennedy and Newark Airports and included the all-cargo and passenger/cargo operations of both domestic and overseas airlines, as well as the activity of the freight forwarders. At the conclusion of that survey, some 28,000 air waybills and forwarder house bills were collected representing freight on board 1400 different flights. Practically every piece of useful information on each of these waybills was recorded. For example, data collected include the names and addresses of shippers and consignees, commodity, weight of shipment, time of shipment, and so forth. For freight forwarder shipments, individual forward house bills were obtained and similar information recorded.

The result was a compilation of a detailed picture of air cargo flows into and out of the New York/New Jersey metropolitan region. There is a tremendous amount of data available from the survey and a number of spin-off studies are possible to provide supplemental data. For example, additional,

more in-depth analyses of air shippers, consignees and freight forwarders are suggested. That is the point at which FAA is presently and the point which we hope will be adequately addressed at this conference.

Hopefully, the combined data generated by the Port survey plus the inputs received here and the follow-on work to be accomplished by the Massachusetts Institute of Technology will provide greater insight into the magnitude of some of the problems that may result from airport nighttime restrictions.

#### Nighttime (10 p.m. - 7 a.m.) Air Cargo Operations at Port Authority Airports

Some of the initial findings from the Port Authority Waybill Survey are interesting by themselves and bear mentioning at this time. For example:

- (1) The Port Authority survey found that about 35% of all Kennedy and Newark Airports' freight moves between 10 p.m. and 7 a.m. -- and that represented some 472,000 tons in 1977.
- (2) "All-cargo" aircraft haul about 94% of all the nighttime tonnage -- which was about 444,000 tons in 1977, and
- (3) About 28% of all nighttime tonnage was transfer freight -- i.e., freight transshipped through New York on its way to some other final destination. Transfer tonnage amounted to about 132,000 tons in 1977.

#### Remaining Activities

There still remains a great deal of work to accomplish. Specifically, we need to know what would become of the current nighttime freight movements if nighttime curfews were put into place. What portion of freight movements

would simply be shifted to daytime air cargo shipments? What portion would turn to alternative modes of transportation such as rail or truck freight? What portion, if any, might not be shipped at all? And, in conjunction with all of these alternatives, what additional costs would be realized by the shipper or receiver in terms of dollars or time? We need your help to answer these questions. With these answers we may begin to get a handle on the potential impact of a curfew type of nighttime use restriction as it relates to interstate commerce.

Add to the picture, however, the potential impacts of the recent "Airline Deregulation Act of 1978" and our focus again gets somewhat cloudy. But I am convinced that our efforts this week will take us far in ultimately assessing this issue.

#### Restrictions as a Means to Reduce Aviation Noise Impacts

But, lest we be accused of concentrating too much on the hole and not enough on the doughnut of the question, some time should be spent on how use restrictions are viewed in general and nighttime curfews in particular.

There is much that an airport proprietor can do before resorting to use restrictions such as curfews. These options include such things as:

- o designations of areas and times of permissible engine runups;
- o close coordination with zoning authorities to preclude further residential land use encroachments adjacent to the airport; and
- o installation of noise barriers at strategic points on the airport.

But in order for the proprietor to determine exactly what his noise abatement needs are, the following should first be accomplished:

- (1) Quantify the nature of the airport's noise problem. Included here should be a thorough treatment of the current problem -- the numbers and locations of people impacted, the kinds of activities being undertaken by those people (educational, residential, recreational, etc.) and an equal treatment of the desired level of airport noise impact.
- (2) Develop a comprehensive list of all actions which can be implemented and which will reduce noise impacts.
- (3) From the start of this effort and throughout its course, thoroughly coordinate all potential noise control actions with the users, the local citizenry and FAA; and,
- (4) Institute that program which brings about the necessary remedial relief while minimizing the impositions of such a program to the airport users and community.

### Summary

We have a good start with the November 1976 Aviation Noise Abatement Policy I mentioned earlier. It is not perfect, but does afford an excellent foundation from which we may all move forward to alleviate the adverse impacts of aviation noise. A little more than two years has passed since the Aviation Noise Abatement Policy's issuance and, as with any initial concept, improvements suggest themselves as a result of day-to-day applications. I have mentioned that our policy calls for FAA to make determinations of impacts of use restrictions (such as curfews) on commerce. Your efforts at this conference will aid us in that regard. Equally important, however, is the need for early and continuing extensive



coordination among all parties who stand to be impacted by potential proprietor noise plans and use restrictions. We need a more comprehensive evaluation by the proprietor of all those actions at his disposal (not just a quick cursory review and selection from a set of use restrictions). We need a better understanding by all parties of what constitutes an appropriate use restriction (if one is absolutely necessary) and an understanding of when that restriction conflicts with the federal areas of responsibility. We at FAA are hopeful that these objectives can be accomplished.

Thank you very much for your attention. I will turn you back to Charles Hoch, our chairperson, who will be attempting to keep the conference on schedule. I wish you well in your efforts this week.

Keynote Speech  
January 15, 1979

Morris Sloane

Good morning. I am very pleased to welcome you to this conference on "Air Freight: The Problem of Airport Restrictions" on behalf of the Port Authority of New York and New Jersey.

John Wesler has done an excellent job of presenting the objectives of our program. I want to fill you in on some background that explains why this question is of such importance and why answers are so essential.

Noise is a serious problem around most of the nation's hub airports. A 1974 Federal Aviation Administration analysis indicated that there are more than six million people in communities around 25 major U.S. airports in which aircraft noise and vibration cause discomfort, ranging from considerable annoyance to severe disturbance.

The three airports operated by the Port Authority in the densely populated New York/New Jersey region are among the most seriously impacted. This same FAA study reported that there are more than one million people in the noise impact area around LaGuardia; more than 500,000 around Kennedy International, and more than 425,000 around Newark International. By rank order of people affected, the Port Authority-operated airports are first, third and fourth in the nation, with Kennedy having more people in the severe noise impacted zone than any other facility.

There is unrelenting pressure from citizens in noise-affected areas for action that will relieve them of the burden that has intruded on their lives for more than a decade. There is no question of the legitimacy of their complaint.

The Port Authority has been in the vanguard of efforts to reduce aircraft noise at its source -- the plane's engines -- and our neighboring communities have been close allies in this struggle. This is the approach that, to a large extent, reconciles the requirement of maintaining viable airport operations to serve the economy of the region while satisfying the need to improve the environment for those who must live and work in noise impact areas. These activities have gone hand in hand with continuing actions on the local level to minimize noise effects by administrative and procedural means.

Progress has been made but questions remain about how far and how fast we must go to find a balanced solution. The Port Authority believes that the best way to insure against the possibility of curfews is to quiet the aircraft fleet as quickly as possible, to the greatest extent possible.

There can be no certainty about the outcome of developments concerning noise. It is already very late in the game and contingencies like airport curfews must be explored to prepare for any eventuality. One way or another, airport communities are determined to quiet the skies above them, especially during sleeping hours. There is also no way of knowing what airport noise abatement plans will be viewed as satisfactory by the FAA in formulating requirements in keeping with its Aviation Noise Abatement Policy.

It is essential that all parties -- including those in noise-impact areas around our airports and other hub airports around the nation -- understand the potential economic consequences that may accompany various actions. We must know the price of any trade-off for quiet. In the New York/New Jersey area, as elsewhere air commerce is a major contributor to the economic well-being of the area served. Hundreds of thousands of jobs

are tied to the activity of our three airport complex. And the air freight field is an important and fast-growing component of the industry.

In fact, almost half of all the air freight shipped in and out of the United States each year is handled at Kennedy International Airport. With the largest air cargo center in the world and the most frequent overseas flight service available anywhere in the United States, Kennedy International has become America's gateway to the world for the air shipper as well as air traveler. Newark International and LaGuardia Airports handle considerable tonnage as well. Together the three airports handle well over one and a half million tons of foreign and domestic cargo and mail a year, making the New York metropolitan area the nation's leader in air freight activity. The dollar value of this cargo is about \$30 billion of which \$20 billion originates or has a destination in the metropolitan area. It is estimated that some 150,000 jobs throughout the region are directly related to the production and distribution of merchandise which is shipped by air through the metropolitan area airports.

Our stake in the question of the impact of nighttime restrictions is as great as yours. The purpose of our conference is to develop answers... to learn about the dynamics of the industry and the ramifying effects that curfews at one or more localities would have. We are interested in knowing whether the industry could shift gears and accommodate airport curfews without seriously affecting its operation and growth potential.

We want your views on what would happen to current freight movements if airport curfews became prevalent. What would be lost in the process of a changeover to daytime hours? To what degree would the loss of the capability for overnight delivery impair the industry's potential? Which of the hundreds of industries reliant on air cargo would feel tremors and

which shock waves? We are, after all, talking about a radical change in the way an important industry does its business. It's imperative that we obtain a clear picture of what the fallout would be.

We are pleased that the Port Authority's earlier waybill survey has provided a foundation on which we can build in addressing these issues. Now the stage has been reached where we need the benefits of your real-world experience and expertise.

I am confident that our conference results will be rewarding and I wish to thank you in advance for your contribution to our important objectives.

Keynote Speech

January 16, 1979

Clifton F. von Kann

My name is Clifton F. von Kann. I am Senior Vice President - Operations and Airports of the Air Transport Association of America, the trade association representing most of the nation's scheduled airlines. I want to discuss with you a new proposal being made today by the airlines to help resolve the problem of restrictions on airport use.

The remarks yesterday of ATA's Director of Cargo Services, Gerry Godbout, and the ensuing discussion should alert us to the seriousness of airport use restrictions and how they can erode the ability of the airline industry to provide full transportation services to meet public interest requirements. Air freight service is especially vulnerable to these restrictions.

The current new regulatory atmosphere for both cargo and passengers, has been created almost overnight by a drastic overhaul of CAB policies and procedures and the enactment of the Airline Deregulation Act of 1978. This has raised new challenges and opportunities for many cities and airports.

We find the CAB in a heightened competitive environment going full bore in granting new route authority, designating new entrants and authorizing service on many routes that have been dormant; all of this in addition to a whole array of low fares which have contributed to a record surge in air traffic. It is difficult to "crystal-ball"

the overall effect of this deregulation except to say that traffic is up, load factors are up, and profits are up -- at the moment.

How and where is all this growth to be accommodated? Certain airports have federally regulated ceilings on operations during certain hours of the day; LaGuardia, Kennedy, O'Hare and Washington National all have limitations, or quotas, for periods of five to fourteen hours per day. New entries at other airports are finding accommodation difficult.

A further inhibition to growth arises from the efforts of state and local governments to enter the field of noise regulation. I will not attempt to elaborate upon these in detail, but can report that they almost always result in continuing confrontation, confusion, uncertainty, and actual or threatened litigation. They involve mountains of reports and other correspondence; they undermine interstate commerce; and in some cases they pose safety issues. They are incompatible with the growth that federal policy now mandates.

How can we deal with the problem of airport use restriction in the new regulatory environment? Let me suggest one answer, ATA, on behalf of its member airlines, today is petitioning FAA to issue a notice of proposed rulemaking to adopt a regulation governing airport noise abatement plans.

The airlines have taken this important step because we have concluded that such a regulation, particularly in the light of the expansion of air transportation and the Airline Deregulation Act of 1978, is essential in the public interest to assure that safety and environmental needs are met in a manner that is consistent with the laws which affect air

transportation and air commerce. Effective and expeditious resolution of Federal, state and local responsibilities for noise abatement is also essential to avert repetitive and time-consuming litigation in the courts.

Essentially, the ATA petition calls upon the Federal Aviation Administration to comply with the Federal Aviation Act of 1958, as amended, by disapproving local noise abatement rules related to air transportation, which are found to be:

1. Inconsistent with the highest degree of safety in air commerce and air transportation; or
2. Inconsistent with the efficient utilization of navigable airspace; or
3. Unduly burdensome to interstate or foreign commerce or unduly interfering with the national air transportation system; or
4. Unjustly discriminatory; or
5. In conflict with the Federal Aviation Administration's statutory regulatory authority.

ATA and its member carriers are convinced that the major hope for bringing order to the disruptive airport noise abatement situation is for the Federal Government to affirm and exercise its preemptive authority in this area. These efforts have been met in the past with governmental reluctance. The reason frequently advanced by the FAA for refusing to take affirmative action is that liability could attach to the Federal Government for damage attributable to aircraft noise at given airports. As explained in the petition, ATA does not believe that there is, or has ever been, a valid reason for inaction in an area affecting the vital interests of the Federal Government, state and local governmental



authorities, airport proprietors, airport communities, the airline industry, general aviation, air travellers and shippers and the public at large.

In lieu of affirmative action, the FAA has partially fulfilled its responsibilities by participating in the consideration of and challenge to proposed airport plans only through "advisory opinion" and statements in local public hearings. This despite the fact that the FAA's public statements and its internal guidelines have consistently maintained that state and local governmental authorities cannot exercise their proprietary or police power in a manner that (1) is inconsistent with air safety, (2) is inconsistent with the efficient utilization of the navigable airspace, (3) unduly burdens interstate or foreign commerce, (4) is unjustly discriminatory, or (5) otherwise intrudes into an area of exclusive Federal responsibility.

The FAA rightfully contends, and we agree, that the field of airport noise abatement has not been totally preempted, and that there is a shared responsibility with state and local authorities that permits some local action. While the FAA has remained relatively passive, the scope and pace of state and local activity is now threatening the ability of air carriers to provide the air transportation services required by the public interest. The educational and persuasive process involved in litigation is time-consuming, expensive and difficult for both airport proprietors and air carriers.

The thrust of the rulemaking proposal would be to establish a regulatory procedure under which any airport proprietor, desiring to implement a noise abatement plan that would restrict aircraft operations in interstate or foreign air transportation, would not be able to

implement that plan without submitting it to the FAA at least 90 days in advance of proposed effectiveness. Upon publication in the Federal Register, any interested party could file a statement in support of or a complaint against implementation of the plan for a maximum period of 180 days beyond its proposed effectiveness. Interested parties could then submit written position statements to the FAA supporting or opposing the plan, and a formal hearing could be convened. Several levels of administrative appeal would be provided for before the Administrator would issue a final decision whether to disapprove a proposed plan or terminate an existing plan.

The FAA would not be required to approve each airport proprietor plan, but would be required to take action only upon a finding that a proposed plan if implemented, or an existing plan, if continued, would adversely affect a valid Federal interest. Also, the proposed regulation would authorize (1) disapproval of a proposed plan or (2) termination of an existing plan on the basis of individual or cumulative impact. This would permit review and termination of a state or local plan, even after it had been subjected to the hearing process without disapproval, based upon a finding that the cumulative effect of that plan, in combination with other plans implemented or proposed subsequent to its effectiveness, would jeopardize the safety of aircraft, interfere with the efficient utilization of the navigable airspace, unduly burden interstate or foreign commerce, be unjustly discriminatory, or conflict with the Federal Aviation Administration's regulatory authority.

We in the airlines earnestly hope that this forward looking petition will help provide a constructive procedure for recognizing the needs of the communities and the needs of an effective national air transportation system.

"Airport Restriction Impact -- Air Cargo and its Associated Environs"

Keynote Speech

January 17, 1979

Albert Bienn

Ladies and gentlemen, we of The Boeing Company are pleased to have been invited here today to express our views on the topic of this seminar -- "Air Freight: The Problems of Airport Restrictions".

As keynote speaker for this particular day, I am supposed to set the tone for the day's discussions. I will try to do so through the title I have selected, "Airport Restriction Impact -- Air Cargo and Its Associated Environs". In choosing the latter part of the title -- "Its Associated Environs", the implications are many, but I will hold today to only the environs of ground cost impact to the airport and the community. I hope thereby to be able to convey to you only a very small sample of possibilities that might occur as a result of the seminar topic implication.

At the outset, it should be understood that any action affecting the air cargo industry is an action affecting an essential part of this country's industrial complex. The distribution element of the design-production-distribution cycle has become increasingly dependent on air transport over the past two decades. This dependence took on an important new dimension with the introduction of jet engines in the late 1950's, and again with the appearance of wide-body airplanes ten years later. Air cargo revenue ton mile growth on a world-wide basis (Figure 1) has proceeded at a rate which represents a doubling about every seven years. (Figure 2) In terms

of total ton-miles, service continues to be concentrated in the U.S. Domestic and U.S.-Europe (North Atlantic) geographical areas. (Figure 3) Growth in scheduled cargo revenue ton miles has consistently equaled or exceeded the growth in scheduled revenue passenger miles. (Figure 4) In terms of the accelerating importance of air cargo as a standard alternative to surface transport, the average annual growth of air transport between 1960 and 1977 has consistently and dramatically exceeded the growth rate of the surface modes.

These trends aren't expected to change over the coming years. Boeing's analysis (Figure 5), foresees a healthy continuation of the growth of air cargo on a world-wide basis, as well as within the U.S. World growth to 1992 could range from a doubling to a tripling over 1977 levels, depending on whether we select a conservative or a "potential" view. (Figure 6) U.S. domestic growth will average somewhat lower than the world rate, but still reflects a healthy increase over the coming decade.

The airplane as an industrial distribution element has grown in importance for a number of reasons. Increased capacity is one. The spread of service to more areas is another. (Figure 7). But at this point, we need to understand clearly that the successful development of air cargo in the U.S., indeed throughout the world, can be largely attributed to the determination of the air transport industry to make it successful. It has taken a lot of hard, consistent effort to combat the intrinsic cost handicap of the air line-haul versus truck, rail, and water. We in the industry have had to labor mightily against the "Everybody Knows" syndrome. That is, everybody knows that air costs more than surface, everybody knows that air is useful for emergency service only. Everybody knows that air can't be used as a standard distribution method; it costs too much.

Well, these assumptions aren't consistently true. Well-tried principles of distribution cost analysis have been invoked by air cargo marketers to disprove them in case after case. Shippers are turning more and more frequently to air transport to eliminate warehousing, increase sales, decrease handling costs, decrease insurance costs; in other words, to whittle down the total costs of distribution and produce a higher bottom line figure. This is the consistent result, a higher bottom-line figure. But it takes a lot of study, and it takes a lot of understanding. It also takes continued good airplane service, and reliable schedules.

The degree of success which the air transport industry has achieved in selling the total distribution cost concept has been demonstrated in shipper surveys, such as one conducted by Boeing in 1978 (Figure 8). Its results have been confirmed by other surveys. When asked to prioritize the key factors governing a decision to use air freight, most shippers cited delivery schedules as the first consideration, customer service as the second. Cost places third. At this point, we begin to detect a very important relationship between the continued momentum of air cargo growth, and the continued ability of carriers to offer optimal service schedules. The withdrawal of 1/3 of the 24 hours available for air cargo scheduling would operate directly in opposition to the continued development of air cargo, because it would have a direct adverse effect on the carriers' ability to respond to shippers' first priority need -- optimal delivery schedules.

To fully appreciate this concern, we need to look more closely at what air cargo marketers have been talking to shippers about for the past several years (Figure 9). One of the most effective arguments for using air cargo in total distribution cost control is to exploit the nighttime

hours between the close of one day's normal cycle and the beginning of the next. When distribution can be accomplished at night, it is least affected by the high costs of holding, of storage, of warehousing, of extra handling, and the increasingly high costs associated with those requirements. The optimal arrangement is to accomplish the line haul in the late night and early morning hours, leaving the periods at each end for local delivery, packing, processing, documenting, etc. In this way, products are away from the shipper's dock by the end of his normal work day, and are ready and waiting on the receiver's dock towards the beginning of his work day.

There is probably no better demonstration of this principle than the recent growth and success of small-package air cargo service. Its ability to serve its customers depends directly on its ability to exploit nighttime hours. (Figure 10) If, for example, you look at the concentration of available capacity in the system of Federal Express, the leader in the development of the small-package service, the essential role of the night-time period is immediately clear. The bulk of the capacity is concentrated in the midnight to 0600 period. The second largest segment is in the evening, 1800 to midnight period, and the smallest segment is during daylight hours. This dependence on nighttime service is absolutely essential to Federal Express, as it is to any carrier operating a "hub-spoke" system and providing overnight service. (Figure 11) If the "hub" is inaccessible during the night, then the system is essentially destroyed. (Figure 12) Federal Express's substantial anticipated forecast growth of 26.5% annual average between now and 1985 would be dramatically reduced -- if it survived at all.

Using September 1978 Official Airline Guide schedules as a base (Figure 13), it can be determined that about 45% of the U.S. domestic freighter capacity is concentrated in the period between midnight and 0700 in the morning. About 7% of the lower hold cargo capacity of passenger airplanes move during that period. Applying those indices to the total tons of cargo uplifted in 1977 (Figure 14), it can be seen that approximately 628 thousand tons of cargo (Figure 15) move annually in the U.S. between 2400 hours and 0700 hours. This is the gross total air cargo, using the 1977 base, which would be affected if curfews were assumed to proliferate throughout the United States. By 1990, that total figure goes to 1.4 million tons. Certainly, a portion of this total could be "saved" by schedule adjustments. In 1976 the Massachusetts Port Authority, studying this same question as it specifically applied in Boston, estimated that about 20% of the schedule could be restored by adjusting arrival and departure times of those flights operating close to the 2400 and 0700 limits. So let us assume that only 80% of the night cargo would be displaced.

The dollar results come out something like this. The cents-per-ton mile figures (Figure 16) can be converted to an average revenue of \$457 per ton on freighter cargo, and \$354 per ton on passenger lower hold cargo. These figures are derived from CAB data. The dollar impact then, at year-end 1977, reduced by 20% for schedule reoptimization, would be \$214 million (Figure 17). This estimates the potential annual gross revenue loss to U.S. carriers if restrictions were in effect throughout the United States. Utilizing a straight line projection, based on domestic cargo growth previously shown, by 1984 this loss

would grow to \$350 million per year. By 1990, it would amount to \$487 million per year (Figure 18). Cumulatively, this represents a loss to airline operators of \$4.4 billion in revenues between 1979 and 1992, at an average loss of \$367 million per year.

The cost impact on airline revenues is in many ways easier to estimate than the cost impact on shippers, on terminals, and on communities. But we can scope these effects by looking at studies that have been done with respect to some specific major terminals.

(Figure 19) Take for example the matter of displacement of airmail at O'Hare, Chicago, from its accustomed night schedules to daytime schedules. The U.S. Postal Service states that about 200 million pounds of mail transits annually through O'Hare, and another 144 million originates or arrives by air in the Chicago area. This is preponderantly nighttime traffic. If this demand had to be accommodated during the daytime, it would completely disrupt capacities available for other cargo. It is estimated that air freight costs to shippers would increase by as much as \$17 million annually in the resulting shift to reserved air freight from lower priority rates. (Figure 20) In Chicago, 70% of total all-cargo operations take place during the curfew period being contemplated. The Chicago study estimates that up to 20% of the O'Hare work force of 34,000 employees would be affected if environmental regulations were to eliminate that heavy concentration of nighttime operations.

In 1976, a study was conducted by the Massachusetts Port Authority on the impact of an 11PM-7AM curfew on the area served by Logan airport, Boston. Results were based on a combination of questionnaire survey and in-depth interview from a master list of 1000 shippers, forwarders,



and motor carriers. (Figure 21) The response from shippers estimated that \$16 to \$25 million per year could be lost in the form of added costs, for example, from forced use of reserved space services on daytime flights. Lost sales volume was estimated at \$83 to \$101 million per year, traceable chiefly to reduced ability to offer optimal delivery. We should note in passing that this substantial impact derived solely from curfew restrictions at Logan. If curfews were in general effect, especially at Bradley Field, Hartford and at JFK in New York, the Boston impact could be even greater.

Finally, shippers estimated that the added costs and lost revenues could be translated into job losses ranging in number from 1350 to 2000. Replies from freight forwarders and motor carriers combined for an additional total of \$5 to \$7 million lost in decreased business, with a nominal 30 to 45 jobs lost. And with respect to these estimates, a final point should be made. The scenario on which they were based did not call for the elimination of the 11 to 7 freighter service. It simply shifted the service out of the curfew period into the evening hours prior to 11 P.M. As severe as that impact was estimated to be, it might have been substantially worse had the nighttime, or curfew period, capacity been eliminated completely.

Let me conclude by posing the very broad question, "What would the economic impact be on a typical American industrial city if curfews were to come into general effect throughout the United States?"

(Figure 22) Using 1977 data, we see that air cargo shipped out of American cities ranged from 366,000 tons at Chicago's O'Hare, down to 17,000 tons at New Orleans, the smallest on a list of the top 25 originating cities. A representative level would be 50,000 tons, in such cities as Philadelphia, Cleveland, or Minneapolis-St. Paul.

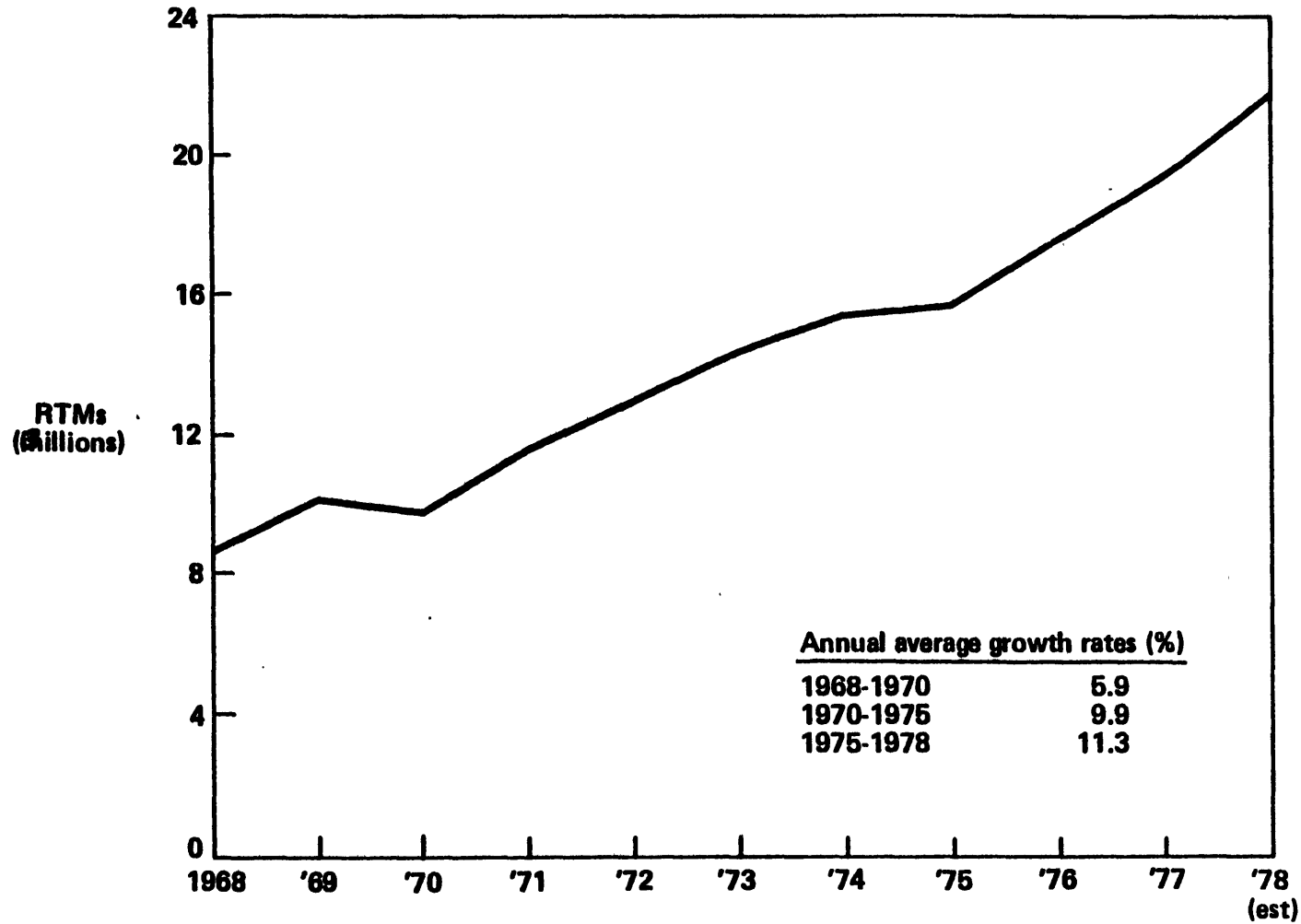
Further scanning of the data shows that the average wholesale value of air-shipped commodities is reasonably close to \$10.00 per pound. In other words, the revenue-generating value to a city's economy of one typical ton of air cargo is \$20,000.

We have already established that 600 thousand tons, or 17% of the total 3.5 million tons moved in 1977 was curfew-sensitive. Seventeen percent then, or 8500 tons, of the 50,000 tons coming out of our representative city, is impacted by the curfew. Some of this cargo is re-scheduled by air, some moves by other modes. However, about 10%, or 850 tons per year, is lost. It becomes a part of that portion of air cargo -- already discussed -- which simply disappears because it can no longer be distributed in a manner that makes it saleable. 850 tons generating \$20,000 per ton. That's \$17 million. Finally, the "ripple effect" of the loss of this "gross community product" is measured by economists of anywhere from 1.25 to 3.00. For our purposes, I suggest we use the 1.8 factor applied by the Massachusetts Port Authority in the study referenced earlier.

The answer to our question comes out \$31 million. \$31 million dollars lost to the economy of an average industrial city if its airport is closed by a curfew.

I opened my remarks by noting that any action affecting the air cargo industry is an action affecting an essential element of this nation's industrial capacity. It is clear from our analysis and from studies undertaken by others that the imposition of an airport curfew indeed constitutes an action whose far-reaching, adverse effects need to be fully understood and carefully considered by any community contemplating such action.

# World Air Cargo History 1968-1978

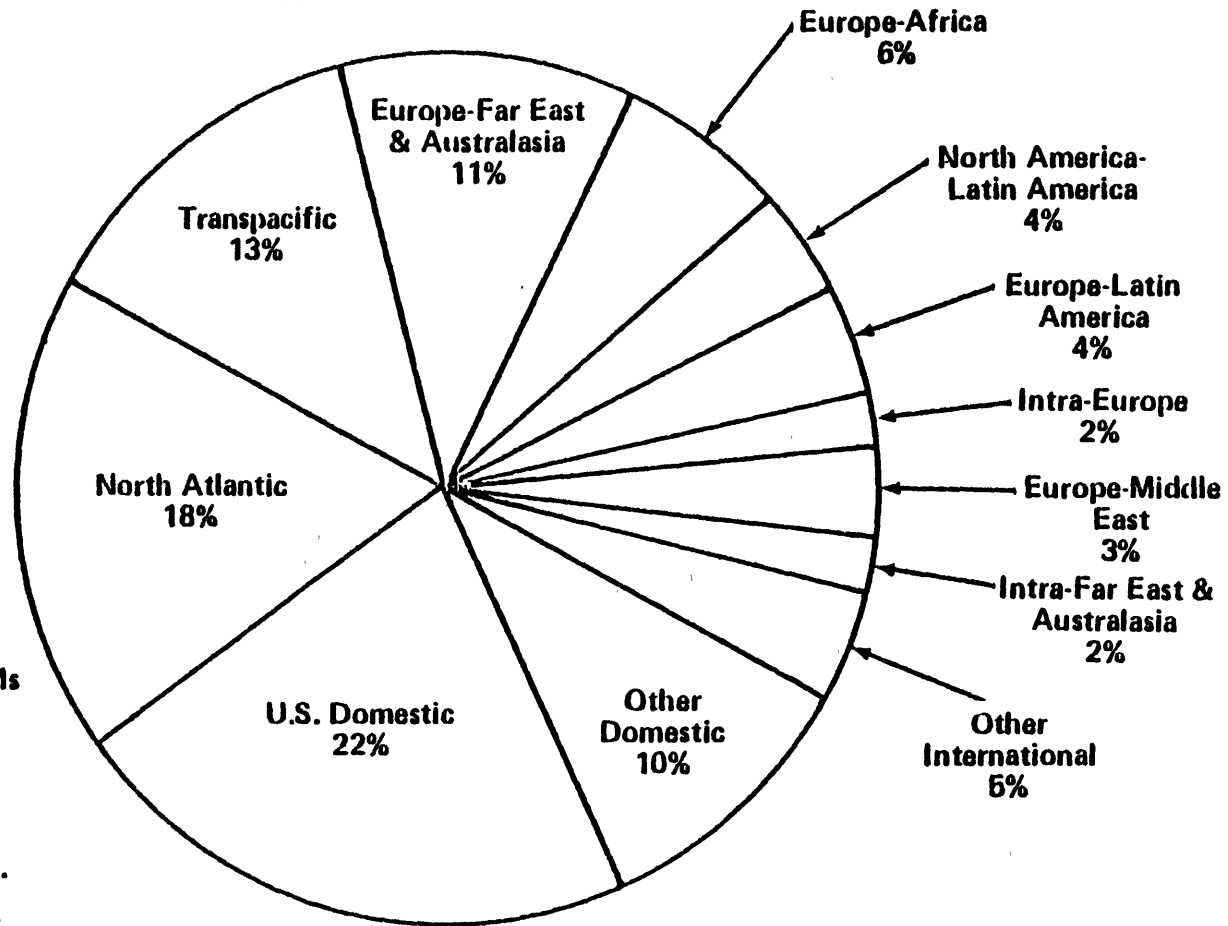


Sources: 1. Air Carrier Traffic Statistics, CAB  
2. Digest of Statistics, ICAO

Figure 1

# 1977 World Air Freight Estimated Breakdown by Market

## Scheduled Service



- Total: 14.40 billion RTMs (21.02 billion RTKs)
- ICAO airlines only: mail not included
- Does not include U.S.S.R. and People's Republic of China (approximately 3.5 billion RTKs)

Note: From preliminary 1977 data

Figure 2

# World Scheduled Freight RTMs vs. World Scheduled Passenger RPMs 3-Year Moving Annual Average Growth Rates (%)

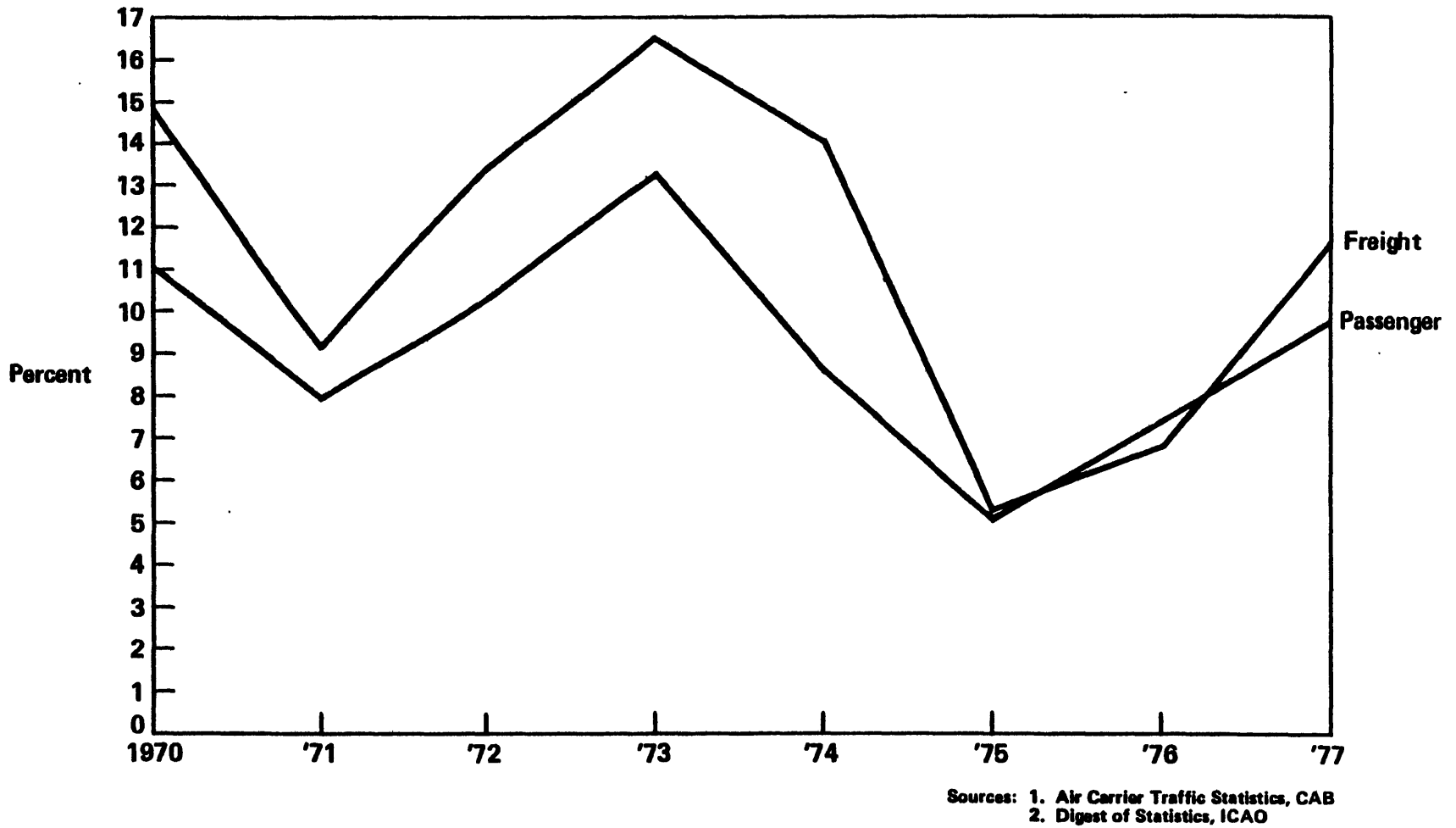
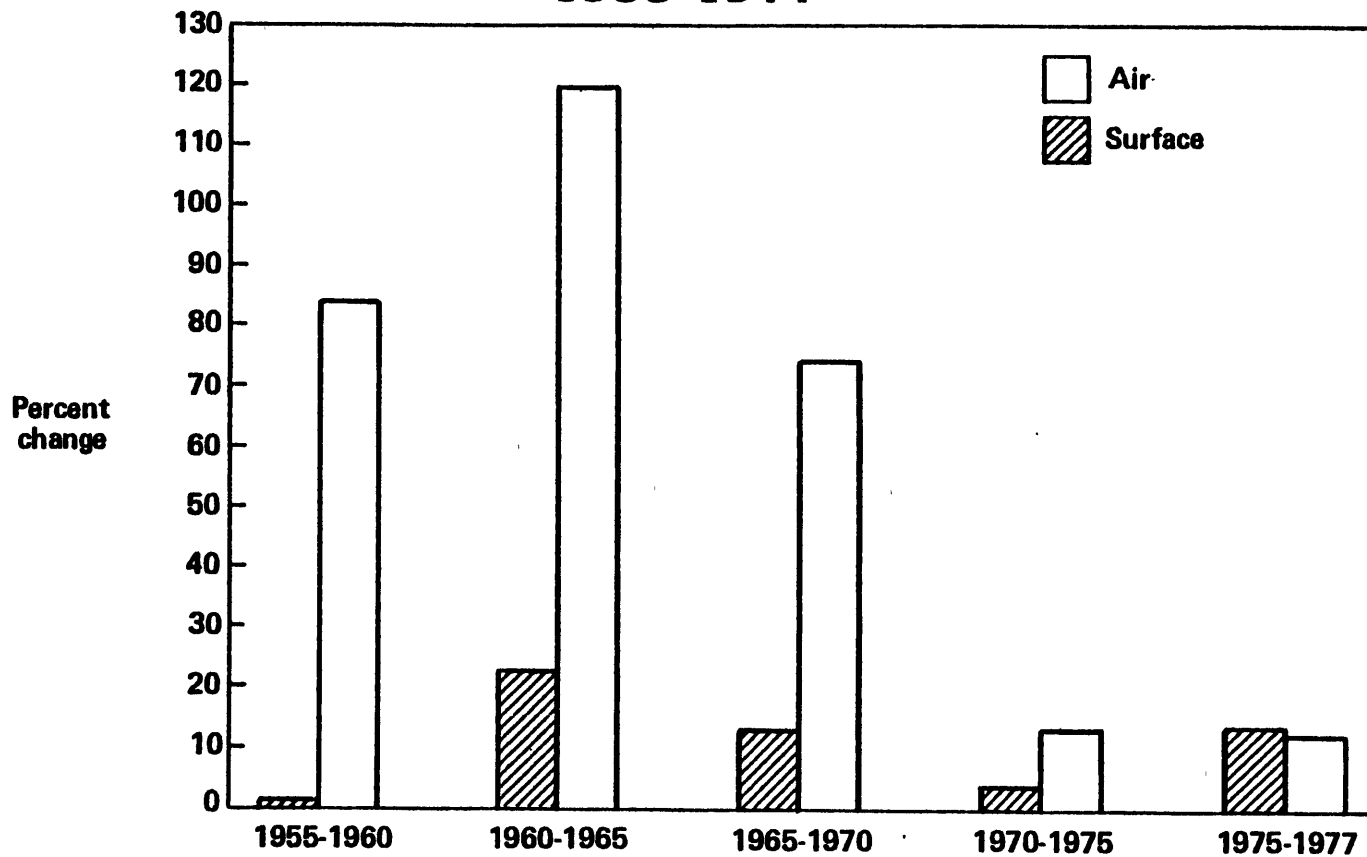


Figure 3

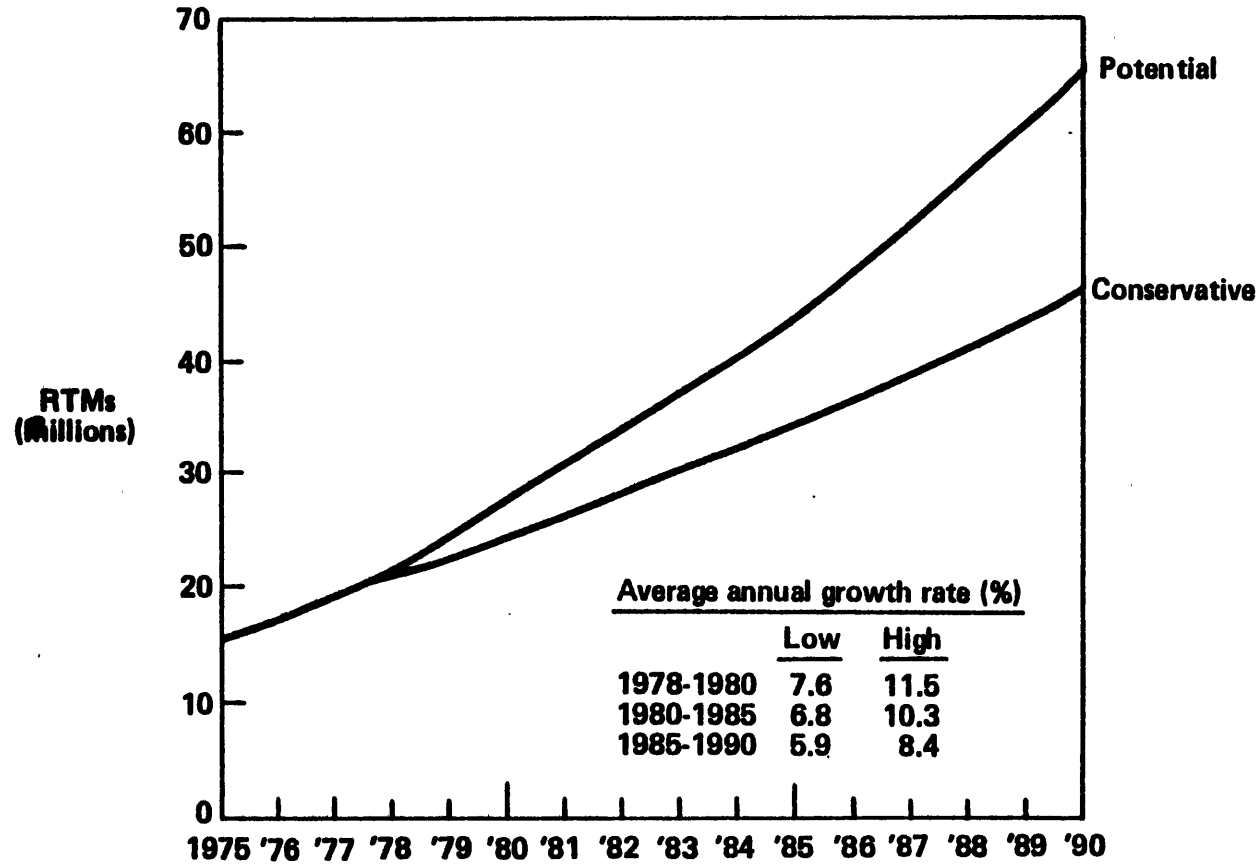
# U.S. Domestic Market Air vs. Surface Cargo Growth 1955-1977



Sources: 1. Handbook of Airline Statistics, CAB, 1971 ed.  
2. Transportation Facts and Trends, Transportation Association of America, 1978

Figure 4

# World Air Cargo Forecast 1977-1990



Source: Dimensions of Airline Growth, Boeing

Figure 5

# U.S. Domestic Air Cargo Forecast 1977-1990

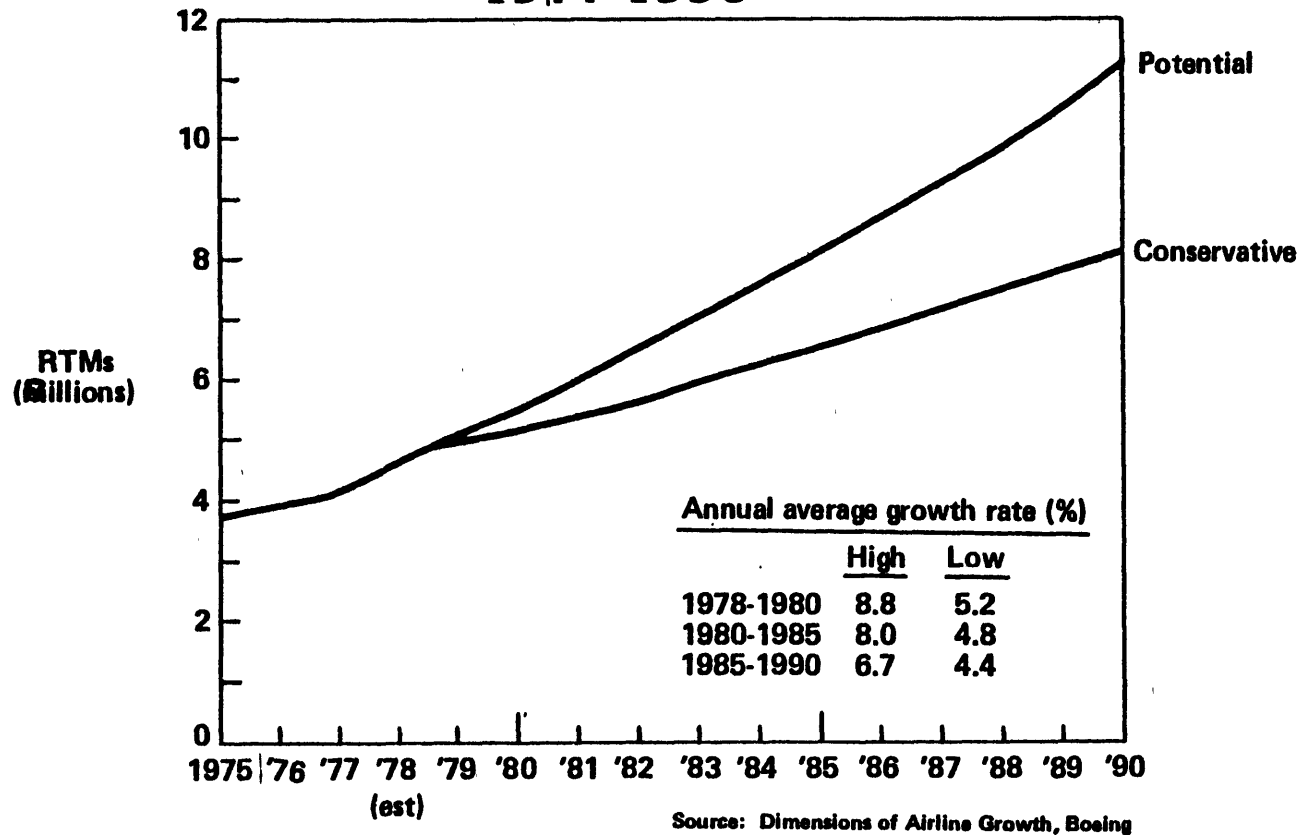


Figure 6



# Air Cargo Decision Elements

## Cost

1. Total transportation cost
2. Transportation rate
3. Obsolescence cost
4. Interest rates on borrowed capital
5. Insurance cost
6. Shipper-packed containers
7. Terms of payment
8. Cash flow position
9. Inventory policy

## Service

10. Distance to be shipped
11. Door-to-door time
12. Domestic or international traffic
13. Shipment frequency
14. Mode reliability
15. Carrier schedule
16. Carrier capacity
17. Markets served by air freight
18. Intra & inter mode transfer
19. Damages and pilferage exposure time
20. Documentation requirements
21. Claims processing
22. Tracing of lost shipments
23. Pick-up & delivery service
24. Availability of suitable containers
25. Convenience
26. Required delivery schedule
27. Penalties placed on late deliveries

## Commodity characteristics

28. Commodity density
29. Commodity value
30. Physical dimensions
31. Time sensitivity
32. Seasonal variation of demand/supply
33. Demand reliability for commodity
34. Commodity sold in a variety of sizes, color, or styles
35. Shipment size

## Marketing/management objectives

36. Price leadership
37. Market penetration
38. Competitors mode selection
39. Commitment to present mode
40. Balance distribution channel inefficiencies
41. Use of mode selection in advertising
42. Service objectives
43. Test marketing

Boeing shipper survey

Figure 7

# Shipper Air Transport Requirements

- **The 6 most influential air freight decision elements are, in rank order:**
  - 1. Required delivery schedule**
  - 2. Customer service**
  - 3. Freight rates**
  - 4. Distance to be shipped**
  - 5. Service reliability**
  - 6. Shipment size**

Boeing shipper survey

Figure 8

# Air Cargo Nighttime Service

Cargo local pickup & delivery, documentation, preparation, staging, on-load/offload and line haul (i.e. all required dock-to-dock distribution functions)

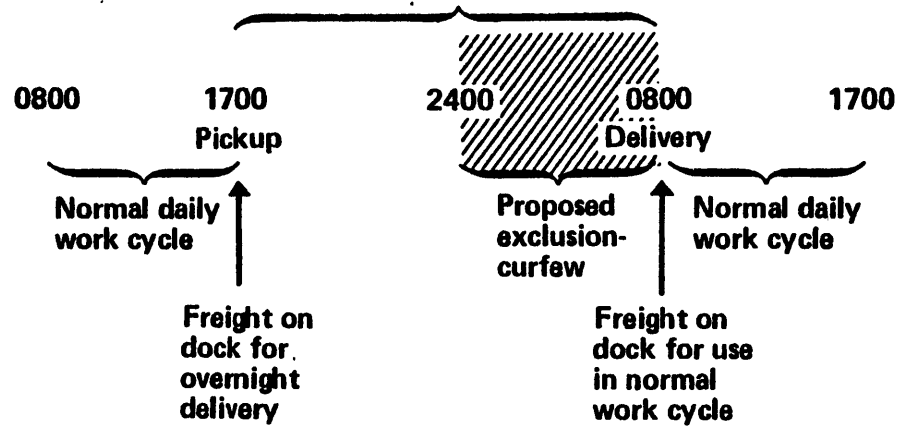


Figure 9

# Federal Express Memphis Departures Capacity Impacted by Curfew

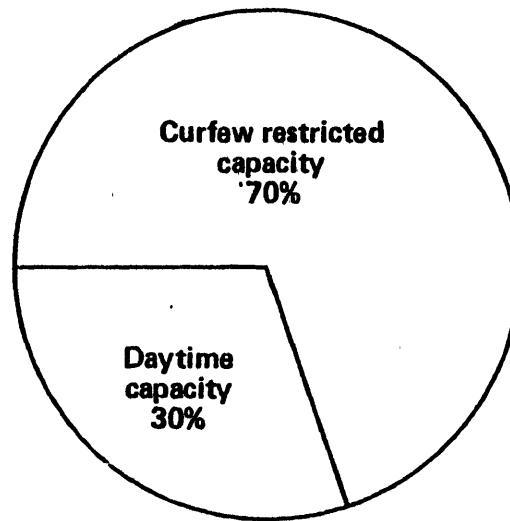


Figure 10

# The Federal Express Hub-Spoke System

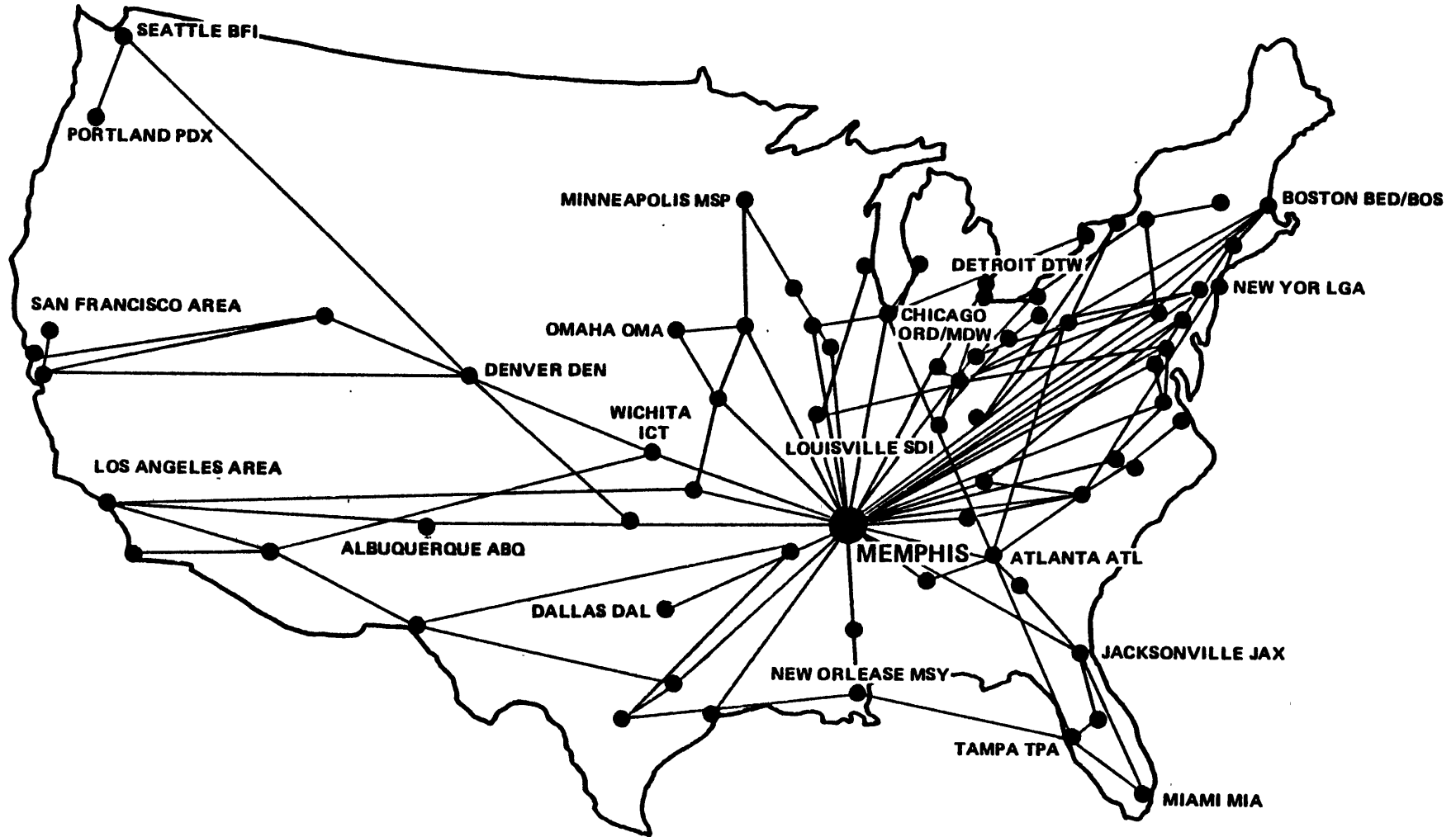
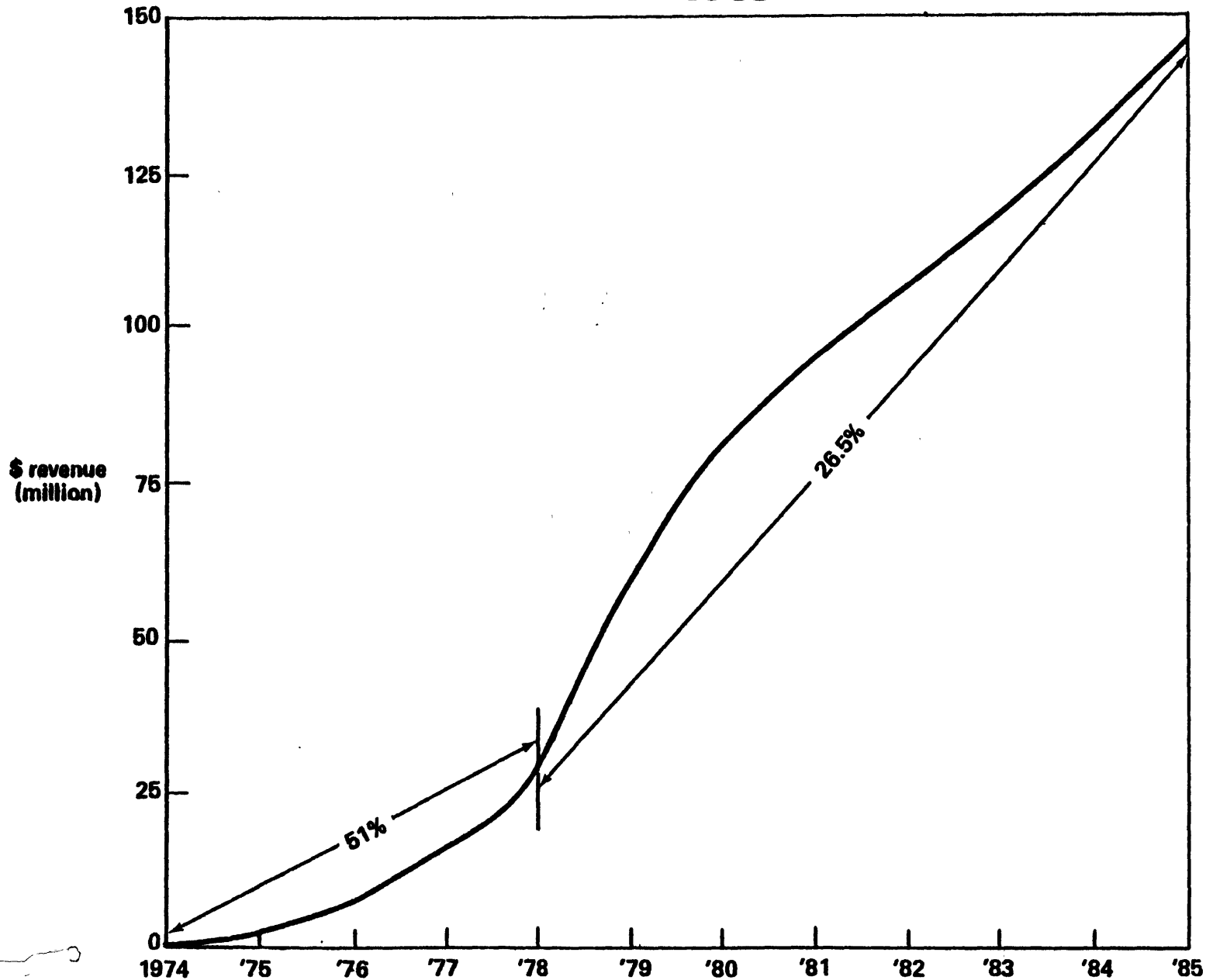


Figure 11

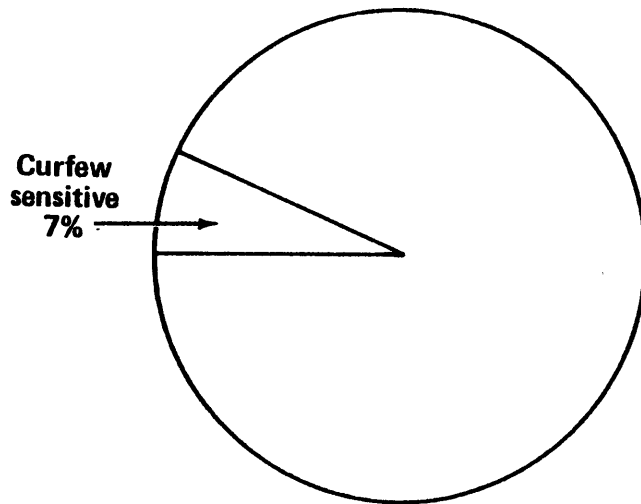
# Federal Express Small Package Market 1974-1985



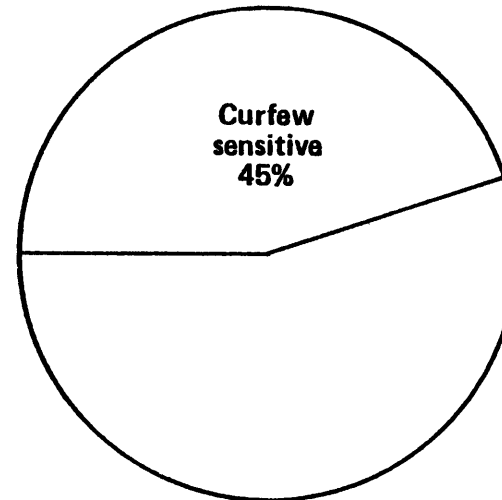
Note: Based upon a Kidder, Peabody & Co. company analysis report, November 27, 1978

# Curfew Impact on Capacity U.S. Domestic Scheduled Services 1977

• 2400-0700 Curfew



**Cargo capacity from  
passenger operations**



**Cargo capacity from  
all-cargo operations**

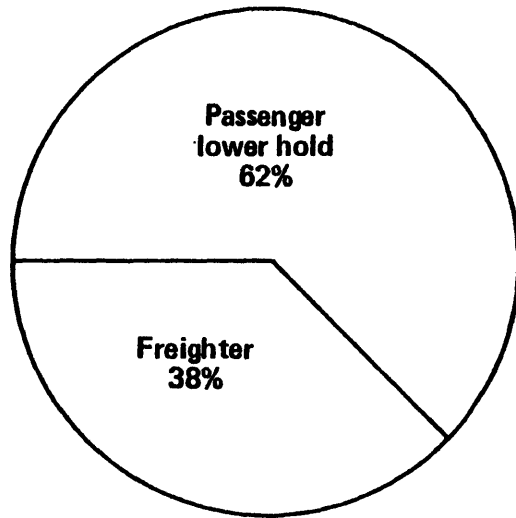
Note: Includes domestic trunks, Pan Am, Flying Tiger Lines, and Airlift

OAG Schedules—9/78

Figure 13

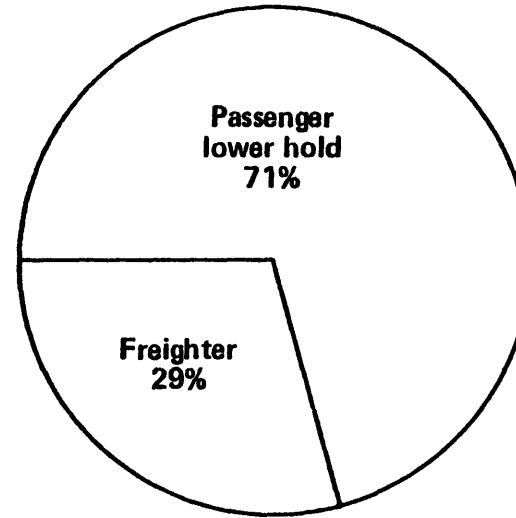
# U.S. Domestic Cargo Traffic 1977

- Revenue Ton-Miles



4.2 billion RTMs

- Revenue Tons



3.5 million tons

Figure 14



# U.S. Domestic Cargo Market Curfew-Affected Traffic 1977 vs. 1990

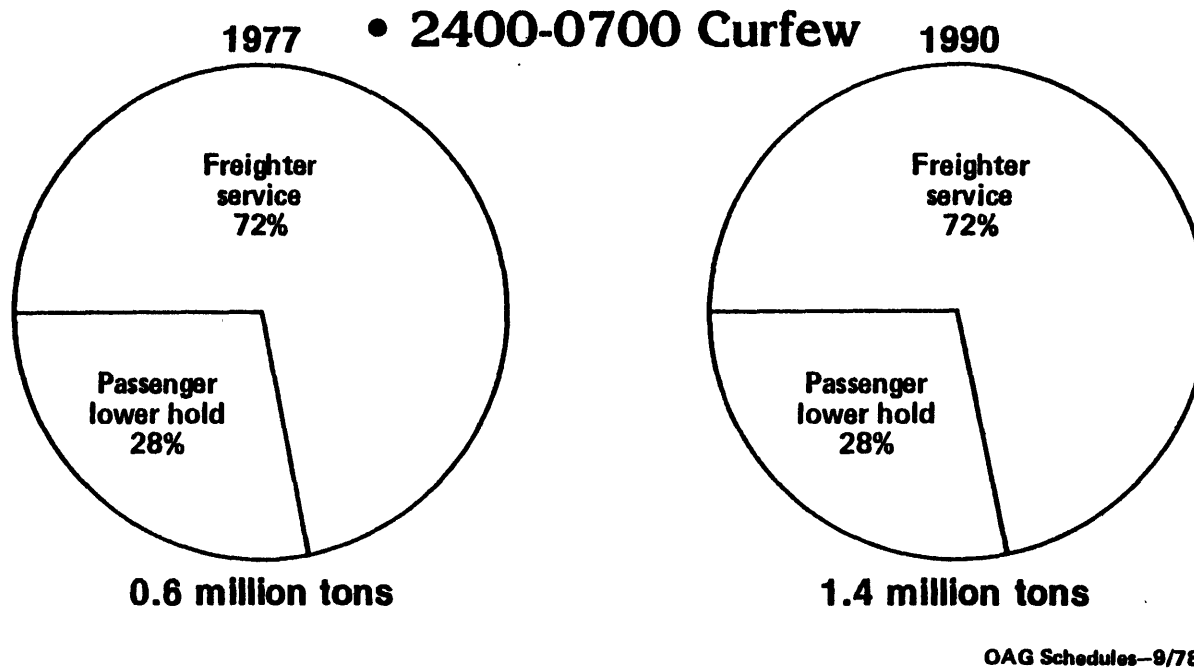


Figure 15

# U.S. Domestic Cargo Yields Scheduled Service Trunks and All-Cargo Carriers

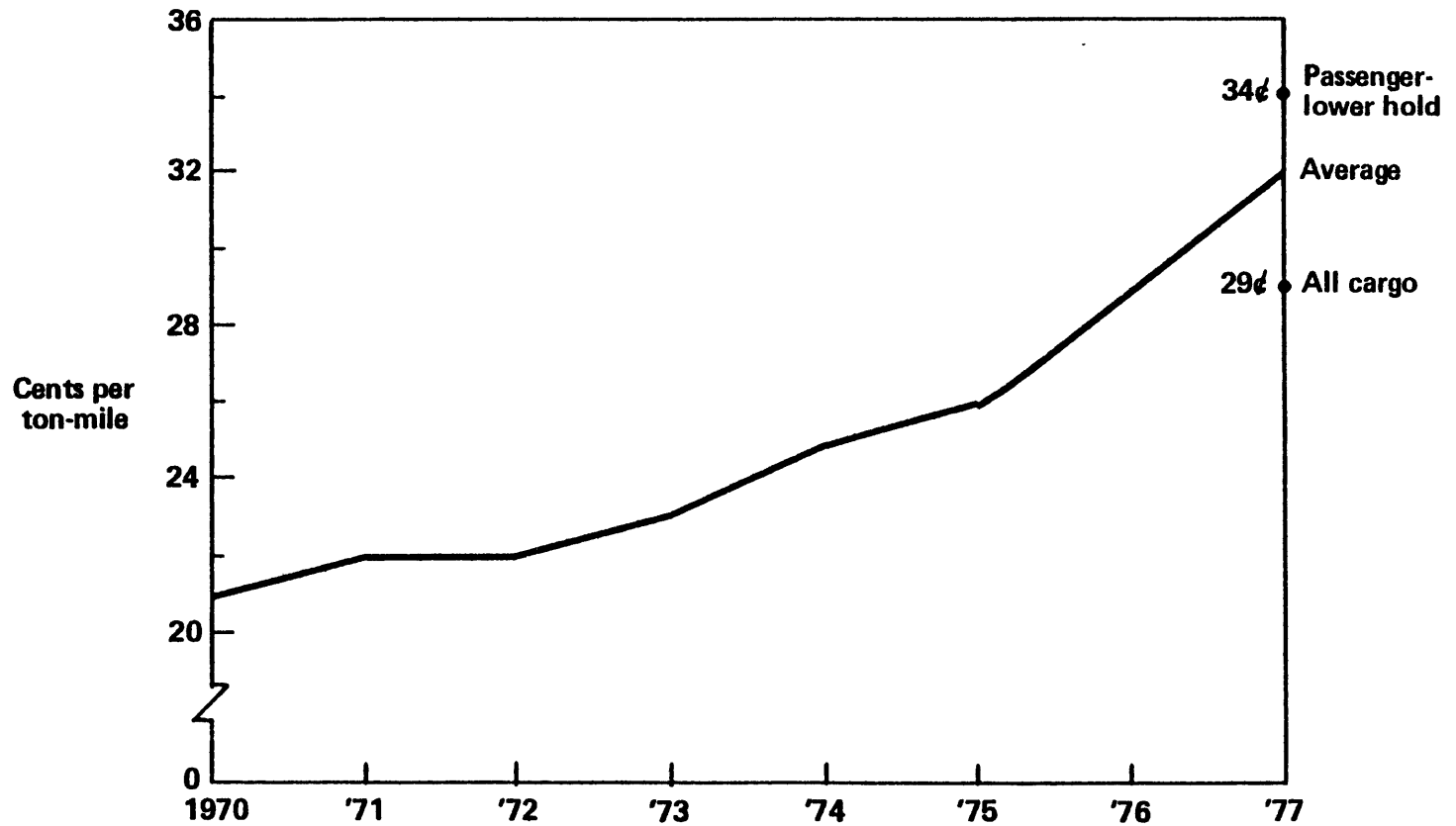


Figure 16

# U.S. Domestic Market Revenue Subject to Loss Due to 2400-0700 Curfew 1977

• \$214 Million

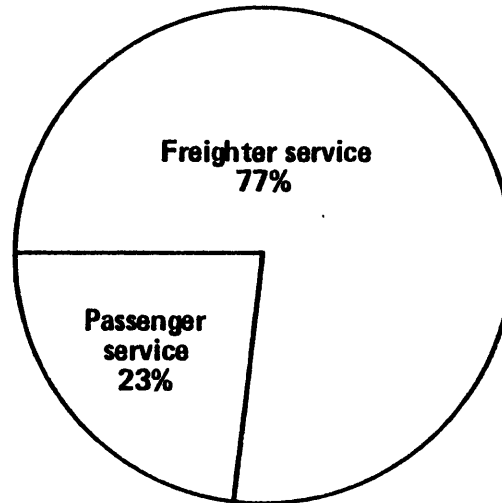


Figure 17

# U.S. Domestic Market Revenue Subject to Loss Due to 2400-0700 Curfew 1990

• \$487 Million

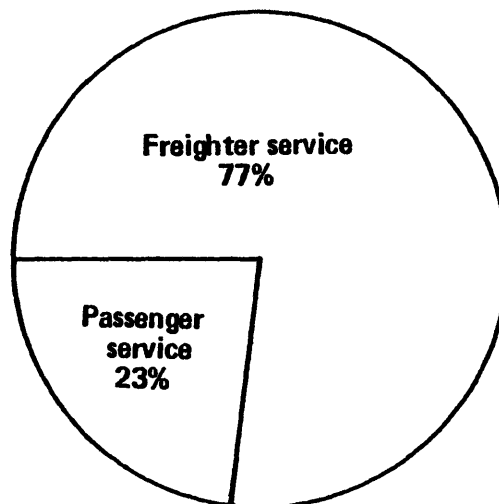
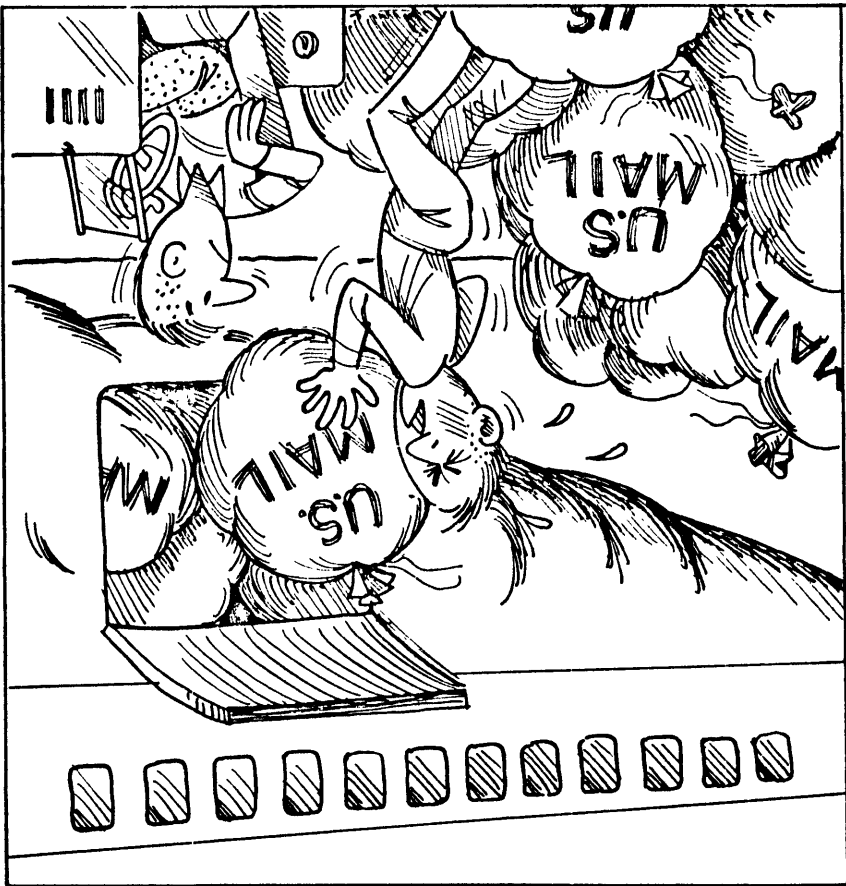
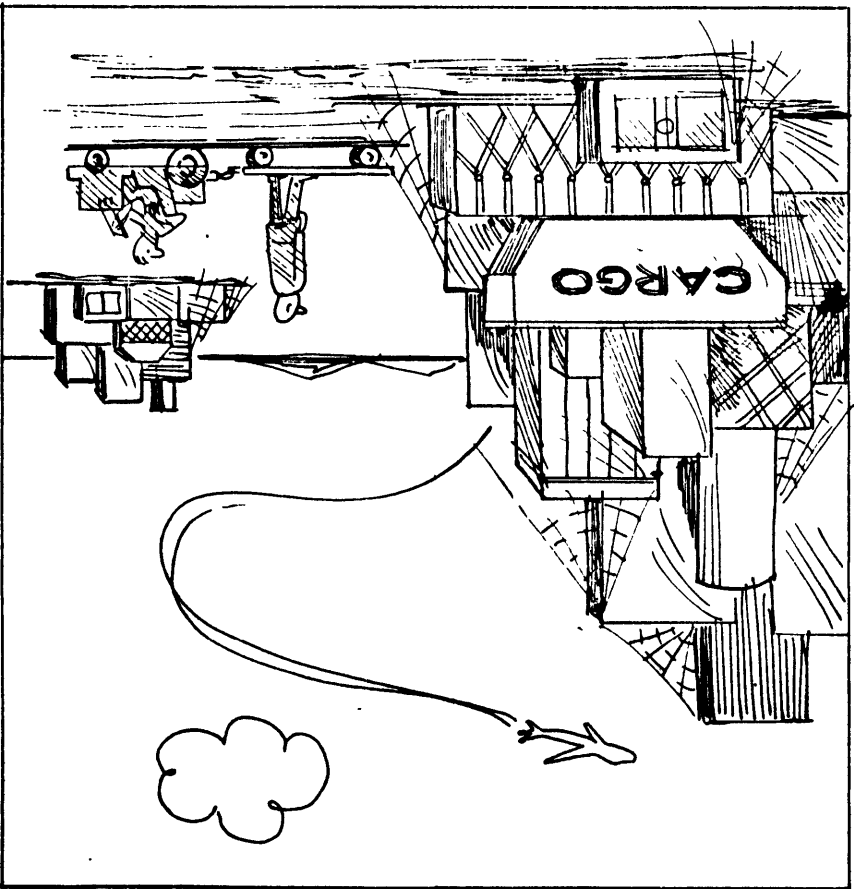


Figure 18

FIGURE 19



# Impact of Curfew Restriction at Chicago-O'Hare

## Preliminary ATA Chicago Study

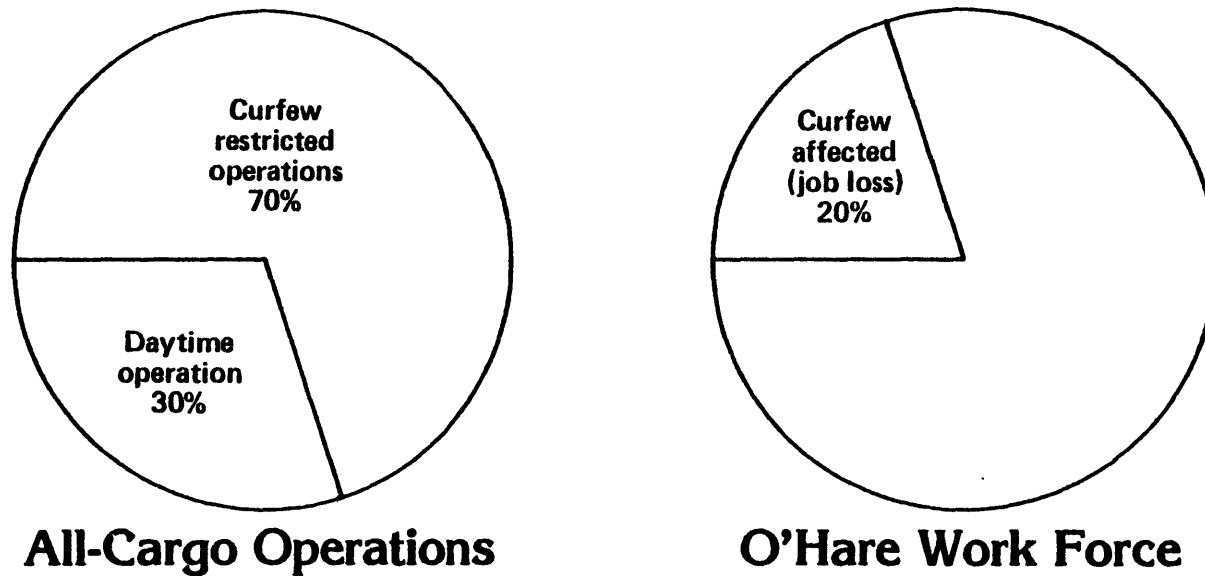


Figure 20

## 11 P.M. - 7 A.M. Curfew Annual Impact Area Served by Boston (Logan) Airport

	Shippers	Freight forwarders & motor carriers	Total
Added costs	\$16-\$25 million	—	\$16-\$25 million
Lost sales	\$84-\$101 million	\$4.5-\$6.8 million	\$89-\$108 million
Lost jobs	1,340 to 2,010	30 to 45	1,370 to 2,055

Figure 21

## Curfew Impact on a Representative U.S. City

Annual city cargo market	50,000 tons
Curfew sensitive (% national average)	<u>x .17</u>
	8,500 tons
Percent complete market loss (national average)	<u>x .10</u>
	850 tons
Average value per ton (\$10/lb)	<u>x \$20,000</u>
Gross community product loss	\$17,000,000
Economic multiplier	<u>x 1.8</u>
<b>Potential Economic Loss</b>	<b>\$31 Million</b>

Figure 22



Appendix C

Panels

Monday, January 15, 1979

Morning Panel

Panel Moderator: Joe Windish -- PANYNJ

Panel Members: Urban Reininger -- Franklin Mint  
Gerry Godbout -- ATA  
Gerry O'Driscoll -- Pan Am

Afternoon Panel

Panel Moderator: Gerry O'Driscoll -- Pan Am

Panel Members: Michael Bell -- Atlanta Airport  
Rick Clarke -- ALPA  
Joe Hinson -- Federal Express  
Dick Marinelli -- American Optical  
Stan Rozycki -- Federated Department Stores

Tuesday, January 16, 1979

Morning Panel

Panel Moderator: Gene Mercer -- FAA

Panel Members: Louis Haffer -- AFFA  
John Hosford -- AIA/Douglas Aircraft  
Ralph James -- Profit by Air  
Jack Shelly -- Aviation Development Council  
John Pogue -- Delta Air Lines

Afternoon Panel

Panel Moderator: Julie Moll -- DOT

Panel Members: Ed Glatzhofer -- Time  
Harvey Safeer -- FAA  
Jack Shelly -- Aviation Development Council  
Charlie Washer -- American Retail Federation/  
Western Traffic Conference  
Earl Peck -- Flying Tiger  
Pat Harnist -- Viasa Airlines

Wednesday, January 17, 1979

Morning Panel

Panel Moderator: Bob Simpson -- MIT

Panel Members: L. Max Burris -- U.S. News & World Report  
Charlotte Chamberlain -- DOT/TSC  
Steve Kaminski -- Seaboard  
Wayne Hill -- National Airlines  
James Schwab -- Hoechst-Roussel Pharmaceutical

Afternoon Panel

Panel Moderator: Ed Roberts -- DOT/TSC

Panel Members: Bill Augello -- Cut Flower Industry  
Cal Brantley -- New England Nuclear  
Manfred Fleischer -- Columbia House/CBS  
Don Reilly -- AOCI  
Seymour Salmirs -- NASA/Langley

Thursday, January 18, 1979

Morning Panel

Panel Moderator: Eric Waldron -- Massachusetts Aeronautics Commission

Panel Members: George Beemer -- Florida Flower Association  
David Campbell -- Burlington Northern  
Air Freight  
Alan Sabol -- Fisher Scientific  
Claude Schmidt -- Minneapolis Metropolitan Airport  
Commission  
Dick Ludders -- Hoyle Tanner Associates

Afternoon Panel

Panel Moderator: Frank Spencer -- Northwestern University

Panel Members: Donna Berman -- Massport  
Paul Brotto -- Air Canada  
Paul Roberts -- MIT  
Herman Friedman -- PANYNJ

Friday, January 19, 1979

Conference Summary

Moderator: Herman Friedman -- PANYNJ

Speakers: Joe Windish -- PANYNJ  
Gerry O'Driscoll -- Pan Am  
Gene Mercer -- FAA  
Julie Moll -- DOT  
Bob Simpson -- MIT  
Ed Roberts -- TSC  
Eric Waldron -- MAC  
Frank Spencer -- Northwestern

Appendix D

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