

variety could be operated. Whether there would be a large demand for this type of aircraft, however, is questionable. In certain individual instances they would probably be the most economical type of aircraft to operate, but these types of situations are limited and their number probably will not grow dramatically. The supersonic transports and the hypertechnology-type aircraft will not become part of the industry until such time as the unit costs of those aircraft can be decreased so they may become economic. Cost precludes these technologies from commercial service at this time.

Competition from telecommunications will not be a major factor in the short term. It could, however, be a limiting factor to growth five or ten years hence. This does not mean that the airlines can expect to lose their business travel market. The consensus was that the airlines potentially stand to lose a portion of the traffic they might be expected to gain in the future. This will be a normal development because the telecommunications industry itself is embryonic and we have hardly even seen some of the potential capability it possesses.

In summary, the safety issue will be the only basis for reregulation. Economic deregulation has met its objective and is working well. The airline industry in the future will be composed of a loose oligopoly. Capacity restraints in the industry can basically be attributed to ground rather than air-borne congestion. Traffic growth will continue at a 5 percent annual rate with the aircraft forecast still centering upon narrow-body aircraft because of market dictation.

Minority View

One panel member's view of the industry's future differed significantly from that of the majority. This individual believed that free entry into the market will prevent a tight oligopoly from developing. Further, he was of the opinion that the structure and practices of Southwest Airlines and People Express Airlines will be the model for airlines in the future. If this trend translates into lower overall industry operating costs resulting in lower fares for the general public, the 5 percent annual forecast growth for the industry could be seriously understated. This growth will have significant implications for airframe manufacturers, airports, and the air traffic control system.

AIR CARGO INDUSTRY

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The United States air cargo industry has changed significantly since the deregulation of the airline and trucking industries. Many combination carriers have sold their freighters, all-cargo airlines have entered the forwarding business, air freight forwarders have entered the airline business, the overnight express business has blossomed, and many air cargo operators now use trucks to haul cargo at air rates when and where applicable.

Industry Trends

Air cargo has become a true service industry promising fast, safe, reliable point-to-point shipment of freight, traditional mail, documents, and express

products. This service has traditionally been sold on the basis of elapsed time to delivery, but the advantages of air cargo are now more widely viewed as a lower total cost of distribution, with the costs including loss or damage, interest expense, other warehousing expenses, economic or physical perishability, and the cost savings associated with the shipment of emergency goods. Just-in-time inventory is becoming more widely used in business, and air cargo is well equipped to support this practice. The developments during the last eight years in the overnight express business have created a new product for business in general to which many businesses are just beginning to adapt.

The growth of the overnight express market, in the near term, seems to be limited only by the availability of new products to be offered by the carriers and the imagination of consumers' management in taking advantage of those products. Double-digit growth is expected in overnight express for at least the next five years, but the market should begin to show some signs of maturing by 1990.

The traditional air cargo market should outperform the growth in real GNP for domestic United States operations, and international operations should do even better. Any new trade restrictions would most likely have a significant negative impact on air cargo given that the most trade-sensitive industries are generally those that are high technology, high value. The products of these industries are also those that are most often shipped by air. The current discussions on limiting trade may not result in new trade laws, but this currently represents a threat to international air cargo growth.

It should be noted that the group was not sure that a reliable measure of air cargo growth is available. The traditional measure has been revenue ton-miles (RTMs), but there are some reasons that this measure is not as effective as it has been in the past. Concern regarding the measurement of air cargo activity came from two distinct sources.

The first source of uncertainty regarding the "growth" of air cargo as measured by RTMs results from technological developments in the industries that have been traditional air cargo customers. Improvements in technology have made possible smaller, lighter, and more durable products including office machinery, statistical machines, auto and aircraft parts, and consumer electronics that can be shipped by air. Packaging for shipment has also become lighter and more compact. These developments would clearly have a negative impact on the number of RTMs performed, assuming that the same "quantity" of goods was shipped. It is conceivable that the air cargo industry has seen a significant increase in real dollar value of shipments while the level of RTMs may have declined. In other words, the air cargo industry may be significantly more "important" to the economy in general although it may look as if it is less important.

The second issue has to do with the availability of data used to measure air cargo activity. The current data bases for United States operators are less than comprehensive with some carriers not reporting their data. Some efforts are under way to provide an industry data base, but not all operators are participating. It is in the best interests of the air cargo industry to have a comprehensive data base available for planning purposes. The significant investment required for aircraft, ground equipment, and sorting facilities

requires credible long-term plans. The recent growth in air cargo, overnight express in particular, has allowed some "mistakes" to go unnoticed, but as growth slows, better data will become more important as a support to long-term planning.

United States air cargo operators can now be divided into two groups with very few airlines participating in both segments. One group is the all-cargo airlines (including overnight express) and the other is the combination airlines that carry air cargo in the lower deck compartments and that have passenger services that dominate revenues.

Most United States combination airlines that once operated all-cargo aircraft have, in recent years, sold their freighters. However, these airlines are now showing more interest in the revenues available from belly pit cargo carriage. This activity is most notable in certain flights scheduled late at night for which cargo carriage is the prime money maker and passenger revenue is considered on the margin. There are also some airlines considering moving lower deck galleys to the main deck as a means of increasing the belly cargo space. This trend could allow for increased use of combination aircraft and lower air cargo yields.

The all-cargo operators adopted a hub and spoke system. The hub accommodates an overnight system capable of serving all city pairs in the system, whereas linear or network systems were only capable of serving major city pairs overnight. Creation of a freight hub requires significant capital and major cooperation from the community where the hub is located. These capital and community support requirements may act as barriers to new entrants in the dedicated air cargo industry. It is not expected that the air cargo business will see new entrants on the scale that passenger services have experienced. The movement of air cargo participants toward a vertical integration has taken the place of growth of new entrants.

Aircraft Noise

The substantial employment generated by an air cargo hub is an incentive to local communities to participate with air cargo operators looking for a hub location, but the noise associated with aircraft arriving between 10 p.m. and midnight and departing between 2 a.m. and 4 a.m. must be overcome. The hub operators have succeeded in gaining community support for the development of the airside and groundside facilities necessary for an efficient hub operation, but there is a risk that noise-sensitive, spoke cities will act to constrain air cargo growth.

Many air cargo aircraft are older, relatively noisy equipment, and the times of departure and arrival create a problem for some communities. There is very little economic incentive for spoke airports to accommodate the noise associated with air cargo operations, but the loss of one spoke city would affect the efficiency of the hub operation because the demand between that city and all other cities to which the airline operates would be lost. Noise is a particularly sensitive issue at some secondary airports. These airports are typically located in a suburb of a large city that has one major airport. The secondary airport would offer reduced ground transit times to many of the communities served by the major airport. The inability to use the more noise-sensitive secondary airports will put additional time pressure on overnight delivery of air cargo and will increase the ground access congestion at some

major airports. The application of curfew and other noise abatement airport rules is somewhat arbitrary. The air cargo airlines need to know the long-term operational environment at the airports in order to best perform their long-term planning.

Standardization

Standardization is a recurring theme in the air cargo industry. Increased trucking activity has caused the air cargo operators to confront the variety of interstate trucking regulations that create inefficiencies in the air cargo system. Individual airport regulations regarding curfews and other noise-related issues have already been mentioned. There are also some standardization issues affecting any given air cargo operator including aircraft type, cockpit instrumentation, and containers. The air cargo operators have to consider the impact of nonstandard characteristics when evaluating the purchase of any new equipment.

The commonality of containers is deserving of further study. Containers that could allow for more efficient use of available space for both all-cargo carriers and combination carriers would have a material impact on the cost of operations. The ability to transfer cargo from one aircraft type to another without changing containers is important to the cost and time associated with an air cargo operation, but the variety of sizes and shapes of commercial aircraft create inefficiencies when using a common container for all aircraft. This highlights the potential value of considering cargo applications when designing new aircraft.

International air cargo operations pose some standardization problems for United States carriers. Clearing customs is sometimes very time consuming, and therefore has an impact on one of the more valuable aspects of air cargo -- timely delivery. Many foreign airlines are government owned and therefore receive preferential treatment by government and airport authorities. The ground handling is often not under the control of the airline, and the air freight forwarding agents that United States airlines are required to use are sometimes owned by the national airline. These issues are sometimes overlooked during bilateral negotiations in favor of the passenger services by United States carriers. As air cargo becomes more important to airline profitability, the handling of air cargo at foreign airports may begin to play a significant role in determining the competitive posture of United States airlines.

Cargo Aircraft

Air cargo requirements were sometimes overlooked in the design of new commercial aircraft. The demand for new dedicated air cargo equipment by air cargo operators was not considered significant enough to warrant the design and manufacture of a dedicated all-cargo aircraft, but the potential revenues from air cargo are likely to become significant enough to justify some enhancements to passenger aircraft designs to better accommodate air cargo. These enhancements include strengthened floors, powered cargo handling systems, cargo door size and location, galley and lavatory location, and aircraft cross section considerations. As combination carriers continue to stress air cargo because of its impact on profitability, airframe manufacturers will become more responsive to the requirements of the all-cargo airlines. This will become evident in the capabilities of the aircraft

design in terms of range at maximum payload, maximum landing weight, and the relationship between aircraft volume and payload. This last item is important because air cargo operators do not want to fly a lot of aircraft weight to accommodate empty space, but they also want to be able to take full advantage of the gross weight capability of the aircraft. A study of air cargo densities could support the balance of space and payload on future aircraft.

Air cargo is becoming a more important source of revenue for many combination carriers, and dedicated air cargo operators are integrating the services required to handle all of the shippers' transportation requirements for documents and commodities. There are some potential limits to the growth of air cargo, especially in international operations, but the industry is expected to outperform real growth in the economy during the next ten years.

REGIONAL AIRLINE INDUSTRY

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In 1984 approximately 26 million passengers, or almost 8 percent of all United States passengers, boarded regional airlines in the United States. Between 1985 and 1995 growth rates of approximately 8 percent per year should raise total air traffic volume in turboprop aircraft to 55 million passengers or 11 percent of the United States total. Several observations support an 8 percent growth figure:

- o Traffic growth will slow as routes replacing larger carriers no longer are available. Post-deregulation growth rates have averaged 14 percent per annum. In 1984 rates reached 20 percent.
- o New growth opportunities in intermediate service on infrequently serviced existing routes, new feed services (particularly to secondary hubs), and flights bypassing congested primary hubs will continue. Examples of this last include Mall Airways flights from Toronto to Hartford and Air Wisconsin's service from Bridgeport, Connecticut to Chicago.
- o Increasing integrations with larger airlines will provide a 4 percent to 5 percent growth rate through connecting or feed traffic.

Fewer Airline Operators

An important change will occur in the number of airline operators. At the start of 1985, 194 passenger airlines were operating. This number is expected to fall to 130 by early 1986, reflecting the continuing decline of the past several years. The rate of suspensions, consolidations, and mergers in 1984-1985 is the same as in past years, but the industry is seeing fewer new entrants. In the contiguous 48 states, the number of carriers may already have declined to fewer than 100. The total of 194 reflects Hawaiian and Caribbean carriers whose numbers have shown no significant

change and Alaskan carriers whose numbers have increased slightly. This trend toward a smaller number of operators will likely continue as a result of economic factors and as a response to the pressure on regional airlines to align with major air carriers. By 1995 the total number of regional airlines (in the contiguous 48 states) is expected to be many fewer than 100 -- perhaps 50.

Fleet Mix Changes

Fleet mix, or aircraft sizes, will also change. In 1984 aircraft with a seating capacity of 19 or fewer seats dominated the regional airline fleet with 1,331 aircraft, or 76 percent of the fleet. Only 416 aircraft with 20 or more seats were in service.

By 1995 the fleet will grow to between 2,200 and 2,800 aircraft, as illustrated in Figure 1. The exact growth will depend on whether the average aircraft seating capacity increases to 24 or 28 seats from the current 18. Conservative estimates of aircraft size increase suggest that the 1995 fleet will comprise almost 1,070 aircraft with 20 or more seats -- about twice the current number of aircraft that size. Stronger estimates place the number of aircraft with 20 or more seats at 1,276 -- three times the current figure.

The four remaining sections identify problems that airlines will need to overcome and opportunities that they can capitalize on to achieve the 1995 forecasts. Two issues dominate: the evolving relationship between regional and major airlines and the need to develop changes in financing practices.

Alignment with Major Airlines

Attempts to identify the type or types of relationships desirable for and developing between regional and major airlines have generated much discussion. Each economic or financial benefit has an associated problem. This balance of benefits and problems precludes a consensus about what relationship will exist between the two types of airlines in the 1990s; according to one regional airline president, "the next worst thing to tying in with a major carrier is not tying in."

Some carriers that have allied themselves with the major airlines have found the relationship to be beneficial. Traffic increases of up to 40 percent are credited to the use of dual designators and interline agreements. Some regional carriers have received new aircraft; most have benefited from an image of improved stability and safety. Carriers have also received assistance in obtaining funding and assistance with gate and terminal space.

However, these benefits reflect the present "honeymoon" phase of the relationship. Dual designator status could lead to increasing control by the larger carrier as it seeks to consolidate its markets and improve its feed. The larger carrier may choose to dictate safety or operating standards, the routes that the regional airline can and cannot fly, and what equipment the airline will operate. If a regional airline is closely allied with a major carrier that experiences a strike, the regional airline would probably have to close shop for the duration. In other words, the pride of independence of the regional operator is lost.

Some kind of relationship will be unavoidable; once some regional airlines start affiliating, the others will not be able to resist, given the competitive advantages of association. The situation of regional airlines today is like that