

broad as shown here or more specific subjects, such as the forecasts of certain events or parameters. It is suggested that such exercises could be conducted by the Transportation Research Board. "Single round" surveys have been conducted by the TRB before; it would be an interesting expansion of such surveys to also ask people for their reasoning behind their responses to the survey questions, followed by a "second round" mailing of the range of responses and the stories behind them. On that basis, people would get an opportunity to revise their views in the light of the opinions of others and approach a standpoint closer to a consensus, producing results similar in structure to those presented in the M.I.T. study.

#### AIR CARGO

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The world air cargo market can be split into four entities: U.S. "Traditional", U.S. "Special/418", International-Developed, and International-Developing. There was general agreement that the U.S. traditional air freight carriers, mostly combination carriers, probably have matured for the time being and will not have very much growth, at least for the next five or ten years. Depending on how much the economy grows, air freight growth might even be zero. More likely it will be positive but less than growth in gross national product. The same evaluation can probably be applied to other developed parts of the world where "traditional" carriers operate within their own developed countries or between developed countries. It is probable that such air freight growth will generally reflect GNP changes.

The outlook is different for the market segment called the "Special/418 Carriers". In the United States, and possibly throughout the rest of the world if freedom for entrepreneurship spreads in the cargo industry, special carriers will constitute a group which has to be recognized. These are the companies like Federal Express, or Emery Worldwide, or small "418" carriers, or other services that have not yet been conceived by some venture capitalist. Growth rates will be very large, much greater than GNP. However, they are growing from a very small base so an extremely high growth rate is not impossible.

Some special carriers, like Federal Express, may have reached a point where their growth rate will have to slow, because they have saturated their market. Either that, or they will have to spread further into other companies' markets, or diversify into new areas such as telecommunications.

In the international arena, air freight growth of the developed nations will generally parallel the growth of GNP maybe slightly higher but not much. However, the total world market is still not mature, and in the international developing nations air freight growth probably will be significantly greater than their GNP growth, and greater than the world GNP growth, in the foreseeable future. These so-called lesser developed countries lack the infrastructure of transport systems. It will take many years to develop rail, highway, shipping or other kinds of transportation systems to or within these countries. Air cargo transport will benefit from that long and expensive developed process.

The total world forecast, then, is a combination of these low growth and high growth segments and the world air cargo outlook can be described as "GNP - Plus". It is not going to grow in great leaps and bounds, and it is certainly not going to explode in five years.

#### Cargo Forecast Models

From a macro standpoint, modeling is still probably adequate for air cargo. The traditional variables of GNP and yield are still valid, but specific events like fuel disruptions, labor disputes, and other major occurrences must also be considered. At a micro level, especially down to a specific market, modeling is much less applicable. This is true primarily because factors such as prices, routes, capacity, schedules, competitors, and big customers' influence are all extremely important at the micro level and any of these can change on a moment's notice. Thus an econometric model that does not include many of those variables, or is not predictable for those variables has little value.

Whether or not models are used to develop a forecast, a primary decision must be made as to which characteristic of the market will be used to measure cargo magnitude. Will the forecast be expressed as package count, or revenue ton miles (RTMs), or as yield (dollars per package or cents per RTM), or as total revenue? It was suggested that in today's deregulated environment in the United States it may be easier to forecast cargo revenue than other parameters. The reason, of course, is the elasticity of demand. More RTMs can be generated if rates are lowered, and vice versa. If one tries to forecast RTMs, and actual RTMs start dropping below these forecasts, the cargo sales organization probably would discount the price, drop the yield, and recover the RTMs. But that may not increase the revenue. So, in the cargo world, especially the part of the cargo world that is a marginally priced byproduct of a passenger combination carrier, it is probably better to focus on revenue than on RTMs, packages, or yield.

#### Data Needs

Data problems are rampant in the air cargo industry, even more so than they are on the passenger side. There are all kinds of complications: whether an airline reports to the Civil Aeronautics Board or not, to International Civil Aviation Organization or not, to the International Air Transport Association or not; whether it reports at all. Timely availability of data has declined recently. In some cases the carriers have forced an aging period prior to release of the data to protect proprietary interests. In other cases the process of filing reports and publishing the data has simply slowed down. It can be a time consuming process to evaluate the reliability and consistency of each data source. All of these data gaps and lacks have important negative implications on the ability to make valid air cargo forecasts or even to determine what has happened after the fact.

#### The Future

What will be the nature of the future air cargo business? Is it going to develop into a business where the air cargo is concentrated in the lower holds of passenger airplanes; or in "combi" airplanes where passengers and main-deck cargo are both carried on the same airplane; or are we going to see a proliferation of freighter airplane operations? Probably both trends will exist. The way the industry develops will reflect the circumstances of the individual marketplace; whether the market is domestic or intercontinental, whether the shipments are very time sensitive or not; whether there is significant competition from other transport models.

The nature of the industry will also be determined by the cargo cost and rate structures. While a marginally costed lower hold can be very low cost, almost zero except for the incremental fuel, freighters have to bear fully allocated costs but probably have the potential to provide better service.

Another conclusion reached was that the extent of future growth depends in large part on the development of new markets.

One certain avenue to growth is to develop a new commodity to be carried by air.

The second category is to develop a new market for a product.

The third category is where an airline offering cargo service might encourage a company, or a whole country, to shift a manufacturing location to take advantage of lower labor costs or other potential benefits that may exist. In exchange, the airline gains the business of carrying freight, and potentially people, too, between that new business location and the former location. It may carry raw products or partially finished products in one direction and the finished product in the other direction.

The fourth basic element in market development is innovative sets of hardware. The manufacturing industry's ability to develop airplanes that add significant new capability, especially in cargo handling systems both in the airplane and on the ground, can encourage more air cargo opportunities.

Another element was the necessity to shift from offering a service to marketing a product. Prior to deregulation in the United States, and prior to the innovative new offerings of Federal Express and similar kinds of new cargo carriers, air cargo was an available service. It basically was a transport service that people came to when they wanted to ship something by air. Some effort was expended to encourage shipment by air, but the operators' attitude basically was: "Here's the service; come to us." That is all changed in today's environment. Marketing and selling are now required to get more cargo into airplanes. There are many elements in this sales job: an understanding of time sensitivity; shipment weights; geography; and the strategy of shippers' distribution patterns. It requires the right emphasis on service, pricing, and marketing tools. Timeliness does not necessarily mean overnight. It may involve sensitivity to day of week, or time of day, or second day delivery, or reliable delivery three days away. Pricing implications have to be consistent. A dependable, superior service can command a premium price. Marketing includes effective communication of the advantages of the service product to potential buyers.

The market impact of changing trends in shipment weight was discussed. It was reported that studies in the last few years showed how the average weight per shipment has declined. One example is that Federal Express has seen a decline in average weight per package from about 12 pounds down to about 6 pounds during their relatively few years in business. On the other hand, air cargo statistics compiled by the Air Transport Association of America (ATA) show that the average weight of domestic air freight shipments has remained constant during the period, and the weight of international shipments has increased.

There are explanations for some of the anomalies. Some studies apparently attempted to generalize from a subset of data. In the case of Federal Express (and other small-package carriers) the decline in average shipment weight reflects a shift

in their product mix from mostly merchandise to a strong emphasis on documents, letters, computer printouts and other urgent pieces of paper. This letter mail tends to come in relatively small packages. It is interesting to note that the U.S. Postal Service experienced an opposite trend, an increase in the average weight per piece of their express mail product as it evolved from mostly urgent letters to include more merchandise shipments. If one can segregate the trends which impact only very specialized segments of the market, and look at just the remaining part of the industry, then the weight per shipment has not changed very much at all. The weight per shipment could change in the future as a function of reduced inventories and changing distribution patterns for goods.

Geography of an air cargo system warrants discussion. The concept of a system served by a hub and spokes is well known on the passenger side. This type of airplane routing applies to cargo as well. It is generally more efficient and permits coverage of more potential city pairs by running freighters through a connecting network. City pairs served grows geometrically as the number of cities on each end increases.

Total cost concepts have been a topic in the air cargo industry for a long time, but they have not been fully utilized by cargo sales people. There were probably two reasons for this. First, cargo sales people often do not understand the concepts themselves. Secondly, the person who is buying the freight service is often a freight traffic specialist, or somebody who is in charge of transportation for a company. To talk successfully about total cost one needs to contact somebody in the company who has more perspective on the corporation's profitability and not just transportation costs. There has to be a trade-off between transportation, warehousing, and inventory costs. The idea, of course, is to achieve the minimum cost of these combined elements, and one can not necessarily do that simply by lowering the costs of transportation alone.

The logical conclusion of total cost concepts is reduced inventory costs from today's levels for many companies, maybe for most companies. And when that happens, it means more frequent shipments by air or however one ships, which means a smaller average shipment size. It means less inventory at each distribution center. It could mean more distribution centers. And it means a faster reaction time because less inventory in the system means a premium on speed for resupply. At least two of those elements, the smaller shipment size and the faster reaction time, are very advantageous for air freight. Small shipments may fit an airplane that could not carry a large shipment; and the airplane definitely is fast, compared to other transport modes.

In summary, the forecasted outlook for air cargo growth is mildly bullish. It is a little better than world GNP growth; not great, but certainly not totally stagnated. There is a premium on innovation. Certainly there is a need for increased marketing emphasis in the field of air cargo, as opposed to thinking of cargo only as a byproduct of passenger service on airplanes, or as opposed to an airline modifying a few old passenger airplanes and then announcing "Now we're in the cargo business. Come to us, and we'll take your stuff by air." With enough attention to the needs of the air cargo customer, by attention to the technical and the marketing aspects of the service product, and with enough patience, the air cargo industry is likely to prove that "GNP-Plus" can be a challenging and rewarding business.