

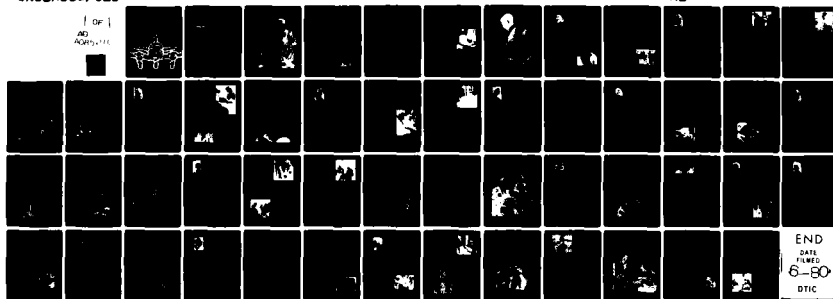
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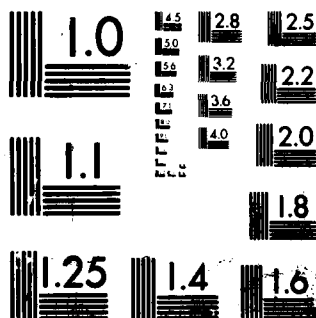
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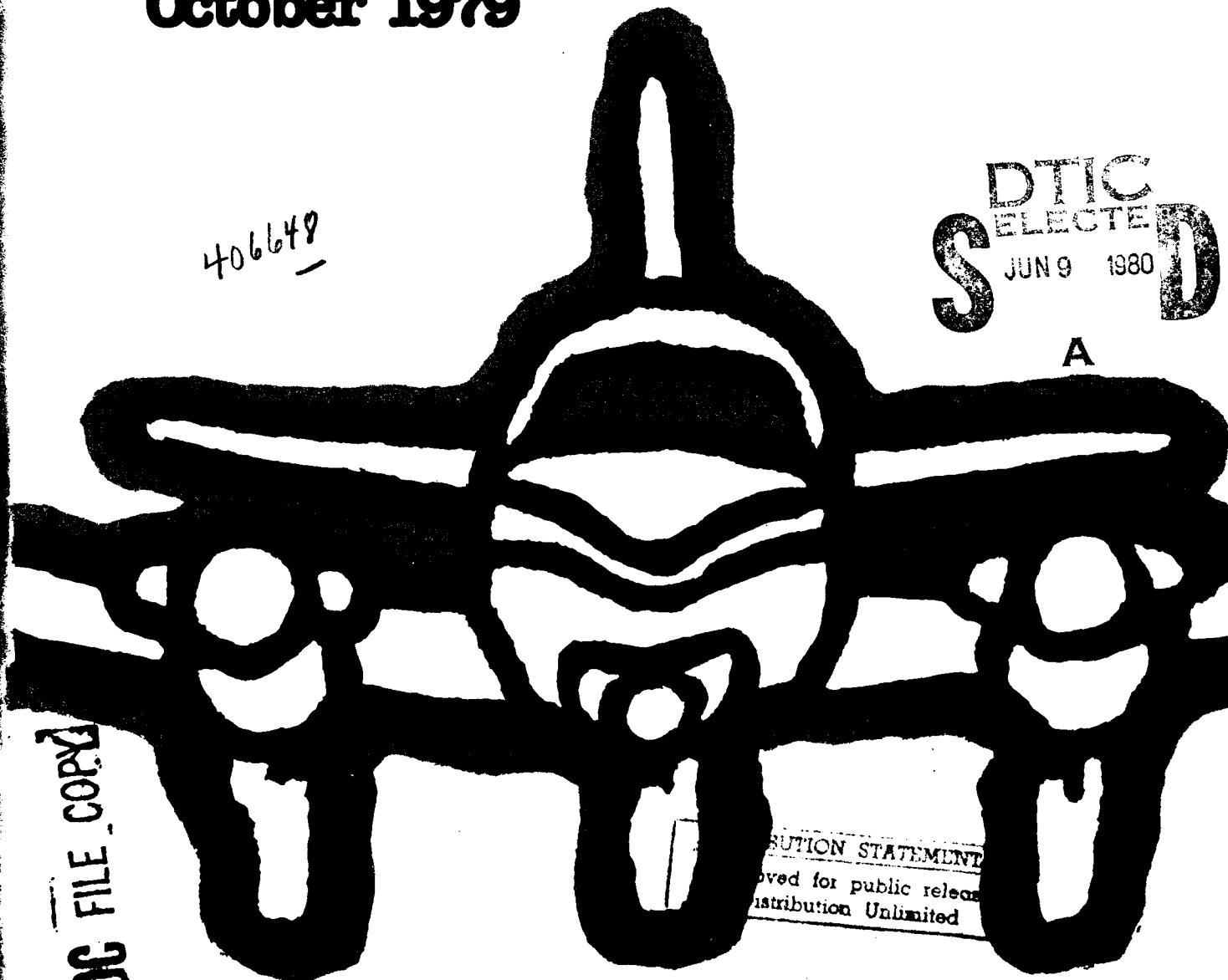


Forecast Conference Proceedings

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Proceedings Summary

Deregulation, fuel, capacity, policy alternatives: These were the issues given primary attention at the Fifth Annual Federal Aviation Administration (FAA) Forecast Conference. As in previous years, the attendees at the conference represented the diverse interests and organizations within the aviation community. At the end of the one day session, agreement seemed to exist among panelists and participants that aviation will overcome the pressing issues of today and expand the services it provides the country.

The events and trends that plague aviation today represent both challenges and opportunities. While it may be difficult to foresee their ultimate effect on aviation, the panelists suggested a number of outcomes involving a restructuring of elements within the aviation community. A few wished forecasters good luck in their attempt to track the changes that seem at hand.

Mr. Quentin Taylor, Deputy Administrator of the FAA, presented the keynote address at the conference. He stressed that aviation has attained a level in size and maturity where it is now as susceptible as any other industry to the major forces affecting the country. The challenges to aviation come principally in the policy, economic and environmental areas.

Given the many issues now confronting aviation, he asked: "Will aviation grow?" The answer was: "Without a doubt." But a considerable amount of change will accompany that growth. As one indication of the magnitude of the change to come he cited the many market changes that had already occurred since deregulation.

Mr. Gene Mercer, Chief of the Aviation Forecast Branch, FAA Office of Aviation Policy, outlined the principal series in the 1979 FAA National Forecast. Responding to the challenges enumerated by Mr. Taylor, Mr. Mercer stressed that FAA aviation forecasters could remain current on these changes only through interaction with the community of forecast users and aviation planners.

Mr. Robert M. Griswold of Shell Oil emphasized that aviation itself has to be considered in the broadest context. Thus, Mr. Griswold discussed the fuel problems of aviation in competitive terms. There are only so many barrels of crude oil available; they must be shared by all petroleum product users.

The Airline Deregulation Act of 1978 was cited by several panelists as a policy decision with both expected and unexpected results. While the major airlines have reacted pretty much as predicted, according to Mr. Sheldon C. Srulevitch of Braniff Airlines, the timetable for major effects envisioned under deregulation has been greatly shortened. Even with inclusion of the time period of ad-hoc deregulation that preceded the legislation, the changes that have occurred in air carrier markets and schedules have been tremendous.

Market exits by the large carriers have been followed by expansion of commuter carriers into many of these areas. Mr. Duane Ekedahl of the Commuter

Airline Association of America indicated that the commuter airlines are now serving 630 airports with scheduled passenger service, 850 airports if air cargo service is included. Optimism, he says, can be drawn from examples such as Air Wisconsin which began service between Appleton, Wisconsin and Chicago when a local service carrier exited that market. Air Wisconsin is now among the largest of the 200 commuter airlines in the country.

Perhaps not envisioned at the time of deregulation is the high demand now existing for new equipment among all carriers, large and small. The timing of this demand, predicts Mr. Theodore Shen, of Donaldson, Lufkin, Jenrette, will result in corporate realignments among the major carriers. He expects that some of the financially weaker carriers will have to retreat a little and shrink to a level supportable by their capital resources.

Overall, however, Mr. Shen feels that this replacement cycle comes at a good time for the trunk carriers. Deregulation gives the carriers the degree of flexibility they need to get their houses in order to meet their financial requirements. If deregulation had occurred ten years ago, the required changes would have been accomplished without the discipline imposed by high fuel prices and the capital constraints of today. Ten years ago weak carriers as well as strong carriers had excess financial and equipment resources. Today, only a few trunk carriers enjoy that advantage.

The commuter carriers have placed orders for new equipment of a value matching the value of the existing fleet. The loan guaranty provisions of the deregulation legislation have facilitated these orders greatly. The smaller size of the airplanes in the commuter fleet as compared to the air carriers allows the commuters to serve small markets in a timely and fuel efficient manner. But, as both Mr. Ekedahl and Mr. Robert A. Jenkins, Allegheny Airlines, pointed out, they can do so only if the additional regulatory burden being imposed on the commuters does not become overly onerous. These economic and safety regulations have the potential of forcing the commuters to grow, emphasize longer haul markets and abandon the smaller cities as the only means of carrying the economic burden. If this occurs, Mr. Jenkins predicts that a new fourth level of carrier may have to come into being to handle the kind of traffic to which only a very small carrier can be responsive.

Mr. Clifton A. Moore of the Los Angeles Department of Airports is acutely aware that the consolidation now underway among the large carriers and the expansion of commuter operations are going to create problems for airport operators. By and large, airports are dependent on users' fees for their survival. The smaller commuter airplanes cannot be assessed the same landing fees as a 747. Yet, there is not a significant difference in the cost of services the airports have to provide the two aircraft. The two types of aircraft cannot be segregated by airport since the air carriers and commuters depend on each other for passengers.

The problem of facilities is further magnified by the demands of general aviation. As Mr. Mercer indicated, this is by far the largest segment of aviation. Ms. Thon Griffith of the Ninety-Nines, Inc. provided a definition of general aviation that clearly poses the problem: General aviation is an alternative means of transportation. Corporate users of aviation are increasingly turning to general aviation because it is cost-effective and the most flexible means of travel available.

General aviation has more than 7,000 public use airports available to it. However, as primary airports across the country become congested, general aviation is being pushed to smaller airports. In many cases, these airports are less convenient and offer fewer services than are available at the larger airports. Consequently, Ms. Griffith asks that a campaign be undertaken to point out general aviation's need for reliever airport support to the entire country.

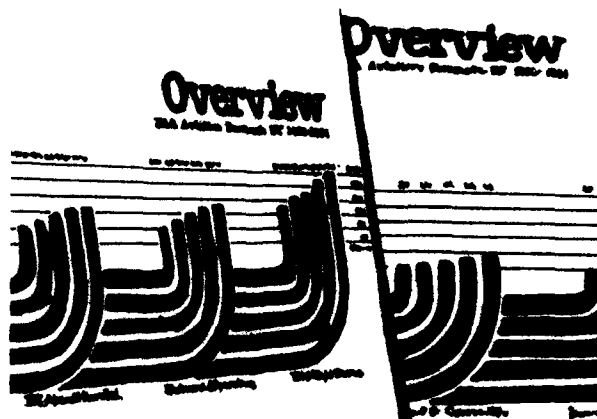
A factor that should not be overlooked is that aviation depends on a set of institutional relations for its existence and continued growth. The internal relationships—between manufacturers, airports, aviation users and regulators—are well established and visible to the entire aviation community. But the external relations—between communities and aircraft users as well as airports—are less well established. They are real and need the same degree of maintenance as any piece of equipment according to Mr. Charles L. Elkins of the Environmental Protection Agency. Noise pollution is his particular worry at this time. He reminded the audience that everyone in aviation has to help resolve this issue if airports are to be kept open. Communities cannot be bought-off since there is no guaranty that future residents will abide by an earlier agreement. Furthermore, the degradation of property values without just compensation, such as that associated with noise pollution, is prohibited by the Constitution of the United States. Laws simply passed by the Congress cannot circumvent that protection.

In the end, it was General Guy E. Hairston of the Air Line Pilots Association who pointed out the high standards against which aviation must work. Safety is the bottom line, not a question of numbers. No trip to the cemetery because of an aviation fatality is a worthwhile trip.

A perfect accident record and a stronger industry can be achieved only if the entire community works together and approaches safety from a comprehensive perspective. No one and nothing in aviation can be absolutely fault-free. So, greater emphasis has to

be given to interruption of the chains of events that precede all accidents. Manufacturers, pilots, airports and their communities, air carriers, aviation users, and government must work together—interactively—to achieve perfect safety.

The issues of deregulation, fuel, capacity and policy alternatives are creating an atmosphere of ever-increasing uncertainty. Aviation forecasters, planners and policy makers will be challenged. It is they who must anticipate what aviation will look like as a result of actions not yet taken. The conference was an opportunity for forecasters and forecast users to explore the outlines of what the future might bring.



FAA Forecasting Initiative Overview

The issues confronting aviation discussed at the conference demand attention from the aviation forecasting staff at the FAA. The Airline Deregulation Act became one year old on the day after the conference. The speakers at the conference agreed that deregulation has increased the tempo of change within several segments of aviation. While deregulation has removed one layer of control over aviation, escalating fuel cost and availability problems amount to a new form of regulation: "Regulation by the gas pump." As indicated by the speaker on the financial prospects of the trunk air carriers, economic uncertainty has as great an effect on aviation as on any other industry. The effect may be greater since this is a period of large scale investments on the part of commercial air carriers.

Now in its sixth year, the Forecasting Initiative sponsored by the FAA Office of Aviation Policy was undertaken as a means of capturing the increasing rate and importance of change within aviation. Its goal is to improve the quality and utility of the forecasts used by the agency and other aviation planners. While the FAA forecasts are produced for use within the agency, much of the data and information used in developing the forecasts must come from external sources. Consequently, greater involvement on the part of the aviation community in the process is a means of improving the quality of the forecasts. Producing forecasts that are

used outside the agency as well as inside becomes an incentive for more broad-based participation in the forecasting process. The entire aviation community gains from the greater reliability of the forecasts and from the elimination of redundancy of forecasts.

Outreach Program

The Outreach Program was established to bring into the forecasting process the best available information on events, constraints and opportunities involving all segments of aviation. The annual forecast conference is one of the events used to achieve this objective. The evaluations provided by representatives of aviation service providers, aviation planners and government officials provide the FAA a reading on the forecast's anticipated reliability and credibility as well as guidance on areas of special concern for the following year's forecast.

For example, the issues of future fuel price and availability continue to be of significant concern to aviation forecasters this year. Fuel price has a tremendous effect on air carrier cost of operations. Projections of air carrier costs, in turn, are one of the more highly weighted variables used in forecasting air carrier activity. In the case of general aviation, fuel cost is the main component of total variable cost. Variable cost is significantly related to whether general aviation aircraft are flown or parked on the apron. Consequently, considerable effort will be expended this year following up on the insights on the fuel situation gained at the conference in order that next year's forecast reflect the events of this year and the likely path of fuel prices in the following years.

The Outreach Program also includes a series of seminars and workshops held throughout the country that focus on specific issues or problem areas. The FY 1980 scheduled seminars are designed to foster resolution of particular local issues of importance to the hub forecasts for Phoenix, Arizona, Minneapolis, Minnesota and Portland, Oregon. These seminars have proven to be valuable tools in obtaining broad community participation in the discussion of aviation facilities needed by these metropolitan areas in the future.

The workshops provide an introduction into the aviation forecasting process to Federal, state and local officials. Improvements in data collection and increased forecast utility are the primary topics at these sessions. This year particular attention is being given to the workload reductions made possible through the interactive capability of the FAA Terminal Area Forecast Data System. Several states are making use of this capability for their own purposes and to update the Terminal Area Forecasts for facilities within their states.

Improved Data Bases

The extent and accuracy of the data bases used in forecasting is a constant issue for FAA forecasters. The Outreach Program addresses the problem by increasing the involvement of those who are most knowledgeable about aviation activity in a particular area. A number of other projects are more directly involved in increasing the data available for input to the forecasting process. One area under investigation that

is of interest to aviation planners at the state level is the use of acoustical aircraft counters. A sampling methodology for use with the counters is being developed that will permit more accurate estimation of general aviation operations at non-towered airports.

Overall, the activities conducted as a part of the Forecasting Initiative seek to make available high quality information for use by aviation forecasters and planners. Given the growing uncertainties within and surrounding aviation, this information is perhaps more important today than at any time in the past. Interaction among forecasters, forecast users and the aviation community is the critical base upon which improvements in available information will continue to be made. The Forecasting Initiative is a means of fostering cooperative—rather than duplicative—forecasting efforts and, not incidentally, more reliable forecasts for long term planning.





Part 2 Proceedings

Foundations for Aviation Growth



Quentin Taylor
Deputy Administrator
Federal Aviation
Administration

Mr. Taylor presents the welcoming remarks to the conference. He defines the purpose of the conference as an exploration into what American aviation may look like in the year 1991. The future of aviation rests not only on actions to be taken by the aviation community, but also on changes that may occur in the economic, policy and environmental arenas.

Let me begin by simply letting you know how surprised I am at the attendance and interest in this kind of event. Over the years, as I have moved around the United States in aviation circles, I have often been impressed, or depressed I suppose, about the absence of planning, the absence of even thinking about our future in aviation. I am driven by the thought that most people live for today in terms of economics and really feel that there's just no way to get a grasp on the future as far as aviation is concerned. Obviously, this forum demonstrates to me that it is not necessarily true. We do have our concerns regarding the future of aviation and we are working diligently to define that future in reasonable and rational terms.

We are here today to explore what American aviation may look like over the next 12 years. Will it grow? Without a doubt. But, how fast will it grow? What events will influence that growth? And, perhaps most significantly, how will aviation affect our lives?

The 1979 FAA Aviation Forecasts for Fiscal Years 1980-1991 we've just published provides one possible set of answers to these questions. I emphasize "possible," because your reactions and comments, and most critically, the actions of all members of the aviation community during the coming years must inevitably change that forecast as we home in on the year 1991. So, in reality, our goal for this conference is to begin, not end, the discussion on the state of the aviation in the year 1991.

Uncertainty and Change

A lot is happening that we know will profoundly affect aviation. But our crystal ball becomes cloudy as to what that impact might be the farther

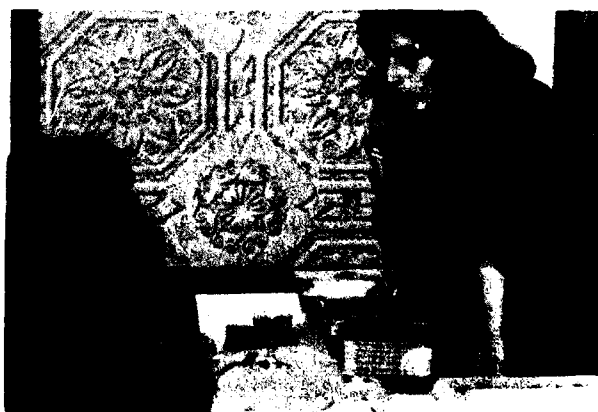
ahead we try to see. It loses precision the farther ahead we look. What I see today is a mature aviation industry. It has the capability and size to participate fully in the marketplace domestically and abroad. But because of its size, economic, political and social factors and events which have an impact on other industries also have an impact on aviation.

In the past, civil aviation has enjoyed a protected status, with considerable support and oversight provided by the Federal Government. Those days are gone. At least in economic terms, providers of aviation service must now reckon with and respond to market forces without the help and protection of the Government. Planners usually have had ample warning on changes in marketplace policy coming from either the Government or the airlines. We could watch petitions wend their way through the Civil Aeronautics Board. Deregulation has eliminated that lead time.

Now we have to deal with phenomena such as Orlando, Florida. Before deregulation, service to Orlando was the province of four carriers. Today, that city's airport accommodates twenty. Using that experience as an indicator, and that of a number of other cities as well, the future promises to keep us all on our toes. We must increase our awareness of from where important policy changes might issue. This is particularly important at the local level where economic changes can have an immediate and profound impact on individual communities and airports.

But as far as the National Forecast is concerned, policy changes created by the marketplace have less impact. That is because the National Forecast does not focus on specific route segments. Nevertheless, FAA hub and terminal area forecasting efforts already are feeling the impact of a more dynamic marketplace.

The cost and availability of energy is, of course, the dominant economic issue facing aviation. We know the cost is going up. The problem is: How can we utilize the available fuel most efficiently and conservatively? We've designated this week as Energy Conservation Week at the FAA. Special programs are emphasizing both the need for conservation and what has been achieved in this area.



Aviation, the air carriers in particular, is doing a lot to conserve fuel supplies. In 1978, with 64.1 million more passenger enplanements and a 13.8 percent increase in revenue ton-miles of cargo carried than in 1973, the domestic passenger and cargo airlines are using only three percent more fuel. I think that if all of us in this industry and in all public sectors were as effective as the airlines have been in fuel conservation, the nation would soon regain control over its energy supplies.

Now, although energy dominates our immediate attention, general economic conditions are not far behind. It is bad enough to be in the aviation forecasting business as we are, but I wonder at how many sleepless nights the economic forecasters must suffer. I think we can agree that we do not know with any degree of certainty what the state of the economy will be in the coming years. We may not even agree on its state today. However, since the economic forecasts others generate play an important role in our aviation forecasts, we cannot ignore general economic issues.

Right now, the economic outlook is less than bright. Our baseline aviation forecasts are also less than enthusiastic. But I have faith in aviation. I believe that events in the coming year will allow us to project more optimistically in our future forecasts. That is, the industry will be a great deal more healthy than perhaps we now imagine it could be.

In addition to contending with evolving policy issues and economic uncertainties, we must now also incorporate environmental demands in our planning. Noise abatement and pollution control are elements that we must work into our planning cycles. These elements are important and are here to stay.

First Step in Planning

Given the uncertainties that are very much with us, there is much that we have to do. Forecasting is a critical part—in fact, the first step—in planning under uncertainty. Your participation at this conference suggests that I probably do not need to convince you of this fact. We have to know what might happen if the aviation industries are to continue developing and if the FAA is to provide effective service to the aviation community and to the flying public.

So, as you know, forecasting cannot be effective or hope for accuracy when done in a vacuum. This conference, the hub forecast seminars, and the technical workshops run by Mr. Gene Mercer and his staff are more important today than they have ever been. The importance of planning is magnified under uncertainty.

At the moment, we are confident of the capability of our forecasting technology. This year, we have integrated our three major forecasts—the National and the Terminal Area Forecasts as well as the current hub forecasts—in an effort to present a consistent picture. The combined output of the three forecast series represents probably as much detailed information as our limited resources allow us to provide to the aviation community. It's not perfect. But, it is perhaps among the better devices, the better documents, the better means of prognostication in the United States.

Where we now must concentrate is on the quality of the information and data going into the process—not only the numbers, but also the events which may constrain or accelerate aviation growth in the future. We need a wide communications net—and we certainly have it here—to capture this information as soon as possible. Only through effective interaction with the aviation community can we avoid surprises inherent in weaker forecasting techniques.

The Terminal Area Forecasts are an excellent basis for this interaction. They are highly specific and focus on individual airports. A lot of the changes we expect will occur in the coming years will be measured first at individual airports. Growth among the commuter carriers, market entry or exit decisions on the part of the airlines, environmental constraints, and utilization patterns within the general aviation fleet all manifest themselves initially at the local level.

If we held to only a national perspective, we would miss these changes. A lot of change can occur—growth in one area cancelling constrained operations elsewhere—without having an impact on the overall National Forecast. But, if we do not pay attention to these relatively small changes, we are very likely to miss some future changes affecting the National Forecast.

The sum of the Terminal Area Forecasts is equal to the National Forecast. From changes made at the local level to these forecasts, we will be able to spot patterns before they manifest themselves at the national level. Thus, to accomplish our objective of having a reliable forecast upon which the FAA can do its planning, we need your input. In return, we offer our forecasts for your use.

Again, let me say personally and also professionally I am delighted to see your interest here. I am delighted to have your input. I am delighted to know that this dialogue will be healthy and complete. Again, thank you for listening to me. I look forward to complete exchanges which will allow a great deal more accuracy in our forecasts of aviation's future. Thank You.



Forecasting in an Interactive Environment



Gene Mercer
Chief, Aviation Forecast
Branch
Federal Aviation
Administration

The days when aviation forecasting was a simple, ivory tower exercise are gone. That is the message Mr. Mercer brings to the conference as he outlines the 1979 FAA National Aviation Forecast. Each series the FAA now forecasts is surrounded by issues that will have a profound impact on the series in the future. It is only through effective interaction among forecasters, forecast users and their communities that reliable and credible forecasts may be produced.

I would like to talk to you today about the 1980 through 1991 FAA Aviation Forecast. We have translated many of the uncertainties Mr. Taylor has talked to us about this morning into actual forecast numbers that appear in the forecast document.

I would like to reiterate his call for more interaction in the development of the forecasting process. We are here today at this conference to get your input into what you think is going to happen in this world we live in; and, to get your perception of how the future growth of aviation will be affected.

Integrated Forecasting

We are constantly striving to improve the accuracy of our forecast models. We feel that we are using the latest forecasting techniques. We are satisfied with most of the models that we have developed. We are receiving the output in a form that is usable to the aviation community. Consequently, there will be less effort spent on improving forecast models in the coming year and more effort devoted to establishing communications and to developing a feedback process in order to receive and use your input in the development of the individual forecasts. Forecasting cannot be performed in an ivory tower. So, to improve the accuracy and the reliability of the forecasts we do need your input.

Three of the major forecasts that we prepared this year—the National, the Terminal Area Forecast and regional hub forecasts—all utilize a common set of assumptions. That is, the activity data for airports in the Terminal Area Forecast are tied to the National Forecast totals that we have projected for 1991. Also, each

of the hub forecasts that we have developed this year are internally consistent with the National Forecast and the Terminal Area Forecast.

One of the major problems the Office of Aviation Policy has faced in developing forecasts is the problem of developing individual facility forecasts—the disaggregation problem. They are required by the agency for manpower planning. Historically, national growth factors were applied to each segment of the industry, right across the board at all facilities. We recognized that this was not a satisfactory approach.

In developing the new Terminal Area Forecast and the individual regional hub forecasts, we have developed a combination top-down, bottom-up forecasting approach. By doing this we recognize that there are areas of the country where aviation is growing at a more rapid rate than the national rate and there are areas of the country where the growth is not as spectacular.

We are, in effect, approaching the time when we can say that this is what the national forecast implies for each of the 4,000 airports in the Terminal Area Forecast. Now, if these implications were certainties, then our forecasts would represent truth, beauty and wisdom. We know better. There are still problems to be solved.

This year's forecast is based on less Federal intervention in the marketplace. We've attempted to deal with each of the uncertainties in the economy, in policy and environmental issues and to translate these into impact on aviation growth. We have attempted in the Terminal Area Forecast to translate this down to specific locations. We recognize that there are airside capacity and utilization problems. There are ground access problems at airports also. All of these factors influence the basic relationship: Aviation growth is tied to the growth of the general economy.

As Mr. Taylor mentioned, the outlook for the general economy is not good at this particular time. Therefore, this year's aviation forecast is slightly lower than we projected last year.

There is a new phenomenon that has occurred in the industry: Aviation is no longer a luxury, it's a necessary part of life. The general public has recognized this. To the family that is utilizing an air carrier to fly across the country either for leisure time or to visit family, air transportation is no longer a luxury. It is a necessary portion of that trip. To the businessman who must use the commuter or air taxi to make a connection to an air carrier flight, the use of that commuter or air taxi is not a luxury, it is a necessity. To the business community, the use of general aviation aircraft is a necessity. It is no longer a luxury.

Recognizing the speed of change, we have to remember that forecasts have very short half-lives. We'll know more about 1991 next year than we know this year. Therefore, forecasting must be iterative, it must be constantly updated. We no longer have the luxury of developing facility plans based on five-year old forecasts. Planning must incorporate a continuous process in response to our changing views of the future. The planning cycle must accommodate these changes.

We also recognize that to be effective and reliable, forecasting has to be interactive. We have to have commentary from the people that are in the field working at individual facilities, the entire aviation community and the general public. That's one of the reasons we're here today.

This morning's panelists will discuss some of the major issues that we are facing from the deregulation, fuel, safety, environment and financial areas. This afternoon's panelists will discuss the opportunities for aviation growth recognizing the challenges that currently face aviation.

The National Forecast

The basic assumptions of our forecast were developed by the Wharton Econometric Forecasting Associates. We utilized various parameters developed by Wharton in our forecast models. We also utilize other forecasting services—Chase and DRI—as checks on the impacts of Wharton's assumptions on our forecasts.

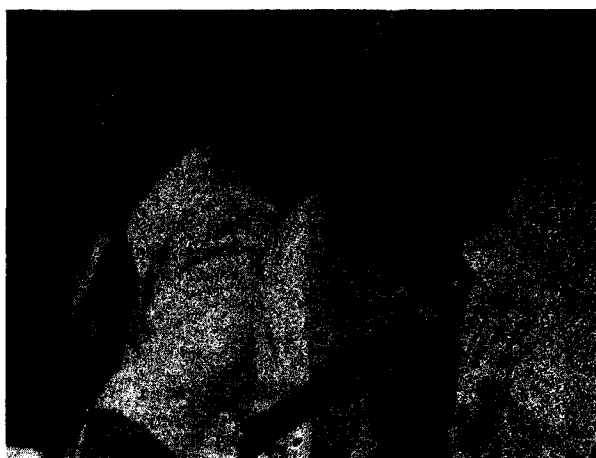
We develop a baseline forecast that is our best estimate of what we think is going to happen to aviation in the next twelve years for use by the agency. This input is vital to the FAA in developing budgets for the next fiscal year and to begin long-term facility planning.

We recognize, however, that as planners and as operators of the aviation system you need to have some parameters in your planning. Therefore, we include a set of scenarios in the National Forecast. One assumes that there will be a period of stagflation. The other assumes that there will be a period of rapid growth. We feel that these are reasonable brackets around the baseline forecast that appears in this year's document.

To illustrate how these economic indicators impact our aviation forecasts we have picked as an example the oil and gas deflator. In the baseline forecast we have assumed that the price of fuel to the aviation industry will increase to 597 by 1991, based on 100 in 1972. With this kind of increase, closely paralleling the inflation rate over that time period, we would anticipate that general aviation operations at FAA towers will increase to 76 million operations, up from about 55 million today. However, if the price of fuel and oil outstrips the inflation rate, then we would anticipate little or no growth in general aviation. If there is some breakthrough in fuel technology, where the price of fuel increases at a slower rate than the inflation rate, we would anticipate a great increase in general aviation—particularly local—flying.

We have indicated some of our individual forecasts on the overview charts along the wall. I'm not going to go through all of the forecasts that appear in your document. However, to give you some indication of what we think is going to happen to aviation over the next twelve years. I will discuss certain of the indicators for each of the segments of the aviation community.

We are projecting air carrier growth at 4.9 percent annually from 1979 through 1991. As a result of deregulation and many of the actions that have been taken by the aviation community, the air carriers have



shown spectacular growth over the last two years. We do not anticipate that this growth can be sustained over the long-term. The trend will be to a more moderate growth over the long-term period. However, it will still far outstrip growth in the gross national product.

The air carrier industry is faced with deregulation. Consequently, our forecasts will be influenced dramatically by individual policy decision of individual carriers. They are able to move now into or out of markets practically overnight. We have seen the impact of this type of activity—the dynamic marketplace—as Mr. Taylor mentioned.

Look at Reno, Nevada in 1977. There were 700 thousand enplanements that year. In 1978, that went up by 45 percent and, in 1979, it looks like it's going up another 40 or 50 percent. A doubling of the number of enplanements at Reno in a two-year time frame. A great deal of this growth is due to the development of new hotels at Reno.

That air transportation is able to capitalize on this growth and institute new service at that airport to accommodate the growth and bring the passengers to Reno as quickly as it has is a reflection of deregulation. We would anticipate that over the forecast period, there will be many more Renos and many more Orlandos. There also will be many communities that will lose air carrier service and receive substitute commuter air carrier service. This implies specific facility problems at these individual airports.

The largest growing segment of the aviation community over the last six years has been the air commuters. As a result of deregulation there are many more opportunities open to commuters. As certificated route air carriers move out of specific markets, these markets become available to the commuter carriers.

Also under deregulation, the commuters are eligible for loan guarantees. We are already seeing that this will stimulate the growth of the commuter industry. Right at the present time, the commuter industry is undergoing rapid growth. Many new commuters are starting up. In the near-term, there will be a period of some instability in the industry. However, over the longer term, as this segment of the industry becomes a stronger part of the national transportation system, we

anticipate that commuter air carrier management operations will become more stable.

The commuters are also eligible for subsidy payments under the new legislation enacted by the Congress in October of 1978. This subsidy payment will be routed through the local community. Therefore, we anticipate that there will be a great deal of interaction between the airlines and the communities in developing the necessary facilities to accommodate the new commuter service at these locations to provide the essential air transportation specified by the law.

The largest segment of aviation is general aviation. An indication of the relative size of general aviation: Of approximately 200 thousand aircraft flying today, 193 thousand of these are general aviation aircraft. We assume that over 50 percent of flying in general aviation today is conducted for business purposes.

We anticipate that over the forecast period the size of the general aviation fleet will grow by 3.9 percent annually, reaching about 304 thousand aircraft by 1991. You can compare this to the growth in the air carrier fleet's size. It will increase from 2.6 thousand to 3.2 thousand aircraft, a 1.7 percent annual growth. The growth of general aviation means facility problems at the local level. There is competition for land use between aviation and shopping centers or housing developments. As recognition of aviation as a necessity spreads, it will be able to effectively compete for this land at the local level.

The FAA is primarily concerned with aviation safety. As a result of the projected increase in general aviation flying, we anticipate that there will be additional regulatory actions taken to ensure aircraft safety. A few years ago the FAA, recognizing the congestion over the major air carrier airports, instituted the Terminal Control Areas and the Terminal Radar Service Areas.

Following the crash in San Diego last year, the FAA put out a notice that they were going to expand the number of Terminal Control Areas and Terminal Radar Service Areas to many more airports across the country, as well as to lower the positive control airspace ceiling on enroute flying. Upon evaluation this was revised. However, in the future, as congestion increases, I anticipate that there will be further regulatory action in this direction.

We also might mention that of the four top busiest airports in the United States in terms of number of operations, three are basically general aviation airports. Van Nuys, Long Beach and Santa Ana are exceeded in number of operations only by O'Hare in Chicago. So, in the future, not only may we be talking about reliever airports for the major air carrier terminals, we may have to start talking also about reliever airports for major general aviation facilities.

How do these activity forecast translate into FAA workload? We see operations at FAA towers increasing at a three percent annual growth rate from 71 million in 1979 up to approximately 100 million operations in the year 1991.

As new technology is developed and put on-line by the general aviation community and as greater



pilot sophistication evolves, we see more and more pilots becoming instrument rated. Therefore, the instrument operations projection is for a 3.9 percent annual growth rate and the enroute center projection is for a 3.5 percent annual growth rate, a higher rate of growth than that expected for actual operations.

Today, approximately 50 percent of the traffic handled by a center is air carrier. Most of the growth that is going to occur at the enroute centers will be general aviation and air commuter growth rather than air carrier.

The FAA Forecasting Focus

We would like to emphasize that the forecast numbers are based on a specific set of assumptions about what is going to happen in the economy; what's going to happen as far as the environment is concerned; what's going to happen among the policy considerations of the individual carriers; and, in the regulatory field. Therefore, when you look at the numbers in the forecast document, use them with care. All forecasts are subject to change. Forecasting is a continuous process. You must look at the assumptions used to see if they are consistent with what is actually happening.

We will continue our emphasis of improving our forecasts by attempting to achieve internal consistency among the various forecasts issued by the FAA. The sophisticated technology is not enough. We have to use a forecast not only as a planning document but as a communication tool.

The Terminal Area Forecast or the hub forecasts are perhaps the most effective communication tools because they deal with local airports and local communities. Through these forecasts, we are able to

spot trends occurring at the local community level and see how these trends are going to impact our future national forecasts. To improve our forecasting effort—to make our forecasting more reliable—we have to have this interaction with the aviation community. We cannot do it alone. That's the purpose of this conference, the seminars and the workshops we hold throughout the country: to receive your input into the forecasting process.

Our goal is to utilize the best information and best data available in developing forecasts. Much of the information and data that we need is information and data developed at the local level. Only you can tell us about the capacity problems at a specific airport in your area. Only you can talk about the access problems. When we were developing the Los Angeles hub forecast, we found out from the local community through a seminar that there was an airport access problem limiting airport growth at Los Angeles International to 40 million passengers per year. This dramatically changed the distribution of traffic as we projected it in our forecast. We show a great deal of traffic diverting to Ontario in Los Angeles and eventually the development of a new airport in Palmdale.

There is no alternative to forecaster-planner interaction. We have to do it together. The question is not whether aviation will grow, but where and how aviation is going to grow and in what time period we are going to reach new levels of activity. In addition to providing a planning tool, we expect our forecasts will foster discussion of the issues faced by aviation at the national and local levels.



Policy Issues in Today's Environment



Moderator:
Pamela Kruzic
Policy Analyst
Office of Aviation Policy
Federal Aviation
Administration

Airline Deregulation



Ray Pulsifer

Associate Director
Licensing Programs and
Policy Development
Bureau of Domestic
Aviation
Civil Aeronautics Board

Airline deregulation, its history and some possible consequences, is the topic of Mr. Pulsifer's presentation. While he does not argue with much of the pessimism with which many see the future of aviation, he can foresee a more positive future tied to the changes and opportunities that face aviation.

Thank you. What I've done basically is review the forecast beginning on page 38 of the main document. I don't have any particular quarrel with the use of Wharton and other long-term forecasts that are based on income, population and other macro indices of the economy. And I personally have no basis to disagree with the general pessimism that most long-term forecasters manifest at this time—that the great post-war boom is over and we are in a period of at least retrenchment, and possibly worse; and that this will go on for at least a decade.

On the other hand, I personally can't believe that that is inevitably true. There are too many things that could happen to change things radically and very quickly. One that is predictable is the favorable impact of higher energy prices. Obviously tremendous innovation will be stimulated in all sectors of the economy, not least of which will be conservation measures. This can throw off all of the long-term demand forecasts of the oil companies or anyone else. But, as I said, I cannot offer any specific alternative to the Wharton long-term pessimism. And, of course, I agree that airline traffic growth will more or less respond to what happens in the general economy. So that if the general economy is down, then airline traffic growth will be down and vice versa.

Relative Prices and Aviation

Where I differ with the FAA forecast is in its failure to focus on relative prices. The real question presented by this forecast is not what will happen to us as a result of macro conditions in the general economy, but rather, can the airline industry out-perform the general economy? To me, that is reducible to a basic question of relative prices—is the price of air travel going to go up or down relative to the average price of all other goods and services? Historically, airline ticket prices have declined in real terms relative to the price of all other goods and

services. This is a very long-term trend beginning in the 1920s. It has continued, except for brief periods, to the present time. The fundamental reason for this relative decline—worldwide, not just in the U.S.—is that the input-output or productivity ratio of the airline industry has improved at a faster rate than it has in other industries. This has been caused by a rate-of-change in technology greater for air transportation and for aviation generally than for other productive activities. For this reason the basic question that should be addressed is whether the rate of technological change will hold to the level that it has enjoyed more or less continuously for 50 years.

The major contributor to technological change in aviation has derived from military R&D. It would appear that as the military investment shifts away from fixed-wing design, the relative throw-off to civil aviation will decline. Therefore, I would argue that in the future it is unlikely that the airlines can sustain an input-output ratio that will improve at its historical rate, and that, relative to other industries, the rate enjoyed by air transportation will decline. In turn, this means that the price of air travel will not continue to decline, relative to all other goods and services, at the same rate and therefore the high historical growth rate will not be sustained. On the other hand there are some suggestions for the government to finance civil aircraft R&D. Whether or not this comes to pass, it seems clear that deregulation will favorably affect productivity.

As far as short-haul travel is concerned, which may be defined as distances to 300 miles, the automobile has enjoyed, historically, a comparative advantage over air that had been improving in the three decades following World War II. So, by-and-large, short-haul air travel did not grow at the rate of long-haul air travel until the 1970s when the automobile ceased to enjoy increases in its relative advantage.

Today, the question with respect to the future of short-haul air travel is whether it will grow rapidly or very, very rapidly. That depends on whether the comparative cost relationship between surface and air travel changes. The slightest shift in the ratio between the cost of surface and the cost of air in favor of air will cause an explosive growth in short-haul air travel. And not just small aircraft commuter operations in thin markets at small points, but also in the kind of operation that has become successful in Texas and shortly will be tried at Midway in Chicago: Large jet operations, operated by a specialist carrier which, by reason of the volume carried, can offer prices that are competitive with some substantial fraction of surface travel.

If there is no change, we can expect a status-quo in terms of growth, which isn't bad, by the way. But if there is a shift that does not favor air, that favors the automobile, then relatively short-haul air travel will not grow at its present rate and could decline.

My own hunch is that technological change in respect to the automobile will quickly out-pace the rate of such change in aviation. We can expect a 50 mile per gallon automobile probably within five years as a standard vehicle, and we can expect other technological

changes in the automobile that will cause it to be more efficient, relatively. But I can be wrong on that.

Now, as far as long-haul travel is concerned, there is no modal competition for air travel. It is the only efficient way to travel long distances. So the main competitors of long-haul travel are substitutes, particularly for discretionary travel. If the price of a camper declines relative to the price of taking a vacation by air, people will shift to buying campers. The demand for discretionary travel in long-haul markets will be vitally affected by the price relationship of air transportation to all other goods and services.

As far as the business traveler is concerned, you heard an earlier speaker say that some people have to travel. But even here there are substitutes—clearly, there are going to be major technological changes in telecommunications. You may have seen the very effective ads of AT&T on TV recently advising businesses to “do it by long distance and save the travel costs.” As the pace of telecommunication technological development accelerates over the next decade, I would expect that the business air-travel growth rate will fall somewhat behind on a relative basis.

Impact of Deregulation

Now, all of this is not a pessimistic forecast. There are countervailing tendencies—principally, deregulation. This is a complex question, but I'd like to survey for you what has happened in the last three years, from roughly 1975, when the regulatory reform movement started, to date. What has happened is that the airlines have become significantly more efficient. The best indicators of this are that average load-factors have increased significantly; that the seating density on any given type of aircraft has been increased; and, that the aircraft utilization rates of the combined fleet have improved. These have allowed enormous productivity gains, and have permitted the airlines to simultaneously reduce average prices and increase profits.

It is also true, however, that these changes occurred largely under the old, protective law, although in a period when the policies under that law were being changed radically by Chairman Kahn and others. The changes also occurred during what is probably a cyclical expansion in air travel because of general economic conditions.



It is very difficult to decide exactly what contribution more liberal economic policies have made to the enormous productivity gains that the airlines have enjoyed in the last three years. But it does seem fair to say that there probably are not many more gains to be made in respect to load-factor and aircraft utilization. If we are to enjoy additional gains from greater efficiencies through deregulation by allowing the airlines to respond to ever changing market conditions, they will probably come in the long-term from fundamentally different ways of doing business. Here, we can only speculate.

Possible Carrier Responses

One scholar in this field, the author of *Airline Regulation in America*, William A. Jordan, whose book compared the efficiency level of PSA to the efficiency level of the interstate carriers under protective regulation, suggested that the existing airlines would gradually evolve into specialists employing perhaps one type of aircraft, and perhaps even specializing in a given type of market. There would be major productivity gains from such specialization. So far, that hasn't happened to any great degree, but we do know that it is a very differentiated market out there.

There are, for example, major markets composed of large volumes of discretionary travelers. These travelers are highly price-sensitive and probably for a really low price would be willing to sit in 747s configured to 500 seats, the permissible limit for that air-

craft. How many markets are there of this kind? We do know that they exist in Europe, in the so-called inclusive tour sector of the air travel market. We do know that if the cost of discretionary travel is to be lowered to rock bottom, aircraft will have to be seat-configured to the highest density. Based on the European experience it is likely that the retail side of the business will have to be considerably changed from what it is now—traffic will be prepackaged and aircraft operated virtually at full up load-factors. Only then can you achieve the lowest cost which would be attractive to discretionary travelers.

There are other aspects of the airline business that we can't really foresee in terms of possible structural changes. O. Roy Chalk, the founder in the 1940s of Trans-Caribbean Airlines that specialized in low fare travel between New York and Puerto Rico, is proposing to form an airline and acquire wide-bodied equipment. He will farm out his maintenance to the lowest priced specialist maintenance facility. He's going to have all his retailing and marketing done by agents. He's going to rent his pilots from a rent-a-pilot firm in New York. So, he is going to run the whole thing with 49 employees. Whether that's feasible or not remains to be seen.

But what seems clear is this: If it is cheaper to run an airline that way, if it is cheaper on the average to contract your maintenance out, and if it is cheaper on the average to sell your tickets through some entity with which you contract and, indeed, if it's cheaper to hire pilots from a rent-a-pilot organization, then the industry under deregulation will gradually evolve in those directions.

We don't know what all those possible directions are as yet. It may well be that very little change will take place. And if so, the improvements in productivity deriving directly from deregulation may be minimal. I'd simply like to end this by recalling that even among those advocating deregulation during the great debate that was carried on between 1975 and 1978, even among those people, there was considerable disagreement. You had some people arguing that although the government's influence on airline efficiency was negative, it was minimally negative. But there were also people like Prof. Keeler who said, at least with respect to the denser long-haul routes, that government regulation caused efficiency to be 50 percent less than it otherwise would have been. So time will tell. There are very few left who would argue, however, that economic regulation of the kind practiced by the CAB—which is generally characterized as "protective" regulation—added to efficiency. I don't think there are any people like that left, although I think I see a couple in the audience.

So, the question is only how much more efficient the airlines may become as a result of deregulation. It may be just a little bit, it also may be a great deal. But to the extent that they are more efficient and that airline prices are less than they would otherwise be relative to the prices of all other goods and services, we can expect an increase in demand in air transportation beyond the level that changes in the general economy would give us. Thank you.



Fuel



Robert M. Griswold
Manager of Airline Sales
Shell Oil

The issue of fuel dominates our concerns well beyond aviation alone. Aviation competes for its share against a number of other users who get their fuel from the same part of the barrel. As a consequence, Mr. Griswold asks that events and trends outside of aviation also be considered in aviation forecasts. Lower automobile gasoline consumption and more fuel efficient generation of airplanes are seen as contributing to a possible eased fuel situation for users of jet fuel. He is not optimistic in the case of aviation gasoline.

Greetings to all of you. I feel very much at home here. This is Houston weather you are having today. I'm sorry that I can't bring great optimism to you today, and so I don't know what your reaction will be when I'm through. But I'll try to give you a perspective. It's not the Shell Oil Company perspective, it's not the oil industry perspective, it's not my perspective. You might say it's somewhat of a consensus.

I'll cover the data with you very quickly in the limited time that I have. I might say that if any of you have interest in any of the material that I go over, I'd be very happy to send it to you. All you would need to do is give Ms. Kruzic your business card and I'll send it on to you.

So, let's start out. Let's get into what I'm going to dwell on: Fuel price and availability. I think that's what this group would most logically be concerned with. I was very pleased when Mr. Taylor made note of the fact that this week is energy week at FAA.

Fuel Supply and Demand

What I'm trying to do is sketch out for you a look at supply and demand. I'm going to talk first about demand as we see it and I'll try to come back into the FAA forecast. I have a different perspective on the fuel portion of the forecast. I'm not saying your forecast is wrong and I'm not saying that I am right. I think the message really is that the future has many uncertainties. That really is the bottom line. I think that if I could tell you for sure what's going to happen—if I could—I'm sure Mr. Carter would have me over there today.

I'm basically going to be talking about barrels, a much more common unit than gallons in use in the industry. The FAA forecast is in gallons. The reason we use barrels is that we are not smart enough to carry all those zeroes out the right hand side. This way we can work with small numbers.

The numbers I have show demand for kero-jet fuel rising from 831 thousand barrels per day in 1977 to 855 in 1980. If you go through a little arithmetic, you'll see that there is not much difference between what the FAA is saying in gallons and what I am saying in barrels.

Beside making my reading life a little easier, the use of barrels per day also reminds me that there is competition for the light distillate part of the barrel. We really can't just talk about the domestic airlines. We have to talk about the heating portion of the barrel—that is, number-one kerosene and number-two heating oil. Although the amount used for heating is declining, it still comes from the light distillate part of the barrel. A little bit of the barrel also goes to transit.

The biggest chunk of the barrel, of course, goes to the domestic carriers, with a smaller amount for the international and foreign flag carriers, general aviation and the military. You cannot just zero in on the domestic airlines by themselves, as much as we would like to. All of these guys are competing for part of the action.

We view the military portion of kero-jet demand as essentially flat. No growth. There is one uncertainty I have to inject at this point. At the present time the military uses more naphtha-jet than it uses kero-jet. Should they convert entirely to kero-jet, then we will have a monumental problem. Pressure for that conversion is coming from Europe and NATO. If the conversion does take place, then all that naphtha-jet demand will be added to the kero-jet part of the barrel. That presents real problems.

General aviation will grow. I only want to make one comment. That is, I don't think I would be as optimistic as the FAA is in its forecast. That forecast seems to indicate five year growth rates on the order of eight or nine percent from 1980 to 1985 and 1985 to 1990. I personally think that these rates will not be attained. The price of fuel will rise and I wonder how much more general aviation will be willing to pay. What is the price elasticity of fuel within general aviation?

The bottom line of the whole thing is, obviously, crude oil. With demand at around 885 thousand barrels a day, we see a gap in refining capacity. The only way the country is currently meeting the demand is through imports, not of crude, but of finished product. Finished kerosene, jet fuel. Today, the country is importing about 50 to 60 thousand barrels per day. So, we have a shortfall to start with. According to some scenarios I could make, that shortfall could get worse. Again, what is the price elasticity factor? I can't answer that. I don't know. But it will certainly have an impact. It is another addition to our uncertainties.

Now, who is importing this finished product and why? Fortunately or unfortunately, depending on whom you are talking about, there really are very few players in the game who have made the investment in capacity to actually make kero-jet fuel. Forty-two percent of total refinery capacity belongs to the six major refiners. The bulk (80 percent) of all kero-jet is produced by this small group. The smaller players produce the other 20 percent.

Now, do I think this will change? Well, I hope it does. We do see some evidence, particularly with the deregulation of turbine fuel that occurred in February, 1979, that some of these other people are starting to get into the game. We are going to need them. So, we strongly endorse their making the investment and getting into the ballgame.

The major importers of kero-jet fuel at the moment are Chevron, Exxon, Texaco and Shell. The pattern of imports over the past three years, measured monthly, is quite erratic, due largely to tanker movements. But overall the trend is toward fewer imports.

Why? Because turbine fuel is very tight worldwide. You cannot get term contracts, generally speaking. So, most of these people have to go into the spot market and this is certainly not a very happy situation.

We are importing about 20 thousand barrels a day—very high priced stuff. Even though we all know what's happening to prices in this country, prices around the world are well above the prevailing prices here.

The demand I have talked about so far is relatively unconstrained. If we carry that out to 1990 it would appear that the U.S. will have to import 8.86 million barrels of crude plus 4.0 million barrels of product per day in 1990. Well, the big questions are: Can we do it and will it be available? I can't answer that either.

But, I think we are all aware that President Carter has proposed to limit imports. So, what would that mean? Of course we do not know what the Congress will finally come up with, but the current import limit under discussion is 8.2 million barrels in 1985. That represents a real shortfall from unconstrained demand. Thus, we have another uncertainty and one that will present a real challenge to all of us.

One of the things I hasten to add here is that we are not complete pessimists. It appears to us that the demand for motor gasoline—that's 50 percent of the barrel right there—has peaked in this country. Gasoline sales are off this year by about four percent.

You are familiar with the reasons. We think it'll be another one percent off next year. That is just a guess. Price elasticity, smaller cars, better mileage are things that are contributing.

If that pattern holds, then that part of the barrel may be diverted elsewhere. So, it is not as completely dark and dismal as you might feel.

A Comparison of Forecasts

Now, let me get to the part that I think is of the most interest to all of you: A comparison of the forecasts. I'll start with the current Air Transport Association forecast. At this point we really do have to look at international as well as domestic fuel demand. I'm sure that the reason why the FAA forecast does not include international demand is that it is very difficult to get. They are not reported to either the ATA or to the Civil Aeronautics Board. Foreign flag carriers are under no obligation to report their fuel.

In any case, the ATA forecast is a good place to start. I think my only comment is that the ATA forecast may be a bit optimistic. It is a compilation of individual carrier forecasts. Undoubtedly, there is optimism here due to deregulation. But let me begin with their forecast.

First, what I have done is adjust the ATA domestic plus international fuel demand numbers to account for that fuel that goes unreported to either ATA or CAB. Having made that adjustment, the 1980 ATA fuel demand number is approximately 15 billion gallons of turbine fuel. Just to completely confuse everyone, I have gone back to gallons. This is so that we can make the comparison to the FAA numbers.



The hump forecast by ATA reflects the expectation of results from what is currently happening to the industry: Deregulation, the bilateral treaties, the Bermuda II type treaties, and so forth.

Now if I compare the FAA forecast and what might be called the Shell forecast, it's not official, I see two curves that are almost parallel. The 1980 FAA figure is 9.6 and ours is a little over 12 billion gallons of fuel. The difference is that my number includes the international demand plus the adjustment. So, all in all, I, as a layman, have to agree pretty much with the FAA forecast up to the mid-1980s.

At that point I see something happening that I am not sure is in the FAA report. It seems to me that out in the years 1986-1988 there is a possibility of the curve flattening out and, perhaps, even dropping a bit. The reason this might happen is the impact of more fuel efficient engines used in the new generation—the 757, 767, and so forth—aircraft. They will be 25 to 30 percent more efficient.

We think there is a good chance of this happening. However, I can tell you right now, another company has a forecast showing the demand curve going up just like the FAA forecast. So, now you know why we have horse races: Because not everybody agrees. But in a preliminary sense, I throw these numbers out because I think it's something worth studying. We certainly are not through with these numbers. They really are preliminary. But it does appear to us that there will be enough of a change in the population of the fleet to have this happen. Demand may not drop off, but we think it possibly could drop off or, certainly, flatten out. If it happens it would be very significant.

Because of what we have talked about and after a good look at the oil and gas deflator, I can't quarrel with it, I'm afraid that overall I have to be more pessimistic than the FAA forecast. That means I would tend to align myself with the stagflation scenario. But that's only one man's opinion.

August fuel prices were 166 percent of January prices and it's now October. Before long you can take a couple more wraps around the pole on top of that. The bottom line, of course, is crude oil both in terms of availability and economics. And I don't think anyone in the country can predict what the OPEC countries are going to do. We can't predict what constraints will be imposed on imports, but I have to believe that there will be some constraints in that area. So there are all kinds of negatives.

The positives are what is happening in motor fuel and what may happen in the aircraft fleet. Thus, the summation of my remarks is that I am not totally pessimistic and not all optimistic. I think there is a balance here. That is what makes forecasting so much fun. You know it is just full of uncertainties. You do the best you can. I would only urge you to investigate a possible change in the complexion of the fleet. Thank you very much.



Safety



Guy E. Hairston, Jr.
Director
Engineering and Safety
Department
Air Line Pilots Association

"No number is a good number" when accidents and loss of life are the subject according to Mr. Hairston. The accidents of the past year and the continuing concern of the public over them indicate that safety is an issue for even the safest form of travel. Safety cannot be ignored. All systems, human and mechanical have to undergo constant inspection and improvement.

I think this is the first time that they've taken the risk of inviting a member of an AFL-CIO affiliated labor union to address this establishment. I appreciate the two very thoughtful presentations which we have just heard, and I am pleased to join you today.

I presume most of you know that the Air Line Pilots Association maintains a full-time staff of engineers, about 16 or 17, most of whom are also pilots. We work solely on safety related matters. We talk safety, think safety, preach safety to anyone who will listen or to anyone who will help us. And I would invite any of you at any time to contact the air safety staff; call me. We'll be happy to discuss any aspect of aviation safety with you. Each day our staff is working on a multitude of concerns in safety, many of them minor. But some of them are important and major. And, of course, the Association has a very large air safety organization made up of pilot members of ALPA. They are very active and we hear from them quite often.

There's obviously no more delicate subject to talk about at this time than air safety. I'd like to make one or two comments on the forecast and then I'll address some of the specific aviation safety issues as time may permit, and also subjects you might be interested in raising during the discussion period. First of all, I think we ought to congratulate Mr. Mercer and the others who participated in the development of this forecast. It does seem reasonable and understandable. Perhaps we ought to congratulate them for the audacity in making a forecast at all. Because when you consider the kind of industry that we are in, forecasting is not easy. It is very hard to see the future.

I do observe that the forecast included a projection of increased FAA interest and actions related to air safety, regulatory and otherwise. I'm sure that's correct. One other thing I observed: Mr. Taylor made the

comment that we're in a mature industry. I think that is a truth that needs to be reflected upon. Because "mature" no doubt is good if it means confident, organized and formidable. But it's probably not so good if it means dull, too settled, not technically dynamic, not innovative in management and other arenas. We don't want to become too mature. It reminds me of an old double breasted suit company that keeps turning out suits and doesn't recognize that times have changed. So, if you are in too mature an organization, kind of stir it up a little bit.

Growing Public Concern

Now, to address aviation safety more specifically. These thoughts may have occurred to you or you may disagree with me. But, for many years, the public has held the aviation industry in high esteem—almost in awe. Commercial air travel is the safest mode of travel—a common attitude.

Perhaps those of us in the business have congratulated ourselves too much on the statistics and on the safety trends which have been good, positive and improving. Perhaps we've become a little satisfied, maybe a little too mature, by looking at the safety record. And I hesitate to suggest it but, maybe even a little smug. But now after the last 13 months, and after two major air carrier disasters in San Diego and Chicago, I would submit to you, based on letters we have received, the comments we get—and I'm talking about everybody from the taxi cab driver to the sales clerk, to the gas station attendant—that the public is having deep second thoughts. Their perceptions are no longer the same.

In both of these recent disasters, we didn't have one headline and a story that faded away in three or four days. We had days and days of headlines. Morning and afternoon editions. Lead stories on the TV network news every night. It didn't go away. These stories brought back in everybody's mind their own experience and their own memories. Tenerife, cargo doors, Paris and every air crash anyone had ever heard of. Even now, a fairly routine engine shut down will make about page two or three in the news and will probably get a mention on the evening TV reports. Added to that, last year, 1978, there was a substantial rise in general aviation fatalities. More than 16 hundred. Now that's ridiculous.

I don't think we need to review the details of these recent disasters, but there are a number of important points of which I think those of us in the industry must be aware. Possibly some of us thought that public concern would pass and that these crashes would be forgotten. It hasn't and they won't. Public comment and public interest continue high. There are many examples of this.

Last night, as I was leaving my office, I picked up the top two letters in my basket. We get these everyday. I can't resist reading them, a couple of them at least in part. Here's one from a man in New York. "I'm writing to you about my concern for the people in these major airlines around the U.S. and the lack of effort to protect these people. I am angry and frustrated. I've written the FAA, the Senators of New York State and my Congress-

man. The only person helping me is my Congressman. I am trying to stress the need for collision avoidance systems on board planes, along with advanced radar systems." Here's a plug for our host. "The FAA is still playing games and, to my point of view, not concerned with safety of the aviation public." I should get this letter over to Mr. Taylor. "I would like to know your opinion on how pilots feel about flying without the safety they deserve. How can they fly day after day when they know the FAA is not concerned with their safety? Why have they not gone on strike to protest the lack of concern? Very truly yours."

Another one. You'll see a second concern in this one. "I am a senior at Central High School, and I'm writing a research paper on airline safety as part of my independent study. The type of information I need most will be changes in airline safety and precautions now taken and any safety developments, any charts, data, graphs, etc. I've noticed that in the last year airline safety has become a big issue and I find it very interesting to write on. Sincerely."

What does this all mean to you and me, to those of us in the industry, and for air safety in the 1980s? I would suggest to you that it may mean a difference in our conduct of business in the next decade. A major factor in aviation will be the public interest.

Aviation is becoming better understood, the mysteries are going away. Some of the terminology is becoming known to the man on the street. They are concerned and they are letting people know about it. So I would suggest, that we should expect more and more public and media attention.

Fostering Better Safety

So, obviously the message on air safety is: We can't afford to be smug or satisfied. It's time to take a good hard critical look at ourselves. We need to establish some very tough, extremely high safety goals and we should attain them. In this next decade, we shouldn't have one or two major air carrier disasters every year. We should have zero air carrier accidents. We should go years without a major air carrier accident. That would get the public perception where it ought to be. General aviation fatalities cannot be counted in the thousands or the hundreds. Let's count them on two hands or, maybe, take off one shoe.

I don't think it's necessary to remind this audience that mishaps and accidents and disasters are never the result of a momentary lapse in one individual—like some lightning-strike out of the blue. They are failures of an entire system, an approach, our overall management.

Oversight with a systems management approach is the only way to overcome the problems. We know we are going to have failures. We know there will be human failures, questionable pilot judgement, material failures; even the best materials delivered in the plan have flaws in them. And because humans are involved, there obviously will be maintenance and manufacturing problems. And there will be less than optimum designs put into manufacturing. That doesn't mean that all of these things can't be remedied and fixed. You take a look at these air disasters and you'll find any number

of places each of them could have been stopped. Individual and systems failures across-the-board caused these accidents.

I hesitate to bring up a detail but we have had one disaster with a tower full of people in San Diego. If anyone had looked over their shoulder. . . . If you'd been up in that tower in San Diego, you would have known where that mid-air was—and there were only two planes in the air. Incredible. Added to the imperfections of human beings, materials, etc., we know we're going to have air traffic control imperfections, wind and weather hazards, and greatly increased air traffic densities. So it will not be easy to achieve our safety goals.

Probably the number one concern of the airline pilot is the danger of mid-air collisions. Second only to the overall concern of air traffic control in general. But take a look at the near mid-airs, 1975-1978. People who study these statistics tell me that it's not a reporting phenomenon but a true phenomenon. There were approximately 269 near mid-airs in 1975; in 1976, 373; in 1977, 384; and 1978, 503. In the first six months of this year, nearly 300. That is not to say our system isn't pretty good. But we have serious problems. Any one of those could have been another disaster.

We've been pushing for a collision avoidance system for years. It is a long time in coming.

Take a look at airports and their facilities, another major concern of air carrier pilots. A Concorde pilot came to the office the other day, just after landing at Dulles after a trans-Atlantic flight. On his approach he requested an ILS; no ILS was available. He requested a runway with a visual approach slope indicator; no VASI was available.

He asked us what kind of airport Dulles was supposed to be. It is not just any airport but the major airport at our nation's capitol. I think that is somewhat characteristic. How many airports do you know with poor approach lighting, etc? We could go into dozens of these problems.

Let me close by saying that air safety will be the major issue in aviation in the 1980s. Within the industry perhaps, safety has always been the major issue. Now it will be the major issue in the public mind. All systems and all factors, more than ever before, will be and should be examined again and again. Air traffic control systems, aircraft systems, ground facilities, all facets of design, manufacturing, maintenance. Again, our goals should be high, very high. Zero air carrier disasters and dramatically decreased general aviation fatalities. We should achieve these goals soon. Certainly by the end of the 1980s. Thank you very much.

Environment



Charles L. Elkins
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Using an analogy to the maintenance of capital equipment, Mr. Elkins develops the argument that aviation depends on institutional relationships that require the same care as the most sophisticated equipment. If aviation does not respect and help improve the relationships existing among airports and their communities, only problems can result. The political pressure for noise reduction from airports has Constitutional support.

Good Morning. Well, I guess I'm the environment "freak" on the agenda today. I thought seriously of giving one of my normal fire and brimstone speeches, telling you the environment is going down the drain and that all of us morally should do something about it—that we have a moral commitment, an obligation to do something about it. And if I did a good job of that, it might be a memorable talk. But I figured if you really wanted that, you could have gotten a better version at church on Sunday.

I thought I'd try to deal with a more practical subject. Perhaps I'm not as qualified to talk about it. But, I'll try anyway, and maybe you can ask some questions. My subject is the impact of environmental control on the economic health of this industry. Will the industry continue to grow and prosper, or not?

We all know that, in theory, noise and these other environmental pollutants are economic constraints on the industry. Today, I think it's fair to say they are minor constraints. Will they be minor tomorrow or in 1991? Really, how much harassment can this industry take, given all the other harassments and difficulties that we see before us? Can we dismiss the noise problem as being simply solved, not really serious enough to be considered when you consider the fuel crisis and the problems of deregulation?

Institutional Relations

Well, I have a basic thesis I'd like to lay out in the form of an analogy. It is important to maintain one's capital equipment in this industry and to upgrade it. I would argue that it's equally important to maintain and upgrade the institutional relationships among the various parties in this industry. I'm talking about institution-

al relationships between airports and their neighbors, between the airlines and the airport, between the manufacturers and the airlines.

These relationships can rust up just like equipment. A little rust doesn't hurt, a whole lot of rust can bring the system down. I would argue that there is very little maintenance or upgrading at this time with regard to these institutional relationships, partly because no one is in charge of it. These relationships seem to be subject to the whims of various parties and to the economic forces of the moment.

Now, what I'd like to do is give you a few examples of what I think are bad signs in these relationships, and how I think these relationships are going down-hill. But you can judge for yourself. Let me state right up front that the EPA is not a regulator of this industry in any way. If we were talking about the trucking industry or the motorcycle industry, I'm a regulator in that sense. I can tell you a lot more about the economic health of those industries. I have to study them because I affect them. This is not true of the airline industry and the total air transportation system. So, let me ask some questions of those of you who perhaps know more about this than I.

First of all, what is the first red flag? Well, I think the first one is deregulation. This activity, which I think most of us are happy to see, from the point of view of the economy, has the potential of destroying the very small amount of progress that has been made in the past reaching accommodations between airports and their neighbors.

I recently heard a noise control official at a major airport indicate that last year they had a 20 percent increase in traffic. This is not unusual across the country as we have heard here today. In this case it is having an impact particularly on the airport's night restrictions. Now, you can say: "Well gee, you could have a 100 percent increase in traffic and it would only increase the noise in the neighborhoods by three decibels. And what's three decibels?" That is an argument that I don't think really holds up in the political arena.

At this one particular airport I'm speaking of, they had worked out an arrangement with the carriers who had served the community in the past. These airlines agreed to limit their nighttime flights. New carriers who weren't part of the deal are coming in now. Why shouldn't they fly in there at five o'clock in the morning to position their aircraft for the next day? The point is that a few flights at night can destroy the relationship that the airport proprietor has worked years to develop with his surrounding communities. It doesn't take a doubling of the traffic to wipe out those years of work.

As we see the industry grow, are we going to see more of the medium hubs and the small airports taking on more of the traffic? If so, does this mean that neighbors who in the past didn't know they had a noise problem suddenly find they've got one? And to those of you who have had to deal with some of these outraged citizens: Do you know that the most vociferous of them all are the ones that didn't have any flights over them

last year, but suddenly begin to have some? You can say to them: "Gee, It's nothing here compared to what it is like living next to JFK, or O'Hare." That doesn't cut any ice with them. They are concerned about the fact that they didn't have any last year and now they've got flights. Particularly of course, if they are at night. OK, that's one red flag where I see things going down-hill.

Another one is the very intense lobbying that we've had here in this city for the last couple years with the Congress. The airline industry is seeking waivers to the FAA regulations which would bring the fleet into compliance with certain noise regulations by 1985. I don't want to open up the debate whether or not the FAA regulation is good or bad. I want to make another point here.

Let's look at the argument. The FAA has proposed retrofit. Many members of the industry see this as not as effective as it might be. The industry has argued for new aircraft on the basis of their fuel efficiency and improved noise characteristics. Of course this approach has a multi-billion dollar price tag. Then, they've argued that, well, of course, they don't have that much money to buy the airplanes. Therefore, they need an extension of the deadline or an outright exemption.

I would only suggest to you that if this were in another field beside noise and beside air transportation—let's say, a firm that is under pressure from EPA or a state agency to clean up its air and water—the situation would be very different. If that firm said to the regulator: "Well, you want me to put this precipitator on my smoke stack and you know that it doesn't really clean up the dirt nearly as much as a new plant would. I really ought to build a new plant but you know I don't have the money to build a new plant. Therefore, I'm not going to do anything." That kind of argument is rejected out of hand. And yet, it is being entertained very favorably on Capitol Hill.

My main point here is not to argue whether retrofit is worth it or not. I'm sure many of you have opinions on this. What I'm trying to ask is whether this approach on the Hill by the airline industry is indicative of an attitude which is going to do some of these relationships harm in the future.



Acceptance of the Environment

Is this an issue to be dealt with by arguing and changing votes in the Congress? We all have a Constitutional right to go up there and petition our Congressman. Agencies do that as much as private citizens do. But the problem is that one Constitutional right is in conflict with another Constitutional right: That is, citizens should have just compensation for property which is taken away from them. Keep in mind that the real pressure by these neighbors of airports is not just because they have some rights under some law that Congress has passed which can be changed tomorrow. Their right falls under the Constitution of the United States. No matter what the Congress does to try to wipe out that ability to sue, Congress is up against the Constitution and it is impossible to change the Constitution simply by vote of the Congress.

Now you know some airlines have decided that this approach to the FAA regulation—of trying to get the waivers—is short-sighted. They have begun seeking retrofit and re-engineering of their aircraft. But that is certainly not unanimous.

A couple more red flags. One is the very strong signal being sent to the Federal Government: "If anybody is going to be regulated, it shouldn't be me. It should be someone else." We all, I think, realize that the air transportation system case is a classic case where people point fingers at the other guy. We see the airports arguing: "Don't regulate us, don't make us do anything for noise control. The problem is with the airlines and the manufacturers. If they just get those airplanes quieter and get the fleet changed over, we'd be OK."

On the other hand, because of some active airports, we're trying to deal with a problem which hasn't been dealt with at the national level. ATA is arguing to keep those airports controlled. "They may do something crazy and really mess up the system. After all, we are a national system, not a system just for Chicago, or just for San Francisco. So, let's regulate those airports to keep them from getting out of control. But of course, don't regulate us, the airlines." We've got everybody pointing the finger at everybody else. This has been going on for years, as we know. Those of you who follow this know it doesn't seem to be getting better.

Unfortunately, each party is trying to solve a problem which really is caused by the other party refusing to compromise. In the meantime, we have the manufacturers building and the airlines buying what are known as stage-two aircraft. Those are the noisier aircraft. The manufacturers are making a bundle off of them because they've already covered their investment costs. One would think that there is no problem with buying stage-two aircraft in 1979! But in fact, all you have to do is draw a graph of what the fleet is going to look like between now and the year 2000, or beyond. These aircraft that are being bought today are going to dominate the noise environment around our airports for many years to come. They're going to be the sore thumbs that stand out.

Resolving the Problem

We have a situation where we all are conscious of the noise problem. Yet the marketplace is driving us away from a solution. The retrofit replacement rule with which you are familiar, along with other rules which the FAA has promulgated and enforced, will bring about a significant dip in the number of people who are exposed to noise around the nation's airports. In fact, perhaps a dip as low as 60 percent of the 1975 levels. That's quite an achievement. But unfortunately, right after 1985, assuming everybody does meet that compliance date—and the Congress hasn't spoken on that issue yet—it starts right back up. The stage-two aircraft which we are buying today aren't going to help any.

A couple more points. The cities and the counties—you've all met those people—say that if nobody else is trying, why should they? Why don't they take care of their tax base? As a result even those far-out airports like Dulles and Dallas are beginning to have pressure from communities that say: "We see residences going right up where we all know they shouldn't go."

And then, of course, there are the citizens. They say that the system is not going to provide them any relief. So, they resort to the courts. The courts have been somewhat favorable, and I would guess, they may be more favorable in the future, as they see lack of action by the other parties.

Law suits are really a very backward way of solving this problem. In many cases, paying people money so they won't sue, doesn't guarantee that a person who moves into the house after them won't sue. I would only say that from the Environmental Protection Agency's point of view, the court system has its limitations. If we try solving complex technological and political problems by taking them to court, many of us will be dissatisfied with the results.

I guess what I'm saying from where I sit—and it is a limited perspective, I realize—is that we seem to be taking our short-term gains and sacrificing the long-term health of the industry because of what we're doing to the institutional relationships among the main actors. All, I think, have to cooperate if we're going to solve this problem. I believe we're running our relationships into the ground, instead of doing the preventative maintenance on them that they really need.

I think people are becoming increasingly intolerant of the promises of better things to come because they haven't seen them coming. I think, at least in the environmental field, law suits are becoming more popular, and I see no reason why they shouldn't be. We are left with the aircraft engine manufacturers, the airlines, the airports, the cities, the counties, and the airport neighbors, all acting independently to protect their own interests. That, I guess, is what I would do if I thought no one else was protecting me. But, it would be awfully nice if somehow people would get together and decide to protect the system instead of just protecting themselves.

Maybe these problems are not serious enough and will not be by 1990 to do anything to the system. I leave that judgment up to you. I'm sorry to bring such a doomsday approach. I guess my closing point would be that, in the past, the Federal Government has been somewhat of a "caretaker"—that's the wrong word—a "helper" in regard to this industry by watching out for problems. We see a trend of: "Leave this to the marketplace and let the industry think for itself in the environmental area." I think that the challenge to the entire system is to see who steps into the breach, or whether the system is left to degrade.



Airline Financing



Theodore Shen
Managing Director
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Jenrette

A "very substantial portion of the airlines' current fleet is already economically obsolete or is rapidly approaching economic obsolescence. . . ." says Mr. Shen. As a result, the airlines are beginning a major capital investment cycle. Unlike twenty years ago, this cycle comes at a time of high equipment utilization rates. Mr. Shen predicts that the corporate configuration now existing among the trunk carriers will be changed when the cycle has run its course.

I'd like to provide you with a Wall Street perspective on the financing requirements of the airline industry over the next five to ten years and some of the structural changes we think these requirements imply. From the previous speakers we have already heard about a number of important constraints with respect to fuel, safety and noise. Unfortunately, I'm going to have to talk about yet one other constraint, that is, a severe constraint on capital.

Our analytical approach to forecasting the financing requirements of the airlines differs somewhat from many others in that we prepare our analyses for institutional lenders and investors. We can't really get away with theoretical "top-down" analyses. Rather, we must analyze from the "bottom-up." We have to assess each individual carrier's own financial strengths and weaknesses, corporate strategy and, in the end, financial capabilities or constraints. Ultimately, we are held accountable by our clients for the accuracy of our specific projections.

What I'd like to do is quickly touch on a few key assumptions that underlie our fleet and capital requirements forecast for the 1980s; then, run through a summary of the outlook that we see; and, finally, discuss in slightly more detail what the key components of our analyses are and some of the key implications we see for the future.

Our key assumptions in trying to forecast fleet and capital requirements include annual domestic airline traffic growth of about six percent over the next six to eight years, reflecting the limited potential for further load-factor improvements sustainable on a

year-in and year-out basis, we're assuming a "normalized" industry load-factor of 62 percent—but at a much higher rate of hours/day aircraft utilization and seating density than is presently being achieved. Another assumption, that now appears to be too low, is our projection that aircraft prices will inflate at an eight percent annual rate.

Airlines' Current Aircraft

Now let's turn to a quick summary of our findings. First, because a very substantial portion of the airlines' current fleet is already economically obsolete or is rapidly approaching economic obsolescence, the airlines are entering their largest fleet replacement cycle ever. This is the first major replacement cycle since the late 1950s and early 1960s when piston fleets were being converted into jet fleets.

At the same time, the airlines no longer have the luxury, as they may have had six or seven years ago, to draw on the capacity excesses in the good part of their fleet. The "good" part of the fleet is now pretty fully utilized. Whereas six or seven years ago fleets were seriously underutilized—many of us can recall the proliferation of "piano bars" and "coach lounges"—now they are being pretty fully utilized. As a consequence, as we look into the next five- to ten-year period, and particularly into the 1982 to 1987 period, it is clear that there will be a really dramatic ballooning of capital expenditure requirements for the industry. Translating those enormous capital expenditure requirements into carrier-by-carrier cash flow projections, we conclude that the industry will soon experience capital constraints that will result in a protracted period of capacity tightness.

Fuel Efficiency

What I'd like to do now is develop these points in somewhat greater detail. The key to the economic obsolescence that the airlines are encountering in their fleets is fuel. A very large portion of the fleet currently consists of 707s, DC8s and 727-100s. These aircraft were designed for ten-cent-per-gallon fuel, not for today's fuel prices which are rapidly approaching a dollar per gallon.

A secondary consideration is physical aging. The airlines really haven't had major replacement activity in their fleets since the early- to mid-1960s, mainly because of the absence of major technological breakthroughs in aircraft design. As a consequence, many planes are simply getting old, particularly as we move into the the 1980s. Finally, Federal noise standards require full compliance phased over the next several years and, as long as they stay in effect, these standards add further to the pressure for fleet replacement.

I would reiterate, though, that fuel inefficiency is the chief cause of the replacement cycle. In this regard, every dollar per barrel increase in the price of crude oil merely serves to accelerate the timing of the replacement cycle as well as the onset of capital and capacity constraints.

Requirement for Capital

In our projections of capital expenditures we have taken into account individual carrier financial constraints. Unlike most forecasting techniques, we have not used a mechanical model that mindlessly replaces every plane when it reaches a particular age—for example, 20 years. Rather, we've looked at the economic efficiency of each individual aircraft type within the context of a carrier's fleet and route structure. We have also looked at the financial capabilities of each carrier.

For the U.S. trunk industry we have projected 30 billion dollars in capital expenditures over the 1978 to 1985 period. That is a fairly hefty amount of money and, yet, is a figure that is probably somewhat lower than the airframe manufacturers are projecting. Nevertheless, after integrating this conservative projection into a carrier-by-carrier cash flow analysis we find that the industry will encounter a 10 to 13 billion dollar "financing gap" between now and 1985.

That is the gap between cash that can be generated from internal operations, on the one hand, and cash requirements necessitated by capital expenditures, on the other. This 10 to 13 billion dollar financing gap will have to be made up by external financing provided by lenders, equity investors, lessors, manufacturers, etc.

We find this to be a huge financing burden and potentially even an understatement because the assumptions that led to this projection were deliberately "generous" toward the carriers. I have already mentioned a very conservative projection of aircraft price inflation. With respect to profit generation, which is a key

ingredient of a cash flow analysis, we have assumed that the airlines will experience major improvements in their return on capital from roughly a six percent average in the past to somewhat around ten percent over the next eight years. In addition, we have assumed substantial upgrading of fleet utilization in order to reduce capital expenditure requirements. Further contributing to a potential understatement of capital requirements was our assumption that the weak carriers will be able to achieve only partial replacement of their inefficient aircraft. And finally, we've assumed some fairly significant leveraging of balance sheets on the part of weak carriers.

Despite all of these assumptions, we've concluded that the prospective external financing burden, particularly in respect to its implications for carrying costs of debt and leases, is so onerous that the domestic trunk industry is headed for fairly severe capital constraints. There are a number of individual carriers, as I'll mention shortly, that are major exceptions to this generalization. But on an industry basis, because of capital constraints, we anticipate very tight capacity constraints to be in effect during the early- to mid-1980s.

Implications of Capital Constraints

Three implications of this prospect deserve emphasis. The first is a rather perverse one. As negative as the prospect of capital constraints may sound, we feel that the implications for profitability are actually quite bullish. We are forecasting a fairly significant secular improvement in profitability among the domestic trunk carriers at least by the early- to mid-1980s. We think that this results from a number of considerations, most importantly capacity tightness.

Capacity tightness will insure that asset utilization will have to be even further upgraded than it already has been. This applies to load-factor, hours-per-day utilization, and seating density. In addition, capacity tightness will force a less destructive mode of competitive behavior in the industry, particularly in respect to pricing and scheduling. From the standpoint of Wall Street observers of the industry, most of the absurd competitive practices of the industry—for example, scheduling to maximize market share rather than profits; and, pricing just to increase "bodies" per airplane without any thought or focus on profitability per flight—really are an outgrowth of the chronic excesses from which the industry has been suffering since the late 1960s and, basically, from which it has suffered on and off over the decades.

A second key implication is that because of major intra-industry disparities among individual carriers—that is, between the weak carriers and strong carriers—we expect significant competitive restructuring in the industry. Among the individual carriers there are major differences in respect to the key determinants of capital adequacy. Those three key determinants are the quality of fleet, the strength of cash flow, and the strength of balance sheets (i.e., borrowing power). Based on our projections, there are a number of weak carriers that will be forced to undergo relative shrinkage



over the next five to ten years—that is, to reduce the scale of their route structures. Some are already facing up to this prospect and are trying to form corporate strategies to anticipate shrinkage pressures, which fortunately won't become intense until the 1983-1985 period but which are, nonetheless, inevitable.

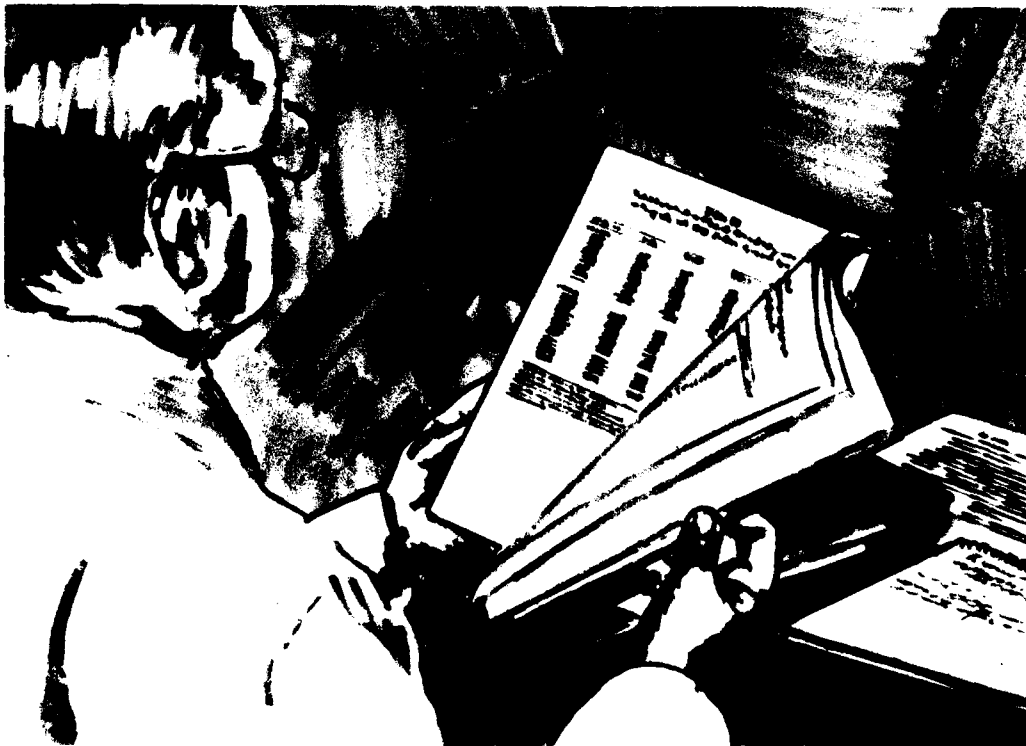
Interestingly, the strong carriers such as Northwest Airlines and Delta Air Lines face unprecedented competitive opportunity. The strong carriers of the 1980s will, in fact, be the same carriers that have been strong during the past two decades. However, in the past, financial strength has never really been translated into competitive advantage because all carriers—strong and weak alike—have had too much capital and capacity available to them. Therefore, it did the strong carriers very little good to have even more capital to acquire even more excess capacity. In the future, though, carriers like Delta and Northwest have major new advantages to exploit. In an environment in which the bulk of the industry will be constrained with respect to capital and capacity, these carriers' virtually unlimited resources will create a distinct competitive advantage. How these carriers' managements exploit their new competitive advantage remains to be seen, but the strategic flexibilities permitted by deregulation certainly provide unprecedented opportunity.

The carriers in the middle—neither the strongest nor the weakest—are not under pressure to shrink, but will nevertheless become capital-constrained. In place of their traditional preoccupation with market expansion, there will be a new focus on the redeployment of limited assets out of marginal areas and into more profitable opportunities.

The third major implication of the prospect of capital constraints is that deregulation can be quite constructive for the industry, at least in the presence of capital constraints. In sharp contrast, the introduction of deregulation eight or ten years ago could have been truly disastrous for the industry. It would have come at a time of tremendously excessive capital and capacity resources that could have led to very destructive competitive practices. Coming now, however, at a time when the airlines are developing increasingly tightened capacity positions, deregulation should actually be very constructive.

It permits carriers to redeploy assets. It creates route and pricing flexibility at a time when that flexibility is badly needed. Meanwhile, capital constraints limit the potential for aggressive expansion at a time when capital-constrained carriers most need to have some degree of competitive peace and stability to achieve route restructuring and asset deployment. Finally, for the weak carriers deregulation affords the crucial opportunity to exit from markets and accomplish shrinkage.

In summary, the impact of deregulation is highly dependent on the availability of capital and capacity at a given time. Mercifully for the trunk airlines, the introduction of deregulation after decades of very restrictive regulation coincides with the emergence of capital constraints, and this coincidence should thus result in a happy outcome for most carriers. And those carriers that don't achieve a happy ending are at least given an opportunity to develop one. On that upbeat note, I conclude my remarks. Thank you.



Focus On Commuters



Introduction by:
Dr. Bill Wilkins
Associate Administrator
for Policy and International
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Federal Aviation
Administration

Focus on Commuters



Duane Ekedahl
President
Commuter Airline
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The commuters have made tremendous gains as a consequence of the economic deregulation of the large air carriers. Mr. Ekedahl provides an overview of where that segment of aviation is today. The future prospects of these smaller carriers is clouded by increasing economic and other regulation, fuel availability more than price, and access to the airways and terminals at the hubs that are important to all commercial carriers.

I want to compliment the Holiday Inn here for anticipating this conference and setting this room up like an airplane. I asked Bob Jenkins of Allegheny Commuter if much was said this morning about the commuters because I was unable to be at your earlier session. He said no. I wasn't sure what that meant; whether you just didn't care or whether you were saving that for me. I guess I'll assume the latter.

I think it might be very appropriate at this time to focus on the commuters for a few minutes. Certainly all of aviation has been impacted in extraordinary ways by deregulation. I expect it would be fair to say that no segment of the industry has been effected as dramatically as the commuters have been. I would like to share with you our view of just how we see ourselves as an industry; as a segment of aviation; and the problems facing us in the future.

First of all, the Deregulation Act really confuses the definition of commuter. It used to be a very simple definition. Anybody who was exempt from the 401 certificate, Part 298 exempt, was a commuter. You flew with small aircraft, smaller than 30 passengers. That was a pretty straight forward definition. Today, some 20 members of our Association are 401 certificated air carriers. Obviously, we are now flying larger aircraft. What we attempt to do is mold this segment into a unit by defining commuter as those carriers who fly primarily commuter type aircraft; that is, aircraft that have less than 60 seats. That is the category that includes those carriers who are now certificated, such as Air Wisconsin and many other carriers.

Status of the Commuters

The commuter profile now, if you were to look at it based on last year's statistics, is kind of interesting. The typical flight would have six passengers. It would have an 111 mile stage length and the average fare would be \$40. The commuter route configuration is typically hub-spoke. We estimate that 80 percent of our passengers are interline passengers. We are in the business of taking people to the primary hubs or other primary airports for connections with the major carriers. This is the business of the commuters.

Forty-five percent of our passengers, in fact, enplane at the primary hubs, in spite of the fact that we are recognized as the category of carrier serving small communities. This suggests that the hub-spoke configuration is real. People are coming in, connecting, and going onward as we expect they are.

Some 200 air carriers comprise the commuter segment of aviation: the fastest growth segment today. Our figures show that over the past approximately ten-year period we have grown at a rate of 10½ percent per year. In 1978, our passenger enplanements grew 17½ percent, the year of biggest growth. The cargo segment of the industry grew 28½ percent. In 1978, we broke the ten million passenger barrier. We are now carrying in excess of ten million passengers a year. I think you are familiar with these figures. We also serve seven out of ten airports in the U.S. that handle scheduled air service.

It is interesting to note that the commuters serve a total of 630 airports in the country—that is, passenger airports. Of that 630 airports, 359 are totally dependent upon commuter service for their link to national air transportation. This compares, for example, to the trunk carriers who serve a total of 190 airports. Ten of those airports are entirely dependent upon trunk airlines for their air service. Including cargo commuter operations, we serve a total of 850 airports in the U.S. One quarter of all U.S. air carrier operations are commuter operations. So, this segment of small carriers, statistically, is evolving into a significant part of the national transportation system. I hope you agree with that and I'm sure you do.

For commuters, it's been a very very dramatic year, unprecedented in the history of this industry. Commuters were from the very beginning a vital part of deregulation as it unfolded in the Congress. Indeed, in many cases, commuters were held up as the argument for deregulation.

Congress recognized that with deregulation would come an expanded role for commuters. With deregulation would also come a withdrawal from certain markets by the larger carriers who, obviously, could place their equipment in more efficient markets. Congress anticipated this by building into that act several very important features to stimulate the growth of commuters. The first of these was to increase the aircraft size that I've mentioned to you.

A second important provision was the loan guaranty provision. You recall that the act stipulated that commuters, for the first time, would be eligible for aircraft loan guarantees, Federal loan guarantees. It also set aside monies specifically for commuter use, which we think was very important. Obviously, one local service carrier financing one large jet could wipe out, maybe ten commuter loans. The set-aside for commuter aircraft was 50 million dollars in fiscal 1979 and 150 million dollars for fiscal 1980.

We estimated that the orders placed for new aircraft by the commuter carriers in the year since deregulation equal the entire value of the existing commuter fleet. Many of these aircraft will not be delivered for two to three years because those are the kinds of delivery times we're now experiencing on some aircraft. But that suggests, again, that the commuter segment is moving and is capable of filling the voids anticipated by Congress.

Joint Fares

Another important element in the act was that commuters were, for the first time, assured that they, too, in an equal way, would participate in joint fares. Up until this point the commuters were not a part of the mandatory joint fare system. I think you know that a joint fare is simply the combination of two individual segment fares, minus a terminal charge. You really only have one terminal charge on a connecting flight. So the terminal charge is dropped out and you then have a joint fare. Basically that's how it works. The act goes a step further, though.

Under the phase four formula, the division of revenues favor the short-haul carrier. This is to stimulate air service to small communities in the nation which were losing air service. Originally, the commuters were not included in that. Well, Congress put the commuters in there and it's a very important consideration in the growth of this industry. We think that it is only fair and logical that if there is a system, that commuters be a part in the construction and division of these joint fares.



Now, perhaps somewhat predictably, shortly after this became enacted, the Civil Aeronautics Board announced that it was going to examine the entire joint fare structure. Indeed, it suggested that they might decide that there will not be a mandatory system for establishing and dividing revenues and joint fares.

The notion of the Board is to turn joint fares loose and free, just like everything else is becoming more free and more loose. It is a very tempting concept. Let the two parties come together and negotiate a joint fare. Let them negotiate a division of revenues. It has a lot of appeal. Well, it doesn't to us, I'll tell you that.

The problem is that it is a David and Goliath negotiation. You know we were not created equal. We were created small. We can't be any bigger than 60 passengers. Historically, this has been the problem in negotiating joint fares.

We think the system should be free. We think the individual segments should be determined by free market forces. When you bring them together, however, there should be a system that's consistent. Joint fares have been a very important thing for us and they seem to be in place now. It has helped stimulate the growth of commuters.

Essential Air Service

Congress, in voting to approve deregulation, assured small communities in the country that they would have uninterrupted air service. It, in effect, guaranteed air service to any point receiving air service from a certificated carrier at the same time the act was enacted. For any airport that had lost service in the prior ten years, the Board would examine their eligibility for such guaranteed service. That's the CAB Essential Air Service Program. If necessary, the Federal Government will underwrite service at minimum levels to those communities. It was determined in the act that commuters would be eligible for this subsidy. This created some interesting reactions among the commuters.

I'd say a good many of the commuters think that subsidy is like the plague: Once you've touched it, you got it, you never get rid of it, and it's to be avoided at all costs. I think many other commuters see that it's going to be necessary for many of these isolated points. In any event, commuters are now eligible to compete for subsidy on certain routes. It is not a subsidy of the airlines, it's a subsidy of the routes.

It's interesting to take a look at what happened before deregulation. In the 12 years prior to deregulation, there were 172 points in this country that lost service by certificated carriers. In the year since deregulation, 130 cities have been served notice by the certificated carriers of intent to withdraw. Going back to those 172 points that lost service prior to deregulation, 140 of those are now served by commuter air carriers.

Of the 130 that have received notice of withdrawal in the past year, at 79 of those cities this represents the last certificated carrier at that point. At 50 of those points, there's already a commuter air carrier providing service. So in essence, we now have a situation where there will be 190 cities in this country who formerly had service from certificated air carriers that are now receiving service from commuter air carriers.

The Civil Aeronautics Board likes to look at the fact that there has been an increase in the number of flights at all airports across the country by nine percent. At non-hub airports the increase in the number of flights is 10.4 percent. This suggests that the withdrawal of service from the small cities to the big cities hasn't been all that precipitous, or at least, that the void is being filled by commuters and that commuters are demonstrating they indeed can do the job.

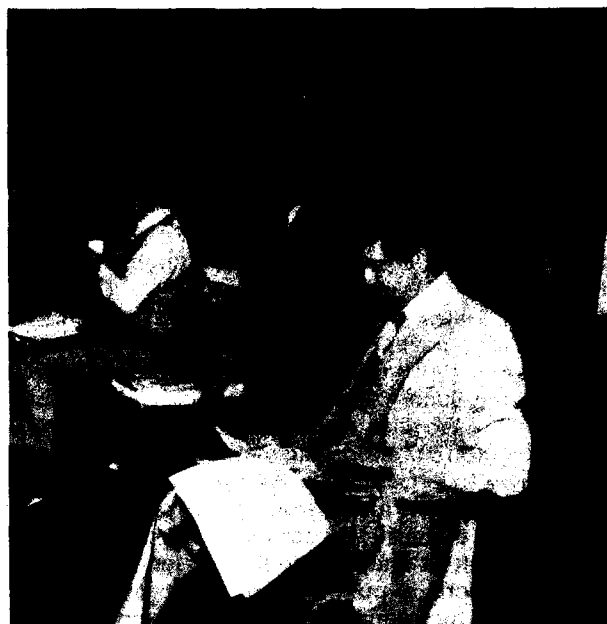
Challenges to the Commuters

I don't envy you the task of attempting to forecast commuter growth. There is a tremendous optimism within the commuter segment of the industry. On the other hand, there are some problems that we face. I'd like to close by touching on three of those. While they are problems, they also might hold out opportunities for this industry. These are the difficult variables to deal with in determining the future of the commuters.

The first one won't surprise you; in my view, it's the Achilles heel of our segment of the industry. That is fuel availability and fuel pricing. This summer, when there was a cut-back in fuel availability, the commuter segment of the industry had a particularly difficult time adjusting. The price of fuel to commuters has increased dramatically as it has to other segments of the industry. I think the commuters might be more dependent on spot market fuel than the major carriers and that it hurts them more.

Typically, a commuter is notified of a fuel increase by telephone, and it is effective immediately. The commuter can't adjust his fares right away. He's on interline agreements, on joint fares. It takes time for his fares to adjust to meet this dramatic cost increase.

Our carriers, who at the beginning of the year were paying on contract for jet fuel something



around 45 cents a gallon, are paying up to 80 cents a gallon now. These are figures that I hear from the field and believe are representative. The spot market for commuters is up around \$1.20. It varies, of course. It is a tremendous increase in cost to be absorbed.

More than price, our concern is availability, however. During our problems this summer when commuters were being cut-back and a couple of the essential air service points were in danger of losing service, I got a call from the Department of Energy saying: "Duane, we have some fuel for you; it's in Kansas City." Well, what are we going to do? Send a Beech 99 to Kansas City to tanker fuel back to Jamestown, ND? It's not going to work. We've got problems that perhaps the majors don't have. We can't move to the fuel. Fuel has to be widely distributed and available.

Do you have any idea how much jet fuel we use? Our fleet is largely turbo-prop—maybe two-thirds turbo-prop. How much of the total aviation fuel is used by the commuters that serve 850 airports in this country, provide the only link to the national system for close to 400 airports? It's one-half of a percent of the jet fuel. One-half of a percent! The total jet fuel consumption in the first six months went up only six percent. Isn't there some mechanism to get this amount of fuel to the commuter carriers?

What about replacement markets? How are we going to go in and replace air service when the carrier who leaves the market typically takes his fuel with him? How can you replace service when there is no fuel there? The argument is: do you want an allocation? Do you want special treatment? On the other hand, isn't it the role of the Department of Energy to see to it that these special situations are handled?

With respect to replacement markets, the Civil Aeronautics Board and DOE have gotten together. There's a letter of agreement between those agencies. There's going to be some attempt made to see that the

exiting carrier leaves fuel behind so that a commuter carrier can serve that market. That seems to us to be perfectly logical.

The other side of the fuel question is this, however. As the price of fuel rises, the opportunities for commuters are also increased. The economic impact of fuel on the larger aircraft is such that it becomes more and more difficult for them to serve the short-haul markets. And we are talking now not of small communities feeding primary hubs, but hub-to-hub short-haul markets.

Take a look at some of the largest commuters in terms of passenger enplanements. You'll see that perhaps the top three are exactly in those markets. Prinair: San Juan to St. Thomas. Golden West: San Diego to Los Angeles. Ransome Airlines: Philadelphia to Washington. All short-haul markets that do not lend themselves to large aircraft. We see this as a very significant factor in the future development of this industry.

You recall that commuters are largely hub-spoke operators. They're bringing passengers into the primary airports to put them on the bigger airplanes. This is nice for everybody. But what happens if the commuter can't get into the primary airport? Airport access is obviously a constraint on our future unless we can come up with some answers to that problem.

We're not talking just about airway access problems, we're talking about terminal problems. Find the commuter terminal in some of our major airports, find it! It's time, as someone said, to get the commuters out of the closet, get them out from under the stairwells. This is a very serious problem. The airport manager at one of the major airports in a mid-western city showed with great pride the new plan for expansion of his airport with wonderful new commuter facilities. Those facilities were located beyond the cargo section. Since our passengers are primarily interline passengers, this is a constraint.

Airway congestion is also a problem. The thought of a bidding system for slots at airports absolutely runs cold chills up our backs, as you can well imagine. The short-haul operator is obviously penalized in any bidding system.

On the airway congestion side there is also good news. We have for some time felt that separate access procedures are perfectly logical for these congested major airports. After all a commuter really only requires two to three thousand feet of runway, not ten thousand feet. He flies at different altitudes and at different speeds. His pilots have flown that airport probably six times a day, they know it intimately. Why not separate access at airports?

At this time, here at Washington's National Airport there is an FAA experiment underway with one of our commuters, using STOL aircraft and entirely separate access. We are following that with great interest. We hope that coming out of this will be some answers that will apply to other primary airports across the country.

The final point I'd like to make with respect to constraints we see on the industry is simply the question of the acceptance of commuters by the communi-

ties. What do people think about flying small airplanes? Why do communities fight to keep the major carriers in place when they have an alternative in commuter service which is timely and more frequent and much better for them over the long run?

I have a story I'll tell you. I do some testing on how people feel about large airplanes or small airplanes. Quite by accident, I tested my mother-in-law. She had come to Washington from Allentown on Altair and I was interested in how she felt about the small airplane. She loved it. I asked her how did she feel in that plane compared to the big planes. She said: "Those big planes scare me. In small planes I know something can be done in case of trouble and that there's somebody there in control of the plane." She's a pretty good mother-in-law; I must say that.

We would conclude that there is necessarily a consumer problem. I think we feel that in many of these communities that are transferring from the large planes to commuter planes after the large carrier serves notice of withdrawal, it is a prestige factor as much as anything.

History is going to repeat itself. In 1967, North Central was providing two flights a day reluctantly to a small town in Wisconsin. They were enplaning 6,000 passengers a year. So they pulled out of that town. A small commuter moved in and started providing roundtrip service between Appleton, Wisconsin and Chicago. They moved their frequency up to 11 flights per day. The enplanements are now 42,000 passengers per year, not 6,000 passengers a year. And that, of course is Air Wisconsin, one of the leading air carriers.

A commuter in Maryland has over 45 thousand passengers per year in a replacement market, a 500 percent increase over a ten year period. That's Henson Aviation, the Allegheny commuter based in Hagerstown. These stories can repeat themselves many many times across the country.



It seems clear to us that the key is frequency and timing of service, and that once communities experience commuter service, they are going to love it. Now there are problems, and the Bakersfield case is one example. I think that all things considered, however, deregulation has moved fairly smoothly. Commuters are demonstrating their ability to move into these replacement markets.

The safety question is one which we should address. You in this room know perhaps that the National Transportation Safety Board has announced hearings on commuter safety to occur the first of the year. We would simply say this: Obviously, as was stated this morning, there is no number that is a good number on safety. On the other hand, there are numbers that confuse. For example, comparing, as the NTSB has a tendency to do, data on the basis of a 100 million passenger miles creates an unfair impression. For example, if you were to load a 747 and fly it across country, the passenger miles generated by the flight would be very large. Taking our typical commuter, it would take a thousand operations to be equivalent in safety for that one cross-country 747 flight in terms of passenger miles. Another element here is that we tend to be compared with what is really the very highest level of safety in public transportation in the world.

I want to say that we believe that the new Part 135, the development of which we in the industry have worked on for four years, will lead to an even higher level of safety for commuters. We agree and are pleased the Administrator of the FAA has testified before Congress that when compared to Part 21 which applies to the larger aircraft, Part 135 provides for an equivalent level of safety among the commuters. We, of course, are dedicated to working toward that end.

It's a bit of irony that with deregulation of aviation generally, we're getting re-regulation of the commuters. This is a problem. As commuters become a recognized part of the system there will be more and more regulation of commuters. Obviously, some of this is good. It can mean, however, that commuters will lose the flexibility to move quickly and to innovate. The challenge that now exists is to assure that this segment of the industry—an industry which has carried out a mission that others could not accomplish without subsidy; an industry which has been an innovator; has been able to move quickly—is accepted into the national transportation system without the kind of regulation which will cause the loss of its dynamism.

Opportunities for Aviation Growth in Today's Environment



Moderator:
Bernard Hannan
Transportation Economist
Office of Aviation Policy
Federal Aviation
Administration

Airports



Clifton A. Moore
General Manager
Los Angeles
Department of Airports

Los Angeles airports and all other major airports have the continuing responsibility to serve the needs of air commerce. It is a responsibility Mr. Moore indicates will be challenged by the growth of general aviation and the commuter airlines. They use a large proportion of an airport's capacity but do not bear the same users fees now borne by the major air carriers. It is very difficult for him to see a way out of the dilemma posed by their operations at an airport that must be self-supporting.

I'm really pleased to be here today. I'm not sure just how much airports really can contribute to a forecasting conference. We are more on the receiving end of the forecast rather than on the end which is normally critiquing it. But I do have a few thoughts with regard to the forecasts. I think sharing them with you today might be of some value.

I'm reminded of the old story of the Army general in World War II who received a call from the front lines that our own troops were being bombarded by our artillery. I suspect a forecast is something like this story. The general, having received this alarm that the American troops were being bombarded by American artillery, started contacting the various artillery enplacements. He finally got one that he thought was the culprit. He said: "This is General Jones. To whom am I speaking?" "This is Sargeant Smith, General." The general said: "I'd like to know, Sargeant, where those shells are going that are leaving there." "I don't know, General, but they are leaving here in fine shape." That is pretty much what a forecast is like. I mean you start out and it goes some place. You hope it gets there all right.

Needless to say, FAA forecasting has been rather good over the years and has served as a foundation for a lot of work done in the airports area. I'm sure it's not been perfect, like most forecasts.

I'm sure every time they do one it will be better than the last one. So, I'm sure this one is better than last year's and, rest assured from the airports standpoint, we will study it carefully and use the inputs in evaluating our own positions.

Landside Capacity

You mentioned that it had been referred to in a report that Los Angeles has a 40 million annual passenger restriction based on landside capacity. Just so that it is understood, that is a planning objective and is based upon a rather comprehensive analysis that was done several years ago of the street traffic in a rather large area surrounding the airport.

The study did show that at about the time that the LA airport reached 40 million annual capacity—despite all the investments that could be made in terms of two new freeways, street widenings, new traffic control signals and other things—the streets simply reached the point of saturation and couldn't handle any more vehicles. We must remember that only 25 percent of the traffic in that environment comes from or goes to the airport; 75 percent is still local traffic for other reasons. So, while it is not intended to be an absolute restriction, it does indicate that when we get the 40 millionth passenger, there's a good chance that we'll have a very difficult time on the surface streets. This year we will probably be somewhere between 36 and 37 million passengers, so we're not going to have very long to go to find out—unless there's a marked change in the program.

Mrs. Armstrong, the President of the Airport Commission is here with me. I don't see her but I know she is out in the audience. She and I recently visited the LA City Council to talk about this. I asked the City Council: "What do you want me to do as the manager of your enterprise here when the 40 millionth passenger arrives? Do you want me to lie down on the runway or close it from November to January first and then start over?" We got the best suggestion we've had yet. One of the Councilmen said: "Stop counting." So my suggestion to you in regard to your forecast is: Please stop counting the passengers and we won't have any trouble whatsoever. There's no restriction on operations.

Seriously though, we will have and the major airports of this nation will have the continuing need to serve the needs of the air commerce. There's no question about it. The economies of the various areas depend entirely on air commerce. We're the only nation in the world that was foolish enough to let our other back-up transportation systems fall into decay and disrepute. We're trying to make it come back but I don't know if we ever will. Therefore, we're utterly dependent on the national air transportation system for a viable economy. There's no question that we're going to continue to serve those needs and to try to do a good job.

We're also going to provide environmental programs that operate concurrently to enable us to provide relief for the communities that are seriously impacted by the movements of air commerce. Those programs are going forward slowly—far too slowly for the communities—but still achieving some benefits.

Economic Challenges to Airports

We see as a result of your analysis and others that general aviation and commuter aircraft are among the bigger challenges that we face. There is no question that the acquisition rate of general aviation airplanes and their demand for use of airspace poses a dramatic challenge to everyone involved both in the airport and in the airway systems.

The rapid rise of commuters certainly imposes a problem on us. At one time in LAX, commuters had a profile that went something like this. If I'm a little off on the numbers, I'm not far off. At one time they were 36 percent of the operations, carried slightly under six percent of the passengers and provided less than one percent of the revenues. Now, that may not sound too bad to you. However, when you operate an enterprise which is entirely self-supporting, which gets no public money except the small amount we get out of the ADAP funds from time to time, and you have someone chewing up a third of the capacity and contributing less than one percent of the revenues, you've got a problem.

Therefore, we feel that we have to watch very carefully what happens in the commuter business and how it is handled. We recognize that it is an interline service; one which is of great benefit to the traveling passenger; one which must be accommodated. But I think we have to approach it cautiously and wisely. We must intergrate it in such a way that we can have many of the benefits and as few of the negatives of the system as possible.

We desperately need general aviation reliever airports in certain areas of the country. We need them and we need them located in such a way that they are attractive to the general aviation user, in close proximity to the area that he wishes to go to. At the same time, they should not detract from the main air channels serving the commercial facilities that are so badly saturated at the present time.

Looking at where this forecast might take us: For the first time, I think, in a long time, we're finding that the public is in a position of making choices. The public—because of the compounded effect of inflation on many different prices—now is deciding, as was described earlier, whether to take a vacation or not, whether to spend that money for travel or for some other purpose. When fares were relatively low compared to income and when choices were freer, the decision was generally made to do both at one time or another, maybe in sequence. Now, that's no longer true. We are beginning to find a situation where people, in fact, are not taking air trips.

This has shown up in LA's own statistics. For example, the month of August: While our international travel which reflects the hard currencies of Europe and the Orient, was up 18 percent; domestic traffic was down almost two percent, and the traffic to Honolulu overseas was down also almost two percent. The net effect was almost a stalemate, a total increase of 0.2 percent. That is the lowest number we've had in LA in six or seven years, I'm not sure how long, except for major strike situations. That's compared month-to-month in the previous year. I understand that September looks like a two percent increase, total for all passengers.

Also, what we're finding in the business for the first time is resistance by businessmen to traveling in the high density seating configurations that have appeared everywhere in the fleet. I just came back into this country on a TWA flight—I guess TWA won't mind if I say that—with all coach configuration on the 707 from Europe. Let me tell you, I don't recommend that for anybody my size nor anyone quite a bit smaller than I am. Unless you like a straight jacket, it's really a very unhappy experience. I expect that this will cause a lot of people who are making optional business trips not to make them. They will choose a telephone, the telegraph or some other form of communication as an





alternative. Because, unless their company policy is such that they can fly in first class, they are not going to find it desirable to make a trip that up to now seemed perfectly OK. It will be a matter of personal choice.

The sum and total of the whole thing, however, is very largely what you have in your forecast. There will be a continued period of growth in the unknowns such as fuel that we've heard several views on today. All I know as a matter of direct experience is that certain airlines already have had to cancel flights, brought about by deregulation and brought about by the new freer international policy. A good example is Continental not being able to fly some of its flights to Taipei and also withdrawing from the Washington to Denver market. Not because they didn't want to fly Washington to Denver and not because they didn't think there was a market, but because they simply couldn't get a fuel quota for that period of time.

Now, how long that's going to go on, I don't know. How many airlines are affected, I don't know. I suspect more than the airlines will probably admit publicly. We have an unknown factor that will continue to affect the business for the next few years. I think all of us just will be watching and trying to figure its effects.

From the our parochial view in LA, we're going to provide new runways in Ontario which is already under construction. We're going to try to provide a new airport in Palmdale if we can ever get the state to stop studying the subject. A hundred million dollars later they want to study it, again, after we've already bought that much land.

The question of another new airport in southern California is being addressed in the hopes of finding a new location, either a military field or an entirely new site somewhere south of the LA County area. It does appear as though a consensus may be developing for the attempt to build a new airport in the harbor adjacent to the Orange County coastline. If, in fact, that political consensus does develop, I'm sure many people in the aviation business will work very hard to get the airport itself built.

Commuters



Robert A. Jenkins
Vice President
Commuter Services
Allegheny Airlines

Mr. Jenkins follows up on some of the points made over lunch by Mr. Ekedahl. A not unreasonable scenario for the future, according to Mr. Jenkins, is the development of a fourth level among air carriers as regulations force the commuters to grow as a means of covering newly imposed regulatory burdens.

We're behind schedule. No good airline likes to operate behind schedule, so I want to help you catch up. Because Duane Ekedahl made such a good speech at lunch, he didn't really leave much to talk about in the commuter airline area. However, I will cover a couple of subjects that I think need further emphasis and this goes to some of the possibly bleak prospects for the commuter industry. Everything so far has been really rosy. There has been painted a very bright picture for the future of the commuter airline industry. But I want to talk about some of the problems that I see in the future for the commuter airlines.

Not too long ago, I heard an address by a senior CAB attorney of another carrier. He spoke on the subject of deregulation. He termed it re-regulation. He talked about how certain of the rules on routes and fares were relaxed but that there were many other new regulations added. So it is with the commuter industry.

The commuter industry is becoming mature. It is growing into a new area of responsibility and along with this new responsibility comes more restrictive regulations. I share with Duane Ekedahl the source of comfort in the new FAA Part 135 operating regulations. We applaud the efforts of the FAA to improve the safety of the commuter industry. We feel it is very important and long overdue. However, I also expect that this will mean the demise of some commuter operators. They will just disappear because they won't measure up. That's probably good for the industry.

Cost Pressures on Commuters

The second area that I see as a problem goes to the various cost elements. One of these is the possibility that security screening will be required, imposing the same requirements on commuters as the large trunk and regional airlines have today. That is a financial burden that many commuters just won't be able to take.

Consumer protection provisions. The Allegheny Commuters carry about 22 percent of the total passenger traffic on commuter airlines in the U.S. Our commuters have been living up to and fulfilling the denied boarding compensation provision, and providing for no smoking sections and the various improved consumer protection elements. But I expect that many commuters won't be able to do that simply because of the facilities required and the expense involved.

Another area where we see a growing amount of regulation is the increase in the scope and detail required by the CAB on financial and traffic reporting. When a commuter acquires dormant route authority, replacing a certificated carrier, the CAB imposes these more restrictive financial and accounting requirements because the commuter then becomes a quasi-certificated carrier. While that may be required, it simply increases the cost to the short-haul operator.

Mr. Ekedahl covered the joint fare problem which up to now has been a boon to the commuters. If the commuters lose the ability to participate in the division of joint fares at a favorable fare pro-rate, it means a considerable reduction in revenue.

Against all this background, I think that you see the possibilities of increased-cost. Commuters are growing into markets that regional airlines have abandoned, and acquiring large aircraft to do the job. We're talking about the aircraft of \$75,000 to \$100,000 per seat.

An obvious question that arises is: If the regional airlines couldn't be profitable using depreciated aircraft in these markets, how are the commuter airlines going to be profitable operating new aircraft while carrying the debt servicing that this entails? I suspect that the alternative is that history will repeat itself and that present day commuters will have to grow in order to survive, enter long-haul markets and abandon the small cities. We may see a cycle repeating itself all over again. It's just possible that we'll see a fourth-level commuter carrier system developing.



General Aviation



Ms. Thon Griffith
President
The Ninety Nines, Inc.

Ms. Griffith presents a strong case for general aviation as an alternative means of travel. The problems of fuel, reliever airports and facility improvements have a tremendous impact on the quality of services general aviation can provide the nation. For these reasons, as well as the size of the fleet, general aviation deserves greater support from all levels of government.

When I was invited to speak to you, I promptly and graciously declined. Thousands of general aviation pilots send good money back here to the various associations which represent us. Any number of individuals from one association or another would have been far more qualified than I to speak to you today. However, Mr. Hannan, quick as lightning, refused my refusal. So I began to research the subject—and it has been interesting.

I talked to many who are here in the audience today. I talked to fixed base operators; to instructors; to other corporate pilots and to just plain vanilla pilots. All are people who work to save general aviation and to save airports. So what you are going to hear is a collection of thoughts—we seem to be quite parallel in our thinking regarding the future of general aviation.

A general theme appears to run through the comments I read in the FAA Forecast, General Aviation section . . . the thought that the FAA displays a lack of understanding of the nature—the need for—and the problems of—various segments of general aviation. For example: the forecast opening statement refers to general aviation as personal flying for business or pleasure. Isn't airline flying conducted for business or pleasure?

Another point made to me is that the FAA speaks to the issue of fuel costs, but does not speak to the issue of cost effectiveness, in terms of fuel, as well as savings of executive time that general aviation often provides over airlines or surface transportation modes. You see, general aviation is an alternative use, it is not an add-on.

Alternative Transportation

Allow me to relate to you a recent example from my own log book—an occurrence which can be multiplied by the thousands every day of the year. Our flight began at John Wayne Airport, Santa Ana, CA at 7:00 am. The passengers were the executive VPs of companies A & B. Forty-five minutes later we touched down at BFL. I dropped off the VP of Company B so he could attend to some city planning problems—then picked up the district manager and superintendent from company A. We hopped over the mountains to Mojave—a thirty minute flight. At Mojave those three men met regarding some construction problems. Two and a half hours later, with the problems solved—time out for lunch—and with the original passengers aboard, we were back in Santa Ana.

Those two men each had time to return to their offices, open their mail, make telephone calls, and go home at their regular time. To have accomplished that by airline obviously would not have been possible. To have done it by automobile would have required approximately 800 miles and 18 hours of executive time devoted solely to travel—and they probably would have had hotel expenses and meals. The companies were highly pleased with the substantial savings effected by using the company plane.

Before returning to the forecast once again, let me further establish the need for, and importance of, general aviation. In other nations, the government pays for training pilots. In the U.S. the individual struggles, with increasing difficulty I might add, to pay for his own training. The cost of the food you consume would be far higher if it were not for thousands of aerial applicators. Air ambulances are needed to transport people from remote areas to modern medical facilities. Business relies heavily on the flexibility of general aviation. Families going on vacation with limited travel time or wishing to visit grandmother on a three-day holiday may be able to do so only with the assistance of general aviation.

I'm a frequent user of the airlines. When I board an airliner, I see businessmen and women with briefcases in hand, or travelers, vacationers, going to, or, returning from some place, carrying or wearing their souvenirs. I see families going to visit grandmother. They are all doing the same thing that the general aviation pilots and passengers are doing. The principal difference is that general aviation can depart from any one of the 7,000 airports in the United States. I said 7,000 because those are the ones open to the public. As you know there are 12,000 to 13,000 airports in the United States. Airlines are limited to approximately 400 airports served by air carriers. This greater personal mobility for not only people, but for light cargo as well, accounts for the increasing importance of general aviation.

Constraints on Growth

The FAA forecast is concerned with the rate and extent of our growth. First let's examine some of the things that will cause general aviation not to grow: The FAA has presented to the Congress recommendations which will change the current seven cent per gallon fuel tax to an ad valorem tax of ten percent. They further proposed excise taxes on all new aircraft and avionics of six percent. All to be contributed to the Airways and Airports Trust Fund. They have then proposed substantial diversion of the trust fund monies to the maintenance and operating budget of the FAA.

General aviation suffers in two ways from this proposal. The most obvious injury will be in the substantial increase in the operating costs of general aviation aircraft. It may well take the hundreds of salesmen out of their light aircraft and put them back in automobiles. It may cause smaller companies such as those for which I fly, to eliminate their aircraft entirely. The increase in operating costs will raise the cost of food for all of us and will make the training of our future pilots—both general aviation and airline pilots—vastly more expensive. Pleasure flying may become practically non-existent.

The second way in which general aviation will be affected will be by the diversion of trust fund money to FAA maintenance and operation. This money is badly needed for the upgrading of the 6,300 public use airports not served by the airlines and for the construction of essential reliever airports in the hub areas. In spite of the surplus in the aviation trust fund, it is well documented that the airport needs are twice as great as the current level of authorizations. A hundred million dollars will be released over the next four years for improvement of the nation's reliever airport system, but nearly 4.3 billion has accumulated in that fund!

It is disturbing to me to see that the backlog of Airport Development Aid Program applications has been growing steadily from \$930 million in April 1978 to the present when it is over \$1 billion. This is happening despite the General Accounting Office's statement that for the decade of 1980 to 1990 they will need over \$10 billion to develop the national system of airports.

If the Administration is successful in imposing these punitive taxes on general aviation through their proposed legislation and they continue to sit on their hands in the area of expediting the flow of trust monies into general aviation construction, rehabilitation and improvement, it will inhibit the growth of general aviation. It also may well trigger its slide into the relative obscurity it already enjoys in other less developed nations.

Fostering General Aviation

Some positive steps can be taken to assist the growth of this important segment of our over-all transportation program. One: If the FAA forecast of new general aviation airports to open in the 1980s is to be realized, there must be a change in Congressional policy to allow trust fund monies to assist the privately owned public use airports. Two: The reliever airports and other new general aviation facilities can only be ob-

tained through a stepped-up public relations effort by the FAA and the general aviation community. Since the general aviation community is not an organized entity with funding to conduct research for facts to present to the general public, the major effort must come from the FAA. It was designated by Congress to be the means to promote aviation. Three: The public and especially the news media must understand that general aviation pilots have the competence and equipment to operate in any environment and communities must be educated to the economic advantage of an airport. Too often the leaders in a community are anti-aviation. We need the FAA's help! Four: The FAA must support the construction and improvement of general aviation facilities. It must reduce red tape in ADAP and streamline the process by which sponsors can fund these processes.

General aviation benefits our nation's economy, contributing more than a quarter of a million jobs and \$10 billion to the gross national product. General aviation substantially helps the U.S. balance of trade by building and exporting \$500 million worth of general aviation equipment every year.

General aviation operates over 98% of all aircraft registered in the United States. We transport about one-third of the total number of passengers. General aviation uses only eight tenths of one percent of the total fuel consumed in all modes of transportation!

So—will general aviation grow because it is a cost effective means of transporting people and goods? I think so, if it is encouraged through the construction of needed facilities; if provisions are made for safe operations which are realistic, but not overly costly; if the public is made aware through a positive approach to the media and with the FAA's help; and, if regulations affecting general aviation are reasonable and realistic. If these happen, then we can expect general aviation to grow as forecast and meet the demands of the people who use this means of travel for business and pleasure. Thank you for your attention.



Air Carrier



Sheldon C. Srulevitch
Senior Vice President
Market Planning
Braniff International
Airlines

Mr. Srulevitch evaluates the past year, since the passage of deregulation, from his perspective within one of the major air carriers. Deregulation was supposed to be a slow and gradual process. It has been anything but slow. The airlines have restructured their routes to such a degree that it's hard to see further restructuring in the coming year. While deregulation has brought rapid change in the past year, changing marketing patterns and regulations to reduce airport congestion as well as fuel costs are factors that have not, as yet, run their course.

I'm glad to see that the optimism that prevails throughout this whole morning didn't scare everybody away. Now comes the good news.

In the letter Mr. Hannan suggested that I might critique the forecast. Well, after reviewing the forecast, I decided that I was definitely not qualified, since in the days when I did forecasting, it was very simple. I took O and D data or some other traffic data, went three to five years back, and then put a straight line on it. If we decided we wanted to be conservative, we let a dip come in every once in a while, and knock a point or two off here and there. We submitted that as a forecast. Strangely enough it was fairly accurate.

The forecasts of today are getting much more involved. We have employment, consumer price index and disposable personal income. And GNP. Yes, we also used GNP every once in a while when we really wanted to get sophisticated. Well, speaking to all these forecasters, I'd rather go where angels fear not to tread—stay away from forecasting for a few minutes. I'd rather talk to you about what I call the real-time present happening—what affect the anticipated trends in air travel will have.

Adapting under Deregulation

First, let's start out with our famous one, the one year old baby, deregulation. Darwin tells us that those species which adapt to new conditions survive. Well, I can guarantee you that Braniff will survive and I'm sure that all the other airlines will survive to a certain extent.

Deregulation was supposed to be a slow gradual blessing for the public and for the airlines. Now a year has passed. Route deregulation has been anything but slow. In fact, I'm predicting that when the carriers come up in January, 1980 to pick their wild card route, there won't be any wild cards. People won't need to request anything because they'll have everything.

In the past year, it's only taken from 60 to 90 days for any carrier to get any route it basically wanted in the domestic system. We had multiple awards of a route, we had exemptions, we had route realignments as well as the "ask for, you shall receive" awards. In fact, many of the so called "protected routes" which came under the act now have effective competition. Even within the first year, when they were supposed to be protected. All this came about in the "slow, gradual" decontrolling process. And just think, the CAB still has control on routes.

What are we seeing now that deregulation is one year old? Usually a child of one starts walking. Well, it looks like the airlines started to run before they walked. Big and little carriers are pulling out of cities, as you all heard. It's not so much the pulling out of cities, but they are also pulling out of segments. You don't hear very much about that. The carriers are dropping routes much faster than they are dropping cities. It is much harder to measure the number of routes they are dropping as compared to the number of cities they are dropping.

The large carriers are going on to the more profitable routes of the small carriers. This is happening and we can see it will be happening this winter. We see many of the major carriers pushing towards the golden areas of the sun belt.

Small carriers are giving the appearance that they are getting bigger, but are they really? I just happen to have *Aviation Daily* here for October 18th. One of the headlines: "United furloughs 195 pilots, and more expected." "American's third quarter earnings' drop to 2.8 million." This is from 90.1 million figure. And Southwest, the darling of the Texas experiment, posts an earnings drop of 28 percent in the third quarter.

We don't talk about PSA anymore, do we? PSA must have done something wrong. Just so you don't think I'm prejudiced, Braniff made 15 million dollars in the third quarter of 1978. In third quarter of 1979 we had a negative figure of nine million dollars. We didn't do everything right either. Well, deregulation is a horse that has been kicked quite a bit. We will just have to see what the second year will bring about.

Problem of Lead Times

Let's look at fare deregulation for a moment. It seems strange that if you wanted to lower the fare you could get short-notice approval in one day. But under deregulation when you try to raise the fare, even though costs are beyond control—the airlines do not control fuel costs—it takes at least two months for increases.

We expect the next fuel increase on November 1. Today happens to be October 24 and I don't

think it came out today. Even if it did, it still gives only six or seven days notice to the general public. I could go on about deregulation; but in short, it's only one year old. So let's see what happens when it grows up.

Let's talk about fuel for a minute and other things very high on the subject list. About the only thing I can say that you haven't heard or read is that I feel when aviation fuel gets to a dollar a gallon, the fuel companies would do very well to change their price structure. Wouldn't it be nice to say it's 14 cents a pound or seven pounds per dollar? I mean, we're in a competitive market now. Let's go and be competitive and say seven pounds per dollar and maybe we can get it for 99 cents. If we get real lucky.

Let me put fuel in a better perspective. It presently costs Braniff \$202 of fuel costs to fly a passenger on a Boeing 747 from Dallas to London, figuring a 65 percent load factor; \$202 per round trip.

Our present budget fare, which has stimulated the market and which is a very popular fare, is \$400. You are all forecasters: Guess what's going to happen to the price of that fare? It has to go up. And that will definitely effect its popularity.

Labor is the other big cost center, but I won't get into detail about that, because that's something I really don't know anything about. It just seems that labor and fuel are presently fighting it out to see which is the largest cost center, which can be the biggest expense. And this is happening when mutual aid is out and strikes are in.

Slot Allocation Systems

It isn't that things are getting tough enough for the airlines, as fuel and labor costs go up. But now, we're coming up with a new system, apparently a "big brother" system for slot allocations at the controlled airports. The airlines will have to buy the right to operate in or out at a certain time in these congested, controlled airports. I suggest we buy only the arrivals. Might corner the market that way. But really. It won't take a long time for a good idea to spread.

Can you imagine how it is going to be for the commuter or the big airline Braniff, for that matter, to operate and try to bid for a five o'clock departure from Chicago to Kansas City, when it is trying to bid against United Airlines who wants to operate a 747 at the same time from Chicago to LAX?

Since a lot of you are from the Washington area, I wonder, without really knowing Eastern's profitability structure, how profitable the shuttle will be when it has to buy or bid on every slot. Knowing it has to keep continuity of its schedules, just think how you could hold them up knowing that they want to go every hour on the hour. Will it boil down to the fact that short-haul operations will operate only at seven in the morning and ten at night? Well, that can't be. The short-hauls, as we all know, feed the long-hauls. So I guess we're in a Catch-22 situation.

And, as I said, a good idea doesn't take long to spread. Our friends at the Treasury Department said that it sounds like a great idea. They're going to use that for customs' clearance. Well just think how interesting it's going to be to schedule. Airlines are told by the

British Airport Authority what time they can leave. That kind of figures out which time you can arrive. Now you have to bid for that arrival time on a sealed bid basis to go through customs as well as landing at the airport itself.

We've seen some strange organizations within the airline industry, but it looks like we're going to have to merge the scheduling and financing department together. Someday we'll see slots traded on the commodity market. But that's what we are looking for, free enterprise.

Now, I'm glad we got the good stuff out of the way. In closing, I'd like to read an excerpt from a letter. It's from a large travel agent group: "Dear Braniff, It would now appear that open commissions will be a reality by early 1980. Accordingly, we invite you to submit a proposal for an undertaking by you and us whereby we will emphasize the promotion of your airline during the first half of 1980, as discussed in greater detail. . . ." I will skip down. "In exchange for a higher commission, we are prepared to undertake a significant coordinated marketing effort on behalf of those carriers who choose to work with us."

For quite a while, they have been saying that commission rates may go as high as 40 percent. It's going to be interesting to be in this business figuring that fuel, going up, will be accounting for 30 to 40 percent of our expenses and labor also 30 to 40 percent of our expenses. That's in the neighborhood of 75 percent of our expenses already. On top of that commissions will be somewhere, possibly in the range of 40 percent? Profit margins get very small! What about the investment bankers and how they will view the airlines?

Now, that I've given you all the bright side. I think we do have our work cut out for us. We have things to do. We will survive. We have gone through this before. It just so happens that we're going through it in a time when there's a recession. There can be rewards in this business for operating during the trying times as well as operating during a very up time. Thank you.



Manufacturing



James T. Burton
Director
Commercial Marketing
Douglas Aircraft Company

Using the aircraft of his company as examples, Mr. Burton provides an overview of what commercial aircraft will look like in the years to come. The new airplanes will look very similar to current jets to the unpracticed eye. However, they will incorporate a number of new technologies to lower fuel consumption and to increase capacity.

Well, Barney sent me the same letter he sent everybody else and I thought I was going to come in here and talk about forecasts. We do forecasts at Douglas. Some of our forecasters are in the room and they gave me elaborate details about our models. I can tell you that I am happy I don't have to comment on the forecast because we are always wrong. I suspect that this forecast is wrong too.

But if it gives anybody any comfort, we think that while the stagflation scenario is about right for the first five years, we're thinking that resumption of normal growth is going to happen after 1986. We plan our business that way.

Aircraft for the 1980s

Let's look at some pictures of airplanes: These airplanes are going to look pretty much like airplanes we've seen for a lot of years now. I'll show you what is different about them and how they meet some of the challenges that have been thrown at us by the oil industry, the EPA, the airlines and everybody else today.

Just for a start, this applies to the Douglas Aircraft Company and McDonnell-Douglas. It's probably generally true for the other manufacturers. I don't pretend to speak for them. I don't really know what's in their plans over and above what they've announced. McDonnell-Douglas has its own character, its own way of doing business and it's different from Boeing or Lockheed. We want to stay different.

The issue of growth that we're all discussing today, deregulation, effects aircraft design. It effects the size and range of airplanes that can capitalize on the growth and deregulation opportunities that the airlines see. Inflation is with us. We, in our scenario, expect it to continue to be with us at rather elevated rates. Of

course, we've talked today at length about fuel. We've talked about costs.

What that means to the airplane designer is that you start looking at things that you didn't look at when fuel was 11 cents a gallon. Crew size and maintainability of the airplane are important things to the airlines because of the cost of labor. And the fuel cost effects the aerodynamic shape of the airplane. Noise control is something that we must improve. It's a happy circumstance that the engine, the same engine that tends to produce better fuel economy tends to produce less noise. So, some things at least are looking better.

What I'd like to do is go through some opportunities now with a chart that we use at Douglas. On the graph, the vertical scale represents the number of seats in an airplane. The horizontal scale represents the distance, or the range, that the airplane has to fly. You can see that we have some airplanes that are filled in solid black.

The DC-10 series, our domestic version of the airplane; the series 30 and 40 which are the intercontinental airplanes with about the same number of passengers, but more range; the DC-9, the standard 30 & series 50, are filled in. That's an airplane in production; the DC-9 Super 80, about which I'll have something more to say in the next slide or two. Around these airplanes are some cross-hatched airplanes. These are on the drawing board, or are ones that we have a fairly firm idea of what they would be. The one here called the Super 80SF: "SF" for either short field or for short fuselage. It's an adaptation of the same technology that's in the DC-9 Super 80, but for shorter field lengths; for special markets such as the Japanese situation where there are a lot of 1,200 meter runways that were put in during the war. They can't be lengthened, but need more service than you can get out of the YS-11. Our SF can stand for short fuselage given the same weight as the regular DC-9-80, achieving greater range. There are attractive markets for an airplane like that, in about the 130 seat category.

Above that we have two airplanes we call the ATMR. The initials stand for Advanced Technology Medium Range. I hope we change that very soon. It's not a very jazzy name for a marketing person to talk about. Then, up above the DC-10 we see airplanes in the 400 seat category and more airplanes out further with a lot of range that we have categorized as the 60 series DC-10's.

The Douglas Aircraft Company, and all aircraft companies now, has always had a habit of stretching airplanes. The DC-3 was actually a stretch of the DC-2. And the DC-2 was a stretch of the DC-1. The DC-7C, which is the last of our propeller airplanes, is a stretch of the DC-7, which was the stretch of the DC-6B; which is the stretch of the '6, which is the stretch of the '4. We have DC-8s in at least three lengths; DC-9s, now in four lengths.

Taking advantage of power as it comes along, as the engine people can give us more thrust, we put more seats in the airplane. That's a good way to make the airplane more efficient. Your airplane mile costs go up quite slowly but your seat mile costs come

down quite rapidly. The idea has never left our minds since the thirties when the DC-3 was born. When the DC-10 was laid out in the 1960s, even then, we made room for that airplane to grow. It's about time to actually execute that now.

What we have is a family of airplanes that develop from the DC-10. With some standard improvements, the '10 can be stretched 40 feet, or about 80 to 90 seats, and give you about the same range as our domestic DC-10 with the inter-continental wing and weight combination. With the modified wing, some other tricks and higher thrust engines we can increase capacity from about 270 passengers up to about 393 in our 63 series. With some more range but at a sacrifice of seats to about 353, we have a version we call the 62, very much like a DC-8 Series 62 for airplane buffs.

Or, with the same high-lift system and power we can add fuel to the airplane and make what we call a very long range airplane and serve routes of over 6,000 nautical miles. These are the same routes that are being served non-stop by the Boeing 747SP, but with the economy of three engines instead of four, less wing area, less weight, less fuel and so forth. So the DC-10 stretch family looks attractive and especially so in view of today's fuel prices.

On this chart we're comparing fuel per trip on the left and fuel per seat on the right, with the 747 in the blue column here. We're essentially able to do with the three engine airplane what Boeing did with the 727 series. It eventually grew to be about as big as the 707. That plane does many of the missions that the 707 could, but with three engines instead of four. Of course it has been a tremendous success.

A parallel in the wide-body fleet then might be an airplane family that looks like this. Our long range series 62 burns some 91 thousand pounds of fuel for a 25 hundred nautical mile mission while a 747 has to burn 117 thousand pounds of fuel for that same mission. The 63 burns some seven percent more than the 62 but carries about the same revenue as a 747. But the 747 has to burn 28 percent more fuel to do that.

The same comparison is made here on a seat basis, so you can see as Boeing most certainly must: Stretch the 747 and get these same economies back because they are inherent in the airplane. But the airplane will have to go up in size to something like 600 passengers to make that happen. And when the market is right, I am sure that that it is a logical and obvious thing for the Boeing Company to do—or for Lockheed or for any other manufacturer. Airbus is talking about that too.

So stretching planes is economical. It has low development costs. It's not quite that simple, but the investment is low and the pay-off is high. So stretching DC-10s seems to be in the cards for McDonnell-Douglas.

The next airplane is a photograph. This is the first, or the prototype, of the first actual production model of the DC-9 Super 80. It's out on the compass rose at Long Beach. This airplane's first flight was last Thursday at noon. It flew from Long Beach down to Yuma, Arizona where we have our flight test operations. It's a stretch of the DC-9 using Pratt-Whitney re-fanned engines with lower noise levels, higher thrust and lower fuel consumption—all the kinds of things we're all looking for. Here is a relatively old airframe. New life is being pumped into it with reframed engines. They meet the noise and fuel requirements.



Compared here are several airplanes that can do about the same job. The numbers are the number of seat miles that you can get out of a gallon of kerosene. The DC-9 produces something like 50. In other words, we get about 40 percent more seat miles out of a DC-9-50 per pound of fuel or per gallon of fuel, than the 727 or early DC-9 models. That's the kind of thing that makes a lot of sense now. A 40 percent improvement is big money when fuel becomes something like 40 percent of the cost of operating the airplane in direct terms.

Low noise is also a feature of the DC-9 Super 80. This is a stage-three airplane. For those of you who don't really know the difference, here are some footprints laid over a runway. The little x here at the cross mark is either the point at which the aircraft releases its brakes or the point at which it touches down on the runway. So aircraft are landing by coming in from the left hand side of the screen and taking off towards the right.

What we've done is plotted the geographical area within which anybody that lives in that area gets a 100 effective decibel noise level or more. Right at the edge it's exactly 100. Everything inside is more, everything outside is less. Now, for a thousand-mile trip a 707 or DC-8 effects about six square miles of territory around the airport with that noise level, a pretty awful noise. A 727 effects about five, a better airplane for that kind of a route. The DC-9 or a 737 about three, carrying fewer passengers, of course. The modern airplanes, the Super 80, less than one mile and a DC-10 less than one mile, too. The engine people are helping us and we're beating the noise problem as well as the fuel problem at the same time.

Applying New Technologies

I'd like to take a little time to talk about an airplane you have heard less about than the stretch DC-10 or the DC-9 Super 80. Now the Advanced Technology Medium Range aircraft doesn't look very advanced. It's a fairly conventional layout from the view that the artist selected for this picture. But in reality, although the advancements in this airplane are hard to see from the outside, they really do contribute to the airplane's economy and usefulness.

Here is some of the technology that we are exercising that make it an advanced technology airplane. In aerodynamics, we are talking about supercritical airfoils, of course. Anybody that designs a jet airplane today to fly in the mach .80 or higher range would do that.

The business jet community has discovered winglets, and tacks them onto everything. We think there may be something there in reducing drag and wing weight.

Improved high lift systems such as flaps and leading edge devices can be built to give better take-off and landing performance. Horizontal tail airfoils and size are effected by augmented stability controls. In propulsion, the engine companies are coming to the party with things like single crystal blades which can take higher heat and be more efficient in the use of fuel.

Active clearance control, full authority power management and variable geometry and things like that are helpful and add a percent here, a percent there.

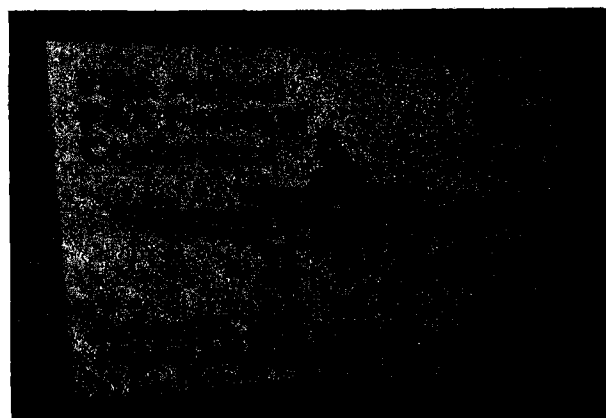
Metallic structures: we're thinking and have demonstrated adhesive bonding rather than riveted structures. We're looking at isogrid window panels hogged out of a piece of metal by numerical control machines, very much the same technology that McDonnell uses in building fighters. Superplastic forming, improved aluminum steel alloys, powdered metallurgy. Those kinds of things are all under consideration for use in various parts of the airplane.

Non-metallic structures, composites; carbon graphite type of structures. We are experimenting, certainly in secondary structures such as gear doors, fairings, control devices, floor beams and so forth. The DC-9-80 has composite nacelles on it. The DC-10s are flying with composite rudders. Very strong, very light weight kinds of things that can reduce the weight of the airplane and reduce fuel consumption. In active control systems: Wing load alleviation, longitudinal stability control, augmented center of gravity management in flight. Not quite as exotic as the Concorde maybe, but something to keep the airplane light and efficient. All of these things we believe can contribute and will.

This kind of technology can reduce the fuel consumption or increase the efficiency of the airplane by over 30 percent over what the typical day-in, day-out 727 or DC-9 flying the line today is getting. That kind of fuel efficiency is we believe very attractive.

In addition, we didn't want Cliff Moore to have to sit in that seat that he had to fly back from Europe in and die of discomfort. The ATMR as it's now conceived has a wide cabin. It has two aisles. These seats are about one inch wider than in the DC-8, 707, or 727. About the same as a DC-9 seat. Two seats are next to the windows, an 18 inch aisle, two seats in the center, very much like the first class of the DC-10 or L-1011, another 18 inch aisle and two seats over there. So Mr. Moore won't have to have somebody on either side of him as he flies across the Atlantic. Of course, this is not an Atlantic airplane.

These are some of the things we're doing. Thank you.



New Technology



Daniel R. Perley
Omnium Consultants
Science Council of Canada

Mr. Perley reports on an investigation his firm is conducting to define an aircraft that can meet the needs and requirements for downtown-to-downtown service in the 150-200 mile range. The aircraft they have defined will provide a bridge between current short-range airliners to second generation STOL aircraft.

Mr. Chairman, on behalf of the Science Council of Canada, I wish to extend their thanks to you and the Federal Aviation Administration for the opportunity to participate in your program.

The Science Council of Canada is a national advisory body which, after appropriate assessment, makes recommendations to the Federal Government on: (a) How Canada can best use science and technology for public benefit; and (b) On how Canada's scientific and technological resources should be developed for that purpose. Areas of concern include research priorities and long term planning and participation in international scientific or technological affairs.

The Science Council's interest in transportation dates back to the early 1970s. It has released three transportation-related reports including: A Canadian STOL Air Transport System—a major program; Aeronautics—highway to the future; and, a survey of Canadian activity in transportation R&D.

In 1977 with the prospect of impending energy constraints, capacity imbalances and increased financial stringencies within the Canadian transportation industry, the Science Council was encouraged once again to investigate the national transportation system. A transportation study group and a steering committee were formed. Their mandate: To discover, define and promote R&D, industrial and institution/management opportunities in intercity passenger and freight transport.

Omnium Consultants on the Science Council's behalf have broken new ground in an area they have chosen to call supplementary air services. These may be generally defined as downtown-to-downtown and various other services which fall outside of current conventional takeoff and landing services (CTOL). Seven supplementary air services were defined. They include: Intercity service with modified conventional

takeoff and landing services (MCTOL); intercity short takeoff and landing services; commuter service with small aircraft; airport to airport shuttle service with smaller aircraft but higher frequency; specialized charter services such as educational airlines; large-scale small-package operations; and, intercity service with lighter-than-air aircraft.

This panel's theme, "Opportunities for Aviation Growth in Today's Environment", seemed particularly appropriate for the exposure of early results for what is being termed modified CTOL. The intention is to close some of the service gaps perceived in the Canadian environment and provide the basis for a more integrated and more functional national air service.

MCTOL Service

Modified conventional takeoff and landing (MCTOL) service is a concept which makes use of 100 to 120 seat aircraft equipped for short field performance and rapid turnaround on short routes where present vehicles of this size are suboptimal but where traffic is too great to allow small first generation STOL equipment to be effective. At present, the replacement of a 100 seat aircraft with a smaller vehicle reduces passenger comfort, renders a slower flight speed, gives increased seat mile costs and increases the number of aircraft movements required to move the same number of people.

Larger aircraft may improve seat mile costs but in a 150 to 300 statute mile route this is not necessarily the case. They provide equal or superior passenger appeal and make effective use of runway slots but require longer runways and tend not to tolerate high-cycle operation as well as smaller vehicles. The 747SR is the only really large vehicle now in use designed to be effective on a sector under 200 statute miles, although current L-1011 and DC-10 aircraft do operate on fairly short trips. The 757, 767 and other new aircraft will be somewhat better in short stages.



The DeHavilland DHC-7 or "Dash 7" has successfully proven STOL technology. It is bringing it to the U.S. commuter airlines now and provides a firm base for future development. Second generation STOL vehicles will serve both feeder routes and, in their larger variants, mainline short-haul routes. They will offer superior comfort, speed, seat-mile economy, noise and emission performance standards compared to today's STOL aircraft. However, it is doubtful that they will be on the market, in any number, before the 1988-1992 period.

We feel there is now a need for a 100 to 120 seat hybrid-technology aircraft to provide a bridge from present operational short-range airliners, with their higher fuel consumption and noise level, to second generation STOL. At the present time many new aircraft are being developed for the 30 to 80 seat range; these include the DeHavilland Dash X and Dash 7-200 and -300 series aircraft, the BAE-146 and others. There is also considerable development occurring above the 150 seat level including the DC-9-80, 757, 767, A-310, possible ATMR, and so on.

There is, in our opinion, not as much being done in the 80 to 120 seat range. McDonnell Douglas is looking closely at a short-body DC-9-80 and Boeing is looking at re-engineering the 737, but both efforts commence with older aircraft—nothing totally new is happening even when the Super F28 is considered. While we would like to see a new 100 seat vehicle emerge we recognize that such a vehicle might well be overtaken by a pure jet short-range STOL "mainliner" early in its life. It is therefore accepted that our concept must be based on a 100 seat vehicle which could be diverted to other profitable uses whenever the second generation STOL arrives.



Service Definition

The clientele of this service is projected to consist mainly of business and other frequent travelers moving in high density corridors who are time sensitive and who do not carry a lot of luggage. Rerouting reservations would be made through normal channels. Ground transportation would normally be by means of free connector buses serving major metropolitan and satellite pick-up points. Customers would have the option of making their own way to the airport. MCTOL would connect large airports to large airports, large airports to small airports and STOLports, STOLports which are STOL network hubs to other such STOLports.

In this way, the effectiveness of a STOL commuter service could be augmented by reducing the total trip time of a passenger who originated in one small center and terminates in another one. This means that the STOL hubs would not be located at the city's major airport. Every flight which directly connects the STOL hub in cities A and B is a 100 seat flight that will not have to be operated between the two large airports.

One's first response to this is that there must be a proven traffic flow between STOLports A and B or the vehicle will be operated at a loss. We accept this argument but would refer to various works performed by Lockheed and others who determined that one major problem with the STOL concept is that many people—even business travelers—are not traveling downtown to downtown. Each metropolitan region must be broken into many segments to determine the XYO/D where X is a zone in city A and Y is a zone in city B. Zones can be then assigned to a small airport.

Passengers may be ticketed off-airport, on the connector bus or by a self-serve ticketing machine at the gate. Luggage would be carried to the aircraft and placed in enlarged overhead bins. No boarding pass would be required to enplane and ticket coupons would be lifted prior to takeoff. Meal and beverage service would be offered as on present CTOL flights.

Aircraft

A 100 to 120 seat derivation of a current aircraft would form the basis of the MCTOL vehicle and a high use of advanced composites would be required. While a substantial fuel capacity would be provided to give the operator flexibility, fuel would normally be traded for takeoff performance due to the short mission. Very large overhead luggage bins would be required as not all MCTOL flights would offer checked-baggage service and soon all such service would be available only to those arriving 15 minutes before flight time. Other passengers could arrive right up until the closing of the aircraft door. A very fast (10-15 minute) turnaround would be essential and the major changes required would be an increased fuelling and provisioning rate.

High lift devices would be utilized and it might be possible to fit active controls as well. There would be three major design goals: economical operation through use of a high bypass fanjet engine; quietest economically feasible operation; and, attractive field performance.

Seat mile costs of the MCTOL vehicle would have to be as close to those of present (or even projected) 150-200 seat vehicle as possible. It is recognized that they will not match these costs, especially within the short stages we considered, but there must be a substantial improvement over present 100 seat aircraft. MCTOL would use a 3,500 to 3,800 foot takeoff under most conditions: under 1000 feet elevation and 86°F. The runway provided would be less than 5,000

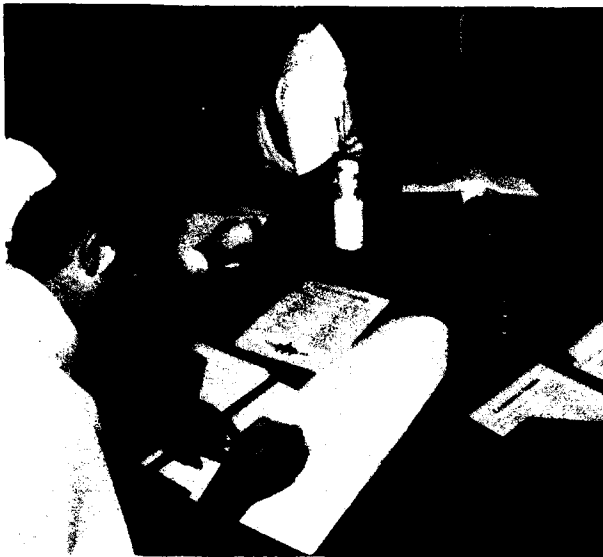
feet in total. This takeoff distance assumes a full passenger load, limited fuel and limited cargo and a 150 to 200 statute mile mission; it should be emphasized that these parameters exceed those of even the relatively high powered DC9-80SF. It is also recognized that such high-power takeoffs will burn more fuel than conventional takeoffs. This is a design necessity.

By having such performance, MCTOL aircraft will be able to provide such improved service—closer to where people live and want to go—that it will reduce automobile useage considerably and boost total air traffic by substantial amounts. Steep approach and takeoff angles would be used and the aircraft would have to have cruise capability up to the 500 mph level.

The community acceptability of MCTOL service is obviously crucial to the type of consideration policy makers will give it. The DHC-7 operates in the 50-60 EPNDB range and has been acceptable. Careful planning, construction of new runways and other measures will be needed to introduce MCTOL operations into future STOLports or present community airports serving suburbs.

Objections of one sort or another are a virtual certainty. Even the DHC-7 is facing stiff objections at Toronto Island airport. It should be noted, however, that MCTOL service can cut passenger trip time and cost over CTOL or even STOL and better serve part of the airline market. If aircraft design, new engines and good operational strategies can be co-ordinated, MCTOL is a possibility.





Market

Business travelers who are time sensitive and other frequent travelers will benefit positively from MCTOL service and could be encouraged to use it. On the 300 mile Montreal-Toronto sector, the highest density city pair in Canada, we estimate that this service would save the traveler 35 minutes of a total trip of 135 minutes operating from Malton to Dorval.

This assumes a STOL takeoff and landing strategy, but not one dollar spent on new runways or airports. This is a greater saving than a DHC-7 STOL operation from Victoria STOLport to Toronto Island STOLport can offer. It will not carry STOL's premium ticket price, at least for the present, eliminating the prospect of spending one to two hundred million dollars on new STOL facilities.

It will not relieve Malton congestion but there are two possible steps to do this. Movement of small business and private aircraft in and out of Malton may be restricted as they presently comprise the majority of movements. Suburban satellite airports may be developed to serve as terminals for one or both ends of any particular MCTOL flight thus relieving the strain on Malton and Dorval. While the first strategy may be more relevant to Canada, where there are still small aircraft to be removed than to the U.S., the second is relevant to both countries.

This service will give the full-fare rider a faster, cheaper trip. It will give a more comfortable ride than one on a present STOL airliner. It will remove him from the hoards of discount-fare passengers, allowing an on-board service more tailored to his needs.

So, there is a market for MCTOL service on the major high density routes in Canada. To date applications on 11 prime city pairs have been identified. By 1988, this number is expected to have increased to 27. While the U.S. market has not been investigated, it is our expectation that the advantages perceived for Canada would be shared in many cases in the United States. We would be most receptive to your comments and criticisms of the MCTOL concept.



Part 3 Questions and Discussions



Question:

Mr. Mercer, you mentioned development of additional Terminal Control Areas and increased controlled airspace. Can you tell us where and when it might happen?

Mr. Mercer:

No, all we know is that there were four additional TCAs established this year. There is still some discussion of whether or not there will be additional Terminal Radar Service Areas. It will be done on a case by case basis. It will be evaluated with local communities before any further action is taken to expand any controlled airspace. I don't think there is any discussion on lowering of the positive control airspace at this time.

Mr. Taylor:

The issue of lowering the floor on the positive controlled airspace has been put on the shelf for reconsideration. Our air traffic people as well as others are examining the airspace as a whole issue, nationally, to see what changes might be made in the near future to accommodate the growth that we know is coming. More specifically, I would not anticipate any major, or for that matter any minor, modifications in the near future.

Mr. Mercer:

I might add that the current aviation forecast is utilizing the assumption of no change in the positive control airspace floor through 1991. We changed the forecast when the rule was withdrawn.

Question:

What is the possibility of lowering the criterion level for qualification of new towers?

Mr. Mercer:

I'm not aware of anything that might change the criteria for towers. Tom Messier is here and I believe his office establishes criteria for FAA facilities. I don't think there is any serious thought being given to lowering the criteria for the establishment of towers.

Question:

Given the fuel situation and other uncertainties, is there a possibility you may change your forecast on a quarterly basis?

Mr. Mercer:

The forecast we issued in September of 1979 was actually finalized in June. We had to finalize our forecast in June in order to meet the budget planning cycle for fiscal year 1981. This forecast is to be used as a basis for our fiscal 1981 budget. We publish it in September and present it to Congress in February and March. It is a basis for our manpower planning for the following fiscal years. Therefore, we can't change it officially until after that point. However, any time that there is a change in the economic outlook, we do run those changes through our forecast model. We do advise our management of the implications of the new economic outlook so that they are aware of what is happening.

The only time when we have ever changed our forecast was when the oil embargo hit. At that time we had to withdraw our September forecast and reissue a new forecast to go to the Hill. It was just a ridiculous forecast at that particular point. But barring dramatic changes, we won't officially change this forecast until next September when we publish our new one for the next fiscal year.

Question:

Then, how can we get access to the latest forecasts?

Mr. Mercer:

We have many many people calling us to ask what we think is happening on a current basis. We provide a short term forecasting model that's available on a current basis to our field people and also to a number of states and consulting firms. They have subscribed to that service through a time-sharing computer system. All you have to do is get a user number. So, feel free to call our office anytime and ask us what we are looking at and we will be glad to let you know what we see happening.



Question:

Can you tell me from where your estimate of 50 percent business utilization of general aviation comes? How does aviation compare to other modes?

Mr. Mercer:

Our management systems department gathers the information on a survey basis. We have also conducted a number of surveys ourselves within our own office. It is through such sources that we found out about the growing trend toward business use of flying. How this compares to other modes I don't know. We have not done a great deal of work in looking at the other modes. Perhaps we should. But I really don't know how it compares with the railroad, or the waterways or the automobile.

Question:

Is your present forecast constrained by the possible non-availability of fuel?

Mr. Mercer:

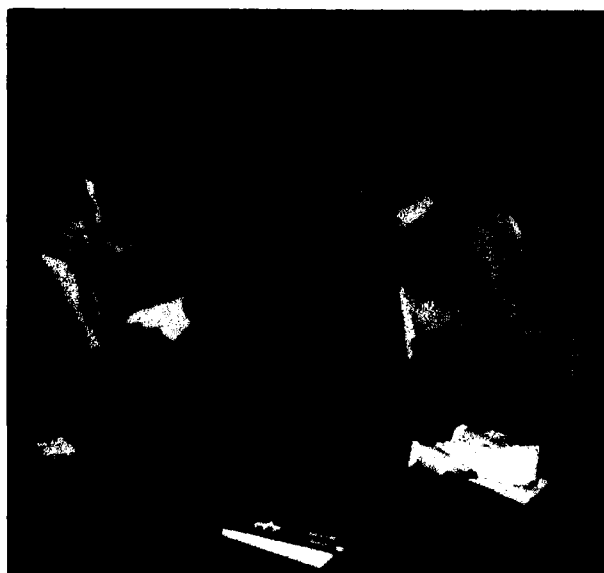
No. The only constraint we have built into the forecast is our price constraint. We assume that there will be an adequate supply of fuel at a price. In the stagflation scenario we do assume that there will be spot shortages around the country, but no serious cutback in the use of fuel. The higher energy prices under stagflation, as you saw from our chart, does dramatically impact general aviation, particularly local flying.

Question:

About the 30 billion dollar figure for new equipment: Is that just trunk requirements? In constant dollars?

Mr. Shen:

I forgot to mention that one of the key beneficiaries of this trend is the commercial airframe manufacturing industry and their suppliers. The answer is that the 30 billion dollars is just for the domestic trunks. It is in current dollars with eight percent inflation built in.

**Question:**

I'd just like to clarify General Hairston's comment. You have to look at the sixteen hundred facilities from another standpoint also. First of all, ten percent of that number was accredited to the San Diego accident. We all know that shouldn't have been there and it was there because it was an intrastate carrier.

General Hairston:

I hope that doesn't mean you like the number. Do you like that number? No, I agree with you. If you push all the statistics in the world, I still don't think that going to the cemetery sixteen hundred times is a good idea.

Question:

Mr. Griswold, you spoke primarily about the air carrier fleet. I wonder what your expectations are with respect to general aviation in terms both of aviation and kerosene.

Mr. Griswold:

I mentioned at the beginning that I felt that the FAA forecast seems to me to be a little optimistic. Of course it's a much smaller part of the total fuel picture, but I do feel that the eight or nine percent growth that's contemplated here is optimistic. The reason I say that is that price is going to be a very decisive factor. Certainly, for the general aviation participant it's going to be meaningful. I think that this is really the sole determinant. I think many of you are aware avgas is in tight supply; it's running head-to-head with motor gasoline. That's the problem. Just to give you a rule of thumb, for every gallon of avgas that the industry produces they sacrifice two gallons of non-leaded fuel.

