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WORKING PAPER

TRAFFIC FORECASTING AND ECONOMIC PLANNING WORKSHOP

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Agenda Item 3 b): Forecasting for Airline Planning

(Presented by the Secretariat)

Introduction

1. Airline planning involves the planning of routes and services, fares structures and fleet development. These various activities are interrelated and require close coordination. Airline planning decisions are important to aircraft manufacturers, airport facilities planners, regulatory bodies, investment community in addition to the airlines.

2. The airline planning process is also influenced by the results of planning in other civil aviation sectors, particularly as reflected in the capacity of the aviation infrastructure, the products of the equipment manufacturers and government policy. In some measure all of these in turn respond to traffic growth and the requirements for air services.

Planning of Routes and Services

3. A carrier's route system is essentially the key to all planning. Internationally, the traffic rights granted by governments in bilateral agreements, provide the basis for the operation of an airline's scheduled route system, for the expansion of operations and the serving of new routes. The degree of flexibility accorded by such rights, including the authority to pick up or carry traffic to various points, varies considerably.

4. The demand for air travel on particular routes is largely a function of traffic generating factors (e.g. population, economic conditions), price and service levels. This demand may also be influenced by the price and relative attractiveness of competing destinations and other transport modes. Moreover, demand for travel between two points usually represents only part of the total traffic between the two airports concerned, since it also includes traffic coming from or destined for other points. This further broadens the range of factors to be considered in the preparation of route traffic forecasts and the planning of services. Several models for forecasting traffic on specified routes or between specified regions are presented in the ICAO Forecasting Manual.

5. Competition between carriers or airline alliances remains one of the most important elements in route and service planning. Such planning will determine where and how the airline or alliance can compete effectively and what must be done to build up competitive strength to enter or defend markets. Various alternatives are explored, markets researched in varying degrees, and opportunities and risks evaluated, leading to the establishment of priorities. This activity is related to the efforts of marketing, scheduling and fleet planning.

6. Traffic shares of competing carriers or airline alliances serving a route can be influenced by a variety of factors such as price, service frequency, aircraft type and number of stops. Governments may exert a strong influence on airline traffic shares through traffic rights, including any capacity arrangements, as well as regulations relating to fares and rates. Other factors may also play a role, such as the quality of customer service provided or traveller perceptions of the carriers.

Impact of Fares Structures

7. Fares structures have become very complex, with a variety of promotional fares offered on many routes in addition to first, business and normal economy class fares. In many markets, fares are often adjusted or introduced to meet competition. In some markets, circumstances may permit more careful evaluations of changes to fares, including predictions of the traffic and revenue shares of the various fare types, which mainly depend on the characteristics of the markets served, price differences and ticket restrictions (e.g. advance purchase, limitations on stopovers or trip duration).

8. In any event, the fares offered will influence the traffic carried on individual routes, as well as revenues generated and their relationship to operating costs. With fares established, the use of "seat management" (the control of the allocation of seats on particular flights to passengers using various types of fare) has become, for many airlines, an important means of influencing their economic result. Fares developments will thus influence planning decisions concerning the capacity to be offered on various routes.

9. The emergence of low-cost carriers in certain regions of the world and the expanding role of the internet as a distribution means in air travel have reinforced fares as the major competition tool and rendered airline planning even more complex.

Fleet Planning

10. Fleet planning can be described as the act of determining future fleet requirements and the timing of aircraft acquisitions. Fleet planning is an important part of the development of an overall operating plan for the airline, which takes into account the airline's objectives, operating constraints and financial position.

11. The fleet planning process must consider the following:

– Airline goals and objectives.

– Passenger and cargo demand.

– Service pattern impact on market share.

– Airplane performance.

– Operating economics.

– Operational and other system constraints.

12. The nature of the fleet planning process is complex due to the following reasons:

– Passenger and cargo traffic continues to increase.

– Available aircraft types and configuration change.

– Route structure, traffic rights and airline competition change.

– Strong emphasis on financial results.

13. Three approaches are currently used in airline fleet planning efforts. They can be categorized as macro evaluation method, schedule evaluation method, and aircraft assignment method.

14. The *macro approach* is a multi-year system analysis wherein the numbers of various types of airplanes required are determined based on a macro traffic forecast. There are several steps in the macro evaluation method:

– Forecast aggregate passenger/freight traffic.

– Convert traffic forecast to a capacity forecast based on load factor assumptions.

– Project the capacity available from the current fleet.

– Calculate the additional requirements for growth and replacement, considering the fleet mix, airplane productivity and system characteristics.

Macro evaluation method is a reasonably quick method of estimating future fleet requirements. Several alternatives can be analyzed, including different assumptions concerning seating capacity, average stage length, anticipated restrictions and summary level statistics. This technique places heavy emphasis on historical seat trends and average stage length, which may not be good indicators of future aircraft requirements. No attention is given to the airline's route structure, and the analyst is limited to information aggregated over the whole system.

15. The *schedule evaluation method* examines the quality of a previously determined schedule. After traffic demand is allocated to airplanes assigned to itineraries, the analyst examines the resulting load factor for direction. If it appears unreasonably high or low, adjustments are made to frequency, previously assigned airplanes itinerary structure and connect opportunities. Operating economics are considered, and finally fleet requirements are determined after several iterations of the approach.

16. In the *aircraft assignment method*, total O-D traffic demand, airplane performance, operating economics, financial limits and system constraints are initially defined. A computer programme is then used to select and assign airplanes that meet the service and operating requirements of the total system while satisfying some objective function such as operating profit. The system may be represented by individual itineraries or cells constructed by market segmentation techniques.

17. Three approaches to planning have been reviewed. Each of these methods enter the airline planning process at a different point in the analysis, and each has a contribution to make. The requirements dictate when each technique is more appropriate. In summary, the planning process must be a system level approach considering traffic demand, airplane performance, operating economics and system constraints. The final results of the fleet plan will usually determine the major portion of future capital and other resource needs forming part of the total airline corporate plan.

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