

AIRPORT OPERATOR METHODOLOGY

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Objectives of Airport Traffic Forecasting

The objectives of airport traffic forecasting are to provide criteria for financial planning and facility planning. For financial planning we are concerned primarily with revenue forecasting, operations and maintenance cost projections, and capital programs. Looking at facility needs, traffic forecasts provide planning criteria for both airside and landside capacity requirements, ranging from FAA terminal area control and ground control systems, runways and taxiways, aircraft gates and parking spaces, to terminal passenger handling facilities, ground access systems, and cargo handling facilities.

Financial Planning Financial planning relies upon the forecast in assessing sources of revenue that depend upon traffic volumes. These include concession revenues, automobile parking revenues, fuel sales, and flight fees. Operations and maintenance cost projections that relate somewhat to traffic volumes include staffing, contractor services, and materials. For capital programs the forecast plays an important role in decisions about the kinds of investments to be made, both dollars and functional requirements, as well as determining reasonable cost recovery plans.

Facility Planning Facility planning requires a close look at annual and monthly traffic levels, as well as daily and seasonal peak load activity levels. Airport traffic is looked at as a number of discrete elements -- domestic passengers, international passengers, parked cars, aircraft movements and seats, cargo tonnage, fuel volumes loaded. For aircraft movement projections to be useful we need to consider them by aircraft type and time of day or season as criteria for traffic control systems, runway, and taxiway planning and by airline for the planning of aircraft gates at passenger terminals. Passenger, vehicle, and cargo flows are projected by the time of day and by terminal as criteria for appropriate facility planning. These criteria may be summarized as follows:

FORECAST ELEMENTS FOR FACILITY PLANNING CRITERIA

1. Airside Capacity Planning Criteria

- | | | |
|-----------------------|---|------------------|
| a. Aircraft movements | | |
| by aircraft type | } | traffic control |
| | } | systems |
| by time of day | } | runways/taxiways |
| (by season) | } | |
| by airline | } | aircraft gates |

2. Landside Capacity Planning Criteria

- | | | |
|--------------------|---|--|
| a. Passenger flows | } | passenger handling |
| by time of day | } | facilities |
| by terminal | } | (ticketing, check-in,
baggage, concessions) |
| b. Vehicles flows | } | terminal curb space |
| | } | |
| by time of day | } | on and off airport |
| by terminal | } | roadways |
| c. Cargo flows | } | cargo handling |
| | } | facilities |
| Trucking activity | } | trucking facilities |

Truck activity has dramatically increased at the New York and New Jersey airports. We are now considering ways to determine the amount of air cargo that travels by road feeder service and methods for projecting the volume of this activity in the future as planning criteria for on-airport cargo and trucking facilities. In preparation for this TRB workshop we had been asked to think specifically about forecasting issues that call for judgment and intuition. Gradual recognition that a substantial amount of air cargo was continuing to move on air waybills but traveling by truck rather than air is probably one of our best recent examples of intuition and judgment leading to further investigation that is now affecting our forecast methodology.

Passenger Forecasting

Let me now focus on our domestic passenger forecasting methodology. Traditionally we develop market demand forecasts using an econometric top-down approach beginning with forecasting national traffic. The rationale for this approach is that approximately 50 percent of our airport users are non-area residents. After developing the national forecast we then develop regional share forecasts. Independent of this approach we are also working on a bottom-up forecast, through which we first look at regional economic factors in order to surface any influences that might be disproportionately important to our region and not show up as

readily on a nationwide basis. In addition to the econometric approach we consider demographics very important, especially for forecasting traffic further out than 10 years. Elements that we are interested in incorporating into our forecasting efforts are national demographic trends such as age and income, travel participation rates and trends, and both inter- and intra-regional demographic shifts. The most recent addition to our forecasting tools has been a networking model developed to assess the potential impact of various hubbing strategies. The model considers both origin and destination and transfer traffic flows, choices in aircraft type, as well as airline operating costs and profit maximization.

The U.S. domestic passenger forecast is defined in revenue passenger miles per capita, as shown on Figure 1.

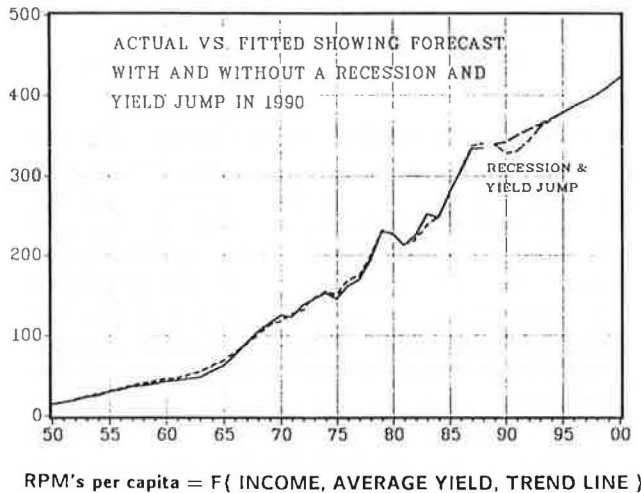


FIGURE 1. Domestic RPM Per Capita

We are increasingly interested in considering alternative scenarios as part of our forecasting process. In a recent domestic passenger forecast we show one example of this, projecting the effect that a recession and yield jump might have. It is important to make the point that we do not consider alternative scenarios substitutes for specific forecast numbers. Instead they are important additional decision-making tools in this environment of constantly changing aviation players and strategies.

Figure 2 shows the New York region's share of U.S. domestic enplanements, which is presently approximately 6.5 percent. In deriving the regional share from the nationwide domestic passenger forecast, income and yields are again

the main indicators. Once we develop a regional passenger traffic forecast, those volumes need to be distributed among three airports. To do so we use a model that takes into account intra-regional demographic trends and relative ease of airport access measured in both time and dollars.

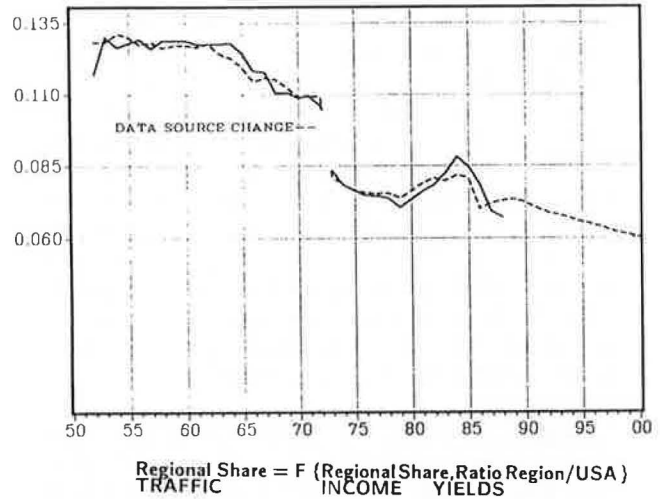


FIGURE 2. New York Region Share of U.S. Domestic Enplanements

Forecasting Aircraft Movements

Forecasting the aircraft movements requires estimates of fleet mix and available seating capacity, projected load factors, and average passenger load per movement. Small narrow-body, large narrow-body, small wide-body and large wide-body aircraft are separately identified. There is a significant difference in average seats per aircraft between domestic and international flights. The significance of these projections becomes apparent in a situation such as we currently face at Newark International Airport, which has been overwhelmingly domestic but is now receiving a surge of attention from international carriers. The fleet mix that this potential activity would bring with it has important implications for airport facility needs.

Importance of Forecasts in Facility Planning

Traditionally the most important use of our air traffic forecasts has been as a planning tool for future facilities. A 10-year forecast has proven over the years to be a very good indicator of the traffic levels to be accommodated a decade in the future. The challenge that we now face is to increase our focus on short-term projections, one to two years. For example, because we are in the

beginning stages of a \$5.5 billion redevelopment program at all three New York area airports, construction staging over the next several years is an important capital investment issue for the Port Authority. Projected traffic levels that need to be accommodated during this period is a key piece of the decision-making process.

Finally, the dynamic nature of airline market strategies increasingly requires econometric modeling to be supplemented by careful tracking and analysis of the current market, as well as development and consideration of alternative scenarios. This need is particularly important to the New York/New Jersey region in light of the recent history of People Express and the current

uncertain activity levels of important NY/NJ airport users such as Eastern and Pan Am.

To monitor the market in the kind of detail that we need, we segment the air passenger market into business versus pleasure travelers, domestic versus international, and various age segments. For air cargo we look at bulk cargo versus small package and all-freighter activity versus cargo carried in the bellies of passenger aircraft and in combos. Through a combination of econometric modeling, demographics, market analysis, and development of alternative scenarios, traffic forecasting retains its role as an important tool for airport facility and financial planning.