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Airport Planning: A Consultant's Viewpoint

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The evolution of airport development, the utility and benefits of airports, and the problems of expanding or implementing a major new airport facility in light of the many constraints imposed by opposition groups are briefly examined. The responsibility of government in planning airport operations and expansion is discussed. It is concluded that too many agencies are responsible for accomplishing a sound airport transportation system and that one overall agency should be responsible for ensuring adequate airport development in all areas—roads, the groundside, and the airside.

The past decade has witnessed extreme frustration in the evolution of aircraft, the forecasting of air travel, and the expansion of existing airports and provision of new airports to serve a growing need. This paper begins with a brief recap of the evolution of air travel and air facility development, highlighting some of my own experiences in planning for the growth and expansion of a number of regional airports in this country and abroad.

Between 1965 and 1970, there was phenomenal growth in air travel, in both passenger and goods movement. Government, state, and municipal groups responsible for airport planning became acutely aware of capacity restraints imposed on this growth and readied many plans and funding programs to proceed expeditiously with airport development.

In the past five years, there have been some major reductions in the growth of air travel as well as a number of major changes in the overall transportation industry. The oil crisis of 1972 and 1973 affected the airline industry harder than most. In contrast to the period of meteoric expansion during the 1960s, the situation has now somewhat reversed. Before the downturn, new aircraft were in the making and interface facilities were being constructed at airport terminals. But

administrative officials have become very reluctant to spend additional money at the earlier pace. In addition, environmental considerations have moved to the forefront in the 1970s to such a degree that air quality and noise levels are considered as important as economic recession and inflation and the energy crisis in the decision making on all investments in airport planning and development.

OVERVIEW OF THE PAST 20 YEARS

The first era of air travel after World War II was one of general accord among aircraft, airports, people, and the environment. Propeller-driven aircraft predominated until the end of the 1950s, when turboprop engines were introduced. This was the golden age, in which aviation lived in a state of amity with all of its neighbors, but it was relatively short-lived. The image of aviation was by no means a negative one. The typical airport was rather modest, short on marble walls and multi-story parking facilities. Most airport terminals featured single-story buildings with a back door to the airport apron and a front door to the parking lot. You could actually see the aircraft!

In general, aviation was accepted by local communities as a good source of employment and a necessary support to local service industries and commerce. Although many problems had already been encountered in the development of new and existing airports, such as Idlewild in New York (now known as John F. Kennedy International), no one yet understood the severity of the problem of airport development.

Further development of aircraft into the jet age and

the jumbo jet age—from the Viscount to the 707, the DC 8, the VC10, the BAC1-11, and now the Concorde, with its noise and negative environmental impacts—has practically stymied the development of new airports.

The past two decades have also seen marked increases in flying speed. From the operator's point of view, this produced an increase in the number of kilometers a plane could fly in a given period of time and especially reduced amortization cost per aircraft kilometer. Simultaneously, larger aircraft were being introduced, accompanied by projections of substantial economies in both capital and operating cost per seat per kilometer. This phenomenon triggered additional growth and a whole new market for leisure and holiday flying. It is not surprising that runway capacity, as well as groundside parking and access systems and terminal buildings themselves, came under pressure.

On the subject of noise, the emphasis has shifted from purely local issues to national and international issues.

FUTURE PROSPECTS

In the past two years, air travel in most corridors has grown by 10-15 percent annually. Most airlines are back in the black, and prognostications of future growth trends in air travel appear positive. Most experts now seem to agree that annual growth rates of approximately 15 percent/year will probably not recur, but growth in passenger travel in the range of 10 percent/year is now reasonable. This points up the necessity to continue planning and building airports, since it is doubtful that equilibrium or a ceiling level will be reached.

Today's problems and prospects in planning for future airport access facilities can be outlined as follows:

1. The difficulty of forecasting growth in patronage;
2. Confusion about responsibility for airports when there may be a state plan and a city plan and a question as to who is to fund improvements;
3. The question of who benefits from a proper

response—(a) owners, (b) carriers, (c) owners of adjacent property, or (d) travelers;

4. The question of who is to pay for (a) energy costs, (b) environmental delays, (c) funding delays, and (d) congestion delays; and

5. How to plan compatibly to serve both existing and future needs.

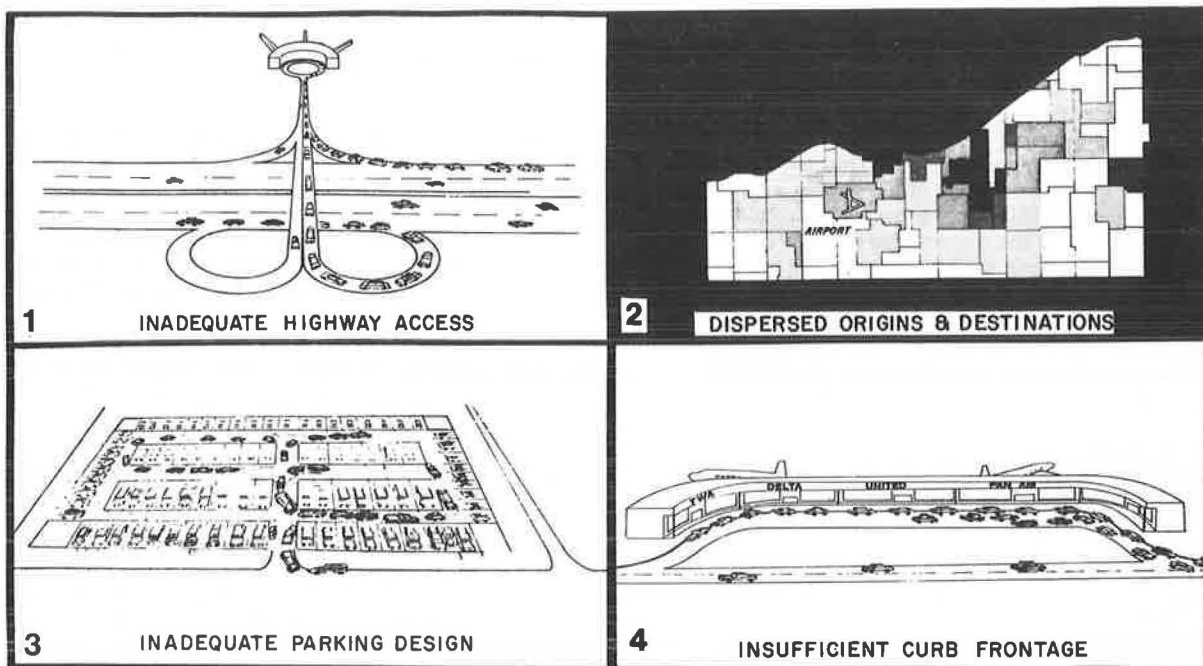
Technological advances will continue to reduce total cost, although these advances may well be less dramatic than those of the past 15 years. Additional marketing strategies to attract charter traffic will be developed. Essentially, more people will continue to use the air mode to link origins and destinations separated by great distances. International air travel is forecast to increase more drastically than domestic air travel, and a high proportion of the predicted growth in demand is in the leisure rather than the business sector.

Airlines will be placed under more pressure to develop greater fuel economy and reduce aircraft noise. They will have to accelerate the retirement of older equipment from main-line service, which will add to the need to reduce their capital for the purchase of new aircraft and ancillary facilities.

Another point that bears mentioning is that, with larger aircraft and greater payloads, airside facilities (runways and aprons) will reach capacity at a slower rate than groundside facilities (roads and parking facilities) and terminal buildings that accommodate person movements. The concentration of curb-frontage activity and related pressures in central parking areas will become a more serious problem on the groundside and necessitate major expenditures on vertical expansions of enplaning and deplaning levels and on parking areas and roads.

Twenty to thirty years ago, the airport was a major attraction for recreational trips and sightseeing. Because of land availability, the airport was viewed in a rural context and thought of only as a support facility to the community. Today, the airport is urban rather than rural in context and a most important part of the urban fabric. We must treat it accordingly, not only as

Figure 1. Major reasons for airport ground delays.



a place to arrive and depart by air but also as a place to shop, to work, and to conduct business.

FUTURE PROBLEMS

Previous studies have indicated that there are four prime issues in landside planning for airports (see Figure 1):

1. Origins of trips from home or work to the airport are so dispersed in urban areas that few, if any, justifiable transit corridors exist to facilitate the trip linkage between home or work and the airport. This makes it necessary to use private, semipublic, or public vehicles on the road system to effect the linkage, which further adds to demands for more and better highways.
2. Few major regional airports have more than one major highway linkage to the major regional highway networks. This adds to the problems of congestion and delay during hours of peak airport use, work-shift changes, and so on.
3. Too much parking has been placed in the central terminal area in close proximity to the airport terminal for a proper balance among terminal capacity, parking capacity, and roadway capacity. This further increases congestion and confusion in the central terminal area.
4. Too much pressure is placed on enplaning and deplaning linkage between vehicles and terminals. Curb frontage is perhaps the most precious real estate at any airport terminal facility because of this great need.

In my opinion, there are institutional constraints that are also paramount in the proper development of new and improved airport facilities. These constraints involve the interaction between the government groups responsible for airport planning and development. Airport development is largely supported by federal funds. Formulas have been conceived to facilitate this development, but they are not realistic, acceptable, and fair in all cases. This fact alone causes great concern among many people and results in animosities and disputes that stymie good, timely airport planning and development. Funds that were designated to be spent on the basis of zero-budget funding are thus encumbered and not used as intended.

Federal regulations are, in many instances, misused to delay airport development. Environmental impact statements alone can set back an airport program for as much as 10 years. It is easy to see that, when the growth of patronage continues and airport improvements are delayed, the problem is further compounded and the

losers are usually travelers, their businesses, and their families and ultimately, in some cases, the community and the owners of the airport complex. From my vantage point, the most difficult institutional problem is the inertia and discord among airport planners, sponsors, and benefactors. It is unlikely that major changes or improvements will occur, but I believe that, if funding mechanisms at the federal level could be more streamlined and funds used more readily for their intended purposes, it would offer the greatest challenge and benefit to airport growth and development.

Another paramount issue in improving airports and expanding existing ones relates to the groundside components of roads, parking facilities, intra-airport transportation, and pedestrian linkage between the automobile and/or public transportation and the airport terminal building. Employee parking must be differentiated from public parking. Public parking should be differentiated as to short-, medium-, and long-term duration. Short- and medium-term parking should be accommodated close to the terminal; in most cases, long-term parking can be more remote from the terminal and some shuttle bus service can connect interim origin and destination at the airport.

Travel needs know no fixed areal subdivision, ownership, or municipal boundaries. Highway planning and fixed-rail planning for access to airports tend to be jeopardized because of the infrastructure of planning responsibility, airport ownership, and regional transportation development needs. Most airport road systems are primarily planned only by the owner, to the boundary of the airport property. The state or city or county responsible for the roads that lead to the airport from the regional network of highways is then responsible for the external road system. Case history after case history clearly emphasize the resulting breakdown in the planning and facilitation of roads that link highways and airports. In my view, if some changes could be made uniformly throughout the country to give the responsibility for airport access to a single agency, this situation would be markedly improved.

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Decision Tool for Analysis of Capacity of Airport Terminal Buildings

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A systems approach to the analysis of the airport system is presented. Airport managers currently do not have a viable tool for determining the

effects on capacity of altering the location, operation, or design of individual components within an airport. Models currently exist for analyzing