Airport Capacity and Level of Service

Extreme traffic peaking at airports generates congestion and severe economic penalties, or delays to aircraft and passengers

SITUATION

The complex problem of traffic peaking at airports has been the subject of increasing concern for airlines and airport operators around the world.

These problems may become even more acute if the timely expansion of airport facilities to accommodate increasing levels of traffic cannot be undertaken. This can be due to many reasons, especially runway/airport curfews imposed for environmental protection reasons. Curfews do not directly affect hourly capacity computations but they can skew demand and affect total airport capacity. While a principal objective should be to increase airport capacity to meet increasing demand, in the interim the need to maximize the utilization of existing airport capacity and airline resources is becoming more critical than ever before. Effectively managing available airport capacity/demand in such an environment presents a major challenge to airport operators and airlines alike.

IATA POSITION

Every reasonable effort should be made by airlines, airport operators, independent slot coordinators, and the relevant government agencies to identify airport capacity limitations and potential congestion problems well before these problems actually occur. Co-ordinated efforts can then be undertaken to avoid such problems to the benefit of all concerned, and will require continuing and open communications and cooperation between all parties involved.

Capacity should be related to design peak hour / peak period processing capability, rather than annual figures.

AIRPORT COORDINATION

Airport coordination is a means of managing airport capacity through the application of a set of rules in the Worldwide Slot Guidelines (WSG). Coordination involves the allocation of constrained or limited airport capacity to airlines and other aircraft operators to ensure a viable airport and air transport operation. Coordination is also a process to maximize the efficient use of airport infrastructure.

Coordination is not a solution to the fundamental problem of a lack of airport capacity. In all instances, coordination should be seen as an interim solution to manage congested infrastructure until the longer term solution of expanding airport capacity is implemented.

PLANNING PROCESS

Demand / capacity and level of service investigations at airports where congestion exists or is anticipated can be arranged in this type of co-operative climate in order to:

↗ Establish the time, degree and cause of congestion

↗ Agree on a methodology for determining the capacity of the airport, taking into account the levels of service to be provided, and comparing this with typical peak demand to identify capacity limitations

↗ Establish clear criteria on how to select busy day / planning day schedules

↗ Consider means of removing such limitations in the short term, at a relatively small cost, taking into account the effect of any related delay factor. It is often possible to increase capacities significantly through relatively inexpensive changes in procedures or personnel deployment

↗ Where large scale expansion cannot be achieved quickly, consider other short-term measures, such as small scale modular extensions or lower service levels, pending improvements in capacity in the longer term through significant but affordable infrastructure development

↗ Where capacity can only be increased in the longer term or at significant cost, produce estimates of those measures required to increase appropriate capacity, and consider whether the capacity should be increased either to a higher level, or to a lower level involving either increased delays or the adjustment of schedules

↗ IATA level of service (or comparable) should be used to measure individual sub-systems of the terminal

↗ Level of service should include both space standards and a time component

↗ Ensure use of robust equations to determine sub-system capacity

↗ Complex systems should use dynamic simulations. This is preferred to equations and rules of thumb as they reflect the dynamic interaction between terminal sub-systems and avoid displacing a bottleneck from one sub-system to another when recommending improvements

↗ Flow simulation is recommended when assessing and balancing level of service. This requires detailed discussions between the airport authority and operators to agree the planning assumptions, inputs and metrics used in the simulation, e.g. passenger mix and report profiles at check-in/security).