AN APPROACH TO AIRPORT PLANNING

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ABSTRACT
Over the past few decades air travel has increased rapidly resulting in significant increases in the number of passengers and aircraft operations handled by airports. This increasing demand for aircraft operations has reached or exceeded the capacity of most major airports causing delays to air traffic both on the ground and in the air. In-order to handle this situation, airport authorities have proposed various solutions such as increasing the operational capacities of the existing systems, expanding the existing airports and as well as constructing new airports. In addition, the characteristics of air travel have also changed over time, thus making certain facilities at airports require alterations.

The necessity for expansion and alteration has resulted in most major airports evolving gradually over time, indeed decades. They will continue to do so in the foreseeable future. In certain cases the evolution could continue for as long as a century. This process of evolution usually occurs as expansions separated by significant time periods. A suitable long-term strategy is essential to ensure compatibility of each of these stages as well as proper functioning of the airport at each stage. Establishment of a set of efficient airside configurations along with possible paths of "evolution" from one configuration to another could provide a significant contribution in developing a suitable long term strategy.

In order to achieve this task it is essential to further understand the factors that affect the choice of airside configuration for an airport. Restrictions imposed by various external constraints, wind, and temperature conditions at the site, elevation of the airport above mean sea level, safety and capacity for aircraft operations and efficiency of movement of passengers within the terminal building system are some of the well known factors. Further, factors such as proportion of different aircraft types that the airport is expected to handle, aircraft taxiing distances, ability of the airside layout to evolve, land availability and accessibility to the ground based transportation network are also important.

Possible paths of evolution from one airside configuration to another can be established by considering the flexibility of different airside configurations and their ability to evolve. However, all the possible airside configurations will not be efficient in handling aircraft operations. The selection of efficient airside configurations can be done by considering the other factors mentioned above. The importance of different factors can vary depending on purpose and the location of the airport.

Understanding of different regulations and procedures relevant to different runway configurations is an important step in determining the safety and capacity for aircraft operations, which is an essential criterion in evaluating the efficiency of airside configurations. To do so, characteristics of aircraft, their effect on airside configurations and means of categorizing them need to be analyzed. Further, the evaluation of overall terminal building configurations while taking into account their effect on aircraft operations in terms of taxiing is also an important aspect in determining the efficiency of the airside configuration.

The selection of suitable airside configurations together with the paths indicating the possibilities for evolution will produce a network of airside configurations that are efficient in handling aircraft operations. This will enable airport designers to select a set of suitable airside configurations depending on the conditions of the site selected for the airport for different stages of expansion.