

Support by the infrastructure for aviation growth strategies

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1. State of and growth strategies for aviation and airports

On October 2010, at Haneda Airport, the fourth runway and new international terminal building began service, initiating full-scale service on international routes. At almost the same time, local approval for increasing the number of flights at Narita Airport was obtained, greatly expanding the airport capacity of the Tokyo region. It has been assumed that the long period when both Narita and Haneda were operated at full capacity, and hence, unable to satisfy airport demand, had a severe impact on the economy of Japan. With nearby Asian countries completing large international airports and vigorously ensuring their competitive strength, resolving this problem has been an urgent challenge. But we believe that we must prepare for the time when, as a consequence of the size of Japan's economy and the further growth predicted to occur in Asia, capacity again exceeds demand, by studying the further expansion of our aviation capacity by all possible means. On the other hand, critics have pointed out that we have many unprofitable regional airports.

In May, the growth strategy of the Ministry of Land, Infrastructure, Transport and Tourism was completed and released. Aviation is included among growth strategy fields, including (1) promoting a thoroughgoing open-sky policy, (2) strengthening Haneda and Narita to increase the inter-city competitiveness of the Tokyo region, (3) taking radical measures to achieve more efficient airport operation by taking advantage of the wisdom and capital of the private sector, (4) aggressively strengthening airports by improving their balance sheets, (5) promoting truly necessary aviation networks, and (6) expanding benefits for users by encouraging participation in LCC.

In this regard, the proposed budget for 2011 was prepared incorporating the reduction of the aviation fuel tax and introducing measures to unify the management of the Kansai Airport and Osaka International Airport. At the same time, project costs were sharply cut and maintenance regulations stiffened. And in parallel, we have conducted open sky negotiations with the member countries of the ASEAN, and have formed a committee to study ways to improve airport operation and proposed specific

methods such as integrating airport management (runways and other basic facilities, terminal buildings and other related facilities which are now separately managed in airports managed by the national government,) and privatizing airports.

Our mission is to use the infrastructure to support aviation growth strategies. In the infrastructure field, the age of priority on new infrastructure has given away to an era when operation of infrastructure is emphasized, so we now focus on developing methods which we can apply throughout the aviation field to tackle challenges such as finding ways to effectively use existing airports or to effectively maintain existing facilities. An outline of these follows.

2. To expand benefits for users by promoting open skies and LCC and enhancing the competitiveness of cities

—Improving precision of demand simulation methods—

The advance of open skies is counted on to promote frequent flights by smaller aircraft at airports in Japan's large metropolitan regions and also to strengthen hub functions of multiple airports in a region, but the problem is to decide how to use multiple airports to maximize convenience for users. Cost reductions achieved by promoting LCC now offer the possibility of creating brand new regional routes. There is also a growing need for policy simulations capable of showing what demand will emerge under what kinds of rules and policies. Our department has been developing and improving a method of predicting demand for air transport, and is now working to improve this method by accounting for the actions of airlines, and we are counting on these playing roles as policy simulation tools. We hope that developing these technologies will result in open skies and in concrete measures to promote LCC based on open skies, providing benefits for users.

We are also conducting research on ways to quickly ensure an alternate route when an international airport transport center or domestic trunk aviation route center cannot function as a result of an earthquake or volcanic eruption. When there are shortcomings in actual circumstances, an immediate response is necessary. To ensure international competitiveness, it is very important to resolve this problem.

3. To maintain aviation networks which are truly necessary

—Aiming to create airports that stimulate regions and to measure their stimulation effects—

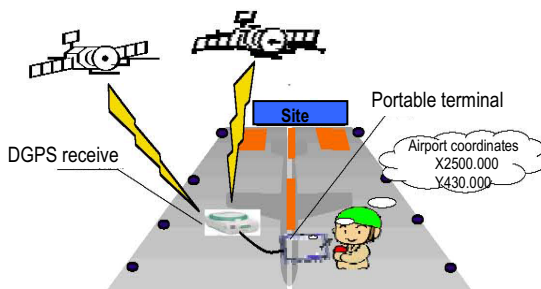
This concerns regional routes which seem to have been maintained with internal support by the airline, but judging that regions should take the lead in ensuring air transport services, efforts should be made to maintain services, develop tourism, or stimulate the region, through cooperation, including grants, etc., with airlines. Our department is conducting research to clarify characteristics of use in order to be able to obtain support taking advantage of the properties of airports to introduce measures to stimulate the region through tourism etc. And transparency is needed to obtain the understanding of the local residents regarding support measures by the region. It is also necessary to quantify the impact of airports on local economies, and to clarify other non-economic effects. We are studying methods of measuring effects which are not accounted for in past cost-effects manuals. We hope these will contribute to the maintenance of aviation networks.

4. Towards radically more efficient airport management

—Stock management of airport facilities—

Integrating the management of airports and privatizing airports in order to benefit from the wisdom and capital of the private sector has been suggested, but there are many airports which failed to become profitable even after unification. Overall strategies must be studied, but more efficient maintenance and operation are also required. As facilities have aged, increasing the need for repairs and reconstruction, the questions we must answer are how should we conduct day-to-day management to minimize these tasks, or how can we carry them out using the least possible labor. It is essential to improve efficiency, while ensuring safety and security, which are issues with priority over growth strategies.

One characteristic of an airport is that it possesses a vast paved area without obstacles, or in other words, without any targets. We have developed a maintenance inspection system using GPS supplemented with information from a multifunctional transport satellite in order to quickly identify defective locations, repair them, and manage them continually.



One challenge is improving the efficiency of grass

cutting, a task which accounts for a large part of maintenance costs.

Specialized technologies are skillfully used and provided because in Japan, it has been necessary to construct hub airports in particular on locations with poor ground conditions and to expand their paved areas. In addition to enacting design standards for new facilities as we already have, we have prepared draft instructions for repair work, which will be the major issue in the future. It incorporates measures to strengthen the weak points, which are joints and edges, and which have been studied experimentally.

To perform design according to the way paving is used, we have established a theoretical design method based on the degree of fatigue of facilities, and also studied a design method based on probability in response to the trend towards performance design.

It is necessary to fly aircraft according to schedule, and to maintain and repair facilities without impacting this activity. Non-destructive inspection methods are one way to achieve this, so we have applied the FWD based inspection method to a new design method, and have developed an infrared beam based separation detection method. We are also studying the possibility of using optical fibers as sensors.

Example of monitoring using infrared beam images

