Research themes at a time of reform

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1. Discussion of the roles of aviation and airports

Fiscal 2009 was a difficult year for Japan's aviation industry. Or more precisely, it may have marked the beginning of a difficult era. The worldwide recession that began with Lehman Brothers' collapse led to cooling demand that resulted in the failure of Japan Airlines International Co., Ltd., a company that was operating with high expenses. Amid expectations that international aviation demand will grow over the long term, particularly in Asia, as globalization continues, one cannot escape the sense that there is something incongruous about JAL's being forced to scale back its routes. It is therefore hoped that JAL will compete its reform and make an early fresh start.

Aviation serves as a public transport system. Almost all passengers traveling long distances use aviation. Aviation is also a valuable means of getting around in the daily lives of people living on remote islands and regions with poor overland transport. Thus, the question of whether or not this means of travel should be abandoned due to the business circumstances of airlines presents a problem. In fact, the plan to bail out JAL is based on the belief that a discontinuation of flights must not occur. Railway companies and bus companies are similar in that they have two aspects; i.e., they are both private companies and public transport systems. However, how airlines—which are subject to international competition and face unstable demand—should exist presents an important topic for discussion.

On the other hand, airports are also a major topic of discussion. Because demand influences how airlines act, airports such as Kansai Airport face severe management conditions when airlines curtail their flights. Currently, discussion is focusing not only on management problems but also on the question of how to use the three airports in the Kansai area. Aviation is a public transport system, and airports are public transport infrastructure. Even internationally, it is common for regional airports to be operated with landing fees combined with the general accounts of local governments. Because airports were originally built to provide convenience for users and stimulate the regional economy, rather than to earn money, it makes no sense to talk about profitability. Discussion is also underway regarding the use of special accounts for nationally operated airports; specifically, people are asking, "Who will bear the costs of airport maintenance and operation?"

Several years have passed since it was said that airports are moving away from an era of construction to one of operation. No substantial construction of new airports has begun during the past several years. However, insufficient airport capacity in major metropolitan areas, including the Tokyo metropolitan area, continues to be a problem. Even in the Tokyo metropolitan area, where airport functions are being expanded, there are limits to what can be achieved, and therefore efforts are underway to find the best possible way of using airport capacity.

The future airport strategy of the Ministry of Land, Infrastructure, Transport and Tourism's Growth Strategy Council focuses on the "open skies" approach and tourism. However, what will be needed to contribute to these goals? Regardless of the directions the above-mentioned discussions take, there are many issues that are essential to maintaining air transportation. Given these circumstances, the Airport Department sees the following points as priority research topics.

2. Research on aviation networks and airport management and operation

- Development of demand simulation methods -

Demand forecasts are essential for aviation and airport policies. Although the Airport Department has developed methods for predicting demand for air transport, demand depends on the destinations and numbers of routes that airlines establish. As was mentioned above, route planning is based on not only actual demand but also on airlines' circumstances. Thus, although realistic forecasting must take into account airlines' behavior, in an era of liberalization, in which routes may be taken over by other airlines, it is impossible to consider the management circumstances of each individual airline. However, as liberalization progresses under "open skies," it is likely that airlines will gradually behave in patterns that are more in line with market principles. At the very least, it will be necessary to develop forecast methods capable of taking into account market principles-based behavior that are in addition to the current demand projection methods. It is hoped that this will raise the accuracy of pre-implementation simulations of aviation and airport policies and lead to

the formulation of more precise policies. If "open skies" gains momentum, it can be expected that overseas low-cost carriers (LCC) will enter Japan's market and that domestic LCC will become prominent. This in turn will further complicate use of multiple airports in major metropolitan areas. Thus far, the department has put a model that considers airlines' behavior to trial use in an attempt to estimate the impact that policies to limit the number of flights at multiple airports will have. However, improving the model's accuracy and expanding its scope of application remain challenges to be tackled.

The department also intends to study possibilities for routes to come into existence if small aircraft are used even at the regional level, and possibilities for the establishment of new international routes to neighboring countries under the open skies policy.

Looking forward, the need for better simulation technology will be required. This is because the future will demand not only airport construction that matches demand forecasts but also strategic maintenance and operation that are based on demand forecasts.

3. Research on higher service levels at airports

- Striving for airport-led tourism strategies and regional activation -

As aviation has become a mass transit system, airport-related needs have become more diversified and sophisticated. Examples of such needs include barrier-free facilities, simplified check-in, and higher security. At the same time, although airports are not tourist destinations in themselves, they are entryways. Therefore, an airport plays a role in how visitors view the surrounding region. While it is of course important to enhance hospitality and guidance for overseas visitors, promotion that makes use of the merits of each region and airport as a tourism strategy is also important. Although it goes without saying that airport usage differs from airport to airport, and that regional characteristics, geographical conditions, and economic scales vary from place to place, a certain degree of speculation is possible based on traveler movement surveys. The Airport Department hopes to propose tourism strategies that are appropriate for airports based on such speculation, as one of the intentions behind the building of airports should be regional revitalization.

4. Research concerning safe and secure airports

Regardless of what growth strategies are employed or who pays the bills, the building and maintenance of safe facilities form the basis of public transport infrastructure. This point cannot be overemphasized. Today, countermeasures against liquefaction of runways are being implemented at major airports. Airports in Japan, and particularly hub airports, were constructed by taking advantage of various special technologies. This was due to a variety of factors, including the fact that they had to be built in areas with poor ground conditions or were constructed with massive paved areas. In addition to the design standards for new facilities it has formulated thus far, the Airport Department is currently urgently working to draft an outline for repairs. The department is also studying probability theory-based design methods that are in line with a trend toward performance design of facilities.

As for non-infrastructure-related areas, the department is engaged in research toward quickly securing alternate routes if international air transport hubs become inoperable due to an earthquake or other such event. If there are deficiencies in the current situation, immediate responses will become necessary. This is important from the standpoint of maintaining not only safety and security but also international competitiveness.

5. Research on management of airport assets

Like other forms of infrastructure, how to efficiently maintain the functions of airport facilities that have been built thus far is a question that deserves attention. Although the technologies involved here differ in terms of content, what they strive to achieve is the same. As expenditure for public works projects shrinks, the need to repair infrastructure continues to increase. It will therefore be necessary to overcome various problems, including how to engage in routine management that minimizes this need to the greatest degree possible, and how to perform such management with minimum staffing. And, where the possibility exists that repair costs will balloon as infrastructure deteriorates with age, how should signs of deterioration be identified and what steps should then be taken? Appropriate response lowers life-cycle costs, and implementing repairs that do not affect operation is part of good maintenance and management.

6. Conclusion

The truth is, the research topics described in this paper are extensions of research undertaken thus far. Although circumstances seem ready to undergo rapid change, there does not appear to be any need for a dramatic shift in facilities-related research themes if they are considered separately from issues concerning airlines and bearing of airport expenses. In fact, we who work in the Airport Division believe that the need to continue research in areas we have already targeted as necessary has grown even greater.