

## How to establish a better information disclosure system on noise and environment

### - Concept proposals of information disclosure and a noise experience tool -

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### ABSTRACT

This paper discusses information disclosure on airport noise and environment at airports in Japan by considering the way to develop a road map to a more successful system.

Recently, it has become more likely to introduce a web-based environment monitoring system (EMS) to the website and visualize the situation of flight routes and noise exposure around the airport as a real-time movie. This study focuses on such on-demand information disclosure systems EMS, but do not include informal information disclosure methods such as Flightrader24.com in the discussion. The aim of this study is to find a solution for such on-demand or real time information disclosure suitable for airports and community in Japan. As a first step, we conducted a brief survey on the current situation of such information disclosure systems. Furthermore, we proposed a mobile application named *AcousessMap* to share subjective impressions to environmental noise and then state the effective scheme to disclose the environmental noise conditions at various places.

### INTRODUCTION

In recent years, airport capacity expansion is one of urgent needs for major airports seeking a solution to meet the increasing air traffic demands. One of the challenging issues in achieving this goal is noise issues. It is now more important to promote noise impact mitigation and to prevent the outbreak of noise issues with the aid of suitable information disclosure on the situation of airport operation and noise impact. It is necessary to establish more effective channels for communication with the surrounding community and to address the advantage to keep airport function as a resource to vitalize the community together with the disadvantage

like noise impact. Information disclosure has been implemented in various ways such as publishing periodicals that report results of noise and other environment monitoring, issuing environmental reports and public relations magazines, setting up public information centers for information disclosure and meetings between the airport and local residents. However, it has become difficult to respond to residents' doubts and complaints promptly and effectively using only such conventional channels, because of changes in life culture and technical innovation. As a result, social problems are arising<sup>1</sup>. For example, low-noise and frequent fly-overs, in some areas new noise issues are occurring, so that even a low noise level is being called "unbearable." It is difficult to solve noise issues only with the aid of conventional noise measures such as noise control at the source side. To solve such problems, we must explore ways to make information readily available in a way that matches the times, and we must grasp complaints and opinions, and respond promptly. However, the most effective method cannot be decided uniformly, but depends on such factors as the specific situation, the affected country or region, national traits, culture, and lifestyle.

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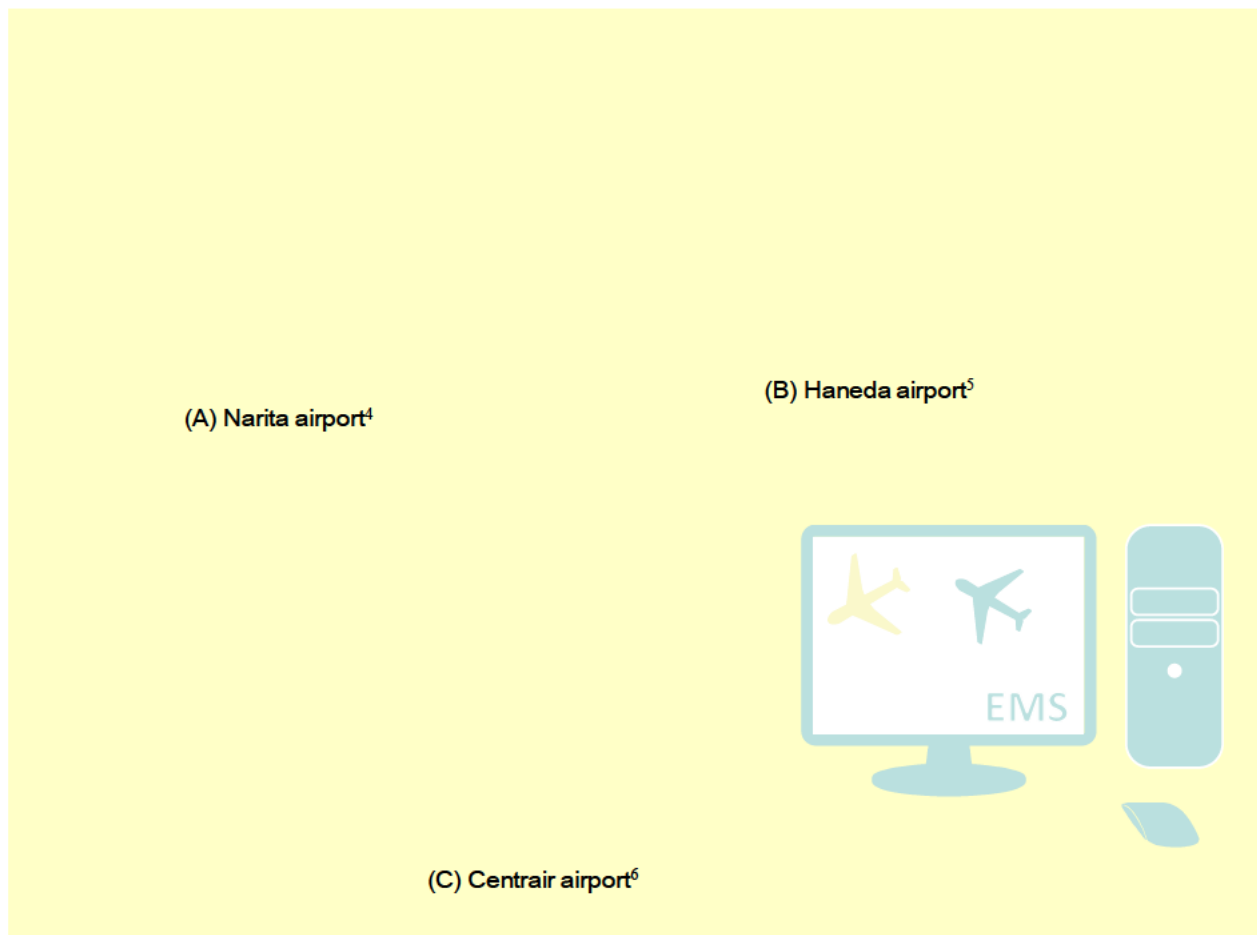
## **INFORMATION DISCLOSURE SYSTEM IN EUROPE AND USA**

Investigation of information disclosure methods adopted at several major airports in Europe and USA was performed during the last two years from 2013 to 2014<sup>2</sup>. For example, Paris-Charles-de-Gaulle Airport (CDG) adopted a method that allows information to be viewed at the ward office or other facilities with a time delay of 30 minutes in disclosure of information. At CDG, officials say, "Live broadcasting of information may cause complaints, so we consider it a good idea to provide a delay of 30 minutes and restrict viewing outside particular places." However, Information can be viewed freely on the main websites of Amsterdam-Schiphol Airport (AMS), London-Heathrow Airport (LHR), Frankfurt am Main Airport (FRA), and Seattle (SEA) and San Francisco (SFO) airports. Time delays vary from 15min to 1 hour. In the United States, the time delay in disclosing information was only 5 min until the synchronized terrorist attacks on Sept. 11, 2001; however, time delays were increased after the terrorist attacks. Clearly, the method of information disclosure varies among countries and airports. A more firmly established quantitative information disclosure method and scientific basis for it are required<sup>3</sup>.

## **THE STATE OF INFORMATION DISCLOSURE SYSTEM IN JAPAN**

Among civil airports in Japan, major international airports are managed by the airport authority, hub airports are managed by the government, and other airports are managed by local governments. Information on the environment is disclosed by the airport managers of these facilities independently. Currently, in Japan, EMS has been introduced to only three airports (Figure1): Narita International Airport (Narita Airport), Tokyo International Airport (Haneda Airport), and Chubu Centrair International Airport (Centrair). At Narita Airport, noise levels at 34 measurement points are disclosed in real time and animation of flight path after a time

delay of 1h or more. Haneda Airport discloses information on types of aircraft and altitude after a time delay of 24h or more, in addition to noise levels at 12 measurement points and animation of flight path. At Centrair, types of aircraft and departure place (or destination) are disclosed after a time delay of 10min, in addition to noise levels at four measurement points and animation of flight conditions. All of these airports have disclosed yearly data and monthly data in the past on the Web together with EMS. At Fukuoka Airport, where construction of a second runway is planned, and at Osaka Airport, where many noise problems exist, minimal information of noise measurements can be viewed; the contents are the same as the environmental information disclosed in conventional printed material. And, it is difficult to access this information. Therefore, residents may request a more convenient and transparent information disclosure system<sup>1</sup>. Japan has no formal guidelines or regulations concerning information disclosure on noise and flight path. However, gentlemen’s agreements are apparently honored between the Government (JCAB) and Airport Authorities. It seems that both parties have tacit understanding that not too much information should be disclosed; for example, “altitude information can be disclosed, but airline names must be never disclosed.”



**Figure 1:** Environment monitoring system(EMS) in Japan airports.

## **VARIOUS NOISE MONITORING SYSTEM IN JAPAN**

Figure 2 shows an example of disclosure of real-time noise levels using an electrical display in Japan. Similar to noise at airports, noise and vibration are generated at construction sites. Therefore, the measured noise and vibration can be disclosed at construction sites to promote reconciliation with the neighborhood. Real-time disclosure of noise and vibration levels at construction sites seems to be an effective method of acquiring community understanding, so

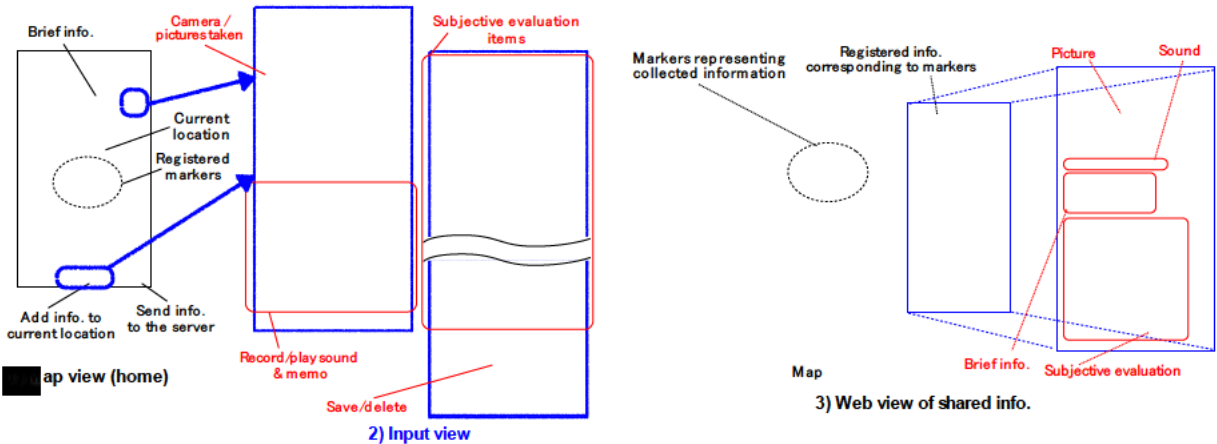
that “a sense of security of neighborhood is obtained” and “consideration and good faith of companies for the neighborhood can be felt.”

**DISCUSSION**

This study investigated the status of information disclosure systems (specifically, EMS) in Japan and the history of introducing these systems at Narita Airport. Results indicate that the information disclosure systems were improved or modified in synchronization with such issues as the expansion of airport capacity or the occurrence of noise problems. Currently, an increasing number of airports worldwide are implementing on-demand methods of information disclosure, such as the use of an information disclosure system on the Web (EMS). However, like the electrical display board at Narita Airport, confirming the present status by experiencing the actual situation is also effective. Information disclosure systems have not yet been established as describe above. Therefore, it is necessary to devise new methods of disclosure that meet residents’ needs (e.g., advancement of technology; changes in generation, national traits, and culture; and regional situations. Furthermore, positioning of such informal applications as SNS and Flight rader24.com must be considered. However, if too much information is disclosed, residents may start noticing things that they had not noticed before and become more sensitive to noise and other issues.



**Figure 2:** Sound level monitoring system for construction site in Japan.



**Figure 3:** User interfaces of our smartphone and web applications to input and share real-world environmental noise conditions.

Consequently, we have preliminarily implemented a mobile application named *AcousessMap* that smartphone users can share real-world environmental noise conditions including subjective impressions [7]. The interfaces of this application are shown in Figure 3 includes views to register information and show shared contributions. These interfaces may accelerate the accumulation of environmental conditions and are available to easily check the subjective impressions of sound corresponding to the places.

In the future, we believe that it is necessary to configure co-existence with tools such as a noise experience (“*TAIKAN*”\*) system that evaluates and shares the impressions of daily noises and sounds with individuals along with providing published information disclosure.

\**TAIKAN* (in Japanese) makes deeper understanding of sound and noise by hearing environmental noise and measuring noise levels on the actual situation.

## REFERENCES

- [1] I. Yamada, “Considering noise policy for low-noise but frequent fly-over events far from the airport,” Proc. 11<sup>th</sup> ICBEN, Nara, 2014.
- [2] M. Ueda, et al., “Survey of efforts for managing recent airport noise problem in European airports,” Proc. INCE/J, Autumn Meeting, 2014(in Japanese).
- [3] P. Hooper, et al., “Exchanging aircraft noise information with local communities around airports: ‘the devil is in the detail!’,” Proc. Inter Noise2013, Innsbruck, 2013.
- [4] NAA: <http://airport-community.naa.jp/noise/>
- [5] TRCAB: <https://www.franomo.mlit.go.jp/Login.do>
- [6] CJIA: <http://www.centrair.jp/torikumi/environment/observation/noise/jouji/current.html>
- [7] M. Ueda, et al., "AcousessMap: Smartphone-based collaborative tool to facilitate assessing acoustical accessibility conditions for visually impaired people," JASA, 140, p.3366, 2016.