Japan’s growing foreign tourism market is making it increasingly important for public transport providers to augment public transport information services for foreign visitors to the country. This article outlines the service requirements needed on traffic flows leading to airports, stations, and hotels (which are the major traffic flows used by foreign tourists in Japan), and summarizes the configuration of systems used to provide public transport information to foreign tourists. Also presented are two Hitachi system implementation examples created for Narita International Airport Corporation—Digital Integrated Transport Information Signage and infotouch. The latter is an interactive information display system that provides comprehensive handling of airport facility and store information, flight information, and ground transport information. A discussion of the future outlook for this area is provided at the end of this article.

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1. Introduction

1.1 Trends in Japan’s Foreign Tourism Market
Japan’s government is focusing on foreign tourism as an industry that will help sustain the country in the years ahead. It has created an action plan called the 2018 Tourism Vision Realization Program. The plan is one of several measures being implemented to increase the number of foreign visitors to the country. Some 40 million foreign visitors are targeted for 2020, accounting for total travel spending of 8 trillion yen.

The number of foreign visitors to Japan has been rising steadily in recent years, with the figure reaching 28.69 million in 2017 (up 19.3% from the previous year). The country is responding to this market growth by taking steps to create an environment that will enable stress-free and comfortable travel for foreign tourists. One example is a project to help create public transport services and travel environments through both hardware and software elements. The software is designed to provide multilingual support along with public transport and transfer information.

1.2 Work by Public Transport Providers to Accommodate Foreign Tourists
Rail service operators are taking various steps to create an environment that will provide public transport service information tailored to foreign tourists. Personal accommodative measures are being improved by augmenting information counters for foreigners.
and providing multilingual translation tablets for station staff. Information and communication technology (ICT) is also being used to improve multilingual services, such as by creating multilingual versions of smartphone apps, guidance, and other displays.

Measures to accommodate foreign tourists are already abundant at Japan’s international airports, where flight information and other information services are available. The airports are now adding to these measures by providing foreign tourists with a better lineup of information about non-airport services, in areas such as domestic transport and tourism.

1.3 Issues when Providing Public Transport Information to Foreign Tourists

A questionnaire survey on the use of public transport in the Tokyo area (carried out by Mitsubishi UFJ Research and Consulting in June 2014)(2) found that most foreign visitors to Japan were very satisfied with the punctuality and safety of the trains, but that some complained of having difficulty understanding route information to destinations, transfer methods, and exit information. The difficulties that foreign visitors encounter when using public transport in Japan may be caused by the language barrier and the difficulty of understanding the intricacies of a public transport network that encompasses many different operators including JR and public/private railway companies. Solving this issue requires information to be provided in a unified manner for many different transport service operators and outside services.

2. Information Needs of Foreign Tourists

To conceptualize systems providing public transport information to foreign tourists, Hitachi has formulated service requirements by creating customer journey maps that trace the traffic flows of foreign tourists. Figure 1 shows an example customer journey map (excerpt) for typical traffic flows. It shows the major traffic flows used by foreign tourists to the airport, stations, and hotels.

Customer journey maps are used mainly in the field of marketing. They provide a graphical representation of a customer’s behavior, thoughts, and emotional processes starting from when they become aware of a product or service, until ultimately making a purchase. The tourists depicted by the example in Figure 1 are a

![Figure 1 — Example Customer Journey Map (Excerpt) for Foreign Tourist Traffic Flows](image)

The diagram maps and formulates tourist guidance needs and service requirements on a series of journeys from the typical traffic flows of foreign visitors to Japan (airports, stations, and hotels).
foreign couple visiting Japan as individual travelers (a type of visitor recently on the rise). The diagram outlines their guidance needs and service requirements from their behavior, thoughts, and emotional processes at typical points (airports, stations, and hotels) located among a series of traffic flows between their arrival at the airport and their destination. The flow of scenarios is as follows: After arriving at the airport, they move through the airport, board a limited express train, transfer to a city train at a major station, then proceed to their hotel. Mapping the behaviors, points of contact, and needs they experience over this time onto a series of journeys has enabled the formulation of the following service requirements for systems that provide public transport information to foreign tourists:

1. Being able to find indoor routes to destinations within station facilities such as boarding locations and ticket counters
2. Being able to search for and find guidance and the time needed for transfer routes to hotels when the routes span multiple public transport service operators
3. Ubiquitous guidance services with multilingual support
4. Being able to search for and find route information that includes information on public transport services, traffic congestion, and the like
5. Being able to easily redo searches to find routes to destinations when the routes span multiple public transport service operators

3. Systems Providing Public Transport Information to Foreign Tourists

3.1 Overview/System Configuration

Figure 2 shows the configuration of a system that provides public transport information to foreign tourists. The system has been designed for the service requirements outlined in Section 2. It uses interactive signage terminals and mobile terminals (smartphones) as operation devices that let users enter their hotel or other destination information. In response to the information entered by the user, the search process application programming interface (API) in the device searches on the network to retrieve the required information from among public transport, facility, indoor map and similar information managed on a public transport service information platform. The search results provide transfer route information spanning...
multiple public transport service operators, required
times, and information about routes within station
facilities to ticket counters and boarding locations.

Information that is not on the public transport
service information platform (such as outdoor map
information and weather information) is obtained
over the Internet from outside content services. It
is used together with information retrieved from
searches of indoor route information, public transport
routes, and outdoor routes to enable seamless travel
from the current location to the destination. It can
also be used with real-time data such as public trans-
port service information to enable service suspension
and delay information to be added to public transport
route search results in the future.

Searches can be entered with multilingual support
for text or speech input. User operation and search
histories can be stored on a guidance history database
on the public transport service information platform
to enable analysis of usage conditions and shared use
of guidance information involving multiple public
transport service operators. Database data and dic-
tionaries can be updated remotely over the Internet.
In the future, it will be possible to share information
with devices such as staff tablets or guidance robots
by using a system connection interface to connect the
system to business systems.

3.2
Digital Signage for Narita International Airport
Corporation
To present examples of systems providing public trans-
port information to foreign tourists as described in
the previous section, this section looks at two system
implementation examples that Hitachi has delivered
to Narita International Airport Corporation (NAA).
(1) Digital Integrated Transport Information Signage
A system created at Narita Airport in July 2015 (see
Figure 3). The system implements the study findings
of The Liaison Council for Improving Accessibility
at Narita International Airport, a group led by the
Ministry of Land, Infrastructure, Transport and
Tourism, and including members such as NAA, and
related public transport service operators and gov-
ernment agencies. The system is designed to provide
airport users arriving by plane at Narita Airport with
information about transport from the airport. It is
composed of a web service and signage installed in
the airport arrival lobby, and is the first of its kind
among Japanese airports. Various types of information
are provided in a unified manner. Rail, bus, and road
transport information is covered, along with informa-
tion on a wide range of public transport services.
Information provided by the signage and the results
of route searches or other searches can be sent to a
smartphone, enabling mobile browsing of route infor-
mation provided by the web service.

(2) Interactive digital signage: infotouch
Signage created at Narita Airport in October 2017.
Both infotouch and the system described above are
designed to provide information about arrival traf-
cic flows, but infotouch also provides information
about departure and transfer traffic flows. It provides
a comprehensive set of information on airport facili-
ties and shops inside/outside security, and on flights
and ground transport. It was created with the aim of
improving the convenience of foreign visitors to Japan
and other airport users (see Figure 4).

The infotouch system works together with the air-
port’s internal flight information system, a website
content management system, the airport’s internal
high-precision map system, and a public transport
information system. It can provide flight information

*infotouch is a registered trademark of NAA in Japan.
for the day’s arrivals and departures, directions to check-in counters, boarding gates, the arrival lobby, and airport shops, restaurants, or other facilities, along with information on routes from the airport to hotels. It also has a video call function that lets users talk to airport staff using the receiver and camera provided in the case of signage without having to go to an information counter.

To provide multilingual support, infotouch can input, output, and print text in nine languages. It supports spoken keyword searches in four languages, and has a search function that infers the intended meaning from simple spoken-phrase input. It also has functions designed specifically for airport use, such as reading boarding passes to retrieve arriving/departing flight information for the current day, and guiding users directly to boarding gates (see Figure 5).

The system currently averages about 286 users per day (as of March 2018), with about 15 users per hour at peak times. Newly arrived passengers sometimes queue to use the kiosks, attesting to the high demand for them (see Figure 6). On the kiosks installed in the airport’s Satellite 5 area (inside security), about 35% of the requested information is about flights and about 65% is about airport facilities. On the kiosks installed in the arrival lobby’s Visitor Service Center (outside security), about 15% of the requested information is about flights, about 25% is about ground transport, and about 60% is about airport stores and facilities. The most commonly searched facilities are automated teller machines, wireless local-area network (LAN) service counters, and Japan Rail Pass exchange points,
demonstrating the demand for information about services needed while staying in Japan.

4. Conclusions

Narita Airport is an entryway to Japan in the traffic flows of many foreign tourists. Creating systems that provide information to foreign tourists here has provided knowledge about information demands. Hitachi plans to implement systems with the following aims: To provide seamless guidance to users by developing systems that provide public transport information on foreign tourist traffic flows from points of origin (airports) to midpoints and end points (railway stations). And, to improve the guidance services of public transport service operators by serving as comprehensive information provider systems that work in conjunction with connected outside services and public transport business systems.

**References**


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