Feature

JR East's Approach to Universal Design of Railway Stations

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Today's rapidly aging Japanese society and an ever-increasing number of tourists from overseas means that railway operators must give more serious thought to universal design (UD) in planning and designing their railway stations. In the 6 years since the Law Concerning Promotion of Smooth Movement of Elderly and Physically Disabled Persons using Public Transportation Facilities (Barrier-free Transportation Law) came into effect, JR East has installed various barrier-free facilities, developed new barrier-free technologies that should find future practical applications, and responded scrupulously to the needs of its elderly and disabled customers. This article describes the results of these efforts.

Introduction

As Japan's population is now aging rapidly, the Law Concerning Promotion of Construction of Specific Buildings Easily Accessible and Usable by Elderly and Physically Disabled People (Heartful Building Law) was put into effect in 1994, followed by the Barrier-free Transportation Law in 2000. According to data on Japan's dwindling birthrate and aging society published by the Cabinet Office, people aged 65 years and over accounted for about 18.5% of the population when the data was collected. Taking into account recent birthrates, mortality rates, etc., the Cabinet Office estimates that this proportion will reach 28.7% in 2025. Moreover, analysis of the revenues of railway operators (sales of commuter tickets versus sales of ordinary tickets) shows that elderly persons who do not use commuter tickets and senior couples who take occasional medium- to long-distance trips are increasing in proportion. Under these conditions, more escalators and lifts have been installed at railway stations so that elderly people can use stations easily. In accordance with the government's Basic Policies on Economic and Financial Management and Structural Reform 2002, the Ministry of Land, Infrastructure and Transport (MLIT) with the cooperation of the other ministries and agencies formulated a 'Global Tourist Strategy' for promoting visits to Japan by foreign tourists. While some 16 million Japanese travel overseas annually, foreign tourists to Japan number only about 5 million each year. The strategy embraces various measures to narrow the gap as early as possible. A 'Visit Japan Campaign' was staged as part of the strategy and a joint secretariat was set up by the relevant ministries, autonomous bodies, private businesses, etc., in March 2003. The presidents of the six JR Companies, including former JR East President Otsuka are members of the secretariat committee. The secretariat is engaged in various activities to achieve its goal of attracting 10 million foreign tourists to Japan by 2010. JR East is promoting improvement of its facilities (such as providing traffic signs in foreign languages) so that foreign tourists can travel easily in the country. JR East's approach to UD began when the company was a special sponsor of the International Conference for Universal Design held in Yokohama in December 2002 and the company's Chairman Matsuda joined the organizing committee. At that time, JR East was the only railway operator sponsoring the International Conference.

What is Universal Design?

The American industrial designer Ron Mace who developed the universal design concept, defines it as the 'design of products, buildings and spaces to be usable by all people to the greatest extent possible.' The seven principles of UD are:

- The design is equally usable by anyone (equitability).
- The design offers a high degree of freedom in use (flexibility).
- The design can be used easily and intuitively (simplicity).
- The necessary information is provided in a form that is readily understandable (perceptibility).

Façade of toilets at Yokohama Station on Tokaido main line (JR East)

Façade of toilets at Chiba Station on Sobu main line (JR East)

Façade of pay toilets at Shinjuku Station east entrance (JR East)

- The design is free from errors and hazards (safety).
- The design can comfortably be used without requiring unnatural posture and strong power (sustainability).
- The design has suitable size and space for approach and use (spaciousness).

All the above principles may seem quite natural but when it comes to applying them to existing railway facilities with long life spans, consideration must be given to both the safety of train operations and passengers. Therefore, it is more difficult to introduce UD to railway facilities than ordinary buildings.

However, introducing UD in planning and designing railway stations has become a very important factor in improving the future social environment.

Specific Activities of JR East

In November 2000, JR East introduced its Standards for Structures and Equipment of Passenger Facilities, Vehicles, etc., Necessary for Smooth Movement of People based on the 2000 Barrier-free Transportation Law. In December 2000, relevant public transport companies were notified about the Guidelines on Improvement of Passenger Facilities of Public Transport Facilities to Smooth Movement of People. The greatest obstacle faced by users of railway stations is level differences. To overcome this problem, since 1998, JR East has been installing more escalators and lifts in its stations. Of its 297 stations with a difference in level of 5 m or more and used by 10,000 or more passengers each day, 233 (78%) had been fitted with escalators by the end of FY2004. In addition, 158 (41%) of its 390 stations with a level difference of 5 m or more and used by 5000 or more passengers each day had been fitted with lifts by the end of FY2004. The company plans to install lifts at all its other stations by 2010. As another example, by the end of FY2004, voice guidance had been installed at 43 of 476 stations with 5000 or more passengers each day.

Although JR East has been installing escalators and lifts at many stations, quite a few stations still do not have them because of extreme difficulties caused by the station structure or severe inconvenience to passengers caused by the long installation work. To overcome these problems, the company is making efforts to develop a slim-shaft, screw-type lift, and efficient installation methods, etc.

Since its establishment, JR East has also made many improvements to its station toilets so customers can use them comfortably. Of the 487 stations, 331 (67%) had been equipped with multifunction toilets by the end of FY 2004. Multifunction toilets have cradles, luggage racks, handrails, etc., so that physically disabled people as well as mothers with a baby can use them conveniently. Toilets for ostomates, which JR East introduced in 2001, are now installed at 282 of its stations. As a result of its effort to prefabricate multifunction toilets, the company has developed a Unit Toilet that can easily be assembled into a low-cost multifunction toilet in a week or so. At present, the company is promoting use of Unit Toilets.

JR East also provides customers with information about station facilities, the current state of train operations, etc., as part of its customer services. For vision- or hearing-impaired customers, the company has installed Braille guide plates on staircase handrails, touch maps, tactile guides and warning blocks, etc. For people, who find it difficult to see level differences in existing staircases, JR East has spent 2 years developing a Level Difference Identification Seal that remains well stuck on steps. The company started applying the seals to existing staircases and expects to complete the work in about 3 years.

Concerning station signs, JR East selected 48 stations where signs were difficult to see in terms of station layout, transfer routes, etc. In order to make the signs easier to see, the company is increasing the size of characters, using more pictograms, and separating signs from advertisements. Signs in 24 stations had been completed by the end of FY2004. In addition, at busy stations like Tokyo, Shinjuku, Ikebukuro, Shibuya, etc., the company has made signs much easier to see by providing signs that match the building design at platform staircases and by discriminating ticket wickets from

Gate sign and glass lift at Omiya Station on Tohoku main line (JR East)


Staircase level-difference seal at Doro Station on Tohoku main line (JR East)


Interior of multifunction toilet at Nisshin Station on Kawagoe Line (JR East)

surrounding space by using unique design and lighting.

The full-colour LED introduced experimentally at Shinjuku Station in 2004 uses blue LEDs, making it possible to generate many different colours. It allows for easy-to-see, easy-to-understand signs indicating different lines, departure times, different platforms, etc., in different colours. JR East plans to introduce the new signs at Tokyo Station on the Tokaido Shinkansen in December 2006. The JR East full-colour LED won a commendation at the 2005 Brunel Awards.

In the 'front office,' the face of ticket vending machines has been inclined slightly forward with the lower part of the machine 'hollowed out' to facilitate wheelchair access. In addition, a new 'Map-Type Fare Table' design has been developed. To eliminate the conventional vertical reinforcement that separates the map, JR East studied a new method, including alternative materials. As a result, the company developed a new sheet-type fare table that is free from ceiling-light reflections and hence easier to read. Tests of this new fare table started at Meguro Station in 2003 and it is being introduced in many other stations this year.

At JR East's major stations, the company has installed information centres that can answer enquiries in Japanese and various foreign languages, so customers who seldom make trips can use the station facilities smoothly. In addition, the company offers customers information about the current state of train operations via cell phones, the Internet, broadcast satellite, etc. Furthermore, the company has installed LED information displays at concourses outside stations.

To keep its New Frontier 2008 'We'll change our stations' promise, JR East has been pressing on with development of a ticket machine that automatically inspects tickets just as the passengers pass through, a technology for visualizing departure information interlocked with the Automatic Train Operation System (ATOS), a new device that displays information that can be understood easily by customers, the layout of next-generation stations for easy used by everyone, etc.

Conclusion

So far, I have described JR East's approach to universal design of its stations, but UD does not concern just hardware—it involves software too. In this respect, it is important to have an organization for creating better things while listening carefully to the opinions of our users and for verifying and feeding-back results. JR East has established a system for listening to customers using the Internet and customer service offices at stations, as well as for various opinions from service managers. As one result, the present level-difference seal applied to stairs was selected from among several methods based on opinions of elderly customers and the Japan Retinitis Pigmentosa Society. We intend to continue making new proposals by listening to opinions.

There is no doubt that UD will become an important factor in our future social environment. Needless to say, the railway business must provide safe and stable transport services, but in the future, it will also have to offer station facilities permitting customers to use stations comfortably. This is not required just of JR East—it is a message from customers to all Japan's transportation systems. I feel that it is important for all system operators to give this message serious consideration and to propose measures that contribute to development of our society. ■

Further Reading

Office of the Prime Minister, Cabinet Office Annual Economic and Financial Report, October 2003

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