With an aim of providing high-quality products and services in anticipation of customers needing them, we have been carrying out surveys on travel and consumption in and around stations since 2002 to identify and predict customers’ overt and potential needs. The year-on-year comparison of the travel and consumption behavior of 10,000 residents in the area within 70 km of Tokyo in the survey results reveals the characteristics of and changes in their travel behavior, their use of railways and their consumption behavior. This article will introduce some of those.

Keywords: Greater Tokyo area, Residents, Travel, Consumption

1 Introduction

JR East transports approx. 16 million passengers daily, of which approx. 90% are concentrated on the Tokyo Metropolis and three prefectures of Kanagawa, Chiba and Saitama. In order to gain a detailed understanding of the situation regarding travel and consumption behavior of people in and around stations, we have carried out surveys on items such as characteristics of travel behavior, use of railways, consumption behavior and the life styles of residents in the high railway use area within 70 km of Tokyo. The result of the survey that has been carried out continuously since 2002 is widely used as the basic data to make action plans on the standpoint of customers and to verify the effect of those plans.

2 Overview of the Survey

2.1 Survey Design

Survey items include time, place and details of travel where travel behavior, railway use and consumption in line with travel of the respondent in one day. The survey method and items are the same every year to allow for year-on-year comparison. Table 2 lists the survey items and Fig. 1 illustrates the flow of those items.

Table 1 Survey Design

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<tr>
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<td>Survey period</td>
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<td>Men and women age of 12 to 69 who live in the area within 70 km of Tokyo</td>
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<td>216-category stratified sampling by gender (two categories) X age (six categories) X residence area (18 categories) to secure representativeness of parent population</td>
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<td>Number of replies</td>
<td>Questionnaires sent: 12,500, Valid responses: 10,056 (2007)</td>
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Table 2 Survey Items

| Travel behavior | Purpose of travel, means of transport, railway use, travel start time, arrival time at destination, time required |
| Railway use     | Start station, transfer station, destination station, time spent at stations, time spent on train, ticket used |
| Consumption behavior | Product purchased, amount spent, type and place of shop |

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Fig. 1 Flow of Survey Items

The results of analysis of characteristics and changes in travel behavior and railway use of residents in line with their behavioral flow are as follows.

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1) Sampling for the survey from 2002 to 2006 was based on the results of the 2000 census and sampling for 2007 was based on the results of the 2005 census.
3.1 Travel Behavior

The rate the residents go out of is 87% on weekdays (Thursday, Friday and Monday) and 74% on weekend holidays (Saturday and Sunday). The highest rate of going out is observed on Thursday (Fig. 2).

On weekdays, where the rate of going out is higher, the number of trips is 9.7 times for men and 10.4 times for women (Fig. 3), but average travel time is shorter for women (Fig. 4). The analysis results of the rate of going out on weekdays by gender and age reveals the difference of the lifestyles between men and women, where women making short and frequent travel in a closer area while men travel longer distances.

The year-on-year comparison of the analysis results shows no major change from the results in 2005, simply a slight decrease of number of trips.

3.2 Characteristics of and Change in Use of Railways

Those who use railways for transportation account for 28% of overall travelers on weekdays (Fig. 5) and 16% on weekends and holidays (Fig. 6). Those figures show that the rate of railway use in transportation overall use is low. The gender and age of heavy railway users are males in their 10s to 50s and women in their 10s to 20s who are students or workers. In contrast, railway users tend to be fewer among men in their 60s and women in their 30s to 60s.

The year-on-year comparison indicates a high increase of the rate of railway use by men in 20s on weekdays in 2007. The rate of railway use of that sector is higher both on weekdays and on weekends than that of other male segments (Fig. 5 and 6). As the rates of driver’s license holders and the frequency of car use (Fig. 7) also show that men in 20s have lower contact with cars, we can see that the means of transportation for young people are changing.
3.3 Change in Means of Obtaining Transportation Information

The tendency for respondents to check modes of transport before going out is high, at approx. 86% (Fig. 8).

As for the means of checking, 60% check via the Internet (60%, Fig. 9) and 33% check by mobile phone (Fig. 10), both of which have been increasing every year. Despite such a tendency, the ratio of the men and women in their 60s who use the Internet and mobile phones to obtain transportation information is lower than the people in other age brackets. The rate of increase is lower too, even though the rate that they check modes of transport in advance is high at approx. 80%. Those survey results suggest that people in their 60s are not obtaining real-time information, so some modifications in the means of providing and obtaining information may be necessary to encourage those people to use railways.

3.4 Types of Tickets Used and Changes in their Usage

Since March 2007 when interoperation of Suica and PASMO systems started, types of tickets used radically shifted from magnetic cards to IC tickets (Fig. 11 and 12). For example, average use rate of IC tickets among JR and private railways is 60% on weekdays (compared to 27% in 2006).

Fig. 13 indicates Suica ownership rate (including both commuter pass type and other types) among IC tickets per residential area. Areas along JR lines show high Suica ownership rates (along the Tohoku line in particular). The survey results suggest a close relationship between type of IC ticket and nearest line.
3.5 Characteristics of Stations

Fig. 14 shows the analysis results of characteristics of 16 major stations from the perspective of the gender and age of stations users.

The segments of users on weekdays are different from those of weekends and holidays, even for the same station. On weekdays in particular, the analysis results center on “an average age of 39 and the ratio of women of 35%”. That indicates existence of core users (male office workers) for individual stations.

We can point out Ebisu and Tachikawa stations as stations with distinctive natures. Those two stations have higher rate of female users (47% for Ebisu, 50% for Tachikawa) even on weekdays. These figures suggest a feature of those stations were many women use those because of commercial facilities around the stations.

The year-on-year comparison shows no major change in the ratio of women. But the survey results showing the average user age becoming higher both on weekdays and on weekends demonstrates a definite aging of railway users (Fig. 15).

3.6 Characteristics of and Changes in Use of Railways for Commuting

Commuting to work and school makes up approx. 40% of the stated purposes of use of railways on weekdays (Fig. 16).

Looking at the characteristics of railway use for commuting, we found that commuters stay at the transfer stations the longest at 4.4 minutes, and they use 1.8 lines. About a half of commuters make one transfer on the way to their destinations (Fig. 17).

In overall terms, the number of transfers showed no major change, but a comparison of residential lines revealed a decrease in the number of transfers on some lines (Fig. 18). A large decrease in number of transfer is observed on the Joban line (northern part) where the Tsukuba Express started operation along the line and on the Takasaki and Utsunomiya lines where service of Shonan-Shinjuku line trains was increased. Those suggest the affect of changes in the railway network that facilitate smoother travel of residents, though such an effect is seen only on some lines.
We can point out the decrease in the average number of shopping trips per capita shopping (Fig. 19) as a change in consumption behavior seen since 2004. Here we will introduce analysis results for the change in types of shops used and consumption style and the change in consumption behavior around station-area shops that have a close relation to railways.

4.1 Change in Consumption Behavior

4.1.1 Change in Type of Shops Used

While the number of shopping trips to supermarkets and retailers decreased, the number of shopping trips to shopping centers and shopping malls (hereafter "SC") increased (Fig. 20). Regarding differences between gender and age, men still tend to prefer specialty stores (including mass-retailers). As for women, while there was a tendency for women to prefer department stores in 2004, we can see a clear difference from 2007 where women in their 20s to 40s prefer SCs and women in their 50s to 60s prefer department stores. A change is thus observed where women of some age groups shifted to SCs (Fig. 21 and 22).

4.1.2 Change in Consumption Style

In consumption style, the rate of respondents who replied they “like shopping around” decreased compared to 2004 (Fig. 23). We can see a shift in consumption behavior where people do their shopping at all at once in the same place.

The rate of respondents who have experience shopping online also increased both among men and women compared to 2004 (Fig. 24). We thus observed that diversified means of shopping (online shopping, home delivery services etc.) is changing consumption to a shopping style that does not involve travel.

Those changes in consumption style should have a complex affect on consumption behavior, such as change in type of used shops and decrease in the number of shopping trips.
4.2 Change in Consumption at Shops Around Stations

4.2.1 Relationship Between Shops Around Stations and Railway Use

The rate of shopping at shops around ticket gates or next to stations is low at 8% of total consumption, but when limiting to consumption generated by rail travel, the rate increases to 24%. That means consumption in relation to railway use is generated at shops around ticket gates or next to the station (Fig. 25).

Further analysis on the timing of consumption and means of transportation to the place of consumption (Fig. 26) shows that both kiosks and station shopping buildings are positioned as shops used in travel by rail. These analysis results confirm the relationship between railway use and use of shops around ticket gates or next to the station.

Year-on-year comparison indicates a change in the positioning of station shopping buildings. The rate of consumption at the destination for station shopping buildings is increasing year by year. That explains that more consumers visit station shopping buildings to shop, making station shopping buildings their destination for consumption instead of stopping by station buildings on the way to someplace else.

4.2.2 In-Station Shops from the Perspective of Time Spent in the Shop

Shops inside the ticket gates are found to be used as the place for short-time consumption, with time spent in those shops being the shortest at seven minutes (Fig. 27). But the time spent in the shops inside the ticket gate is lengthening every year (by three minutes longer than in 2003). That suggests an increase and enhancement of in-station shops is making those shops be places to stay long for shopping and refreshment, thus starting to change consumption behavior at the station.

4.2.3 Sense of Value by Consumers for In-Station Shops

From the perspective of sense of value by consumers for in-station shops, the rate of respondents who replied that they “often (or sometimes) shop or have meals or beverages at the station” is higher among women in their 10s to 20s than among men.

This might be due to enhancement of in-station shops and image improvement of shopping buildings next to stations changing the sense of value for consumers to position in-station shops to be closer to women (Fig. 28).
5.2 Intention to Reside Along Lines

We asked respondents to evaluate their intention to reside along a line. That was done by having them evaluate their attachment to their place of residence (hereafter “place attachment”) and intention to continue living at the present residence (hereafter “intention of living along a particular line”) on a four-point scale (applicable, slightly applicable, not very applicable, and inapplicable).

The analysis results per line showed the correlation between the values of place attachment and intention of living along a particular line, so we can say that residents consider continuing living along a line in relationship to those two items (Fig. 31). As for the characteristics per line, evaluation on both place attachment and intention of living along a particular line is high for both the Yamanote line and Tokyu Railway lines, followed by Keio Railway lines and the Chuo line. On those four, the values of intention of living along a particular line are higher than those of place attachment. That suggests that residents along those lines have stronger consciousness of the attraction of the line.

Since both men and women of higher age have stronger intention of living along a particular line, we suppose that the relationship between residents and the intention of living along particular line is not transient; rather, it develops with the accumulation of experience and consciousness.
5.3 Raising Intention of Living Along a Particular Line

In order to increase residents’ desire to continue living along the line where they presently live, we verified the effects of improvement of railway convenience.

Targeting commuters who often use railways, we analyzed the relationship between number of transfers and intention to live along a particular line (Fig. 33).

Among residents along JR lines, a correlation is seen between number of transfers and intention to live along a particular line. In other words, the fewer the transfers to commute destination, the higher the intention to continue living along a particular line is. From that, we can assume that increasing through service for better transport convenience will have a strong effect on improvement of the value of a line.

The analysis showed varied results, however, for lines other than JR lines. Although use of Tokyu Railway lines required more transfers compared to other lines, residents have high intention to live along the lines. That suggests that factors other than rail traffic services (attraction of the line, etc.) have impact on the intention of residents. We found that we have to make efforts on improvement of image and attraction of lines in addition to improvement of railway network if we are to improve intention to live along a particular line.

Since this survey excludes users outside of the area within 70 km from Tokyo, it does not correspond to the actual characteristics of railway use in some places. But, it can be used to comprehend the characteristics and year-on-year change of travel and consumption behavior of consumers. The data of this survey accumulated since 2002 is used to develop plans for station facilities, examine the actions for better transport services and otherwise create services in anticipation of social changes and customers’ needs.

We carried out a similar survey in May 2008. We will continue conducting surveys to accumulate data and further the analysis for creation of railway services that will satisfy customers.