PROMOTION MEASURES FOR USE OF PUBLIC TRANSPORT IN OSAKA CITY

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ABSTRACT

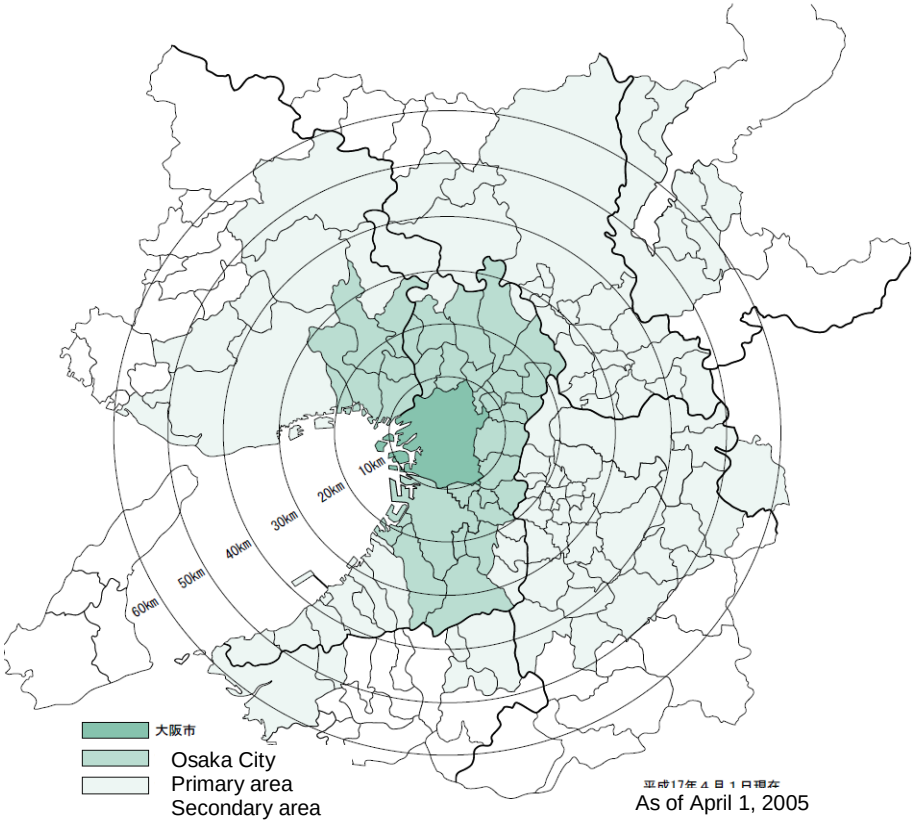
Osaka City is one of the core cities in Japan. Under responsibilities as a metropolis, the City has established high-standard public transport system which centers on railways, accompanied by bus routes designed for smoothing complex movement of people and goods.

With this well-developed public transport network, the City promotes measures to shift excessive car use to public transport aiming at mitigation of environmental impacts and congestion and building a city which is easy to get around for everybody.

1. BACKGROUND

Osaka is the core city of the second largest Keihanshin metropolitan area following Tokyo metropolitan area, with 22,000ha in size and population of 2.6 million at night and 3.6 million during the day. It is highly concentrated with urban functions in a small urban area compared to other large cities worldwide. Thus, the City has great responsibility, having diverse people, firms, technologies, and information. To support them, it is critical to establish transport system for smoothing complex movement of people and goods.

Figure 1 - Location of Osaka



Key indicators for Osaka Metropolitan Area

		Osaka Metropoitan Area		
		Osaka city	Primary area	Secondary area
Number of municipality	71 cities, 50 towns/villages	1 city	33 cities	37 cities, 50 towns/villages
Area (km^2)	8,088	221	1,465	6,402
Population (1,000)	17,298	2,599	7,051	7,649
Population density (persons/km^2)	2,139	11,743	4,813	1,195
Employment (employment location) (1,000)	8,163	2,252	2,663	3,248

Note) Number of municipality: As of April 1, 2005

Figure 2 – Osaka Metropolitan Area

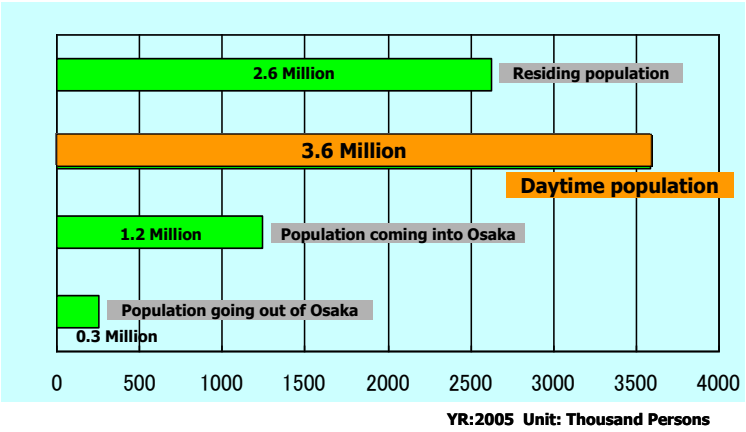


Figure 3 - Night and daytime population of Osaka City

Osaka City set out transit-oriented urban transport based on the concept of integrated transport system, with urban transport infrastructure promoting convenience of people's lives and lively urban activities. The City makes efforts to establish public transport system, mainly with railway, complemented with local bus routes, as well as to reinforce road network for smooth traffic. It attempts to maintain comfortable urban environment and control unruly increase of cars at the same time. As a result, urban transportation in the City has steadily improved, and Osaka became a city with one of the most advanced public transport systems worldwide. Convenient travel supported by a good public transport system has made Osaka one of the most attractive cities.

2. CURRENT SITUATION IN TRANSPORT AND POLICY OF OSAKA CITY

Osaka City has conducted Person Trip Survey every ten years since 1970 with other prefectures and other designated cities in Keihanshin metropolitan area and has observed transport situations from the survey results.

As seen in Figure 4, modal split of public transport (i.e. rail and bus) has been around 30% while car transport around 15-16% in the City. Compared to the entire Keihanshin metropolitan area, Osaka City has higher share for rail and lower share for cars. Moreover, between 1990 and 2000, modal split for cars had increased in Keihanshin metropolitan area, but it remained at the same level in Osaka Citv.

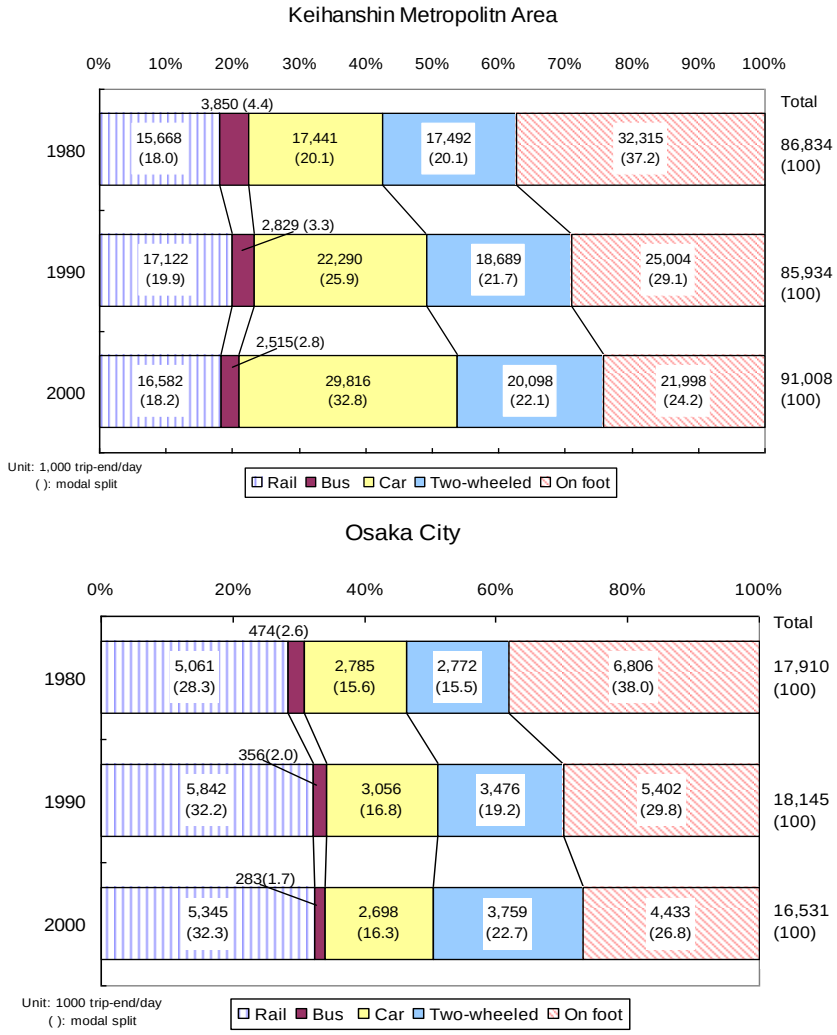


Figure 4 - Modal split at trip generation

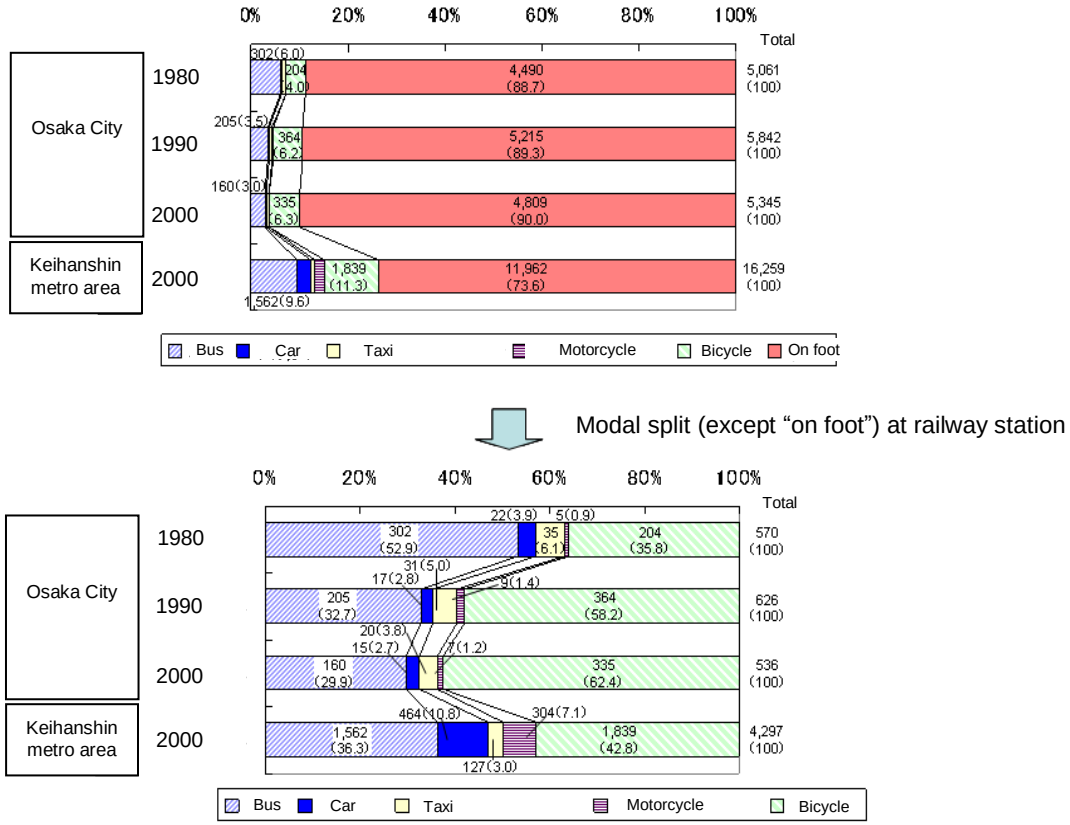


Figure 5 - Modal split of feeder trips started/ended at railway stations in Osaka City

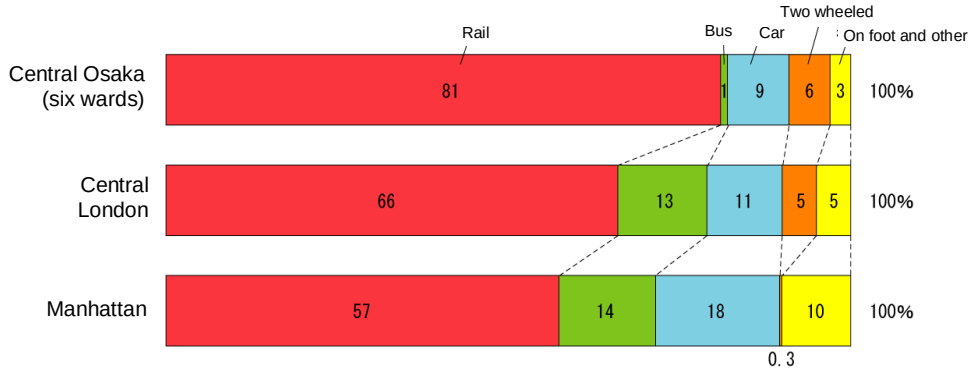


Figure 6 - Modal Split of commuting (%) in International cities

Sources (year):
- Osaka: Keihanshin metro area Person Trip Survey (2000)
- London: Labor Force Survey (2004) in London Travel Report 2005
- New York: Census (1990)

Ninety percent of modal split for feeder trips to and from railway stations is on foot in Osaka City, as seen in Figure 5, relatively higher than the average of entire metro area. This implies density of railway stations in the City is high. Figure 5 also indicates that for the same modal split excluding walking, bicycle use has increased while bus use has decreased.

As shown in Figure 6, compared to other international cities, use of railway is higher while bus use is lower. Car dependence is significantly lower as well.

From the above situations, railways appear to play a primary role in transport system in Osaka City. Public transport system including buses need to be carefully considered taking

account of situations around transport. Public transport will play increasingly important role in society with more aging population, and in more low-carbon oriented society in the future, as well as in revitalizing local towns. It is crucial for the City to form public transport system to revive local towns using its advanced network while promoting its use.

Moreover, in transition to diverse society such as aging, globalization, women's advanced role, etc. with a variety of people will be on streets, it is essential to have viewpoint to realize transport environment that everyone is able to walk easily and comfortably.

This paper introduces transport measures of Osaka City for public transport including measures for railway and bus, public transport promotion and urban planning in order to become a city which everybody is able to get around easily.

3. RAILWAY NETWORK AS THE CENTRAL OF PUBLIC TRANSPORT

3.1. History of Railway Network Development in City of Osaka

Railway network in Osaka (Figure 8) consists of routes of six private rail companies (JR West, Hankyu, Hanshin, Keihan, Kintetsu, Nankai) and subway (Osaka City Transport Bureau). It is highly developed compared to other cities in Japan and overseas, as shown in Figure 7.

Development of rail network around Osaka City began with opening of the section between Osaka and Kobe in 1874. Network by Japan Railway (former Japan National Railways) and private railway companies were almost complete before the WWII (1945), mainly with radial routes. Transport in urban area had been mainly on-street public transport with street car which opened in 1902, together with bus routes around it. However, rapid motorization since the late 1960s reduced the functions of roads significantly, and then, streetcars were forced to be abolished.

To handle increasing transport demand and as an excellent alternative to streetcars, subways had been developed and expanded due to its capacity, speediness, and punctuality.

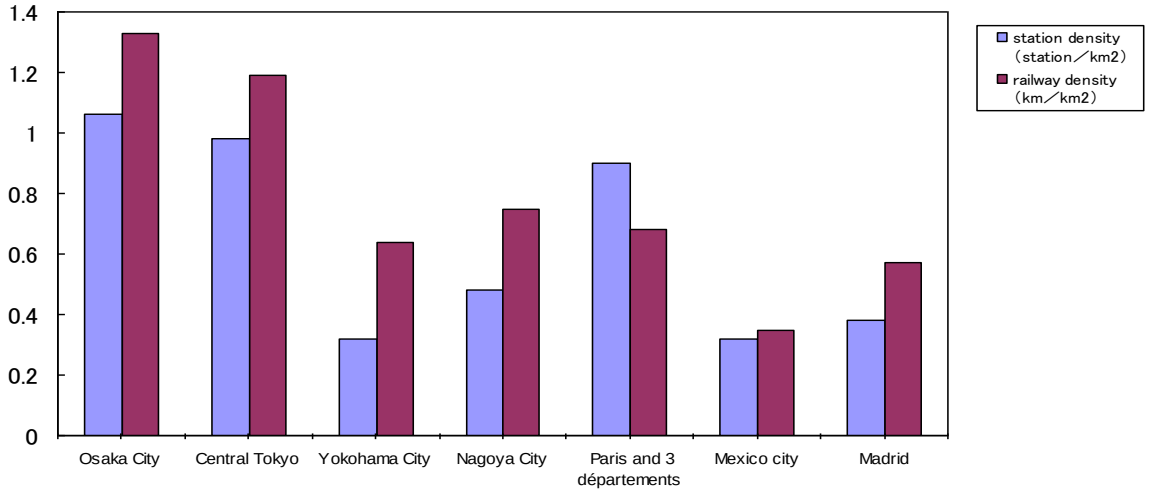
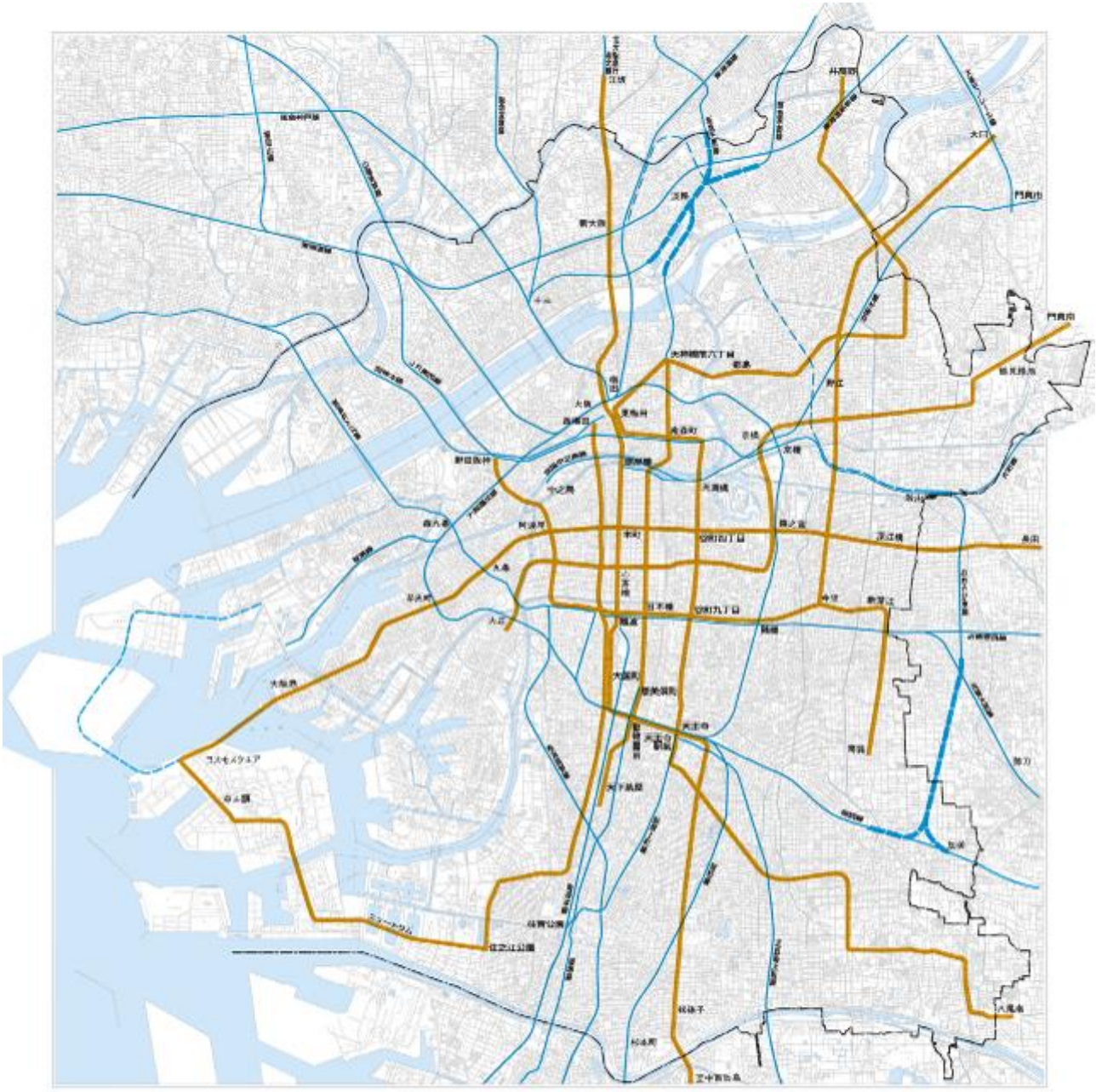


Figure 7 – Comparison of station density and railway density

*station density: number of railway stations divided by area
railway density: railway length in operation divided by area

Source: Japanese cities: “Comparison of Statistics Chronologically for Metropolises” (2006), “Regional Transport Annual Report” (2006) International cities: PIARC TCB3 report



Legend		Length（km）
	Transport Bureau (Municipal Subway, New Tram) of Osaka City	116.3
	Private Railways	202.5
	Private Railways (under construction)	10.4
	Line Undergoing Grade Separation Work	10.6

Figure 8 – Railway Network in Osaka City

3.2. Development of New Railway Routes and Urban Planning

Railway is central to public transport in Osaka City. It advances urban revitalization, mitigation of environmental effects caused by car traffic, improving urban attractiveness, etc. The City has been working on the development of private railways as well as municipal subway, and accordingly, the rail network today includes about 200 stations, and length of approximately 300km in total.

Lately, three new railway routes were opened: a section of JR Osaka Higashi line (between Hanaten and Kyuhoji) in March, 2008, Nakanoshima line in October 2008, and Hanshin Namba line in March, 2009. In total, 16km in length and 12 new railways stations (four stations of Osaka Higashi line are located in adjacent Higahi Osaka City) were added to the network in about a year. Opening new railway lines benefits the existing lines which make up the entire network through promoting economic and cultural exchange and regional attractiveness besides in new lines themselves. Increased number of visitors from inside and outside the area will stimulate the entire Osaka prefecture and Kansai metropolitan area in a long run.

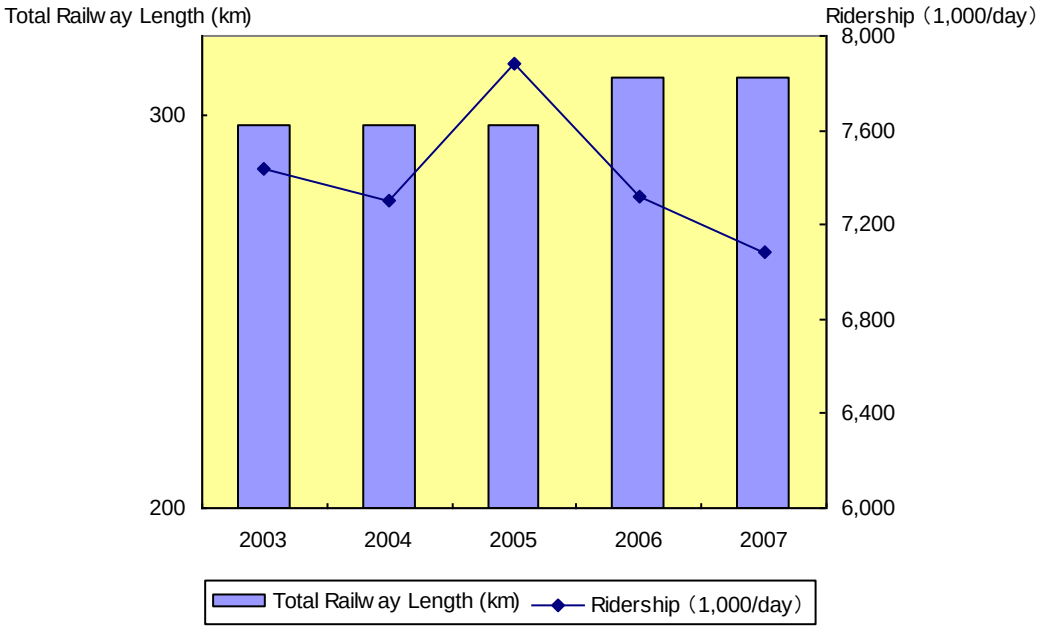


Figure 9 – Evolution of Total Railway Length and Ridership

4. BUS SERVICE THAT COMPLEMENTS RAILWAY NETWORK

4.1. Progress in Bus Network Development in Osaka City

Bus network in Osaka City consists of municipal and private bus companies, making up total length of 700km currently in operation. Municipal bus service accounts for 90% of bus network and plays a primary role to support people's lives and urban activities along with other public transport such as subway.

Municipal bus routes are classified into three types according to their services: arterial, feeder, and community. These routes were designed and operated properly for each type, aiming at providing easily reached services which is also closely connected to everyday lives in the region.

Taking advantages of buses, being more flexible in routes and capacity relative to railway, the City establishes bus network to enhance railways as well as improving connection with railway, and serving convenient transport according to regional characteristics. However, bus ridership has decreased constantly in the context of socioeconomic situations such as recession, aging, besides the fact that buses have efficiency issues such as punctuality, etc. compared to railways. Given social conditions such as forthcoming aging society and global environment, bus will play more essential role as a sustainable means of public

transport in the future. The way to secure citizen's means of transport in everyday life will be a fundamental issue.

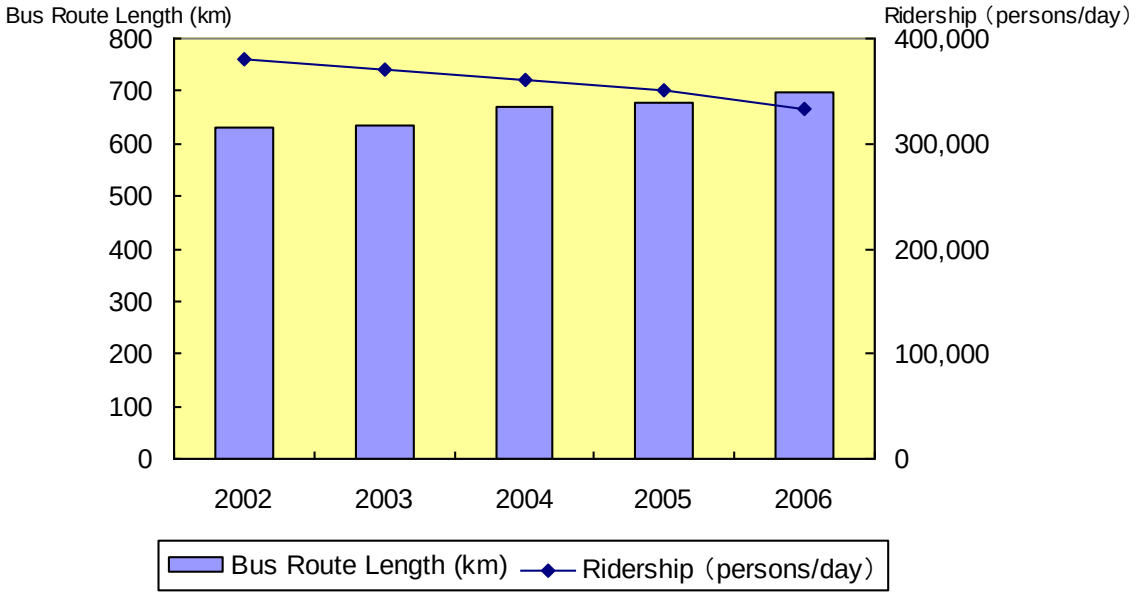


Figure 10 – Evolution of Bus Route Length in Operation and Ridership

4.2. Measures to Improve Convenience

In order to secure convenient and smooth traffic as public transport, bus needs to assure its punctuality. In collaboration with police department, enhancement measures such as installing bus priority lane, bus priority signal, and bus exclusive lane with colored pavement have been implemented.

Since 1986, Urban New Bus System has been introduced with additional measures such as improving bus stops and introducing new type of bus fleet. Then, since 1994, Osaka Prefectural Police Department started Public Transport Priority System to control passenger cars on bus exclusive lanes and improve punctuality by flashing registration numbers of those cars on digital displays.

Bus Location System is also introduced to provide information of approaching buses to passengers; signs are installed at bus stations to inform passenger either if bus is approaching from three or five bus stops ahead, or departure time of the next bus. Measures to make transportation services more passenger-friendly in computers and mobile phones are implemented too, as passengers are able to obtain bus location information from six bus stops ahead.

5. PROMOTION OF PUBLIC TRANSPORT

City of Osaka promotes behavioral shift from excessive use of passenger cars to public transport in order to reduce environmental impacts and congestion. Followings are examples of those measures:

5.1. Promotion of "No Private-Car Day"

Since 1990, Osaka City set the 20th of every month as "No Private-Car Day" – the day not to use private cars for commuting and shift to public transport – and illuminate it to the

public and organizations. The City posts educational posters in public facilities, schools (elementary/junior-high/high), in subway cars and stations, buses, banks in the City, and other municipal offices in the prefecture. They are also posted at parking lots, etc. via Parking Business Owner Association of the prefecture, to raise awareness among car users. In addition, announces are aired at City Hall, and in subway cars and stations.

Moreover, Unlimited Ride Ticket on No Private-car Day for municipal transport is sold for 600 yen for one day, making easier to ride subway and municipal bus (minimum fare for municipal subway is 200 yen).

Besides on No Private-car Day, Unlimited Ride Ticket is sold every Friday. Since it stimulates citizens to go out and spend money, it is used as urban planning measures tied up with events besides a transit promotion tool. A special promotion was held every Saturday and Sunday in February, 2011, and ticket sales increased 50% than usual. According to survey results, over 80% of respondents indicated that the promotion was the motive to leave house on those dates: it attracted customers significantly. In this Golden Week (from April 29 to May 8 with four national holidays within), Golden Week Special Campaign was held to attract customers to several newly opened commercial facilities around terminal stations in the City.

5.2. Discount Fare System for Municipal Transport System (Subway, New Tram, Bus）

In 2005, a Smart card called “PiTaPa（Postpay IC for “Touch and Pay”)” has been introduced to promote convenience of public transport. With PiTaPa, users will receive:

- Discount for use of rail and bus, and shopping at member stores
- Paying back on fares, depending on accumulated points (amount of spending)
- Various user discount services

The system is that the more frequently passengers use railway and bus, more discounts they receive, resulting in promoting public transport. PiTaPa is used with private railway companies as well as municipal subway, and its service area is expanding to outside Osaka metropolitan area. Users are able to receive other discounts for transfer between different railway companies as well, consequently, promoting public transport.

5.3. Mobility Management

Minato-ku of Osaka City established a study team for Project to Promote Environmentally Friendly Transport with officials of the City, prefecture, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Environment (MLIT), and regional organization to promote mobility management.

Mobility management (MM) is transport measure aimed at individuals and various organizations, areas, etc. to encourage them to shift voluntarily from dependency on cars to use public transport or bicycles. The team works with citizens, businesses, and other government organizations to penetrate the concept of MM.
A survey was conducted to examine transport behavior of residents, employees and people who moved in from outside and within Minato-ku, as well as travel feedback program (TFP), called Project to Promote Environmentally Friendly Transport, which directs behavioral change through provision of information for public transport, or brochure of environmental education.

Figure 11 shows the survey results in 2007 for residents and employees in Minato-ku. Certain impacts of the project were observed in their transport behavior; car use was decreased and railway and bus use were increased after the project.

Osaka City carries on several other measures continuously since constant action promotes better understanding by participants, and therefore, continuous changes in transport behavior toward more environmentally friendly. Those measures are; experimental rental cycle system for businesses to shift from commuting by private car to bicycle or for short distance travel for business purpose, eco-driving education by loaning onboard eco-driving diagnostic equipment and holding training session, lecture for enlightening Environmentally Sustainable Transport (EST), and environmental study program in elementary schools.

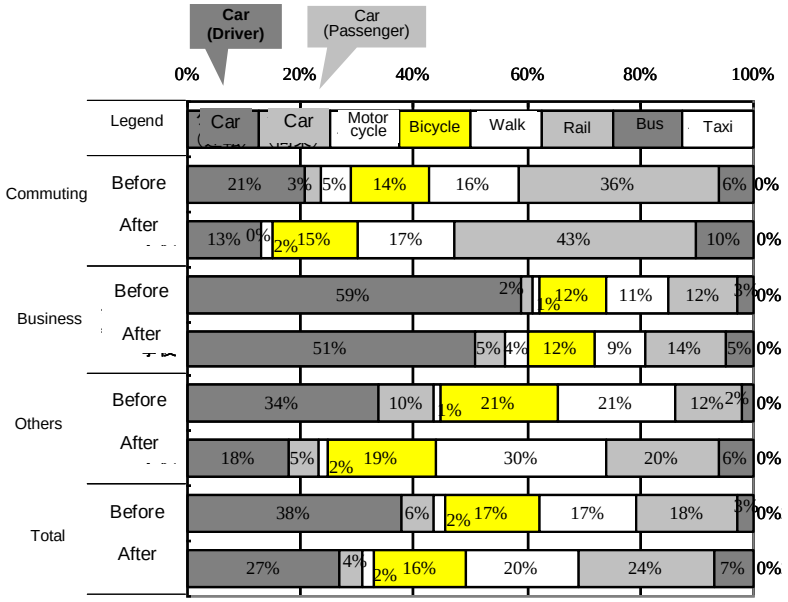


Figure 11 – Change in travel time by purpose and by mode (citizens)

5.4. Travel Demand Management in Osaka Prefecture

In March 2000, Osaka Council for Transport Demand Management Promotion was launched by Kinki Regional Development Bureau of MLIT, Osaka Prefecture, and Osaka City for the purpose of promoting TDM measures in wider area.

The Council supports a shift of use from car to public transport by promoting Park & Ride and Rent a Cycle services at railway stations. Moreover, Bus Eco Family Campaign has been held on certain days in fall by almost all bus operators in the prefecture for the purpose of promotion. It offers free ride for up to two children if accompanied by an adult (held in November in 2011).

5.5. Osaka City Transport Handy Map

Since 2006, in order to disseminate and raise awareness of public transport, Osaka City Transport Handy Map (total 40,000) has been distributed at subway stations, municipal offices in the prefecture, etc. It provides information such as railway routes including private rail companies, bus routes, and major facilities, etc. around Osaka City for getting around easily with public transport.

5.6. Transport Education at School

Since 2006, transport education program has carried out on choosing environmentally and naturally-friendly transport modes at elementary, junior-high, and high schools in the integrated study classes.

Textbooks for transport education were organized for each age group for better understanding. The topics included are “extreme climate and global warming,” “relationship between greenhouse gas and transport,” “characteristics of public transport and car transport,” “concept for choosing transport mode,” and “importance of environmentally-friendly transport behavior.”

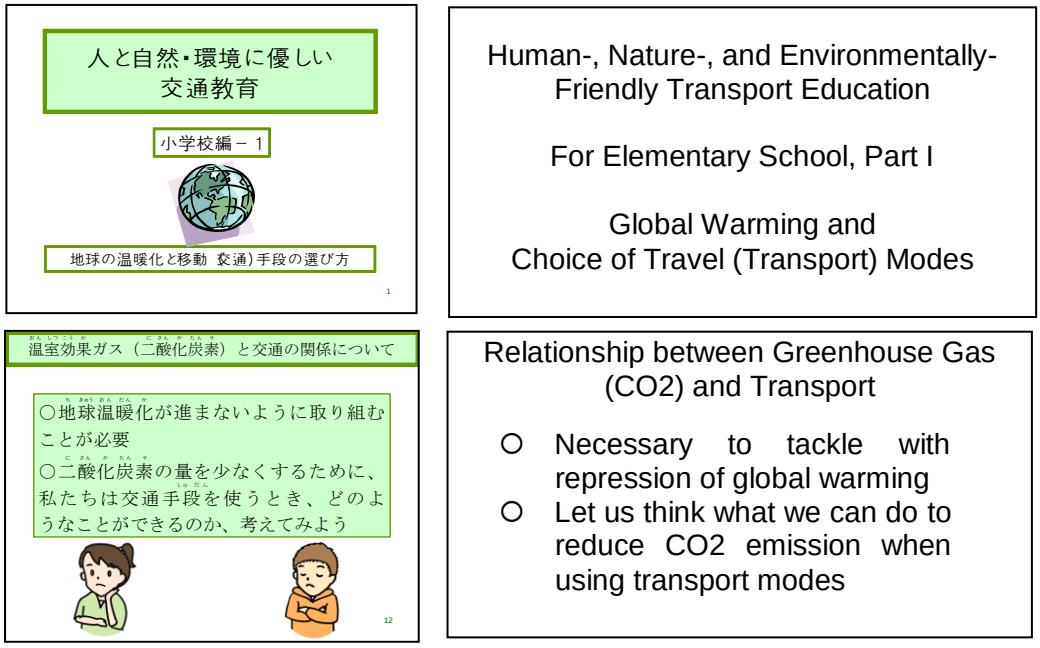


Figure 12 - Class Material for Transport Education

6. BUILDING A CITY THAT IS EASY TO GET AROUND FOR EVERYBODY

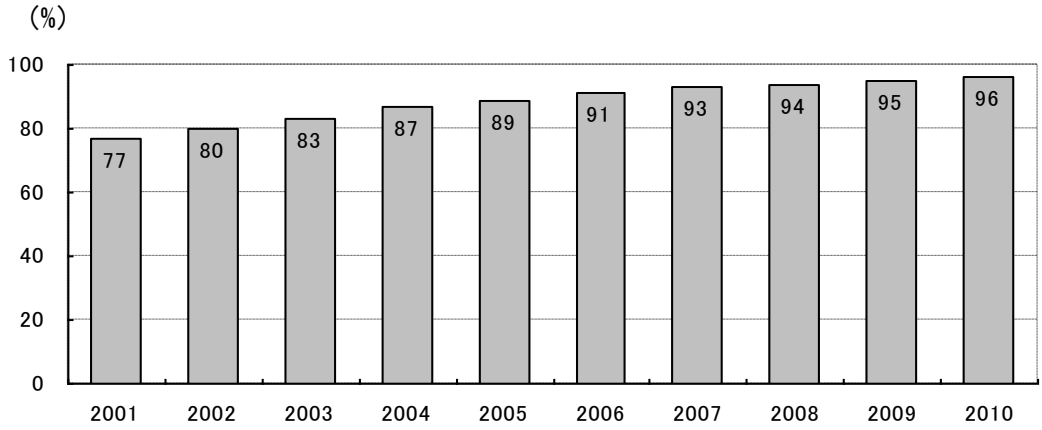
Given rapid aging and increasing normalization in involvement of disabled in social activities in Japan, Heart Building Law (Law for Buildings Accessible to and Usable by the Elderly and Physically Disabled Persons) was enacted in 1994 in order to make publicly-open buildings with the elderly and disabled barrier-free. Then, in 2000, Transportation Accessibility Improvement Law came into force to make public transport facilities (i.e. station, rolling stock) and walking space near passenger facilities barrier-free.

Prior to the above legislation in relation to accessibility, Osaka City launched “Subsidy System for Installation of Elevators, etc.” in 1991 in order to improve environment of public transport and promote participation of general public including the elderly and disabled. The system subsidized railway operators to install elevators, etc.

Osaka City also enacted Osaka City Human Friendly Urban Planning Development Outline in 1993 which directs private buildings open to public (i.e. hospital, welfare facilities, shops, etc.) to install textured paving blocks for the visually impaired and handicap-accessible elevators. The City has also implemented the improvement of public buildings, roads, parks etc.

Based on 2000 Transportation Accessibility Improvement Law, efforts toward Planning Basic Concept for Transportation Accessibility Improvement was started. In planning, creative methods were used so that as many views as possible are reflected in the concept. Some of those methods are; My Town Watching with participation of the elderly

disabled, and local residents in planning meetings, walking around stations and nearby roads and identifying accessibility issues, and public comments. So far, 25 areas with various characteristics including large-scale terminal station, transfer station, residential area, and port, were designated as priority areas. Basic Concept for Transport Accessibility Improvement was planned for these areas.



* Survey was conducted for stations with over 5,000 ridership and 5m difference in height

Figure 13 – Evolution in installation of elevators at stations of railway and other public transport modes with track(s) (%)

Currently, the City promotes furnishing barrier-free access on major roads to key facilities (i.e. station building, public office, welfare institution, etc.) with priority in which the elderly and disabled may use daily around stations and surrounding areas in an integrated manner. As shown in Figure 13, installation ratio of elevators in railway stations, etc. reached 96% in 2010, showing steady progress in improving access in the City.

In particular, Osaka municipal subway implements securing access routes with elevators from platform to the level of ticket gate, and then, ticket gate to ground level at all stations. In March 2011, it finished securing routes with elevators at all 133 subway and New Tram stations from platform to ground level.

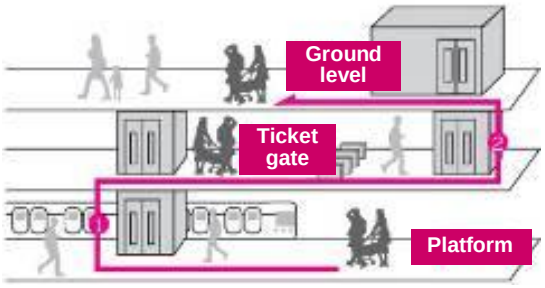


Figure 14 – Elevator in municipal subway and image of securing route

In the future, the City is going to employ Barrier Free of Mind on review of accessibility improvement measures such as countermeasures against illegally parked bicycles based on comments from the elderly and disabled through public collaboration. The City considers further accessibility improvement is critical through planning measures according to New Transportation Accessibility Improvement Law which integrated Heart Building Law and Transportation Accessibility Improvement Law, and enacted in December 2006.

7. CONCLUSION

In a long run, City of Osaka has established high quality transport system as a result of its public transportation measures mainly in railway development.

As noted earlier, since public transport plays an essential role to enhance attractiveness of the city, building public transport system that contributes to urban redevelopment and revitalization is the key factor. In the context of global outcry for global warming, achieving environmentally-friendly city will be increasingly important by using high quality public transport and promote transport modes with low environmental burden such as railway, bus, and walk. Moreover, achieving transport system everybody can access safely and comfortably will be required in the future, considering conditions such as further aging, women's advanced role in society, globalization, etc.

Moreover, in order to establish such transport system, viewpoint of people moving the city must be identified and learn their various needs. Since transport is critical to support urban activities today and in the future, a perspective to accomplish sustainable transport concerning various aspects such as economy, society, and environment is vital. Under fiscal constraint, fundamental facilities need to be reviewed in terms of their role and needs, and making maximal use of existing stocks is needed. In addition, strengthening the cooperation between different transport modes and implementing soft measures are important.

To carry out transport measures, government need to coordinate with citizens, businesses, urban planning organizations and local organizations.

Based on these concepts, Osaka City will carry on various transport measures for the future considering the role of public transport in urban planning.