1-1 Quantitative and Qualitative Changes in Mobility

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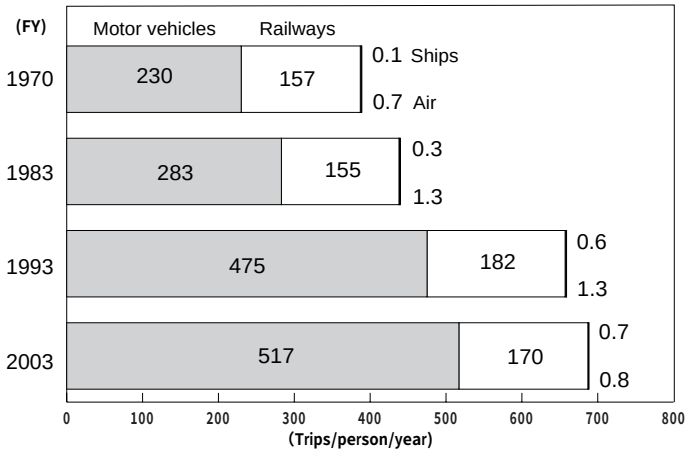
Fumihiko Nakamura

The trend in the flow of people remains almost unchanged. Increases in number of trips and travel distance and increasing trends in motor vehicle use by females and the aged was confirmed. Concerning the flow of goods, the number of tonnes decreased, and the number of motor vehicles is leveling off. Air transport, however, was up slightly.

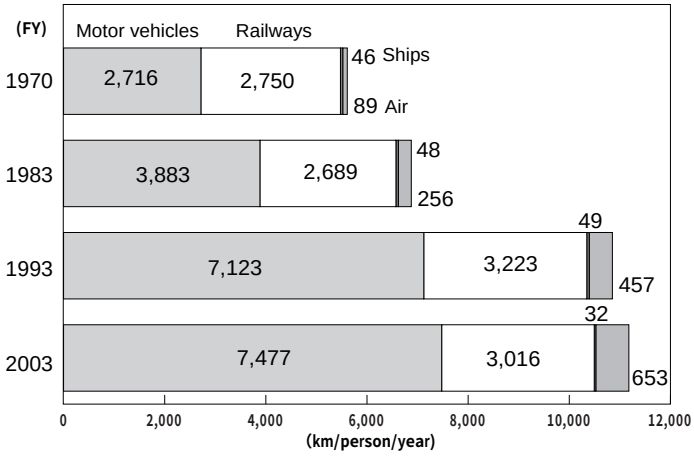
■ Annual number of trips by air and motor vehicle is on an upward trend, while annual trips by rail and passenger ship has been on a slight downward trend for 10 years. Trends for annual kilometers traveled are similar. Increased number of trip of air travel and kilometers traveled by air leads to the conclusion that overseas travel has become easier.

Fig.1 Annual number of trips (per person)



Source: Ministry of Land, Infrastructure and Transport "Annual Land Transport Statistics 2004"

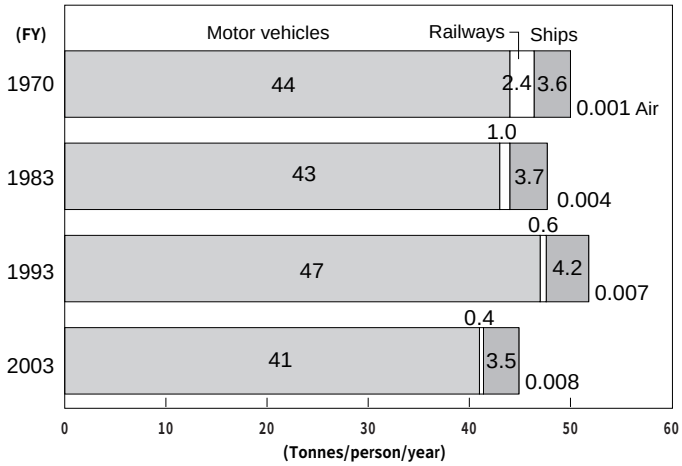
Fig.2 Annual kilometers traveled (per person)



Source: Ministry of Land, Infrastructure and Transport "Annual Land Transport Statistics 2004"

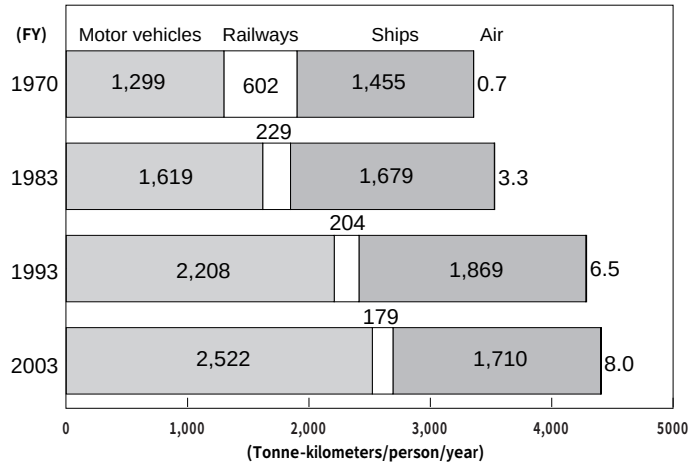
■ As for flow of goods, over the past 10 years, tonnes transported have decreased, but transport tonne-kilometers have increased slightly. Tonnes transported by motor vehicle were flat, while tones transported by rail and coastal shipping continued on a downward trend. The rate of decrease in coastal ship transport over the past 10 years has been remarkable. Air transport increased slightly. The same tendency is visible in transport tonne-kilometers, which are on an overall upward trend, with an upward trend for motor vehicles. As with the movement of people, air transport is probably becoming more convenient year by year.

Fig.3 Annual freight transport tonnage (per person)



Source: Ministry of Land, Infrastructure and Transport "Annual Land Transport Statistics 2004"

Fig.4 Annual freight transport tonne-kilometers (per person)



Source: Ministry of Land, Infrastructure and Transport "Annual Land Transport Statistics 2004"

■ The motor vehicle usage rate in major regional cities is high for each age group, with higher usage among males than females. For females, the percentage over age 65 that walks was remarkable.

Fig.5 Modal share by male age/district group

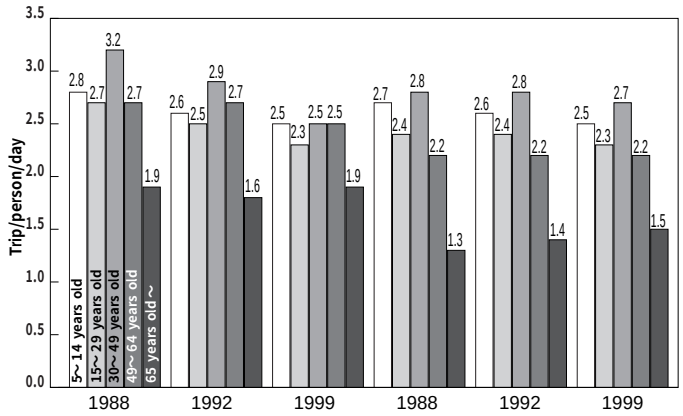
Source: Ministry of Land, Infrastructure and Transport "Fiscal 1999 Survey of Personal Travel in Japanese Cities"

Fig.6 Change in the share for different female age/district group

Source: Ministry of Land, Infrastructure and Transport "Fiscal 1999 Survey of Personal Travel in Japanese Cities"

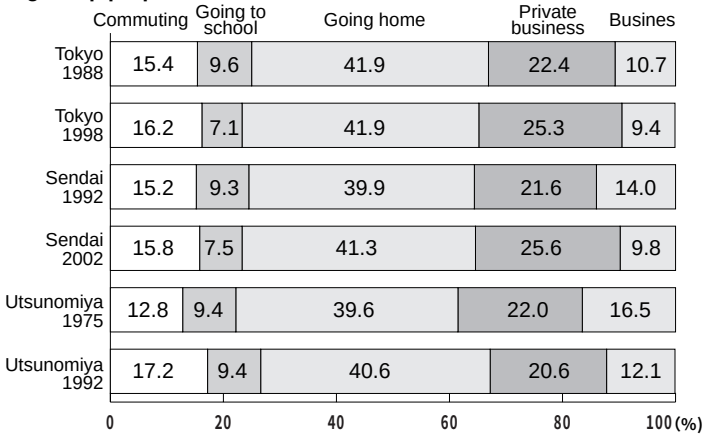
■ Trips per person per day showed a slight declining trend for those under 65, with a slight increasing trend for those 65 and older. By purpose, the rate of increase and number of trips was higher for commuter trips to Utsunomiya than for other major local cities.

Fig.7 Change in trips/person/day for each age group



Source: Ministry of Land, Infrastructure and Transport "Fiscal 1999 Survey of Personal Travel in Japanese Cities"

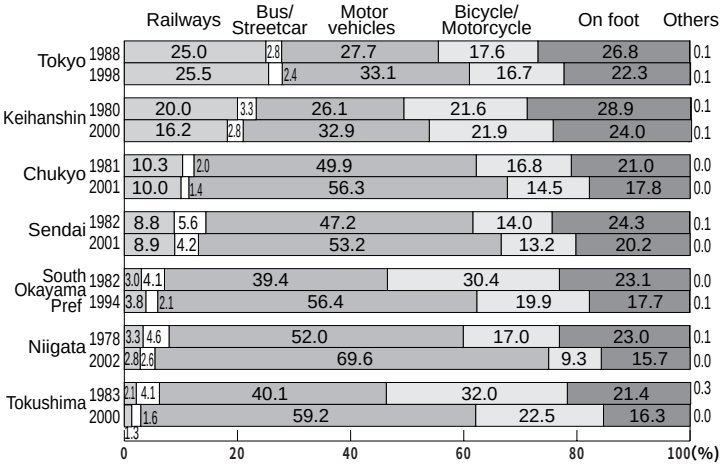
Fig.8 Trip purpose in various cities



Source: Prepared from Survey Reports on Person Trip in Each Urban Area

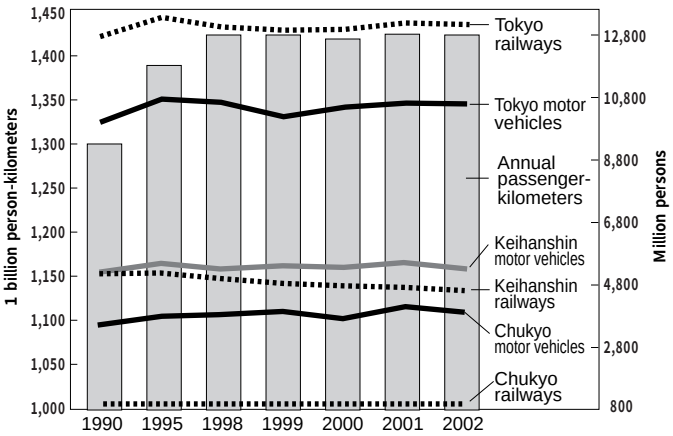
■ Looking at usage rates by city, the usage rate for motor vehicles increased for each city, most notably in the areas around local cities. Among the three metropolitan areas, the number of bus passengers in the Chukyo(Nagoya) and Keihanshin(Kyoto/Osaka/Kobe) areas decreased slightly from 2001 to 2002. In addition, the number of rail passengers in the Chukyo and Keihanshin areas was on a year-by-year declining trend.

Fig.9 Modal share of various cities



Source: Prepared from Survey Reports on Person Trip in Each Urban Area

Fig.10 Changes in passenger-kilometers and number of three metropolitan area passengers



Source: Ministry of Land, Infrastructure and Transport "Annual Land Transport Statistics 2004"

1-2 Transport Network Today

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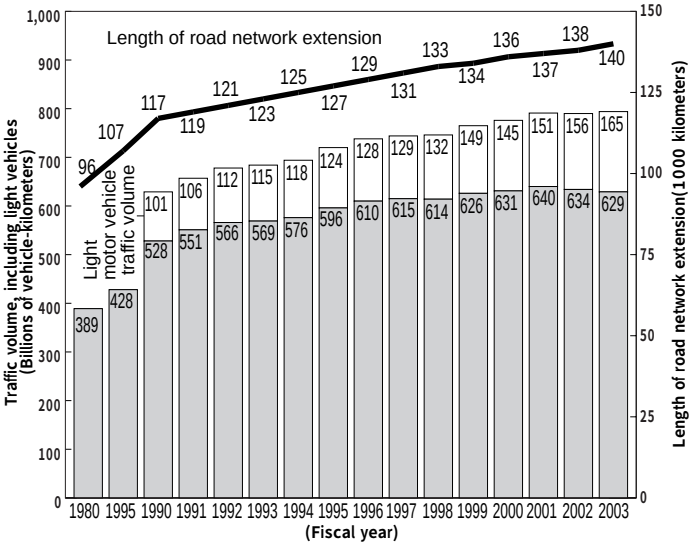
Fumihiko Nakamura

There is a continuing trend where the rate of road network extension is unable to keep up with the increased demand in road traffic. As a result, the average travel speed on roads has been leveling off. On the other hand, new initiatives such as the effective use of unused road capacity, resolving bottlenecks by partially increasing the number of lanes, or techniques for developing smooth traffic flows by centrally controlled management are gradually increasing.

■ For road traffic, there is a continuing trend in which the number of new roads being constructed is unable to keep up with the increase in demand. As a result, the average running speed on roads has been leveling off at a low figure.

Fig.1 Changes in traffic volumes and extensions to the road network

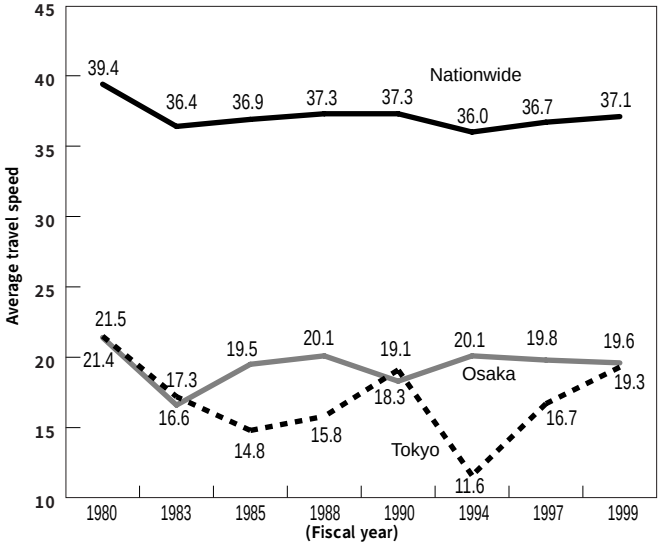
Road network extension and road traffic volume have been on an increasing trend since 1990, although road traffic volume has been up and down subsequent to 1990.



Source: Ministry of Land, Infrastructure and Transport Annual Land Transport Statistics 2004 , Annual Report on Road Statistics 2004

Fig.2 Average travel speed on national roads

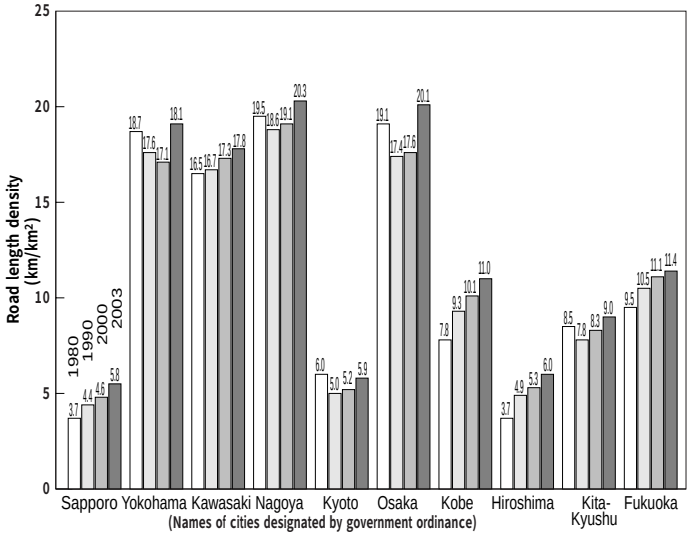
Although annual changes are not large, at 10-20 km/h, average travel speed in the Tokyo and Osaka areas is about half the national average of 35-40 km/h.



Source: Ministry of Land, Infrastructure and Transport 1999 Road Traffic Census

Fig.3 Changes in road length density for cities recognized by government ordinance

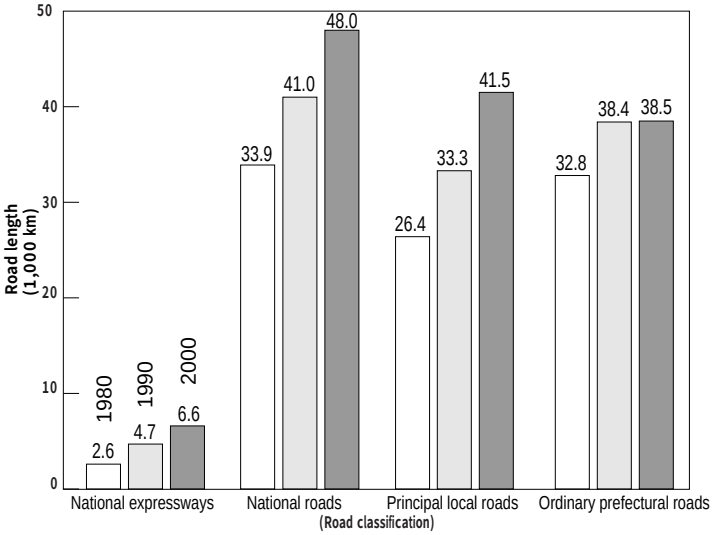
Yokohama, Nagoya, Osaka, and Kyoto were on a downward trend from 1980 to 2000. Yokohama rapidly increased in 2003.



Source: Annual Report on Road Statistics (each year)

Fig.4 Improvements and new construction by road type

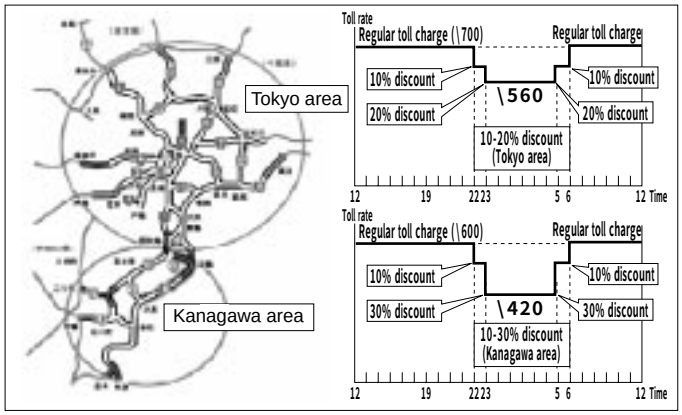
An upward trend since 1980 is apparent for national expressways, national roads, and principal local roads. Ordinary prefectural roads show no change since 1990.



Source: Annual Report on Road Statistics (each year)

Fig.5 Metropolitan Expressway night discount experiment (FY2004)

New initiatives such as the effective use of unused road capacity, resolving bottlenecks by partially increasing the number of lanes, or techniques for developing smooth traffic flows by linear centralized management, have gradually started to increase.



Note: With the elimination of the FY 2003 ETC advance payment discount, the maximum discount in Tokyo declined from 34% to 20%, and that in Yokohama from 42% to 30%.

Source: Metropolitan Expressway Public Corporation

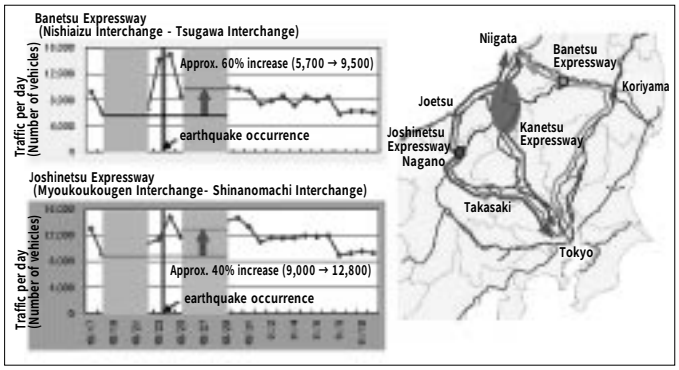
Tokyo area (Standard-sized car)
\700 ⇒ \630 (10% discount): 20:00-23:00, 5:00-6:00
\560 (20% discount): 23:00-5:00

Kanagawa area (Standard-sized car)
\600 ⇒ \540 (10% discount): 20:00-23:00, 5:00-6:00
\420 (30% discount): 23:00-5:00

The Metropolitan Expressway night discount experiment provides a discount on the Metropolitan Expressway at night, when traffic is relatively light. It is intended to shift traffic from ordinary roads to the Expressway, improving roadside environmental conditions and easing traffic for those roads. It was implemented from April 27, 2004, through March 31, 2005, and continues during FY 2005 with some changes.

Fig.6 Redundancy of wide-area expressway networks

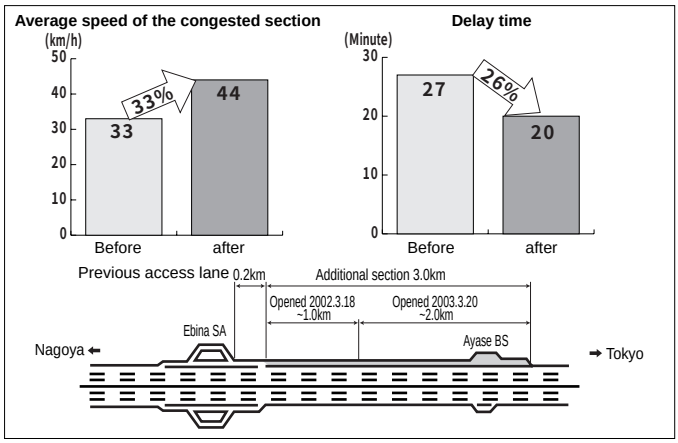
The Niigata-Chuetsu Earthquake closed part of the Kanetsu Highway. This led to traffic volume increases of 40 percent on the Banetsu Expressway and 60 percent on the Joshinetsu Expressway compared with the average. Because a wide-area expressway network between the Tokyo area and Niigata Prefecture was in place, the Banetsu and Joshinetsu Expressways could be utilized as alternative routes when part of the network was closed by the earthquake.



Source: Road Bureau of the Ministry of Land, Infrastructure and Transport

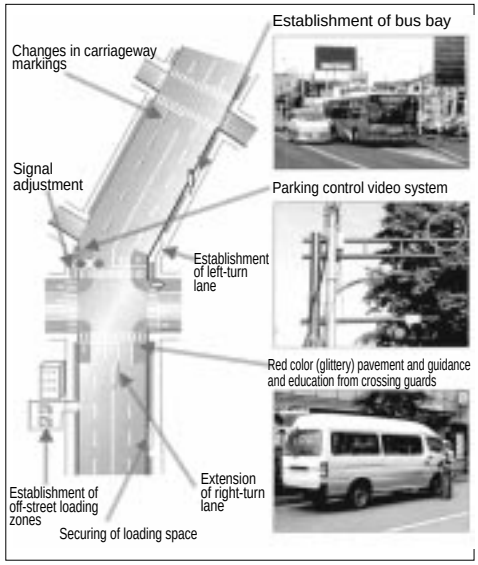
Fig.7 Area traffic congestion mitigate project at Tomei Expressway (Up line) Ayase

On March 20, 2003 the Japan Highway Public Corporation (JH) completed an acceleration lane(about 3 km) merging into the main lane from the Ebina Service Area (SA), to mitigate traffic congestion on the Tomei Expressway between the Atsugi Interchange and the Yokohama Machida Interchange (Up [toward Tokyo] line).



Source: Japan Highway Public Corporation

Fig.8 "Smooth Tokyo 21" initiative



The five-year "Smooth Tokyo 21: Expanded Strategy" began in 2003. It aims to smooth traffic in Tokyo by redoing lane composition, adjusting signal lengths, establishing bus bays and loading zones, providing audio warnings via a parking control video system to those who park illegally, and guiding drivers to parking lots.

Source: Metropolitan Police Department Website

Table.1 Area traffic congestion mitigate project

Districts with busy streets **Shinjuku, Shibuya, Ikebukuro**	**Major arterial roads Meiji-dori, Yasukuni-dori, Kasuga-dori, Yamanote-dori**
***Open utilization of corporate parking areas** ***Taxi pools** ***Off-road sites for freight handling**	***Red color pavement** ***Improvement of stopping sections** ***Changes in road signs and carriageway markings**
***Parking meters for freight handling** ***Parking deterrent system** ***Traffic guides, etc.**	

Source: Japan Highway Public Corporation

1-3 Public Transport Today

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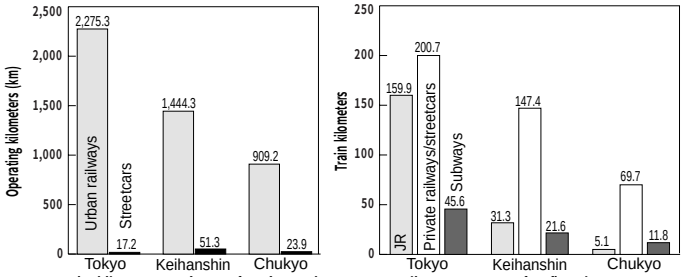
Fumihiko Nakamura

Demand for the Shinkansen lines (new trunk railway lines) and for air travel, has been increasing, while the use of conventional railways and buses is leveling off. In light of the fact that bus network extension is not declining, halting the decrease in bus passengers is particularly difficult. In metropolitan areas, the easing of traffic congestion has progressed, and the number of cases of transport services such as through-operations of railway tracks owned by different companies has increased. While still few in number, new transport systems including monorail systems have been increasing gradually. Development of debates regarding the renewal of existing lines and the beginning of work on planned lines can be expected.

■ Demand for the Shinkansen lines (new trunk railway lines) and for air travel, has been increasing, while the use of conventional railways and buses is leveling off.

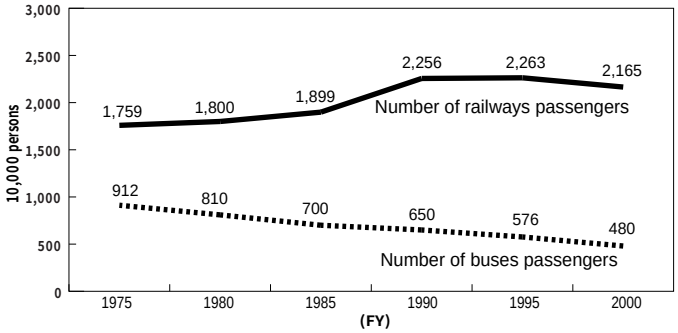
Fig.1 Operating kilometers and train-kilometers for conventional lines in three metropolitan areas



Note: Train-kilometers shown for the Tokyo Metropolitan area are for fiscal 2000, JR train-kilometers shown for the Chukyo and Keihanshin areas are for fiscal 1985, others are for fiscal 2000. Also, JR train-kilometers for the Chukyo area show numerical values for the Tokaido Line.

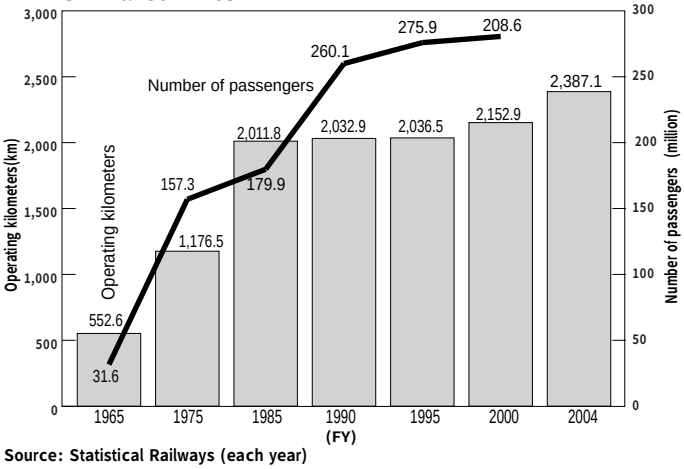
Source: Annual Urban Transportation Reports (each year)

Fig. 2 Trends in passengers of railways and buses(nationwide)



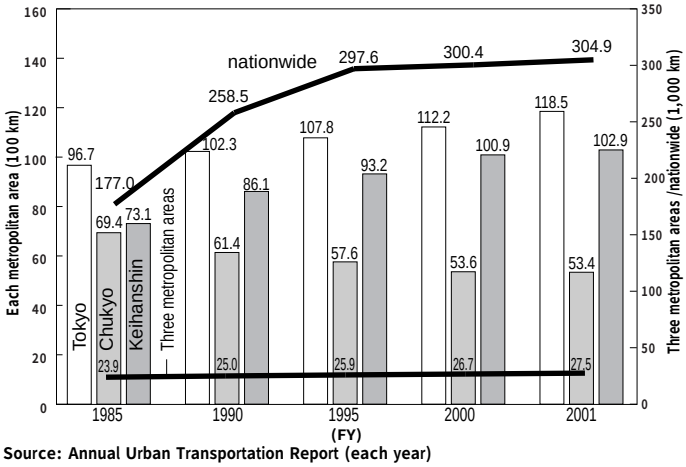
Source: Annual Land Transport Statistics 2002

Fig.3 Transition in operating kilometers and number of passengers Shinkansen lines



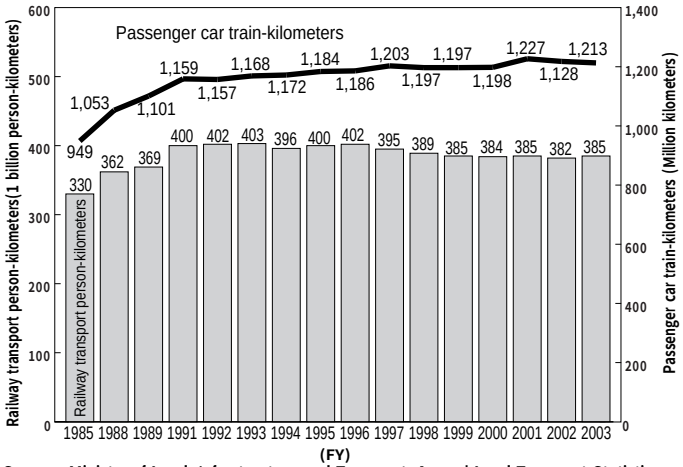
Source: Statistical Railways (each year)

Fig. 4 Extensions to bus routes



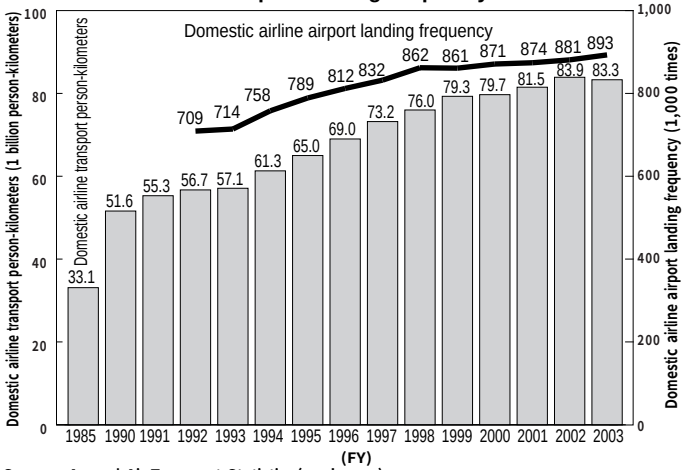
Source: Annual Urban Transportation Report (each year)

Fig.5 Railway transport passenger-kilometers and passenger train-kilometers



Source: Ministry of Land, Infrastructure and Transport Annual Land Transport Statistics

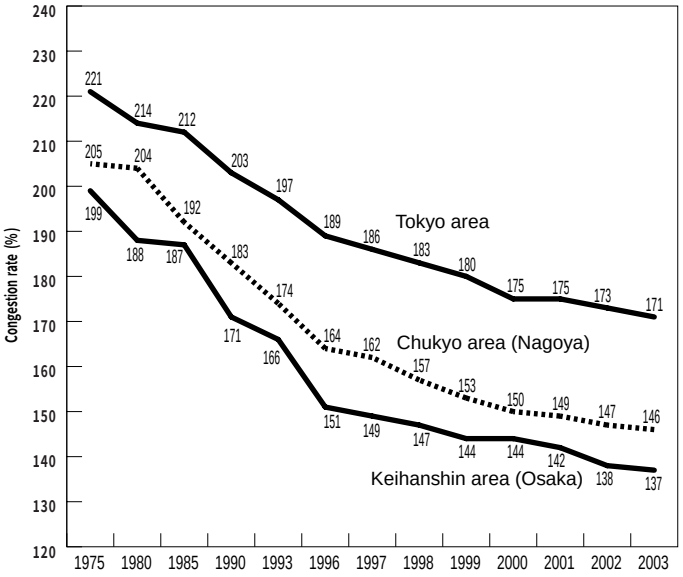
Fig.6 Domestic air transportation passenger-kilometers and domestic airline airport landing frequency



Source: Annual Air Transport Statistics(each year)

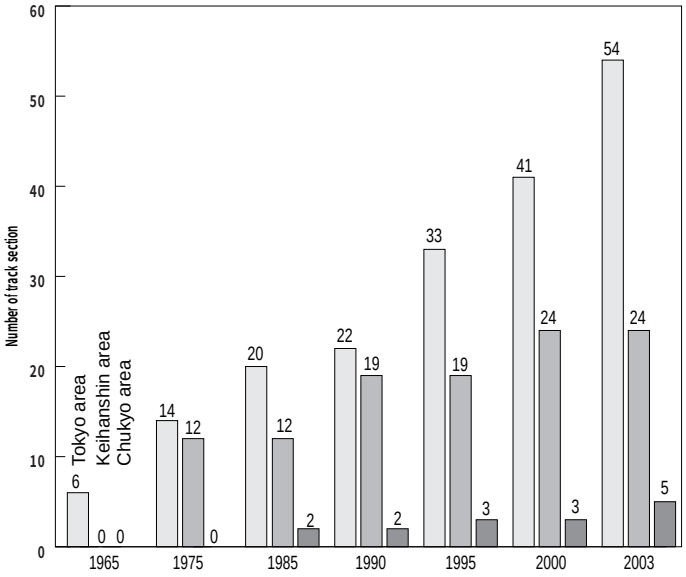
As for major urban areas, the railway congestion rate is easing in each of the three major metropolitan areas. In the Tokyo area, the number of track sections with through-operation between multiple railway companies is increasing, as are through-operation services. In the Keihanshin and Chukyo areas, however, through operation has changed little since the late 1980s.

Fig.7 Trends in railway congestion rate in three metropolitan areas



Source: Statistical Railways (each year)

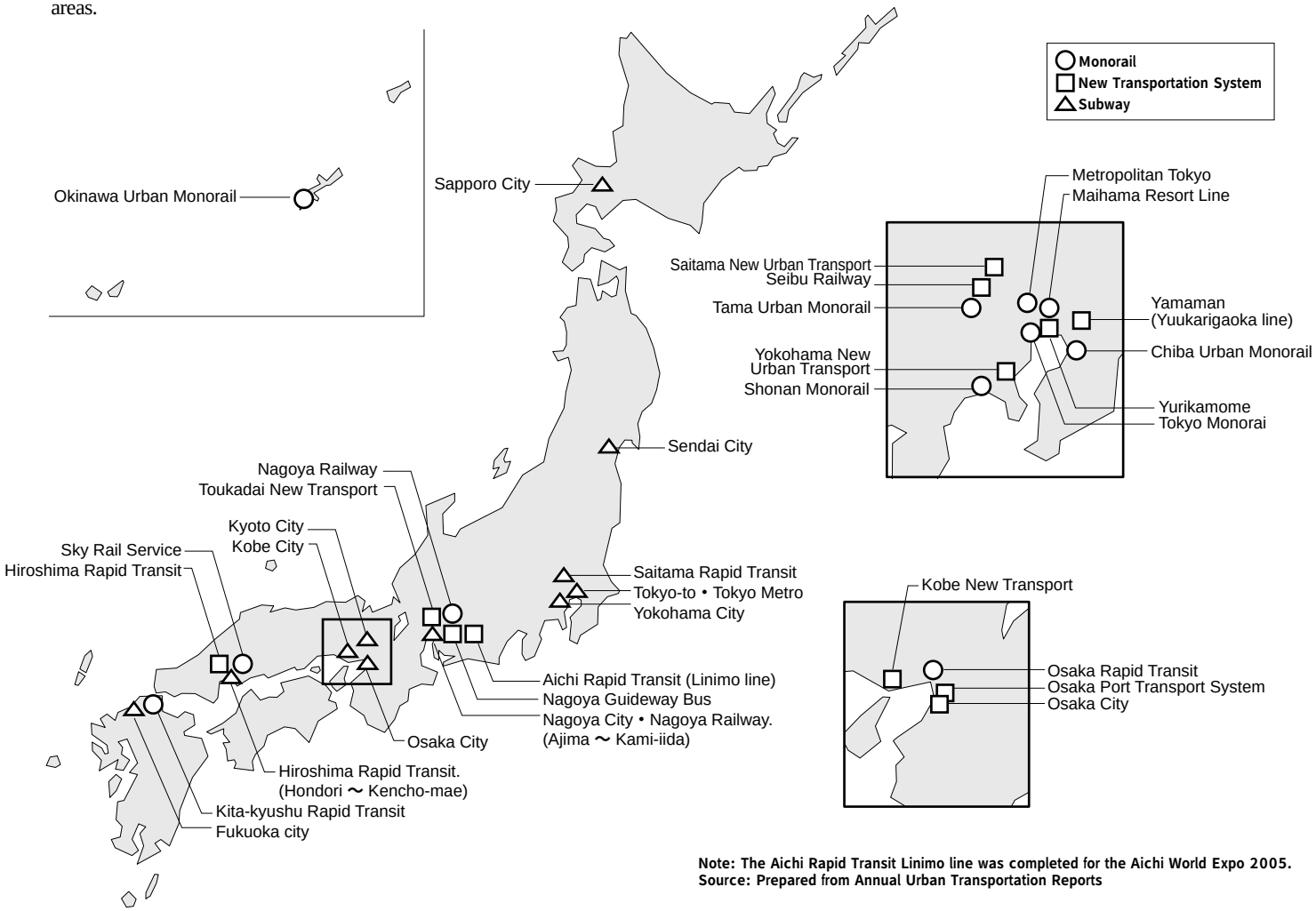
Fig.8 Change in the number of track sections with through-operation



Source: Statistical Railways (each year)

Fig.9 Examples of monorails, new transport systems, and subways in Japan

Many examples of new transport systems such as monorails can be found in the three metropolitan areas of Tokyo, Keihanshin, and Chukyo. In Naha, a monorail has been adopted as a core transport system. New subway projects are being implemented in Yokohama and other cities, and the Nippori-Toneri Line, a new transport system, is under construction. Subways and new transport systems are expected to increase, especially in the three metropolitan areas.



Note: The Aichi Rapid Transit Linimo line was completed for the Aichi World Expo 2005.
Source: Prepared from Annual Urban Transportation Reports

1-4 Developments in New Urban Transport Systems

Professor, Graduate School of Environment and Information Sciences, Yokohama National University

Fumihiko Nakamura

Various forms of transport systems that adopt new technologies have been designed and introduced into many cities as ways for coping with diversified travel needs. Various new developments can be seen in modes of transportation, not only including new technology such as mini-monorails for transport on slopes, but also new developments involving ingenious methods for using various modes of transportation, such as car-sharing systems, and contrivances for greater use of public transportation such as existing street cars and buses.

Table 1 New urban transport system trends

Proliferation of various new urban transport systems has started all over Japan.

Type of Demand	Road-based System	Rail-related System
Support for short-distance trips	Utilization of bicycles (see 2-7) City rent-a-cycle Park & Cycle	Slope elevator New capsule technology Sky rail
Improving the overall convenience of travel in urban areas	Joint use of cars Car sharing Eco Park & Ride (sharing electric vehicles) Bus utilization Demand responsive bus	Improvement of existing system : LRT. Utilization of new technology: Monorail, New transport system
	Guideway bus (rail + road travel) IMTS (un-manned rail + road travel)	

Table 2 Innovative measures of public transport

Innovative measures are being used in cities to solve a variety of public transport problems.

Improvement Category	Major recent developments	Related cases
Vehicles/ equipment	Implementation of non-step vehicles Station/stop facilities with better information services	Hiroshima (street car), Kanazawa (mini-bus) Hamamatsu (high grade bus stop)
Access, etc	Common station platforms for rail and bus transfer Improved connections with monorail and existing rail Rail and bus allowing the carriage of bicycles	Hanover Kokura (use of subsidy for grade separated road construction) Mie Prefecture, etc.
Service	Providing real-time travel information Demand responsive bus system using ITS Route-type shared ride taxi services Elastic travel fare system Travel system responsive to rainy weather	Yokohama, Okayama Kochi, Nakamura Adachi, Quebec (taxi bus) Fukuoka (100 yen bus) Hamamatsu (rainy bus)

Fig.1 Slope transportation system in Saruhashi

The slope transport support system "menu" is being diversified.

Saruhashi's BTM System: Connects JR Saruhashi station with mountain top housing area with an altitude difference of 100m in 3 minutes. It is a magnetic belt monorail where a caterpillar type "magnetic belt" grasping the rail girder from both sides while the magnetic belt is mobilized to move the transport system.

Fig.2 Low-floor LRV in Okayama City

The spread of low-floor streetcars has been outstanding, but mass introduction has not yet taken place because the cars are expensive and the subsidy system is restricted.

Photographed by Tsutomu Yabe

Fig.3 Community bus in Yokohama City

Many communities have started to introduce low-floor vehicles, and their introduction in Japan is on the increase.

Source: Yokohama City website

■ Experimental urban transportation systems were adopted for the Aichi World Expo held in 2005.

Fig.4 LINIMO

Fig.5 IMTS

Fig.6 Global Tram

Fig.7 Velo Taxi

Fig.8 "Eco-Park-and-Ride"

Some joint utilization systems for motor vehicles have developed from the social experiment stage and are now in practical use. Ways of putting suburban residential area type "Eco-park-and-ride" systems into practical use are now being sought through long-term trials.

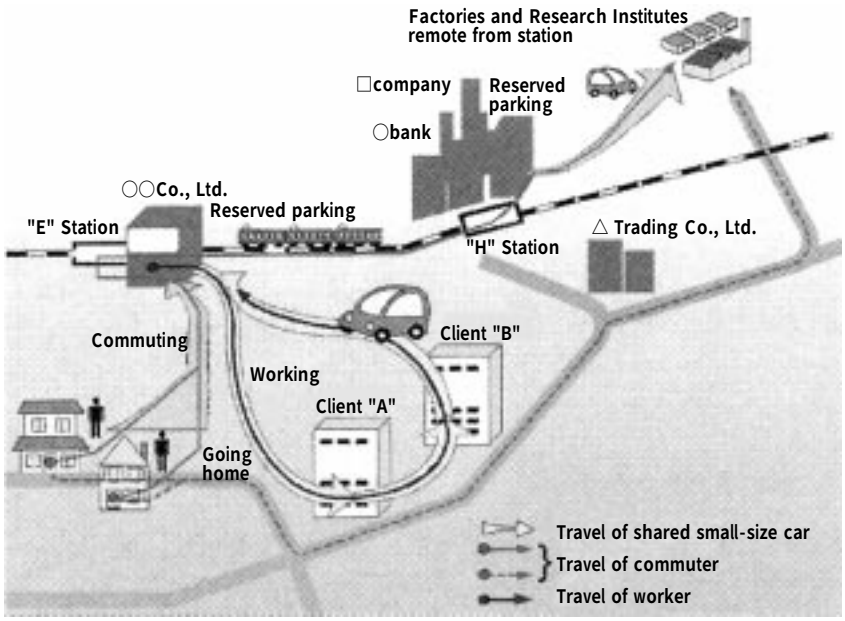


Table 3 Summary of deregulation of buses

In the two years since bus deregulation, the gradual entry of new bus companies has been seen, although the relationships between the running of these new corporate buses and road administration and operations as well as the relationships between the running of the new buses and overall urban transportation plans have become important problems to be resolved.

Category	Before deregulation	After deregulation
Related legislation	Road Transport Law	
Entry	License by route	Permission by operation
Withdrawal	Permission	Prior application only (6 months before, if there are no adverse effects, 30 days before)
Fare/rate	Permission	Prior application under a permitted ceiling(change order possible)

Table 4 Expansion of \100 fares, and diversified fare systems

Diversified fare system was introduced just before deregulation started.

Method of setting 100 yen fares	Cases
Same rate applied to new routes	Musashino city, etc.
Similar to above (100 yen/day)	Fukaya city
Setting minimum fare for short distances and cutting rates	Gunma prefecture, etc.
Cutting fares for current minimum fare sections on existing routes	Takaoka city, etc.
Cutting neighboring section fares in addition to the above	Hamamatsu city
Setting new districts within existing routes and lowering fares	Fukuoka city

■ Practical application of BRT (a high-speed trunk bus system) has begun.

Fig.9 A four-lane bus-only road(Bogota, Colombia)

Fig.10 A rubber-tired tram that can operate without a guide rail (Nancy, France)

Fig.11 A bus that follows a white line(Las Vegas, USA)

Fig.12 The number of articulated bus lines is increasing in Japan (Fujisawa City)

Fig.13 An articulated bus line in Japan, where they are increasing(Fujisawa City)

Fig.14 Model diagram of Transit Oriented Development in Curitiba City, Brazil

The concept of linking urban planning with urban public transportation planning is coming to fruition overseas.

Source: Curitiba City materials

Fig.15 Development axis in Curitiba City

The Curitiba City development axis is reaching completion after 30 years.

Photographed by Katsutoshi Ohta

1-5 Transportation Accesibility Improvement for People with Disabilities

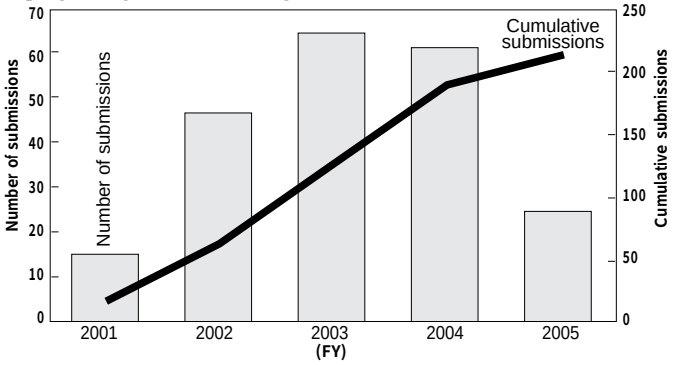
Hyogo Assistive Technology Research and Design Institute Research Unit 1

Hiroshi Kitagawa

Accessible environments on transportation facilities are progressing in various locations because of the aging society and to enable greater participation by the elderly and people with disabilities in Japan. Currently, pedestrian spaces are being made accessible environment mainly in accordance with Transportation Accessibility Improvement Law, which prioritizes improved access in train stations and surrounding areas. In addition, recent years have seen continuing enhancement of the "support by people" concept and other information-related initiatives, as well as welfare-related transportation services and other new initiatives to ensure mobility.

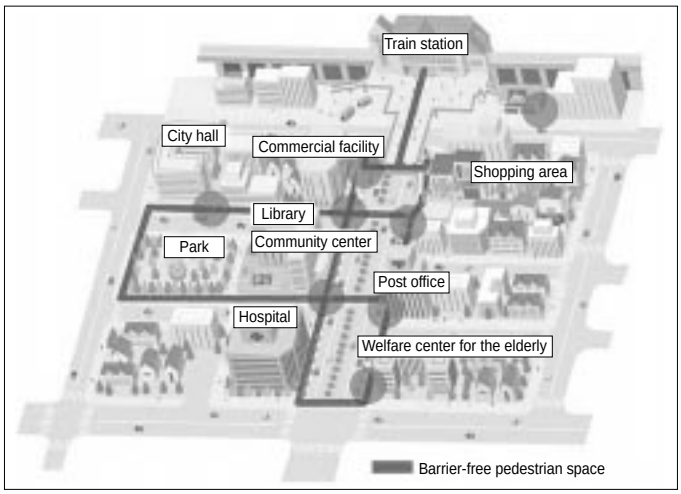
Fig.1 Basic concepts for Transportation Accessibility Improvement submitted

Setting forth of basic concepts for transportation accessibility environment is progressing in various local government.



As of July 29, 2005
Source: Ministry of Land, Infrastructure and Transport materials

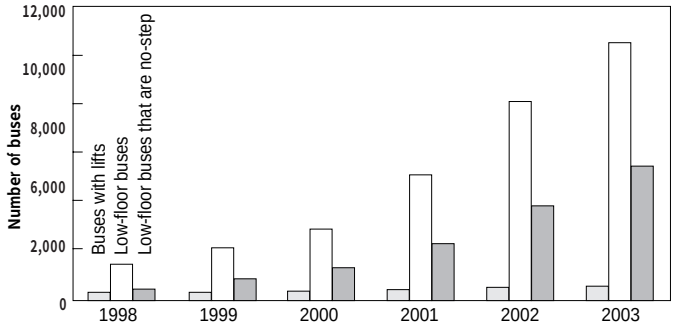
Fig.2 Pedestrian environment considering a pedestrian network



Source: Website of the Road Bureau of the Ministry of Land, Infrastructure and Transport

Fig.3 Number of non-step buses in use

In 2003, 9.3 percent of all buses used are non-step.



Source: Materials from the Road Transport Bureau of the Ministry of Land, Infrastructure and Transport

Fig.4 Call for train station volunteers

Volunteers are sought at train stations as part of the "support by people" initiative.

Source: Materials from the Policy Bureau of the Ministry of Land, Infrastructure and Transport

Fig.5 Example of barrier-free route search on the Internet

Enhancement of information is implemented for realization of barrier-free. (Easy Outing information service).

Source: Transport Ecomo Foundation website

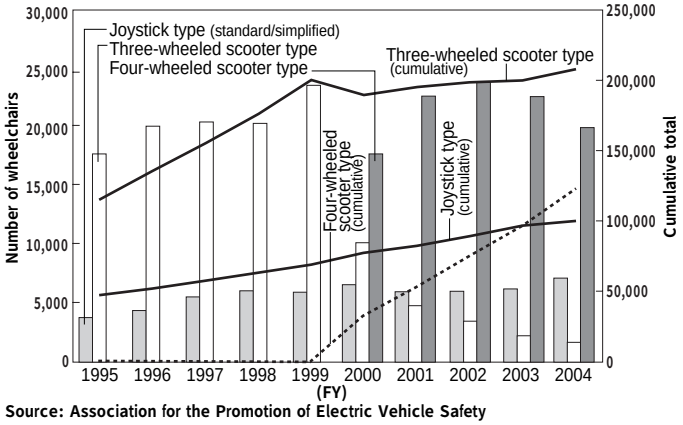
Table 1 Outline of universal design policy concepts

Building a participatory society
Integration of barrier-free policies
Public transportation that anyone may easily use
Town planning that enables anyone to live safely and at ease
Response to diverse activities through technology and methods

Source: Website of the Policy Bureau of the Ministry of Land, Infrastructure and Transport

Fig.6 Dissemination of scooter-type power wheelchairs

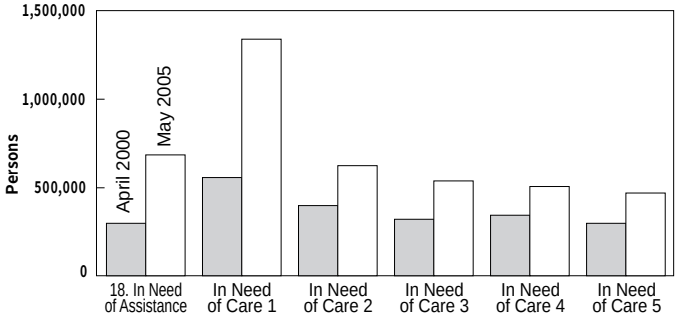
The number of scooter-type power wheelchairs is rapidly increasing mainly among the elderly.



Source: Association for the Promotion of Electric Vehicle Safety

Fig.7 Increase in elderly persons certified as In Need of Assistance or In Need of Grade 1

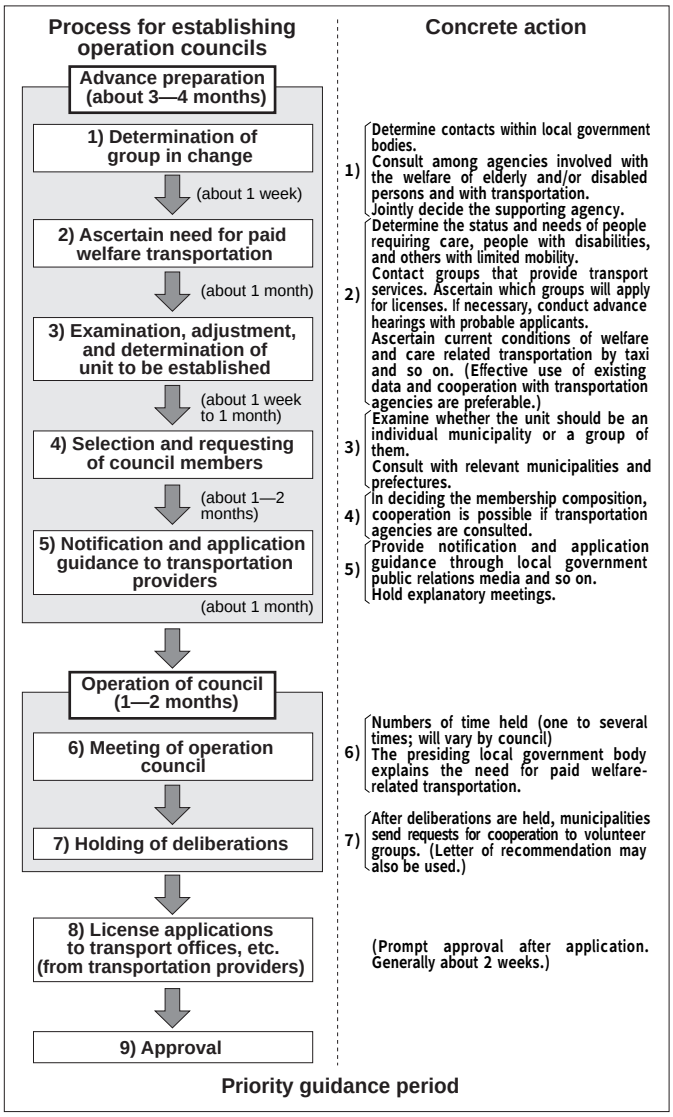
The number of elderly persons requiring care is climbing, so improved transportation services and transportation for those needing care is necessary.



Source: Ministry of Health, Labor and Welfare "Report on Status of Long-term care Insurance Businesses"

Fig.8 Flow chart for councils on the operation of volunteer based transportation

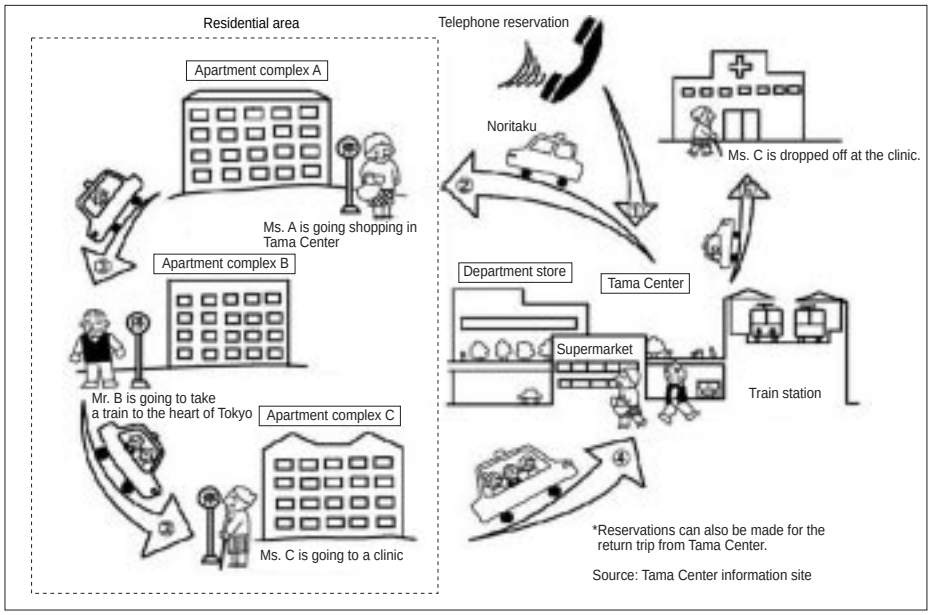
Guideline for the creation of operation councils: From determining a contact to establishment (model case)



Source: Website of the Road Transport Bureau of the Ministry of Land, Infrastructure and Transport

Fig.9 The "Noritaku" (shared ride taxi) system

A new community bus transportation initiative is making progress.



Note: This is a test of a DRT (demand responsive transport) system operating shared taxis based on a registration/reservation system. It is for the elderly and others in urban areas who have difficulty using routed buses.

1-6 Future Transport Infrastructure Development

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The government released a new Comprehensive National Development Plan which envisages the Grand Design for the 21st-Century. (Approved by the Cabinet in March 1998) Future transport infrastructure improvement plans are expected to call for investment in the urban sector and investments to construct trunk transport networks that offer high cost-effectiveness. The plans are also expected to put an emphasis on investments that promote effective use of existing networks including the Intelligent Transport Systems (ITS) for transmitting information from the road to vehicles using information and telecommunications technologies. The Cabinet also approved the Social Infrastructure Improvement Priority Plan to unify nine sectorical infrastructure improvement plans which the government formulates every five years. Under the new social infrastructure plan, the government will evaluate policy measures and their implementation, using selected outcome indexes.

Table 1 Outlines of the Comprehensive National Development plans

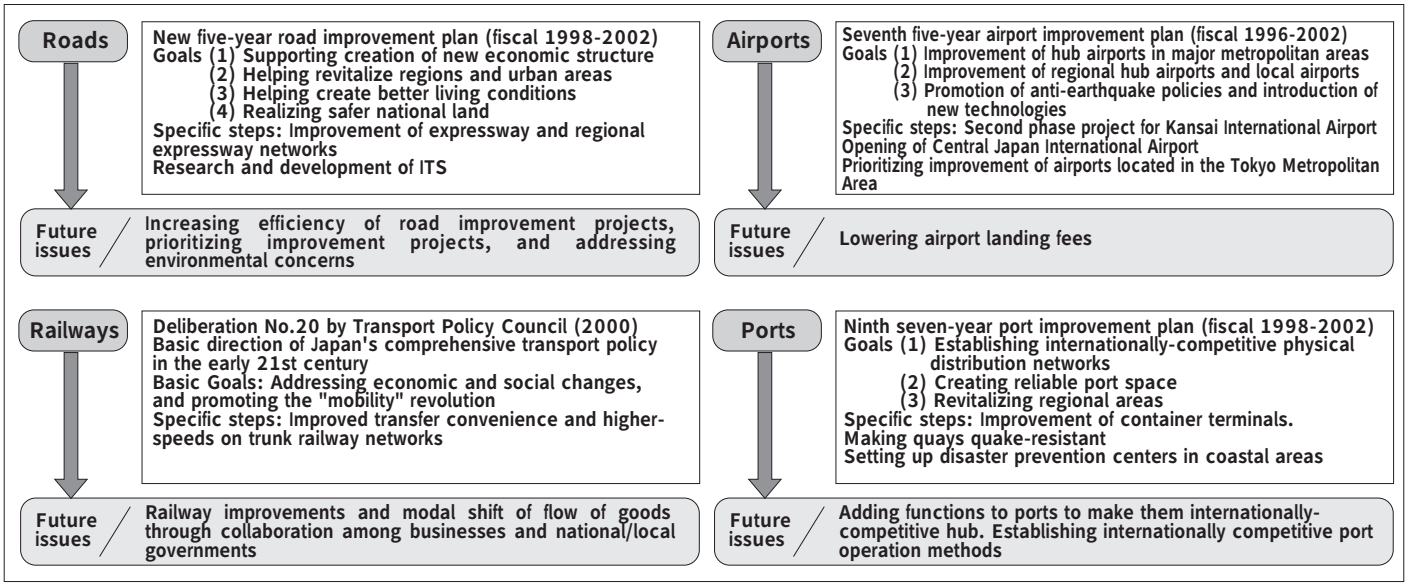
Under Comprehensive National Development Plans, Japan's transportation infrastructure was improved to form the backbone of national land development.

Development plans	Outline and goals	Main projects
Comprehensive National Development Plan (1962-)	The plan was designed to prevent the widening of gaps in development between regions and to achieve balanced national land development by distributing capital, labor, and technology appropriately among all regions. The plan focused on development of selected areas by designating 15 cities as "new industrial cities" subject to such development.	Start of Tokaido Shinkansen bullet train service (1964). 7,600 km expressway scheme (1966). Completion of Tomei and Meishin Expressways (1969)
New Comprehensive National Development Plan (1969-)	The plan was designed to promote preservation of nature, balanced regional development on a nationwide scale, revised use of national land, and improvement of surrounding conditions for safe, comfortable, and culture-rich livelihood. The plan centered on upgrading transportation and telecommunications networks.	Establishment of Honshu-Shikoku Bridge Authority (1970). Start of Sanyo Shinkansen bullet train service (1972). Scheme to reform the Japanese Archipelago(1973-)
Third Comprehensive National Development Plan (1977-)	The plan was designed to promote balanced use of all national land and improve living conditions in a comprehensive manner. The plan proposed making the natural environment, people's livelihoods, and manufacturing conditions harmonious while seeking to shorten the distance between workplaces and residences.	Opening of New Tokyo International Airport (1978) Start of Tohoku and Joetsu Shinkansen bullet train services (1982)
Fourth Comprehensive National Development Plan (1987-)	The plan was designed to create a multi-polar, dispersed land structure so as to achieve balanced development of national land. The plan promoted expanding networks for regional interaction in order to achieve these goals.	Scheme to extend expressway and regional expressway networks for 14,000 km (1987) Opening of the Seto-Ohashi Bridges linking Honshu and Shikoku and the Seikan Tunnel linking Honshu and Hokkaido (1988) Opening of Kansai International Airport (1994) Opening of Trans-Tokyo Bay Aqualine (1997)
Grand Design for the 21st-century (1998-)	The plan was designed to pave the way for creation of a multi-axial land structure while promoting participation by a variety of parties and regional coordination. The plan did not specify aggregate investment sums but showed priority areas for investment and policy direction for efficient land development.	Opening of the Akashi Kaikyo Great Bridge (1998) Start of Kyushu Shinkansen bullet train services (2004) Opening of Central Japan International Airport (2005)

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Fig.1 Outline of previous and future infrastructure improvement plans

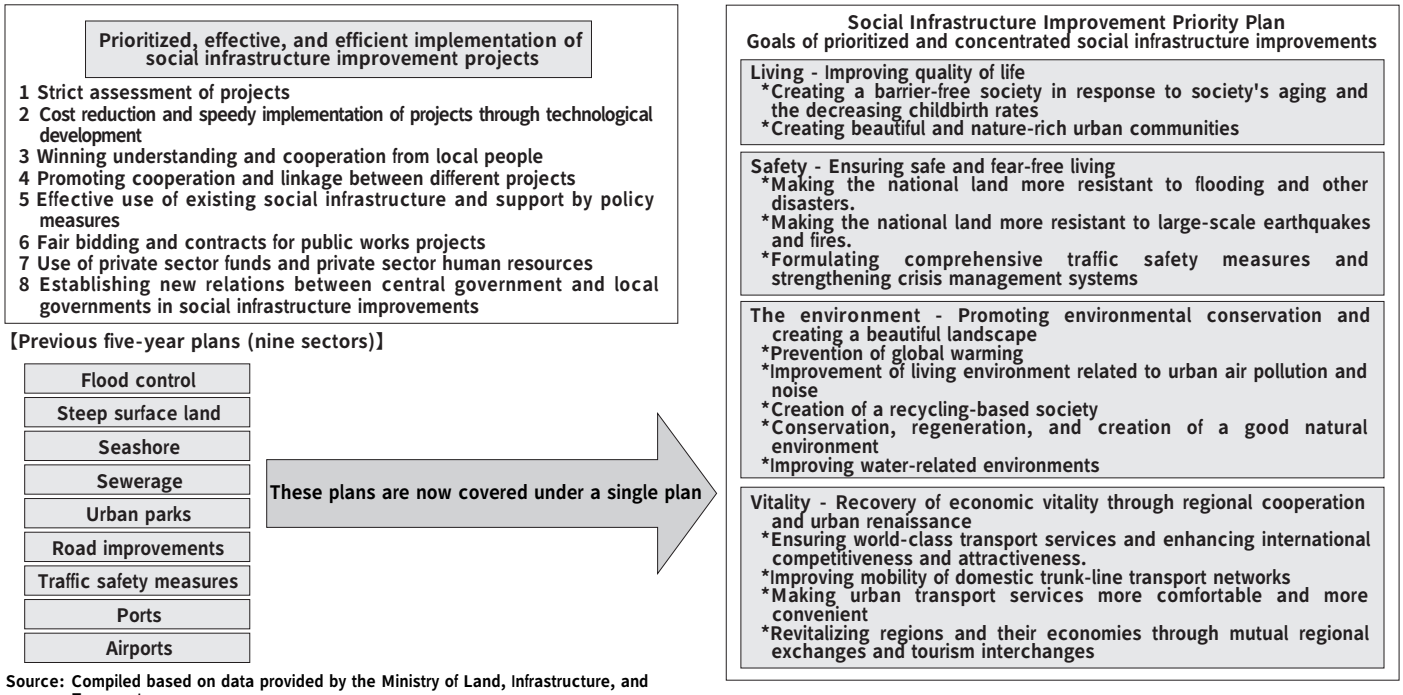
Under infrastructure improvement plans, improvements have been implemented by taking into account not only quantitative aspects of the plans but the qualitative aspects. How to secure financial sources should be considered when formulating these plans.



Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Fig.2 Outline of Social Infrastructure Improvement Priority Plan

The government reviewed the five-year Comprehensive National Development Plans that started in 1962, and the Cabinet approved the new Social Infrastructure Improvement Priority Plan (implementation period runs from 2003 through 2007) based on the Social Infrastructure Improvement Priority Law. As a result, improvement programs in 13 areas, including long-term plans in nine sectors such as roads, ports, and airports undertaken under the previous Comprehensive National Development Plans, were placed under the Social Infrastructure Improvement Priority Plan.



Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Table 2 Priority items for road improvement under the Social Infrastructure Improvement Priority Plan and examples of Assessment indexes

Road improvement projects focuses on the efficient construction of roads and their effective use based on a set of policy themes. As a result, high-quality, reasonably-priced road services are provided while the participation of citizens in road planning and management is made possible.

Policy themes	Priority items	Assessment indexes	Numerical targets for assessment indexes		
			2002		2007
Living	*Creating high-quality living environments by giving pedestrians and cyclists special priority areas *Making walking space for pedestrians barrier-free at major railway stations and their surrounding areas *Removing electric poles along non-trunk roads in residential areas and historical areas known for their landscape beauty in addition to trunk roads	Ratio of roads that are free of electric poles	7%	→	15%
Safety	*Concentrated implementation of traffic safety measures and comprehensive safety measures for pedestrians in dangerous areas along trunk roads	Percentage of traffic accidents resulting in death or injury	118 cases per 100 million vehicle km		
			About a 10% reduction in these rates (108 cases per 100 million vehicle km)		
	*Minimizing areas being isolated in the event of heavy rain and snow, road improvements to ensure traffic access to medical institutions in emergencies, and implementation of road-related measures against disasters, earthquakes, and heavy snow to support rescue operations during disasters	Maintenance rates for road structures (paved roads)	91%	→	Current levels maintained
	*Efficient and meticulously-planned maintenance and management of road structures, including the introduction of comprehensive asset management systems	Maintenance rates for road structures (bridges)	86%	→	93%
Environment	*Improvement of surrounding road environments, conservation of the global environment, and the creation of beautiful road landscapes through the expansion of trunk-road networks, and implementation of TDM measures, reduction of car-derived air pollution, and roadside tree planting	Percentage of targets achieved on night-time noise levels	61%	→	72%
Vitality	*Reducing traffic congestion through road improvement projects, thorough streamlining of street construction work, and promotion of ETC systems	Loss of time due to traffic congestion	An average 38.1 hours were lost per year for 100 million people Reduction of about 10%		
		ETC diffusion rates	5%	→	70%

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

1-7 Revenue Sources and the Use for Road Facilities

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There are three main revenue sources for road construction: (1) tax revenues collected from vehicle users at each stage of vehicle purchase, ownership, and use, and earmarked for road construction, (2) general revenues paid to the central government and local governments, and (3) borrowings under the government's fiscal investment and loan program. Tax revenues allotted for road construction account for the largest portion of the total sum. With increased investment in road projects, the government's collection of tax revenues designated for such projects has increased through the application of provisional tax rates. The first two categories of revenues are used to finance expenditures by the central government and local governments, with almost all of these funds allocated for general road construction projects or projects undertaken independently by local governments. Borrowings under the fiscal investment and loan program are used mainly to finance projects by the Japan Highway Public Corp. and other government-sponsored corporations to build toll roads.

Table 1 Vehicle taxes and revenues earmarked for road construction

	Tax	National tax/local tax	System	Use	Tax rate/tax amount	Basic tax rate
Acquisition stage	Consumption tax	National tax/local tax	Levied on vehicle price	General revenues (national and local)	25%(Note 2)	—
	Vehicle acquisition tax	Prefectural tax	Levied on acquisition price at the time of purchase (\500,000 or less is tax exempted)	Earmarked for road construction (local)	Private use 5%. Business use/light vehicles 3%. (Provisionally levied until March 2003)	3%
Ownership stage	Vehicle tonnage tax	National tax	Levied on vehicle weight at every vehicle inspection	Earmarked for road construction (national) Note 1	Private-use car example: \6,300 per year for every 0.5 ton of weight (Provisionally levied until April 2003)	\2,500
	Vehicle tax	Prefectural tax	Fixed amount levied on each owner as of April 1 every year	General revenues (local)	Private passenger car example: 1,001-1,500 cc \34,500 per year	—
	Light-vehicle tax	Municipal tax	Fixed amount levied on each owner as of April 1 every year	General revenues (local)	Private light-vehicle (four-wheel) example: \7,200 per year	—
Use stage	Gasoline tax	National tax	Levied on gasoline. Levied on diesel fuel	Earmarked for road construction(national)	\48.6 per liter. (provisionally levied until March 2003)	\24.3
	Local road tax			Earmarked for road construction(local)	\5.2 per liter. (provisionally levied until March 2003)	\4.4
	Diesel fuel transaction tax	Prefectural tax	Levied on liquefied petroleum gas	General revenues (local)	\32.1 per liter. (provisionally levied until March 2003)	\15.0
	Liquefied petroleum gas tax	National tax	Levied on fuel prices	Earmarked for road construction (national 50%; local 50%)	\17.5 per kg	\17.5
	Consumption tax	National tax/local tax		General revenues (national and local)	25%(Note 2)	—

Revenues earmarked for road construction

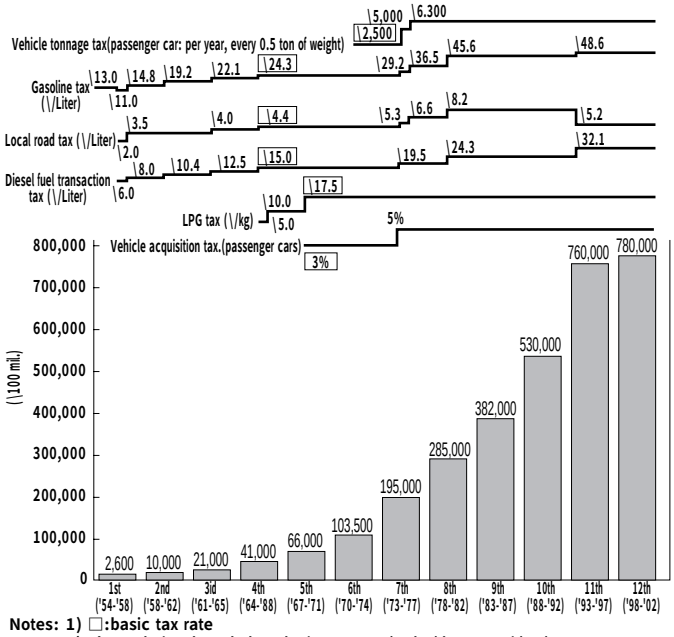
Note 1: Three-quarters of vehicle tonnage tax revenues are earmarked for road construction by the national government and one-quarter is earmarked for road construction by local governments.
Note 2: The 1% portion of the 5% tax rate is local consumption tax (local tax).
Source: Japan Automobile Manufacturers Association

Table 2 Revenue sources for road construction in major countries

		U.K.	France	Germany	U.S.A.	Japan
Revenue sources	Automobile-related taxes	To 2) and 4)	To 1) and 2) and 4)	To 1) and 4)	To 1) and 3)	To 1) and 3)
	Other taxes	To 2) and 4)	To 1) and 2) and 4)	To 2) and 4)	To 2) and 4)	To 2) and 4)
	Private-sector funds, tolls	To c) and d)	To c) and d)	To a) and d)	To b) and d)	To b) via fiscal . investment . and loan program
Use of collected revenues	1) Revenues earmarked by central (federal) gover nments for specific purposes	None	To a) and b) To c) and d)	To a) and d)	To a) and b) and d)	To a) and b)
	2) General-purpose revenues by central (federal) governments	To a) and d)	To a) and b) To c) and d)	To a) and d)	To a) and b) and d)	To a) and b)
	3) Revenues earmarked by municipal(state)governments for specific purposes	None	None		To a) and b) and d)	To a) and b)
	4) General-purpose revenues by municipal (state) governments	To a) and d)	To a) and b) To c) and d)	To a) and d)	To a) and b) and d)	To a) and b)
Parties in charge of road construction	a) governments	Roads	Roads	Roads	Roads	Road and .public transportation systems
	b) government-sponsored corporations	None	None	None	Expressways	Expressways and others
	c) private businesses	Toll roads	Toll roads	None	Toll roads	None
	d) public transport operators	Public transport	Public transport	Public transport	Public transport	Public transport

Source: Based on International Comparison of Data 2000, supervised by the Ministry of Land, Infrastructure and Transport

Fig. 1 Investment amounts under 5-year Road Improvement Plans and changes in provisional tax rates concerning revenues earmarked for road construction



Notes: 1) □:basic tax rate
2) The 2nd Plan through the 7th Plan were revised midway, resulting in some years overlapping

Table 3 Revenue sources for road investment (FY 2006 initial budget)

	State budget			Local budget			Fiscal investment and loan program
Revenue categories	Breakdown	Amount(\100mil.)	Ratios	Breakdown	Amount(\100mil.)	Ratios	
	Gasoline tax	29,629.06	80.6%	Local road transfer tax	3,072.00	6.3%	
	LPG tax	152.72	0.4%	LPG transfer tax	147.00	0.3%	
	Vehicle tonnage tax	5,851.00	15.9%	Vehicle tonnage transfer tax	3,767.00	7.7%	
	Loan redemption☆	601.57	1.6%	Diesel fuel transaction tax	10,556.00	21.6%	
	General revenues☆	534.32	1.5%	Vehicle acquisition tax	4,655.00	9.5%	
				General revenues☆	26,744.26	54.6%	
Total	Total	36,768.67	100.0%	Total	48,941.26	100.0%	13,500.15
	Users' burden(other than ☆)	30,996.72	84.3%				
Ratios			37.1%			49.3%	13.6%
					Total		13,500.15

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Table 4 Road-related budget

(Unit: ¥100 mil.)

Breakdown : Category	2005 initial	2004 initial	Growth rate
Temporary subsidies for local road improvements	7,408	7,072	1.05
Road improvements, etc.	23,589	24,990	0.94
Total for special accounts for road improvements	30,997	32,062	0.97
Subsidies for town planning	550	300	1.83
Subsidies for road improvements	100	-	-
Funds to promote the Hokkaido model project for the regional system	27	27	1.00
Promotion of the spread of ETC	56	-	-
Support for independent movement	4	-	-
Smoothing traffic through use of information systems	70	-	-
Technical development to promote the removal of electric poles	17	17	0.98
Measures concerning the setting of diverse and flexible rates for toll roads	89	115	0.77
Land register surveys for the smooth promotion of urban renewal	29	30	0.98
Support for the introduction of DPF/oxidation catalysts	-	40	-
Honshu-Shikoku debt alleviation	4,829	3,049	1.58
Total for general accounts	5,772	3,578	1.61
Total	36,769	35,640	1.03

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Table 5 Composition of road investment by implementing body

(Unit: ¥100 mil.)

	2005 initial	2004 initial	Growth rate
Total expenditures for general road projects	46,720.78	48,615.10	0.96
Total expenditures for toll road projects	16,217.35	18,850.35	0.86
Total expenditures for projects undertaken independently by prefectural and municipal governments	30,500.00	37,100.00	0.82
Total	93,438.13	104,565.45	0.89

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

Table 6 Breakdown of general road project funds

(Unit: ¥100 mil.)

Category	2005 initial	2004 initial	Growth rate
National expressways	2,000.00	1,720.52	1.16
General national roads	20,797.50	21,737.38	0.96
Municipal roads	6,885.03	7,463.53	0.92
Streets	9,132.41	9,774.32	0.93
Cold weather	992.16	1,083.89	0.92
Machines	176.08	190.81	0.92
Research expenditures	301.36	279.78	1.08
Traffic safety	4,693.39	4,458.42	1.05
Roadside improvements	104.30	109.78	0.95
Grants to independently-operated public corporations	14.65	14.71	1.00
Road related social infrastructure	1,623.90	1,781.96	0.91
Total expenditures for general road projects	46,720.78	48,615.10	0.96

Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport