TRANSPORT POLICY

IN PERSPECTIVE: 2010

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Preface

Automobiles made rapid advances in the last century, surpassing railways to take over the main role of surface transport, and contributed greatly to the advancement of global socio-economic systems. Therefore, the 20th Century is very much "the Century of Automobiles".

Automobiles are now playing a major role in moving people and transporting goods. Our lifestyles and the economy are based upon the mobility provided by automobiles in all aspects of our society, from where we live and how we do business. Our "automobile-dependent society" has become the base for more affluent lifestyles. On the other hand, road traffic problems including traffic accidents, traffic congestion, and environmental problems such as global warming and air pollution, social problems including the transport poor, urban sprawl and the decline of city centers, are widely acknowledged as serious problems throughout the world.

Under these circumstances, we are reaching a major turning point in the movement toward a mature motorized society for the 21st Century. Fortunately, advanced road traffic systems and environmentally friendly next generation motor vehicles that are safer as well as more environmentally friendly are beginning to emerge. These include technological innovations for motor vehicle themselves, such as less polluting and more efficient hybrid and electric motor vehicles, and the development of intelligent transport systems (ITS). Since Japanese society is now facing decreasing total population together with rapid aging, we have to solve a variety of existing problems and move towards a road and motor vehicle transport systems for a vibrant and sustainable society.

The Japan Research Center for Transport Policy was founded in 1971. Since then, the Center (a private non-profit organization involving transportation specialists and researchers active in universities, private industry, government, and local governments) has been carrying out interdisciplinary academic research focused on transport policies for roads and motor vehicles, and providing educational activities and proposing policies regarding a comprehensive transport system that will contribute to the beneficial development of Japanese society. It has been formally certified as a Public Interest Incorporated Association under the new organization reform act.

Every year since the year 2000, with the full support of the Japan Automobile Manufacturers Association, the Japan Research Center for Transport Policy has published "Research on Automobiles and Transport – Environment and Policy" annually, a booklet giving a general view of the trends in policy and research concerning motor vehicles and road traffic in Japan. This is a translation of major parts of the booklet with additional introduction.

The original work was completed mainly for Japanese interested in transport policies. Bearing in mind that the amount of information in English concerning transport policy of Japan in limited, this booklet summarizes the current problems and policies in Japan and other countries concerning transport, focusing mainly on Japan, and provides some basic statistical data. We intend this booklet to provide comprehensive information that will be useful for those interested in the transport policy of Japan. We hope that this booklet will be effectively used for a wide range of educational, research, and policy study activities in many nations.

Finally, we would like to express our sincere gratitude to the Japan Automobile Manufacturers Association, which has given us its full support, and to all those who have given their valuable time in writing or editing, or who have provided important data for inclusion in the booklet.

November 2010

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TRANSPORT POLICY IN PERSPECTIVE 2010

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Current as of April 2010

TRANSPORT POLICY IN PERSPECTIVE: 2010

Japan Research Center for Transport Policy

Automobile and Road Transport Policies in Japan

Masahiro Sugiyama

1. Domestic modal share of transport and automobile transport statistics in Japan

Japan consists of four main islands (Honshu, Hokkaido, Shikoku, and Kyushu), all surrounded by sea. The feature of its geography is that it has no international land borders. The area of the country is approximately 380,000 square kilometers, where more than 127 million people live. Population, like in some other developed countries, is projected to decrease in the future; according to an estimate, it will have fallen to 44.7 million by 2100 — about one third of the current numbers. Japan' s mountainous geography limits the habitable area. The population tends to be concentrated in city areas, where s traffic congestion countermeasures are needed. By contrast, in rural areas, many places are facing depopulation; ensuring transport services (due to the withdrawal of conventional public transport, etc.) is becoming an urgent problem awaiting solution. Besides the four main islands, there are over 68,000 islands within Japan, of which over 400 are inhabited. For those inhabited islands, the current issue is how to continue providing transport services by sea and/or air over routes that are not likely to be profitable.

A highly mobile society inevitably depends on transport services provided by motor vehicles, railways, ships, and aircraft. In terms of the domestic transport share by mode of transport, motor vehicles take a high percentage for both passengers and freight transport. Passenger transport figures for the fiscal year 2008 assign the biggest share (74.2% of passengers, and 64.9% of passenger-kilometers) to motor vehicles. Railways come in the second with figures of 25.5% and 29.0%, respectively; for maritime transport,, the figures are 0.1% and 0.3%; and for aviation, 0.1% and 5.8%. For freight transport in the same year, 91.7% of the tonnage, and 62.1% of ton-kilometers, were transported by motor vehicles. Those figures are 0.9% and 4.0% for railways; 7.4% and 33.7% for coastal shipping; 0.02% and 0.19% for aviation: so the motor vehicle percentage share was the highest here, too. Since 2005, passenger transport has shown a slight upward trend in the railway percentage; freight transport shows an increase in the motor vehicle percentage, and a decrease in the coastal shipping percentage (in terms of ton-kilometers). Those changes, however, were far from drastic; all in all, the trend has been toward stability.

Historically, ship and rail have been in the first stage mode of modern transport in Japan. It was after World War II that motor vehicles and aircraft began to be used in popular. In the fiscal year 1960 (about a half century ago), for passenger transport, the railway percentage was 60.6% for the number of passengers and 75.8% in passenger-kilometers — considerably above the motor vehicle percentage (38.9% for the number of passengers and 22.8% in passenger-kilometers). But in freight transport, the motor vehicle percentage in transported tonnage was 75.8% even in the fiscal year 1960. However, in ton-kilometers for the same year, it was only 15.0%; not until about 20 years later did it exceed 50%. We can identify a significant development in freight transport by pointing to the major role that coastal shipping used to play. In ton-kilometers, the coastal shipping percentage was close to 50% until it yielded first place to motor vehicles in the fiscal year 1985. Therefore, in Japan's case, coastal shipping would be able to play a fallback role in case of a "modal shift" from motor vehicle trunk line transport services to rail or marine transport.

In motor vehicle transport statistics, passenger transport is roughly divided into buses, passenger cars, and trucks for private use, with the biggest share going to passenger cars. Passenger cars are further divided into commercial use and private use vehicles; those for private use have the highest share of tonnage. Those for commercial use are required by the Road Transport Law to obtain a license (or, as is mostly the case in recent years, a permit), and to transport passengers (or freight) on request. Private use vehicles are defined as passenger vehicles other than those used for commercial use. A peculiar category in the Japanese system is that of "light motor vehicles," reserved for vehicles whose total engine displacement is less than 660 cc. Statistics for private-use passenger cars and trucks are therefore derived from combined lists of "registered motor vehicles" and "light motor vehicles."

Japanese Transport Trends for Past Years

			FY 2007	FY 2008	FY 2009
Transport volume[1]	Passengers (×100 million passenger-kilometers)	Total	14128	13949	–
		Motor vehicles for private use	8360	8221	–
		Motor vehicles for commercial use	831	838	–
		Railways	4055	4046	–
		Maritime	38	35	–
		Aviation	843	809	–
	Freight (×100 million ton-kilometers)	Total	5822	5576	–
		Motor vehicles	3548	3464	–
		Railways	233	223	–
		Coastal shipping	2030	1879	–
		Aviation	11	11	–
Number of motor vehicles owned* (×1000)[1]		Total	79081	78801	–
		Trucks	6884	6568	–
		Buses	231	230	–
		Passenger cars	41469	40799	–
		Special vehicles	1578	1528	–
		Two-wheeled vehicles	1479	1505	–
		Light motor vehicles	27440	28171	–
Driving license holders** (×1000)[2]		Total	79907	80448	80812
		Male	45413	45518	45539
		Female	34495	34930	35273
Traffic accidents[2]		Number of accidents (× 1000)	832	766	737
		Fatalities within 30 days	6639	6023	5772

* Figures as of end of March (registered vehicles + light motor vehicles)
** Figures as of end of December

References for data:
1) Annual Statistical Report on Motor Vehicle Transport, Annual Statistical Report on Air Transport, Annual Statistical Report on Railway Transport, and Annual Statistical Report on Coastwise Vessel Transport
2) Traffic Statistics

In freight transport statistics, motor vehicles are divided into those for commercial use and those for private use. Under each category, volumes transported are assigned to both registered motor vehicles and light motor vehicles. Recently, both in terms of tonnage and in terms of ton-kilometers, there has been an upward trend in commercial use percentages, the reason being that commercial transport, which has a higher load factor, is now offering personalized services that make it competitive with private transport.

2. Japan's transport policies in transition

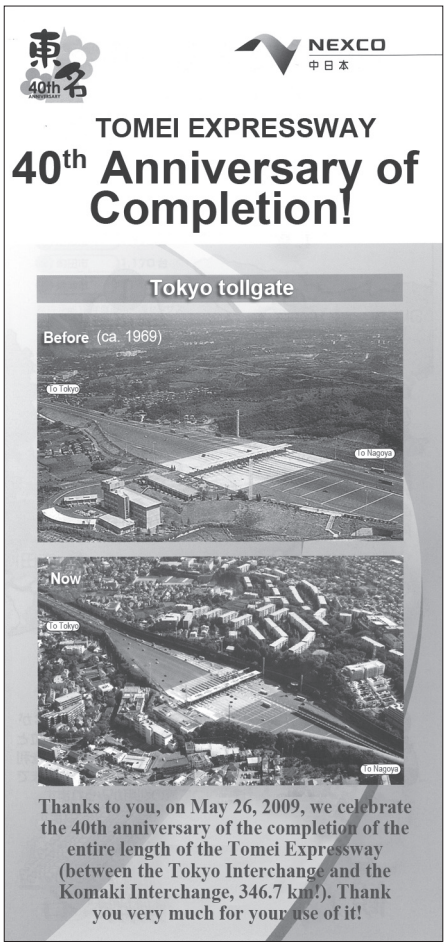
One of the biggest changes in policies regarding roads, which are playing a linking role for the motor vehicles transport services, was the privatization of the four road-related public corporations that had been building and managing toll roads. Another was the transfer of the special funding source system for road works, under which earmarked taxes (e.g., the so called gasoline tax) had been used for road improvement, to the general revenue fund (more about this in Chapter 4). At this point, let us look at the main changes in each mode of transport.

Railway services were at first under the direct control of the government. The Japanese National Railways (JNR), which became a public corporation after World War II in 1949, had the same management nationwide. Due to the inefficiencies in this unified nationwide organization and mismanagement of the public corporation, an enormous backlog of deficits had accumulated. The major change was finally brought about: Japanese National Railways was reformed, and, in April, 1972, it was regionally divided and privatized. Honshu was divided into three areas (east, central, and west Japan) served by three railway companies; one company was allotted each to the islands of Hokkaido, Shikoku, and Kyushu. The management form decided upon was joint stock companies. Traditionally, private railway companies, mainly in metropolitan areas, played a greater role in Japan than in other countries. Now, for more than half a century, there has been a history of cooperation between different railway companies in managing direct transport services over their own routes. The six established railway companies from JNR, in their form of management, are now no longer different from the already existing private railway companies; it is possible for them, for example, to be involved in new businesses. In railway stations in recent years, various commercial facilities have been set up and we can buy goods through multi-purpose magnetic tickets (SUICA, etc.) in those facilities. In urban transport, private management plays the same role with busses as it does with rail; the record of transport achievements for private management always exceeds that for public management. The freight railway company was created as a single company for the whole country. Because it didn't own railroad tracks, the separation system of operation and infrastructure was adopted. That system was implemented for the super express railway train Shinkansen (as a typical example) when the Japanese National Railways was reformed.

The reform of Japanese National Railways, by the way, gave considerable impetus to the reform of railways in the developed countries in Europe.

As for ocean shipping, the Japanese merchant marine fleet, which had been dealt a crushing blow in World War II, was reorganized into a grouping of ocean shipping companies in 1964 with preferential financing from the government. This was done in order for the fleet to play a role in the transport sector to help to sustain Japan's high economic growth. Ninety-five companies (which included most of the ocean shipping companies of those days) were organized into eighty-eight companies in six groups. This grouping of ocean shipping companies is considered to be the most significant event in Japan's maritime activity since World War II. After further mergers of the core companies among those six groups, there are now three major companies — Nippon Yusen Kaisha, MOK Lines, and Kawasaki Lines. Those three major companies account for about 70% of the total income in ocean shipping.

In 2008, the Japanese merchant marine fleet transported 11.3% of the world's cargo by volume. However, when it comes to the nationality of a ship, the number of



40th anniversary of the completion of the entire Tomei Expressway
Material provided by: Central Nippon Expressway Company Limited, Tokyo branch

Ohashi Junction
Photo provided by: Metropolitan Expressway Co., Ltd.

Skyliner, Narita Sky Access Line (Nippori station)
Photo provided by:
Professor Dr. Katsutoshi Ohta

foreign chartered ships (e.g., flag-of-convenience ships) is overwhelming; increasing the number of Japanese ships and getting them registered is an ongoing policy problem that needs to be solved. Also, the international standing of ports in Japan is getting lower and lower; in terms of volume of containers handled, the Port of Tokyo and the Port of Yokohama dropped to the world's 26th and 36th places, respectively, in 2009. The Japanese government is attempting to salvage this situation by pushing for improvement of those ports in the Tokyo-Yokohama area and the Osaka-Kobe area, utilizing their strategic situation (i.e., with big cities as their hinterlands) to develop them as ports for container cargo.

After World War II, all Japanese commercial aviation was prohibited by GHQ (General Headquarters). It was reopened in 1951, and international flights started in 1954. The government policies of 1970 and 1972 had regulated the airline business area with a view to promoting coexistence and shared prosperity among airline companies. In 1985, however, following the trend toward the deregulation policy (started in the U.S.A.), those regulations were rescinded, which made it possible for new airline companies to enter into the market. Thanks to those policy changes, Skymark Airlines, Air DO, and others have already started up businesses. When commercial aviation went back into operation, the initial plan was to form two domestic airline companies. The reality configured itself as three major companies — Japan Airlines, All Nippon Airways, and Toa Domestic Airlines (later changed to Japan Air System). Later, Japan Airlines (handling mainly international flights) and Japan Air System (mainly domestic flights) merged as Japan Airlines, so that Japanese airline system was consisted in two major companies. Finally, Japan Airlines, which had been suffering from deficit after the merge, fell into bankruptcy in January, 2010; it is now trying to reorganize, with 2013 as the deadline, under the direction of the Enterprise Turnaround Initiative Corporation of Japan.

As of April, 2010, there are 83 airports that conform with the Airport Law. The three international airports that are used for international air transport — Narita, Kansai, and Chubu — are structured as joint stock companies; Tokyo (Haneda) and Osaka (Itami) international airports are operated under government management. Narita, which is located in the metropolitan area of highest demand, is purposed mainly for international transport with two runways (4000 and 2500 meters), and 220,000 slots per year. Tokyo (Haneda), which has been used for domestic transport, has four runways (3000, 3000, 2500, and 3120 meters); total 350,000 slots per year. From October 2010, an international flight service was also reopened. Ultimately, Narita and Haneda airports are to have 747,000 slots per year in total.

3. The automobile industry and automobile transport policies in Japan

The automobile industry is the key industry of Japan. Currently, the number of people who work in motor vehicle-related businesses is over 8% of the total work force. Income from shipment of its products is less than 17% of the total income from all shipments. The automobile industry share for capital investment is less than 22% of all capital investment, and its share for research and development is over 19%; it is indeed the driving force in Japan's economy. Led by Toyota, Nissan, and Honda, there are 14 motor vehicle manufacturers. Normally, more than 10 million four-wheeled vehicles per year have been produced, but in 2008 and 2009, the numbers of vehicles produced were below these figures of previous years. In 2009, in particular, the number dwindled to only more than 7.9 million. The number of new four-wheeled vehicles sold decreased four years running; in 2009, it went down to 4,609,000. Since 2005, the number of motor vehicles owned has been over 75 million. Though its recent trend is downward, still the number of passenger cars is increasing slightly; as of December, 2009, it was 58 million. In 2009, the number of people who had a driver's license was more than 80 million; this signifies a move into an era in which everybody drives.

Though the issues of recent Japan's automobile industry are now facing to the worldwide economic recession, the progressive yen scale down and so on, still there have been steady improvements in environmental measures, both "hard" and "soft."

The amount of carbon dioxide emitted during the manufacturing process has been consistently reduced. Legal performance standards of new vehicles on fuel efficiency and emission gases have been very successful in reducing greenhouse gas emission and regional air pollution. By 2008, the average mileage of a gasoline-powered motor vehicle had been improved to 16.9 kilometers per liter; the reduced amount of emissions conforms to the world's strictest regulatory standard. In addition, steps have been taken to spread and promote ecological-driving (also energy-saving driving), to improve preventive equipment for safety to avoid accidents, and to develop and promote automatic safety equipment; those efforts have contributed to a reduction in the number of traffic accident fatalities. Though motor vehicle improvements can not by themselves reduce the number of traffic accidents, still the annual number of fatalities (4914 in 2009) has decreased nine years running, which achieved the government's goal three years in advance.

On the minus side, the automobile industry and users of motor vehicles are forced to bear an excessive tax burden. There are nine different taxes related to motor vehicles; in the initial national budget for 2010, the motor vehicle taxes were 10.7% (7,694.8 billion yen) of the total income from taxes. The purchaser's initial tax burden is heavy by international standards (motor vehicle tax, motor vehicle tonnage tax, and motor vehicle purchase tax).

Motor vehicle traffic policies are trending toward deregulation. Private motor vehicles are by far the biggest number of motor vehicles owned. (in 2008 percentage breakdown of motor vehicles in private use: passenger cars: 99.7% of ordinary cars, 99.0% of small cars; buses: only 21.6% of ordinary buses, but 81.4% of small buses; trucks: 62.4% of ordinary trucks, 98.1% of small trucks.) Although business activities are not permitted to use private motor vehicles, such illicit activities can still be occurring. The reality is, however, that given the overwhelming numbers of private vehicles, it is hard to take effective countermeasures. This is a problem in other countries as well.

As for commercial motor vehicles that provide transport services: in 1998, the Ministry of Transport (reorganized as the present Ministry of Land, Infrastructure, Transport and Tourism) announced its intentions to basically abolish the regulations and entrust market mechanism in supply-demand adjustment. Pursuant to that policy, access to the business shifted from a licensing system to a permit system. As far as fare regulations were concerned, bus business is only required to provide advance notification of fare changes. With the taxi business, the authorization system remained, but the criteria for authorization were now limited to the upper limit of the fare. As for trucking businesses and freight forwarding business, both of which had already been deregulated in 1990, fares can be freely determined. Basically, the expectation is for the business to regulate itself through competition in the marketplace.

Emblem encouraging use of the Aqua-Line
Material provided: Chiba Prefecture

4. Japan's road policies

Japan really had no era of coach transport. Because there was an abrupt shift from transport on foot to motor vehicles, there were insufficient road capital stock for building a system to accommodate automobile transport. The situation of those days is characterized in the report of the Watkins Commission (1956), which made a feasibility study for the expressway between Nagoya and Kobe (requested by the Japanese government, which was inquiring the expressway plan). In the beginning of the report it was stated that "The roads of Japan are incredibly bad. No other industrial nation has so completely neglected its highway system." After World War II, the toll road system and the special(earmarked) funding source system for road works were introduced as the two main road policy. For the former, with the Law Concerning Special Measures for Highways (1952) as a basis, the building and management were conducted by public corporations. For the latter, in accordance with the Emergency Measure Law for Road Improvement (1953), a system was established in which road users paid for their road usage, creating a source of revenue to be used only for road improvement. Those systems enabled the Five-year Road Improvement Program that was started in 1954 to be carried forward. The Five-year Road Improvement Program was combined with other transport infrastructure programs to become the Priority Plan for Social Infrastructure

Improvement . Those two systems played a significant role in accumulating Japan's road capital stock.

Toll roads were built and managed by (among others) four public corporations that included the Japan Highway Public Corporation (founded in 1956). As part of the program, started in 2002, for streamlining special public corporations, privatization of these corporations was considered. In 2005, the four road-related public corporations (the Japan Highway Public Corporation, Metropolitan Expressway Public Corporation, Hanshin Expressway Public Corporation, and Honshu-Shikoku Bridge Authority) became joint stock companies. At that time, the separation system of infrastructure was adopted. That is: Japan Expressway Holding and Debt Repayment Agency (JEHDRA) would hold expressways and repay the debt, and six expressway companies (the Japan Highway Public Corporation alone was divided among three regions) would build, manage, and collect tolls. Unlike the privatization of railways, it typifies a separation system of infrastructure provision from its operation.

While many countries with advanced road systems are opting for road pricing, the Democratic Party of Japan, when it came into power, announced its new policy on toll-free expressways. In June, 2010, social experiments started in which the toll was eliminated in limited areas. That toll-free policy goes against the redemption principle, which was the rationale for setting the toll. The new policy means that the burden will now shift from the user to the taxpayer. It will distort the competitive abilities of transport modes that are competing with the expressway service; there are many problems to be reconsidered.

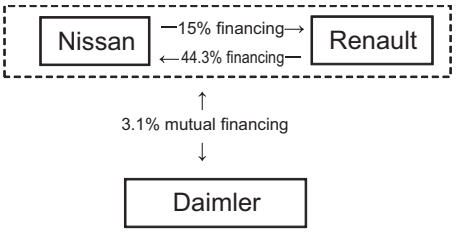
As of August, 2010, the total length of Japan's expressways is 7722 kilometers. The final goal is to construct 14,000 kilometers, which is based on the following criterion: wherever you live in Japan, it will take you no more than an hour to access to the nearest interchange.

The special (earmarked) funding source system for road works was based on the principle that those who are benefited are to pay; the system was excellent in its rationality (paying for the benefit you received from the service), fairness (avoiding free-riders), and stability (insuring a necessary source of revenue by usage). Eight different tax sources (e.g., the so called gasoline tax) were utilized to fund road improvement. Nevertheless, in the face of those advantages, the financial authorities started to propose, beginning around 1980, the transfer of the road improvement system to the general revenue fund, on the pretext that the total amount of tax paid was too great, or, that road improvement, in their opinion, had already reached a level of sufficiency.

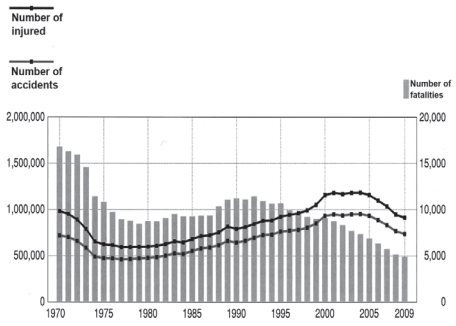
It was after the turn of the 21st century that policies to transfer road improvement to the general revenue fund discussed concretely. In the beginning of 2005, government policies on reviewing the special(earmarked) funding sources for road works were announced; the decisions were made at the Cabinet level. In the end, by revising the Emergency Measure Law for Road Improvement and its successors, the system was transferred to the general revenue fund for the fiscal year 2009. The political process of discussion of such legislation is extremely complicated; unless directly involved in the discussion, there is much that is not easy to understand.

The logic of the transfer to the general revenue fund contains not a small number of contradictions. A typical example is how the provisional tax rate was treated. On the assumption that the fund for road improvement would be insufficient, the provisional tax rate for many of the taxes had been set to be approximately double the tax rate in the main rules. However, even after the transfer to the general revenue fund, the policy to keep the provisional tax rate was adopted. This obviously contradicts the argument that road improvement had reached a level of sufficiency. It is nothing but an excessive burden on road users. That is the first of many points regarding logical consistency in discussing the transfer to the general revenue fund. In 2006, members of the Japan Research Center for Transport Policy made the urgent suggestion that the logical inconsistency be corrected.

Future road improvement in Japan is to be carried forward under general revenue funding; this will require an objective and precise understanding of the road stocks so as to fulfill the needs of the actual users.

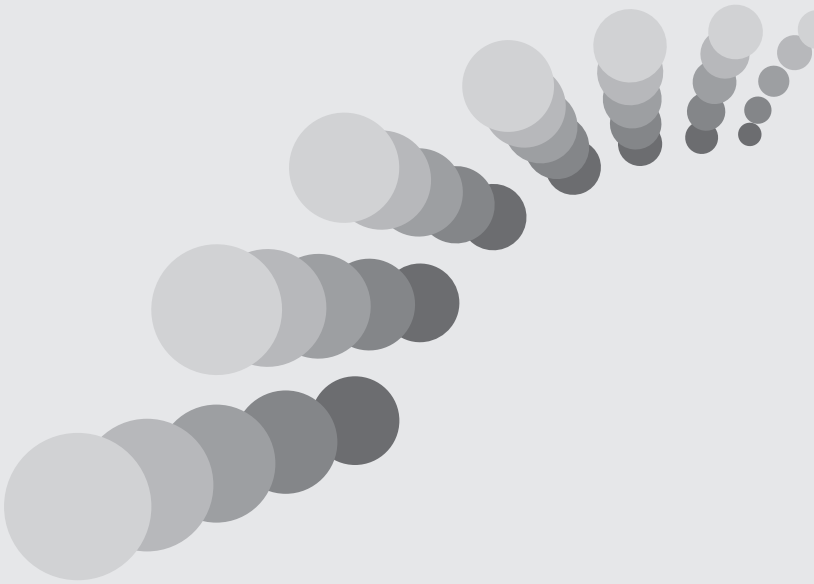


Financial arrangements between motor vehicle manufacturers
Source: Japan Automobile Manufacturers Association, Inc.



Changes in incidence of traffic accident
Source: Japan Automobile Manufacturers Association, Inc.

Transport Today



1-1 The Quality and Quantity of a Changing Mobility

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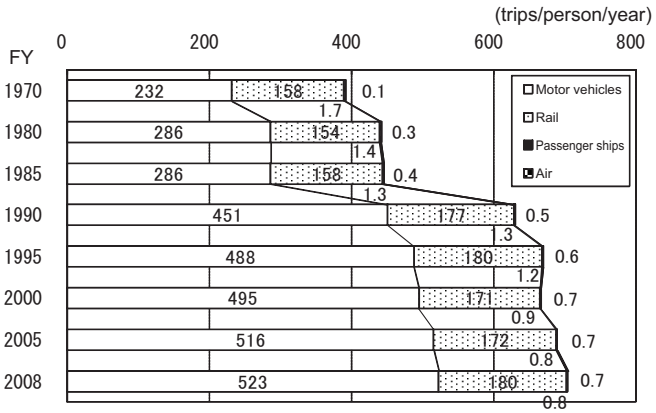
Kiyoshi Takami

We now have the basic data on the movement of people and goods. In regards to the flow of people, in recent years, the number of trips per person is on an upward trend, while the distance traveled is on a gradual decrease . The data also reveals an upward trend in the motor vehicle share of trips of the elderly and women, and in the number of private trips. Regarding the flow of goods, the tonnage per person has been constantly decreasing since the latter half of the '90s; transportation in ton-kilometers has been almost flat although there some periodicity is observed. In ton-kilometers, the share of motor vehicles is increasing noticeably.

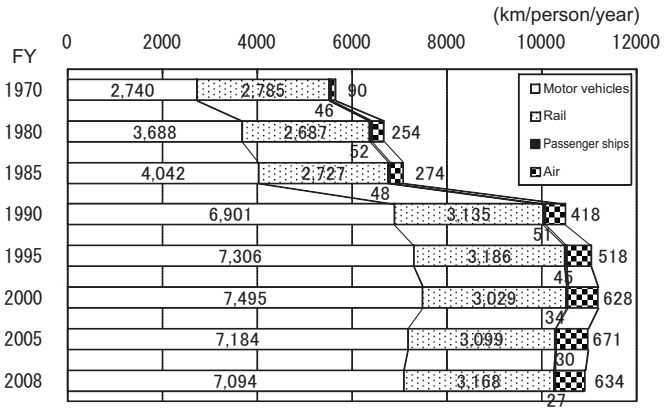
□ Passenger transportation in the past 35 years. In regards to motor vehicles, the number of trips and the distance traveled per person per year have been generally increasing, although the distance traveled started to decrease from FY 1999, then became stable. Railways, after their peak in the early 90's, decreased to the lowest level in FY 2004, then began another upward trend. There has been a near-constant decrease in travel on passenger ships, and an increase in air travel, but for the past several years, both have remained almost stable. The cumulative total of all those transportation modes shows that the number of trips has been generally on an upward trend, while the distance traveled has shown a generally downward trend. (Fig. 1 & 2)

Fig. 1 Annual number of trips (per person)



Source: Transportation-related statistics data collection (latest edition, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 2 Annual distance traveled (per person)

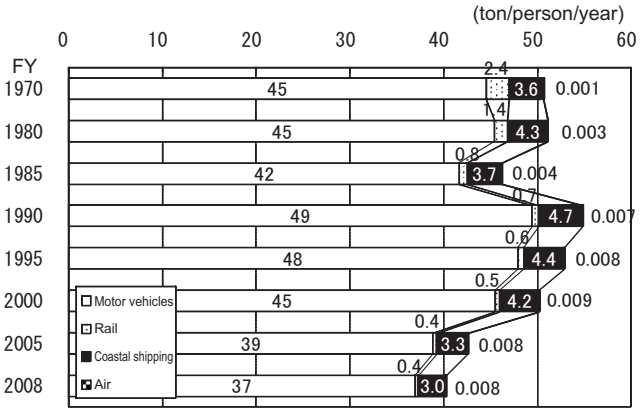


Source: Transportation-related statistics data collection (latest edition, Ministry of Land, Infrastructure, Transport and Tourism)

Note: "Motor vehicles" includes small-engine vehicles ("light motor vehicles") since 1987, which explains the noticeable change in the figures beginning around that year.

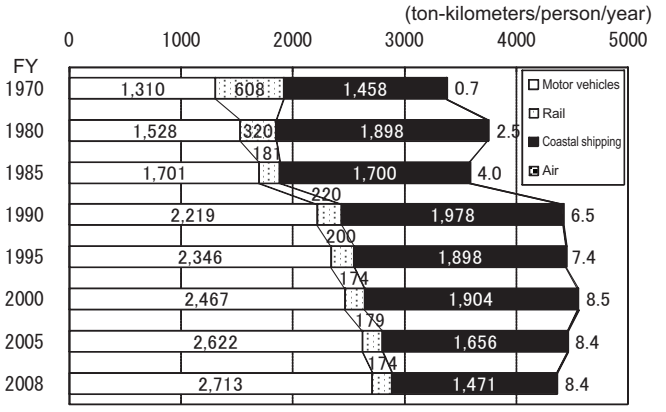
□ In regards to freight transport, the annual transportation tonnage per person has been decreasing since around 1970 for railways, and since the '90s for motor vehicles and coastal shipping; for aircraft, the figures have remained flat in recent years. In annual transportation ton-kilometers per person, there is an upward trend for motor vehicles and a downward trend for coastal shipping; for railways and aircraft, the figures have been flat for the last ten years or so. (Fig. 3 & 4)

Fig. 3 Annual freight transport tonnage (per person)



Source: Transportation-related statistics data collection (latest edition, Ministry of Land, Infrastructure, Transport and Tourism)

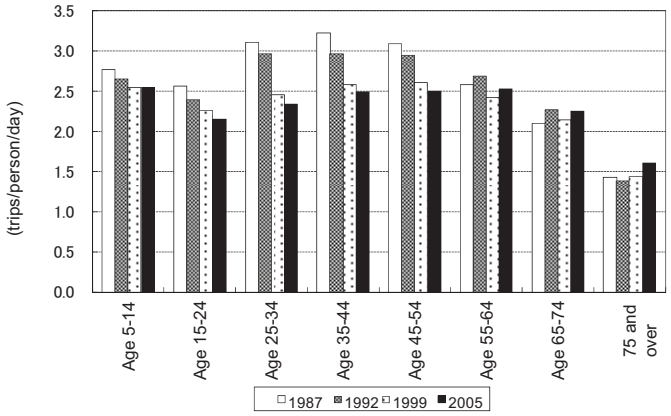
Fig. 4 Annual freight transport ton-kilometers (per person)



Source: Transportatio-related statistics data collection (latest edition, Ministry of Land, Infrastructure, Transport and Tourism)

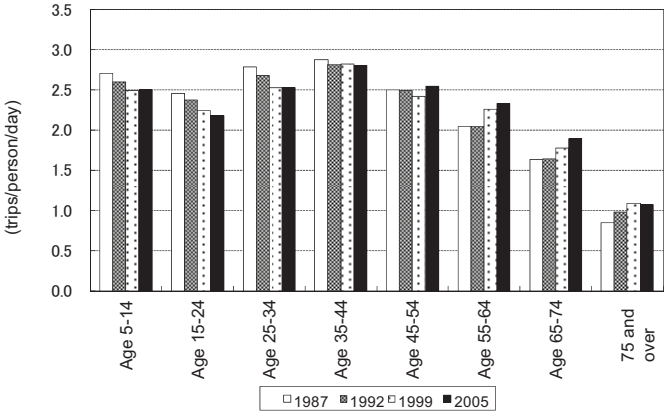
□ The number of trips per person per day is decreasing for males 54 and younger and females 34 and younger, while it is increasing for the elderly. For the total of all age groups, it has been decreasing year by year until recent years, when the trend flattened out. (Fig. 5 & 6)

Fig. 5 Changes in the number of trips per male per day (nationwide, weekdays)



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

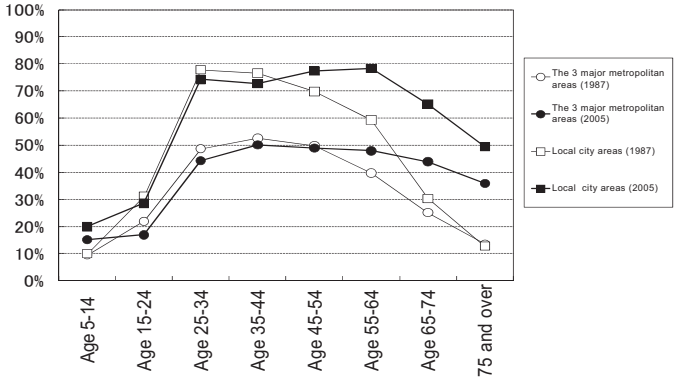
Fig. 6 Changes in the number of trips per female per day (nationwide, weekdays)



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

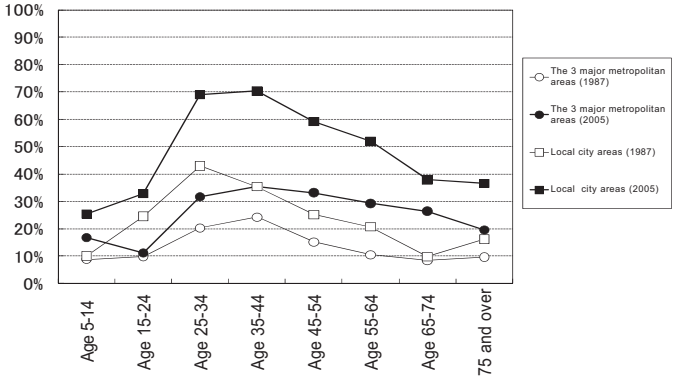
□ Looking at the modal share of motor vehicle by gender and by age, we see that for males, there was a greater increase among the elderly; for females, the increase was through most age groups. This tendency is more noticeable in local city areas than in the three major metropolitan areas. The modal share of motor vehicle by females aged 25 to 44 in local city areas has increased to that of males. (Fig. 7 & 8)

Fig. 7 Changes in the modal share of motor vehicle by males (by age, weekdays)



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

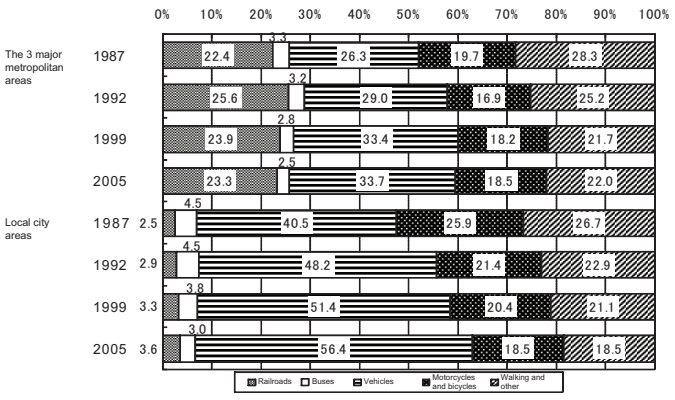
Fig. 8 Changes in the modal share of motor vehicle by females (by age, weekdays)



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 9 Changes in the modal share(based on the main/ representative mode) (weekdays)

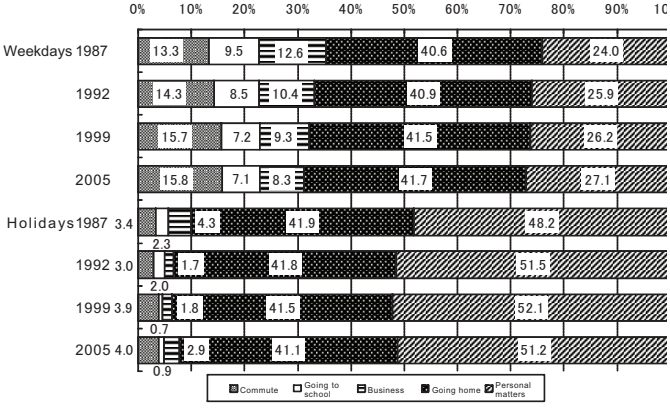
■ The motor vehicle share is on an upward trend both in the three major metropolitan areas and in local city areas. Motor vehicle use is even higher on holidays than on weekdays.



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 10 Changes of the trip purpose

■ As for the trip purpose, here is a downward trend for "going to school" and "business." while "personal matters" is on an upward trend.



Source: 2005 Survey on Transportation Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

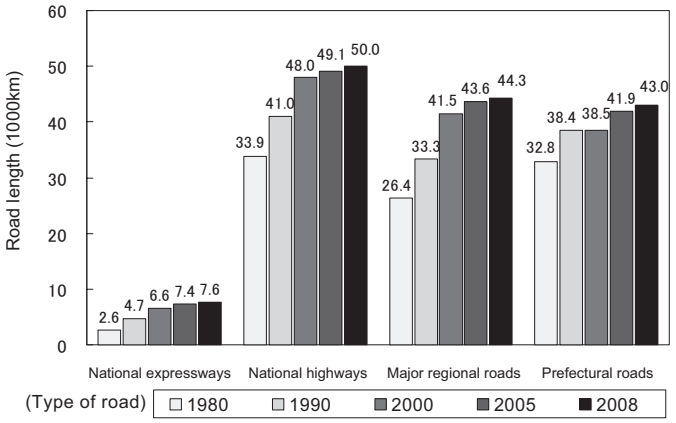
1-2 Road Network Today

Chief Researcher, The Institute of Behavioral Sciences
Tsutomu Yabe

The length of our roads has been steadily extended thanks to ongoing road improvement, yet it is not still sufficient for traffic demand. As a result, the average speed on roads remains unchanged at a lower level. A case in point: in city centers such as Tokyo and Osaka, and in DID(Densely Inhabited District) areas , there is still chronic traffic congestion. Given that background, road network improvements (e.g., the ring road improvement plans that are proceeding in the three major metropolitan areas) are obviously playing a significant role.

Fig. 1 Changes in the length of completed roads by road type

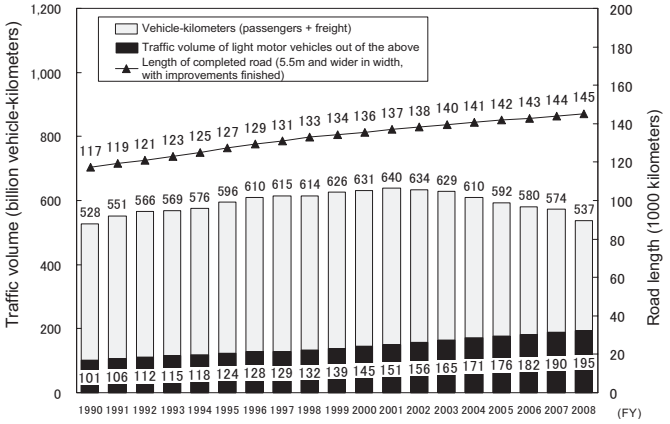
■ For all types of roads, the length of completed road (i.e., with improvements completed) is increasing steadily.



Source: Road Statistics Annual Report (Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 2 Changes in traffic volume and road length

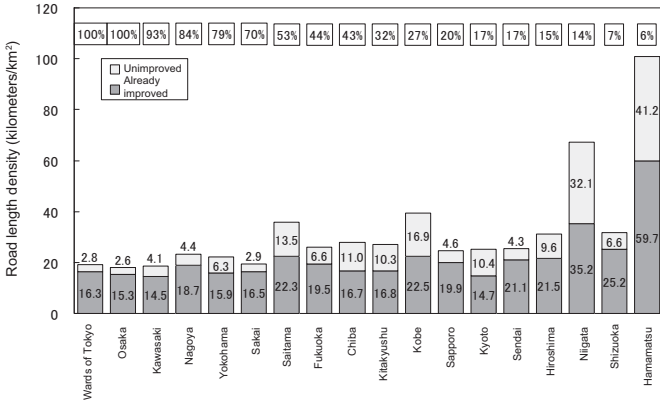
■ The figure for traffic volume in vehicle-kilometers, after peaking in 2001, is on a downward trend; but the figure for light motor vehicles is on an upward trend. Road length nationwide is steadily increasing.



Source: Transportation–related statistics data collection (Transport Research and Statistics Office, Information Security, Research and Statistics Division, Information Policy Headquarters, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 3 Comparison of road length density in ordinance-designated cities

■ The greater the area of the city the DID (Densely Inhabited District) occupies, the higher the percentage of improved (vs. unimproved) road length on the road length density scale.

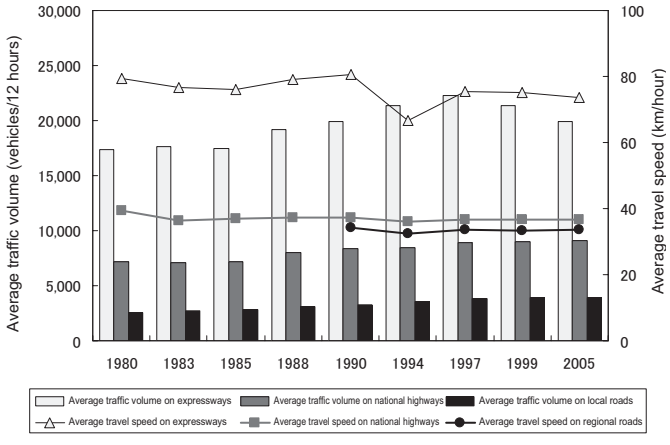


* Road length density = road length per area of DID
* Among roads as defined by the Road Act; excludes national expressways.
* Number of lanes and road widths are not taken into account.
* The figure in the square is the DID area percentage of the total city area.

Source: road length: taken from data of each municipality (Apr., 2008)
DID area: 2005 National Population Census

Fig. 4 Changes in average traffic volume and average travel speed by type of road

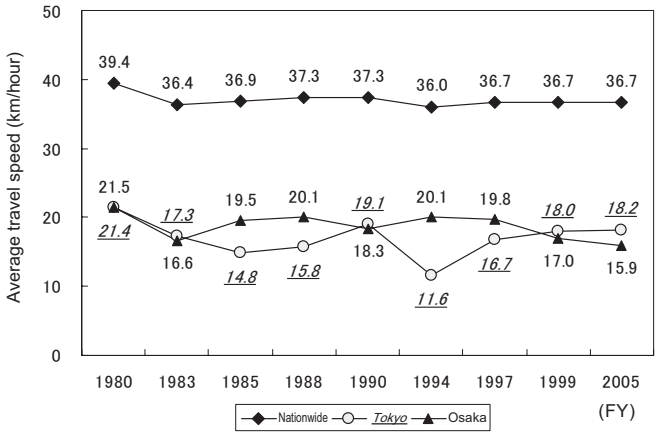
■ The average traffic volume on expressways has been on a downward trend since 1997, partly because of the newly constructed ones with less traffic. However, traffic is on an upward trend for national ordinary roads and regionsl roads. The average travel speed for either type of road remains level or is on a slightly downward trend.



Source: Road Traffic Census (website of the Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 5 Average travel speed on national ordinary roads (Nationwide, Tokyo, & Osaka)

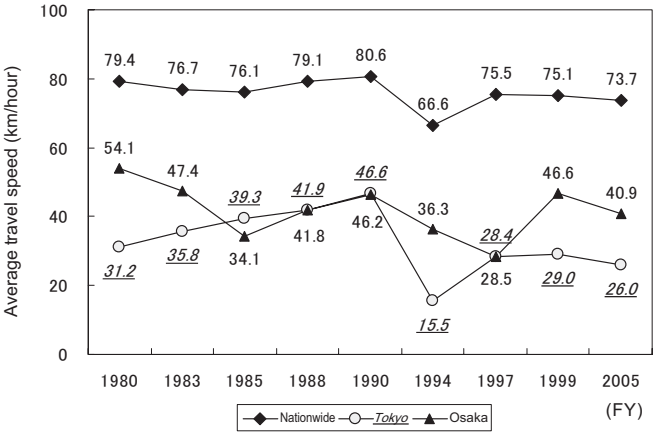
■ For years there has been almost no change in the national average. The average travel speed in the wards of Tokyo and in Osaka City is about half the national average; there is still severe traffic congestion.



Source: Road Traffic Census (website of the Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 6 Average travel speed on expressways (Nationwide, Tokyo, & Osaka)

■ For years the national average has been on a slightly downward trend. Though there had been changes through the years in the average travel speed in the wards of Tokyo and in Osaka City, the speeds were always lower than the national average.

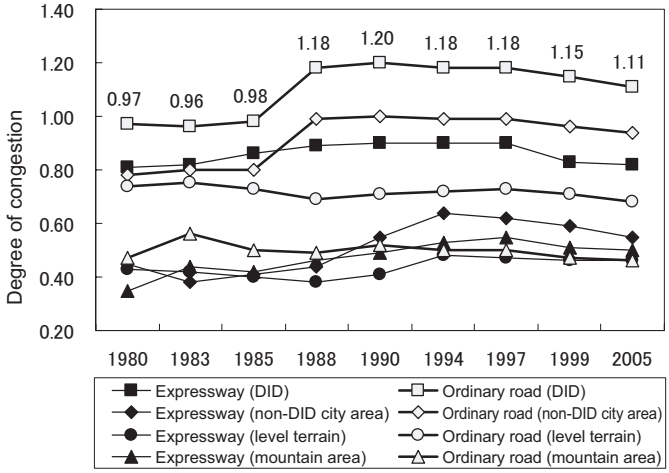


Source: Road Traffic Census (website of the Ministry of Land, Infrastructure, Transport and Tourism)

Note: For expressways in Tokyo and Osaka, the Metropolitan Expressway and Hanshin Expressway include segments managed by NEXCO.

Fig. 7 Degree of congestion of expressways and national ordinary roads (by roadside condition)

■ The degree of congestion exceeds 1.0 on national ordinary roads along densely inhabited areas (DID).

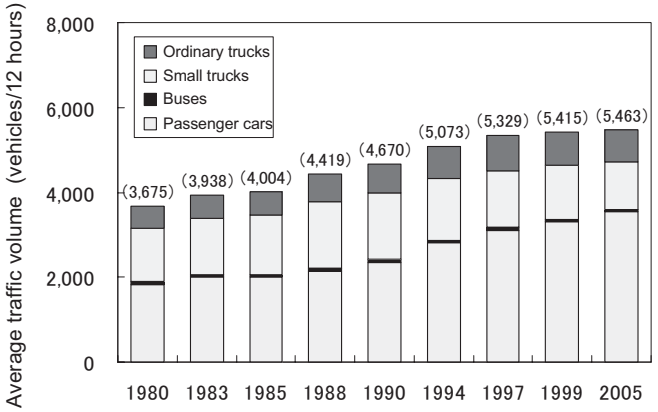


Source: Road Traffic Census (website of Ministry of Land, Infrastructure, Transport and Tourism)

Note: Congestion level is given by the traffic volume per road capacity (in daytime 12 hours).

Fig. 8 Average 12-hour traffic volume on ordinary roads by type of vehicles

■ On ordinary roads, the traffic volume of passenger cars is on an upward trend.

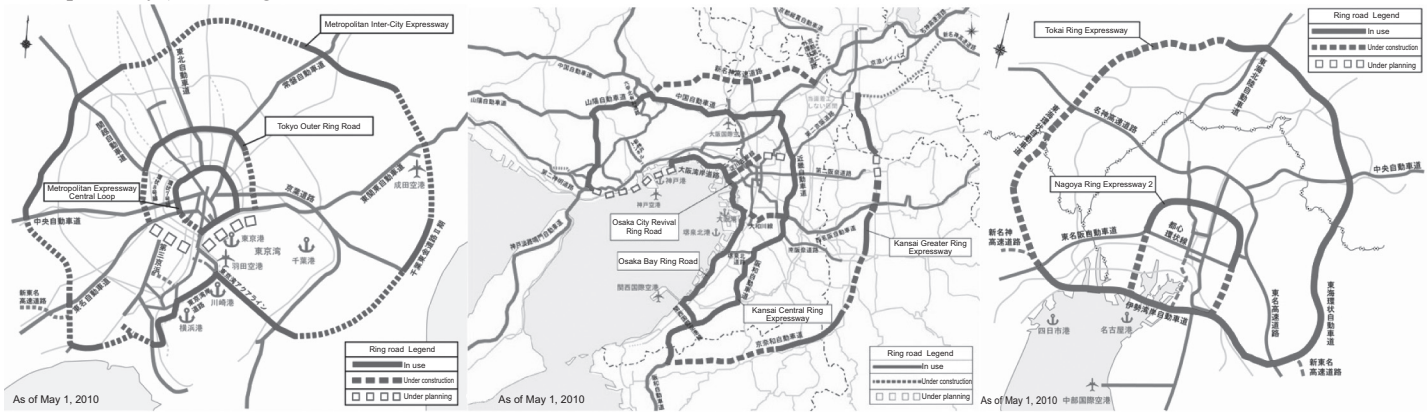


Note: Figures in parentheses are the average traffic volume of all types of vehicles.

Source: Road Traffic Census (website of Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 9 Road network improvement plans and road conditions in the three major metropolitan areas (from left: Tokyo, Kinki , and Chukyo area)

■ To cope with chronic congestion in the three major metropolitan areas, road network improvement plans (e.g., ring roads and expressways) are being carried out.



Source: website of Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism

1-3 Freight Road Transport Today

Associate Professor, School of Commerce, Senshu University
Eiichiro Iwao

Freight road transport today has several features. For ordinary trucks in commercial use, there has been almost no change in distance traveled, but total cargo weight is on a downward trend. At the same time, for ordinary trucks in private use, the distance traveled and the weight transported are both on a downward trend. In the number of trucks owned, there has been a constant decrease of private trucks and an increase in commercial trucks. Such data would indicate that freight transport is shifting from private trucks to commercial trucks.
Also, the fact that package and mailing handling, as well as regular parcel post delivery, are increasing indicates that small-lot freight transport is on the rise.

□ Distance traveled by vehicles: For passenger transport, there has been a downward trend since 2001 for passenger cars (private use). For freight transport, there has been a continuous decrease for small vehicles (private use). However, almost no change has been seen for other types of motor vehicle.

Fig. 1 Changes in distance traveled in passenger transport, by vehicle type

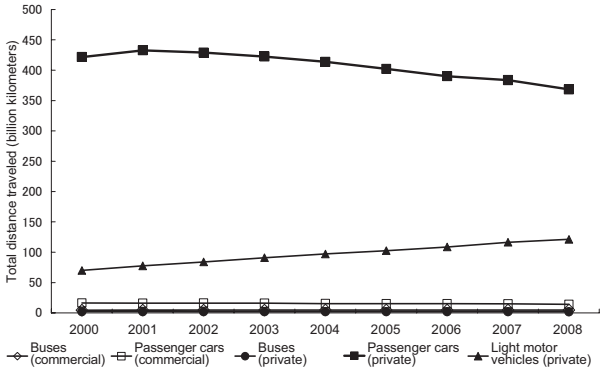
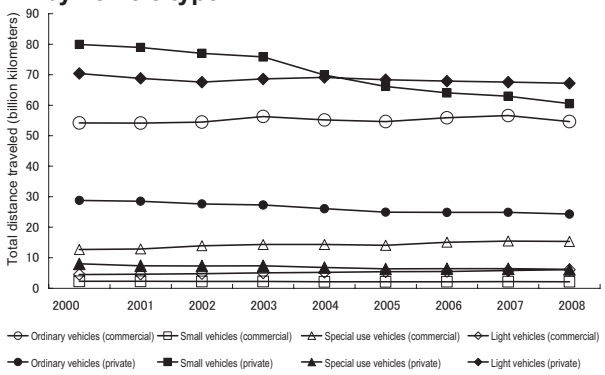
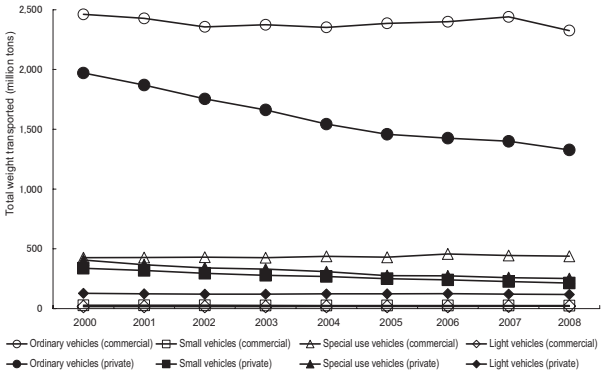


Fig. 2 Changes in distance traveled in freight transport, by vehicle type



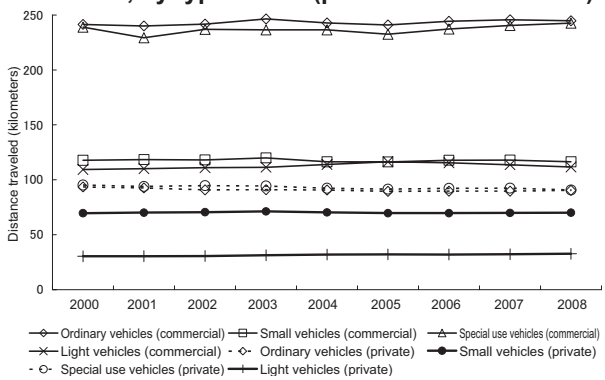
Source: Annual Statistical Report on Motor Vehicle Transport (Information and research Department, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism); Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 3 Changes in cargo weight, by vehicle type



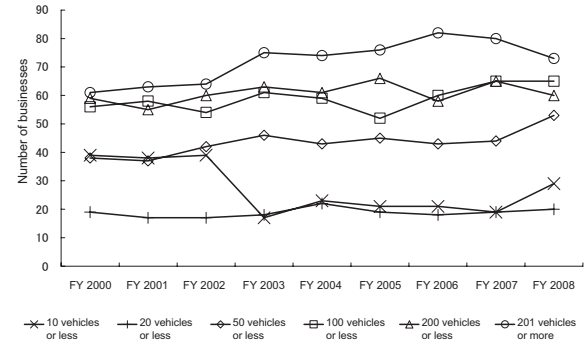
Source: Annual Statistical Report on Motor Vehicle Transport (Information and research Department, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 4 Changes in distance traveled per working day per vehicle, by type of use (private vs. commercial)



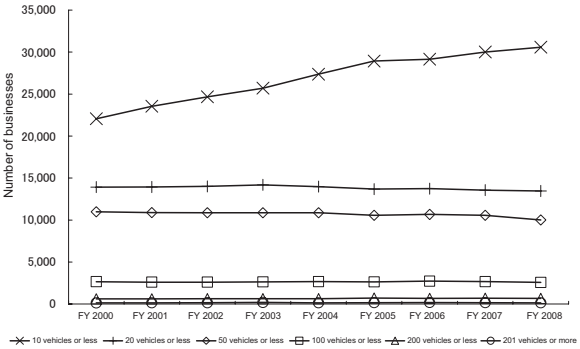
Source: Annual Statistical Report on Motor Vehicle Transport (Information and research Department, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 5 Number of freight businesses, by number of vehicles owned (mixed load services)



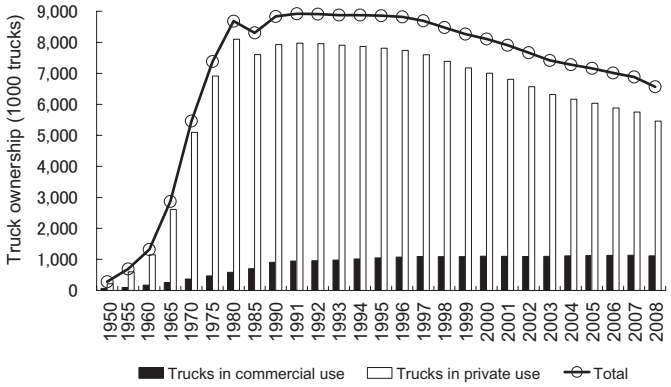
Data: assembled from data of Cargo Transport Division, Road Transport Bureau
Source: Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 6 Number of freight businesses, by number of vehicles owned (general freight services)



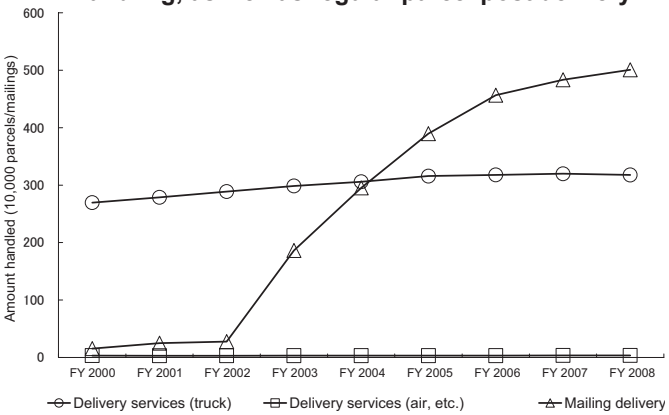
Data: assembled from data of Cargo Transport Division, Road Transport Bureau
Source: Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)

Fig. 7 Changes in private and commercial truck ownership



Source: Annual Land Transport Statistics (Information and Reserch Department, Ministry of Land, Infrastructure, Transport and Tourism); Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)

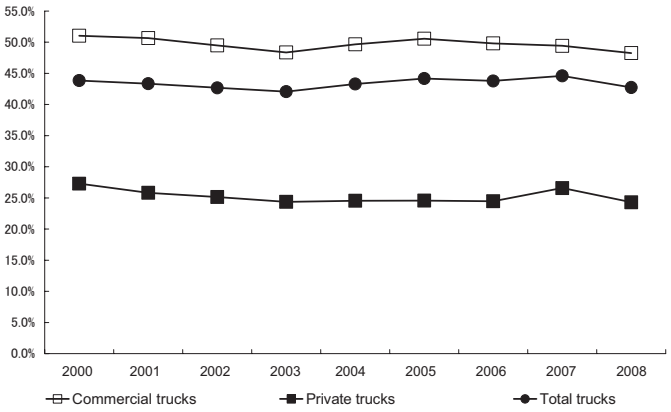
Fig. 8 Changes in the amount of package and mailing handling, as well as regular parcel post delivery



Source: website of Ministry of Land, Infrastructure, Transport and Tourism; statistics data of Japan Post Service Co., Ltd.

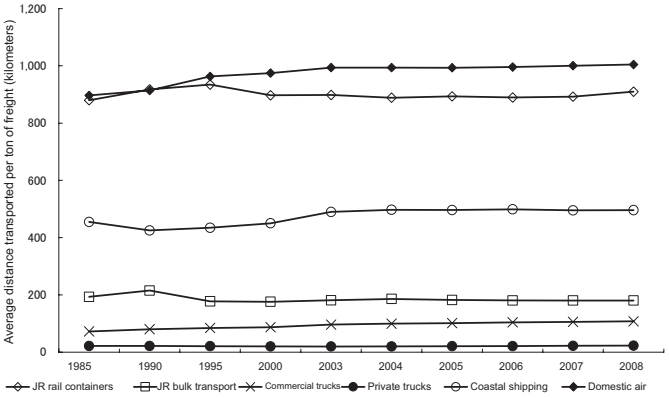
Fig. 9 Changes in percent of capacity loaded (trucks)

■ The percentage loaded on trucks was on a downward trend until 2003; since then, it continues to fluctuate. The percentage is higher for commercial use than for private use.



Source: Annual Statistical Report on Motor Vehicle Transport (Information and research Department, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)
Note: Percentage of capacity loaded is derived from transported ton-kilometers per capacity ton-kilometers. Excludes vehicles for special use.

Fig. 10 Changes in average distance transported per ton by mode



Source: Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)
Note: 1) Coastal shipping includes private ships.
2) Figures for Japan Railway are the total transport distance with fee and without fee before 1986, and (since 1987) with fee only.
3) Figures for domestic air (regular flights only) include figures for overweight checked baggage and mail.

□ Fuel consumption per ordinary truck (commercial) per day is on a downward trend regardless of fuel type.

Fig. 11 Changes in fuel consumption per truck per day (gasoline)

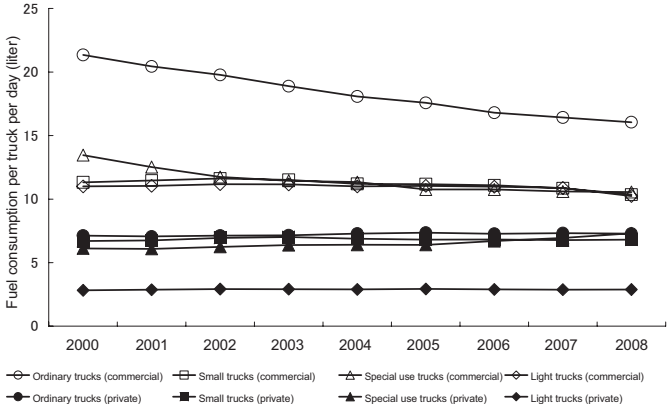
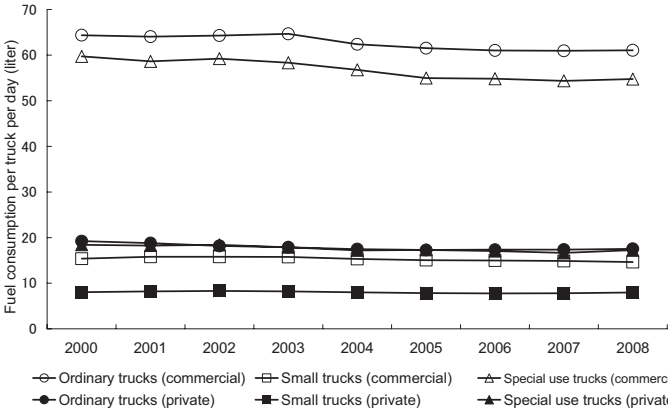


Fig. 12 Changes in fuel consumption per truck per day (diesel)



Source: Annual Statistical Report on Motor Vehicle Transport (Information and Reserch Department, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism); Transportation-related statistics data collection (Information Policy Headquarters, Ministry of Land, Infrastructure, Transport and Tourism)

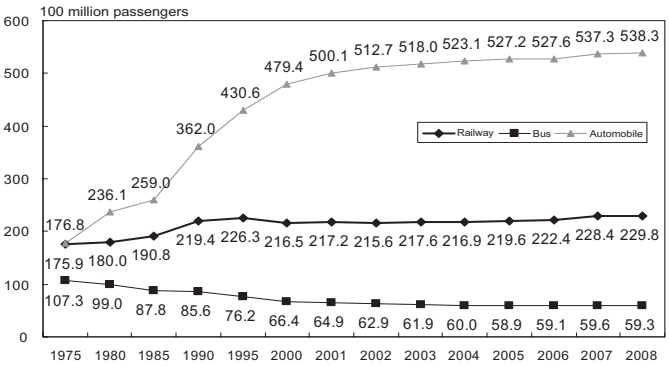
1-4 Public Transport Today

Chief Researcher, Institute of Transportation Economics
Kazuya Itaya

In general, automobile passenger-kilometers are decreasing; while railways and buses have been increased slightly since around 2002. The passenger moving between cities on public transport is increasing, and there is a particularly noticeable increase in the number of passengers of Shinkansen lines. The role of public transport is increasing, especially for long distance travel. In the three metropolitan areas, the railway congestion rate continues to decrease; then too, many new lines have been built. Trough – operation of railway service using tracks of different company's railway line is also being taken. By contrast, the bus industry in general is becoming unprofitable; nevertheless the number of businesses is increasing. Finally, the total number of traffic fatalities with public transport is very small; public transport is safe transport.

Fig. 1 Number of passengers of railways and buses

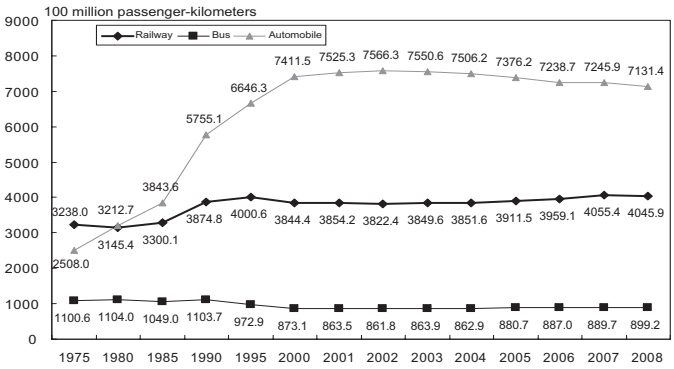
■ In recent years, the use of railways is gradually increasing; but the use of buses is almost unchanged.



Source: Annual Statistical Report on Motor Vehicle Transport; Annual Statistical Report on Railway Transport

Fig. 2 Railway and bus passenger-kilometers

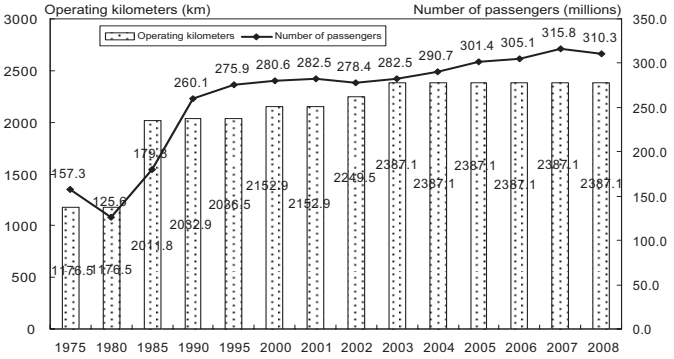
■ While automobile passenger-kilometers are gradually decreasing, railway and bus passenger-kilometers are gradually increasing, after having reached their lowest level in 2002.



Source: Annual Statistical Report on Motor Vehicle Transport; Annual Statistical Report on Railway Transport

Fig. 3 Operating kilometers and number of passengers of Shinkansen

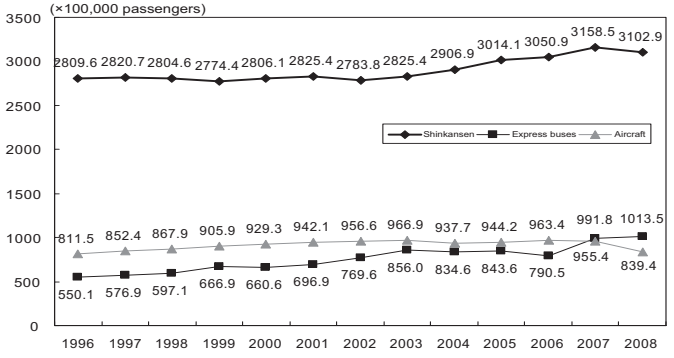
■ Use increased over a long period, then decreased in 2008.



Source: Before 1985: Railways 2008: the numbers.
After 1990: Annual Statistical Report on Railway Transport

Fig. 4 Number of intercity passengers, by mode

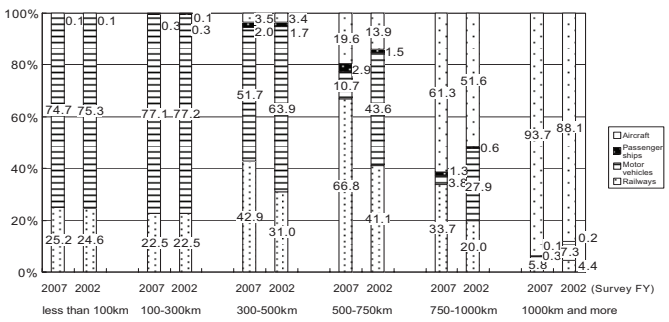
■ In 2008, the use of Shinkansen and aircraft decreased; but the use of express buses continues to increase.



Source: Annual Statistical Report on Railway Transport; Railways 2008: the numbers; Annual Statistical Report on Air Transport (each year)

Fig. 5 Modal share by distance traveled

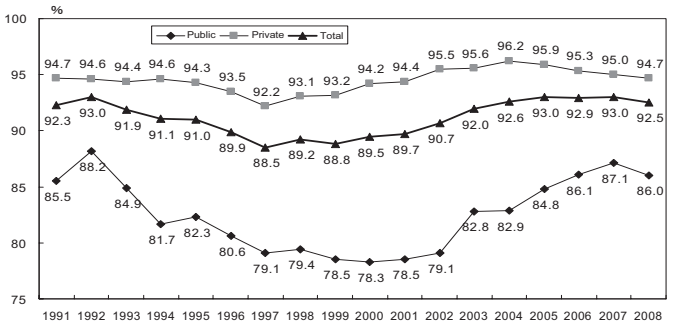
■ Comparing 2002 with 2007, on the whole the transport share of motor vehicles decreased while the share of public transport increased.



Source: Analytical data from Survey on Flows of Freight and Passengers (2007 edition)

Fig. 6 Bus industry income vs. expenditures

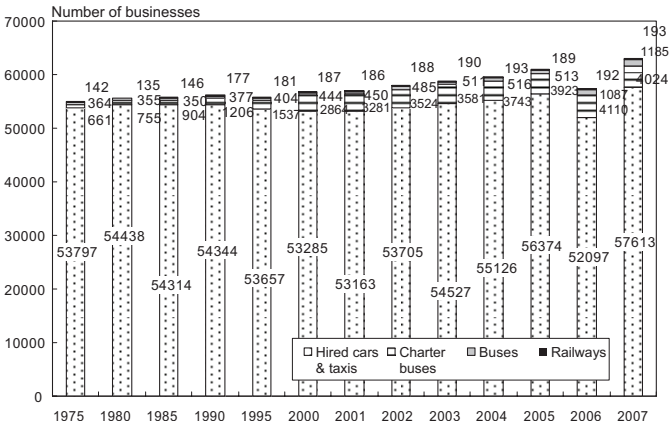
■ In the past 18 years, the balance ratio overall has never exceeded 100. [Balance ratio = (current income / current expenditure) × 100]



Source: Bus industry income and expenditures - FY2008

Fig. 7 Number of businesses engaged in public transport

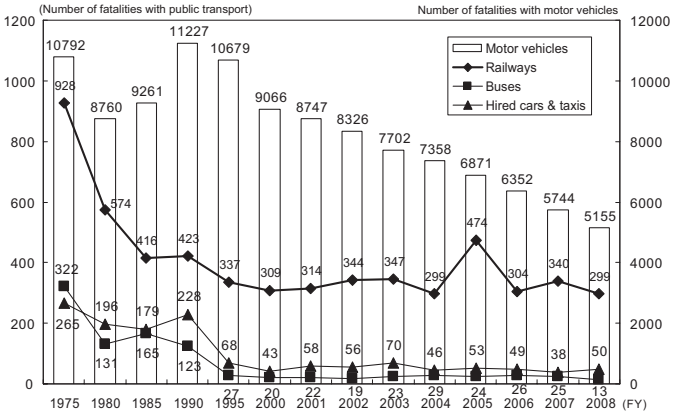
■ In recent years, the number of businesses has been on an upward trend. The number of charter bus businesses had been noticeably increasing, but it decreased in FY 2007. In FY 2006, the number of taxi companies and hired car businesses decreased markedly; however, in FY 2007, they were on the rise again.



Source: FY 1975 to FY 2005: Annual Land Transport Statistics (2006 edition)
FY 2006-: Transportation-related statistics data collection

Fig. 8 Number of traffic fatalities with public transport

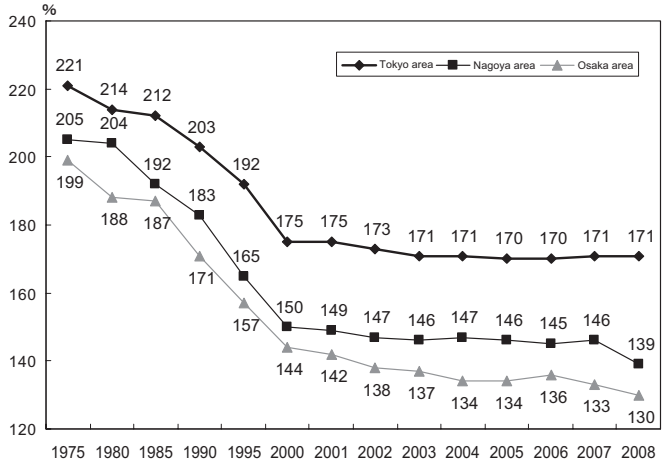
■ Numbers of fatalities with buses, hired cars, and taxis continue to decrease. Compared to the number of traffic fatalities with motor vehicles (5155 in FY 2008), public transport safety is outstanding.



Source: White Paper on Traffic Safety in Japan 2010:,Statistics on Traffic Accidents of Motor Vehicles for Business Use (2008)

Fig. 9 Railway Congestion rates in the three metropolitan areas

■ Railway congestion rates kept decreasing in all three areas; in the Tokyo area, however, the rate has flattened out in recent years. On the other hand, in the Nagoya and Osaka areas, it decreased noticeably even in 2008.



Source: Railways 2009: the numbers

Table 1 History of through – operation of railway service using tracks of different railway companiess in the three metropolitan areas

■ In Japan, some railway companies operate suburban railway service directly connecting to lines in the central area using tracks of other company based on a mutual agreement for the sake of passenger convenience.
The table shows the history of such practices between metro lines in the city centers and major private railways in the three major metropolitan areas.

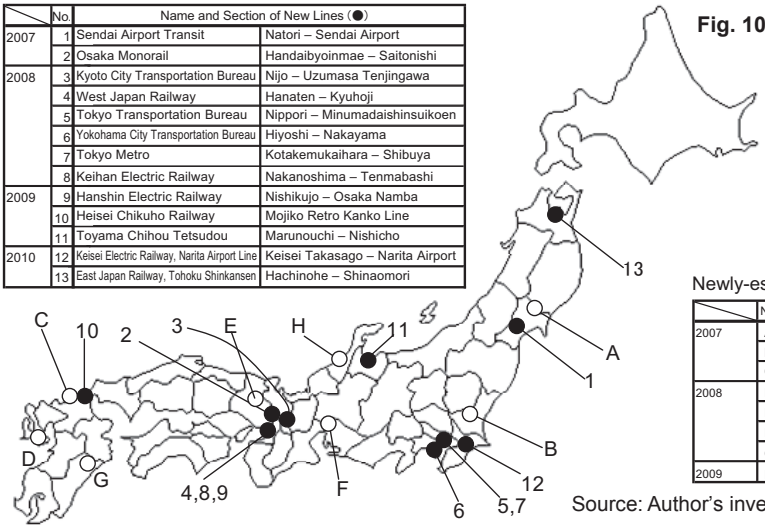
Year of start	City area	Lines involved
1960	Tokyo	Toei Asakusa Line, Keisei Line, Keikyu Line, Hokuso Line, Shibayama Railway Line
1962	Tokyo	Tokyo Metro Hibiya Line, Tokyu Toyoko Line, Tobu Isesaki Line
1966	Tokyo	Tokyo Metro Tozai Line, JR Chuo Line & Sobu Line, Toyo Rapid Railway
1968	Osaka	Hankyu Kobe Main Line, Hanshin Main Line, Sanyo Main Line
1969	Osaka	Osaka City Sakaisuji Line, Hankyu Kyoto Main Line, Hankyu Senri Line
1971	Tokyo	Tokyo Metro Chiyoda Line, JR Joban Line, Odakyu Odawara Line & Tama Line
1978	Tokyo	Tokyo Metro Hanzomon Line, Tokyu Denentoshi Line, Tobu Isesaki Line & Nikko Line
1979	Nagoya	Nagoya City Tsurumai Line, Meitetsu Toyota Line, Mikawa Line, Inuyama Line
1980	Tokyo	Toei Shinjuku Line, Keio Line
1983	Tokyo	Tokyo Metro Yurakucho Line & Fukutoshin Line, Seibu Yurakucho Line, Tobu Tojo Line
1986	Osaka	Osaka City Chuo Line, Kintetsu Keihanna Line
1988	Osaka	Kyoto City Karasuma Line, Kintetsu Kyoto Line
2000	Tokyo	Tokyo Metro Namboku Line, Toei Mita Line, Tokyu Meguro Line, Saitama Railway
2009	Osaka	Hanshin Main Line & Namba Line, Kintetsu Nara Line

Note: Lines with short distances have been omitted. Lines are those involved as of July, 2010.
Source: based on The Facts about Major Private Railways (2009)

Fig. 10 Newly-established / discontinued lines of railways

■ New lines in the Tokyo and Osaka areas are quite noticeable. At the same time, the number of discontinued lines has been on a downward trend over the past several years.
Examples between 2007 and 2010

	No.	Name and Section of New Lines (●)	
2007	1	Sendai Airport Transit	Natori – Sendai Airport
	2	Osaka Monorail	Handaibyoinmae – Saitonishi
2008	3	Kyoto City Transportation Bureau	Nijo – Uzumasa Tenjingawa
	4	West Japan Railway	Hanaten – Kyuhoji
	5	Tokyo Transportation Bureau	Nippori – Minumadaishinsuikoen
	6	Yokohama City Transportation Bureau	Hiyoshi – Nakayama
	7	Tokyo Metro	Kotakemukaihara – Shibuya
	8	Keihan Electric Railway	Nakanoshima – Tenmabashi
2009	9	Hanshin Electric Railway	Nishikujo – Osaka Namba
	10	Heisei Chikuho Railway	Mojiko Retro Kanko Line
	11	Toyama Chihou Tetsudou	Marunouchi – Nishicho
2010	12	Keisei Electric Railway, Narita Airport Line	Keisei Takasago – Narita Airport
	13	East Japan Railway, Tohoku Shinkansen	Hachinohe – Shinaomori



Newly-established lines : ●　　Discontinued lines : ○

	No	Name and Section of Discontinued Lines (○)	
2007	A	Kurihara Denen Railway	Ishikoshi – Hosokura Mine Park Mae
	B	Kashima Railway	Ishioka – Hokota
	C	Nishi-Nippon Railroad	Nishitetsu Shingu – Tsuyazaki
2008	D	Shimabara Railway	Shimabaragaiko – Kazusa
	E	Miki Railway	Yakujin – Miki
	F	Nagoya Railway	Inuyamayuen – Dobutsuen
	G	Takachiho Railway	Makimine – Takachiho
2009	H	Hokuriku Railroad	Tsurugi – Kaga Ichinomiya

Source: Author's investigation

1-5 Recent Trends in New Urban Transport Systems

Professor, Graduate School of Engineering, Yokohama National University
Fumihiko Nakamura

In response to the ever diversifying transport demand , various forms of new technology have been developed and introduced into urban transport systems. Utilization of the DMV (Dual Mode Vehicle) on a pilot basis; amphibious motor vehicles; the battery-powered LRV (Light Rail Vehicle); trial operation of the electric-powered mini-bus; getting the lithium-battery LRV into mass production; car sharing systems, and so on — new transport concepts and different ideas for using existing public transport (trams, buses, etc.) are typical of various developments that can be seen both inside and outside the country. At the same time, it is worth noting that new legislation promoting local public transport has been enforced, and financial aid programs have been established.

Table 1 Recent trends in new urban transport systems

■ A variety of new urban transport systems have been gaining nationwide attention.

Targeted demand	Road-based system	Guideway system
Short-distance trip inside the community	Community cycles Velotaxi Park & Cycle	Inclined elevator Sky rail LRT (Light Rail Transit)
Inside the city overall	Car sharing On-demand bus Shared taxi service BRT (Bus Rapid Transit) Articulated bus	LRT (Light Rail Transit) Wireless tram
	Guided bus, IMTS (Intelligent Multimode Transit System), DMV (Dual Mode Vehicle)	

Table 2 Trends in public transport

■ New ideas are being tried for various problems in urban public transport.

Field of improvement	Typical examples in recent years
Vehicles	Low floor articulated bus, domestically produced low floor streetcar
Station/stop	Shelter covered with advertisements; bus terminal shelters provide more information
Access	Transfer between LRT and bus on the same platform (system used in Toyama, etc.) Bicycle-loading bus (used in Chigasaki)
Services	Flexible fare, discount for transfer (used in Fujisawa, Yokohama, etc.)
Environmental improvement	Electric vehicles, low gas emission vehicles
Systems improvements	Public response test programs (e.g., “free day” on city train in Kagoshima), Local Public Transportation Revitalization Act

Fig. 1 Inaugural ceremony for the electric community bus in Toyama City

■ New electric low floor community bus was introduced.

Fig. 2 Lithium-ion LRV manufactured by Kinki Sharyo (from the website of Kinki Sharyo)

■ This tram can run with or without a catenary . Production started in 2010 for use in North America.

Fig. 3 DMV trial run (Akechi Railway) (website of Ena City)

Night trial run of JR Hokkaido’s new DMV, moving from the rails to the road.

Fig. 4 Transfer between streetcar and bus (Hiroshima Electric Railway, Hatsukaichi-shiyakusho-mae Station)

Transfer to the feeder bus on the same platform. Also operates in Toyama City and Nagasaki City.

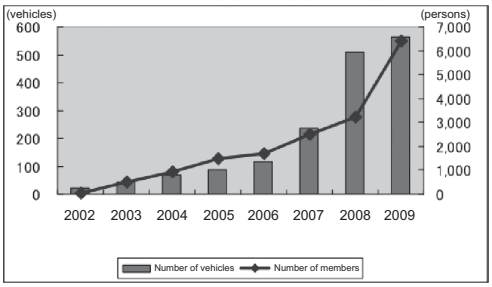
Fig. 5 Twin Liner in Atsugi City (articulated bus made by Benz)

The bus is over 2.5 meters wide. Despite being oversized, it is operated by special exception. Chiba City followed this example, and Gifu City soon will.

Fig. 6 Changes in the number of car sharing systems

■ In the past ten years or so, both the numbers of systems and users have been expanding tremendously.

Changes in numbers of car sharing vehicles and members in Japan



Source: website of Foundation for Promoting Personal Mobility and Ecological Transportation

Fig. 7 Car sharing pictogram (Germany)

■ Car sharing that can be found at stations is gaining popularity. A pictogram points to the access point. The photo is from the central station in Freiburg.

Fig. 8 Outline of the Integrated Project for Local Public Transport Revitalization, and its progress to date

■ In order to reconstruct and revive local public transport from the ground up through a united and efficient effort, we need to determine the following: (1) the basic policies determined by the responsible Minister; (2) integrated cooperative plans for local public transport made by the municipalities, which are based on local citizen involvement; (3) special provisions in respective laws in order to expedite specific local public transport projects; and (4) required exceptions in order to permit ordinal Railway Business Act procedures that ensure smooth operations for new local passenger transport projects, and enable a company to provide, using the same vehicle or ship, direct transport service through areas devoted to multiple types of passenger transport system. As of August, 2009, 115 research projects and 251 planning projects have been designated nationwide.

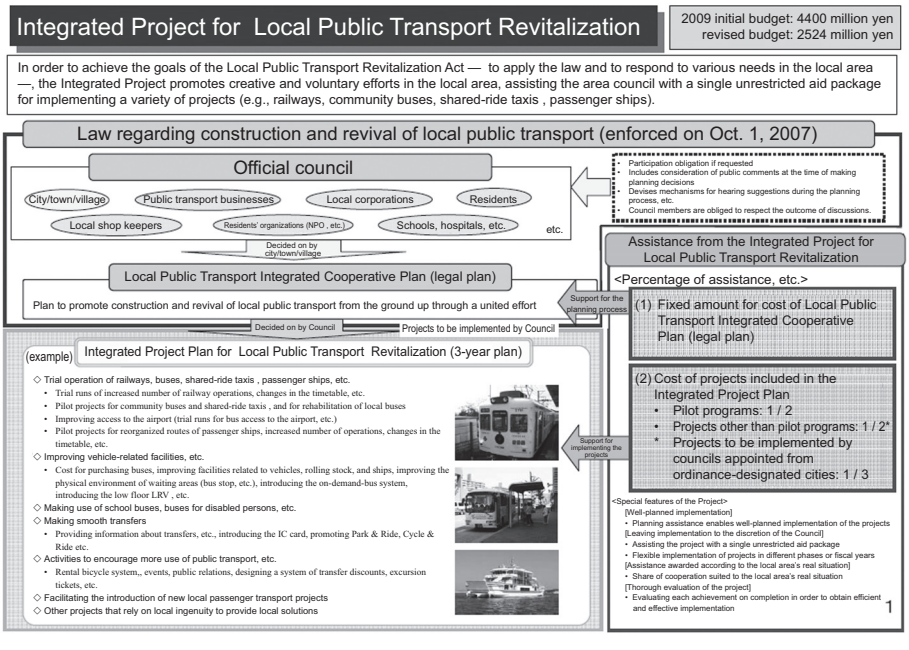
Source: website of the Ministry of Land, Infrastructure, Transport and TourismMinistry of Land, Infrastructure, Transport and Tourism

Table 3 Recent examples of car sharing businesses(as of January 2010)

■ The trend in the past several years is for various types of businesses (e.g., railroads, rental car companies) to get involved.

Operating organization, related organization, etc.	Name (name of business / system / operation)	Date of start	Operating area	No. of stations	No. of vehicles	No. of members
Car Share Kanazawa [Hokusei Sangyo Inc. / Tsuji Shoji, Co., Ltd. / Orix Auto Corporation (cooperation in joint business)]	Car Share Kanazawa	Nov., 2006	Kanazawa City, Nonoichi Machi, Nomi City (Ishikawa)	11	12	93
Eco village Tsurukawa Kinokanoie (vehicle section)	Kinokanoie VS club	Apr., 2007	Machida City, Tokyo	1	2	6 households
Eburika K.K.	Eburika Car Sharing	Oct., 2007	Osaka City	4	4	50
Toyota Motor Corporation / Toyota Tokyo Rental & Leasing Co., Ltd. / Toyota Rent-A-Lease Aichi Co. Ltd. / Toyota Rent-A-Lease Shin Osaka Co., Ltd.	Toyota Car Share Club	Nov., 2007	Wards in Tokyo / Nagoya City / Toyonaka City, Osaka	5	15	95
Eki Rentacar Shikoku Company	Car Share Shikoku	Mar., 2008	Takamatsu City, Kagawa	6	6	158
Nippon Parking Development Co., Ltd.	Ecoloca Car Sharing	Mar., 2008	Tokyo, Osaka City, Nagoya City	22	29	500
Dism Inc.	QuiCar	May, 2008	Setagaya Ward, Itabashi Ward, Shinjuku Ward, Bunkyo Ward, Koto Ward (Tokyo)	6	9	55
Car Sharing Japan Co., Ltd.	careco car-sharing club	Jan., 2009	Wards in Tokyo, Yokohama City, Kawasaki City	105	110	1100
Be-R Inc.	Wilca	Jan., 2009	Osaka City	3	3	70
Cleaty Co. Ltd.	Withree	Mar., 2009	Chuo Ward, Shinagawa Ward, Koto Ward (Tokyo)	9	12	120
JR East Rental & Lease Co. Ltd.	eco renta	Mar., 2009	Chiyoda Ward, Tokyo / Hachioji City / Kawasaki City	3	6	Recruiting
comuca Inc.	Comuca	Mar., 2009	Setagaya Ward, Meguro Ward (Tokyo)	21	21	400
Gulliver International Co., Ltd.	Gulliver Car Share Mate	Apr., 2009	Ichikawa City, Urayasu City (Chiba)	9	9	162
	Leo Gulliver Car Sharing	Nov., 2009	Tokyo, Kanagawa, Saitama	117	117	Recruiting
Nissan Car Rental Solution, Co., Ltd.	Nissan Rent-a-car Sharing Club	Jul., 2009	Yokohama City	1	2	Recruiting
Rhyme Auto Lease Inc.	Car Sharing Osaka	Aug., 2009	Osaka City	1	1	5
Aktio Corporation	Aktio Car Sharing (AKTIO e DRIVE)	Oct., 2009	Edogawa Ward, Tokyo	2	2	9
Japan Car Sharing Inc.	i share	Oct., 2009	Setagaya Ward, Koto Ward, Katsushika Ward, Shinagawa Ward, Ota Ward, Adachi Ward (Tokyo) / Yokohama City / Kawasaki City	9	9	100
Shares Inc.	Ekispress	Nov., 2009	Shinjuku Ward, Setagaya Ward, Suginami Ward (Tokyo)	5	10	150
Meitetsu Kyosho Co., Ltd.	Meitetsu Kyosho Car Share cariteco	Nov., 2009	Nagoya City	13	17	Recruiting
Sanpuku Sogo Fudosan K.K.	Sanpuku Car sharing department	Nov., 2009	Matsuyama City, Ehime	3	3	19
Showa Shell Sekiyu K.K.	Machinorikun	Dec., 2009	Nerima Ward, Suginami Ward, Setagaya Ward (Tokyo)	4	5	Recruiting

Source: website of Foundation for Promoting Personal Mobility and Ecological Transportation



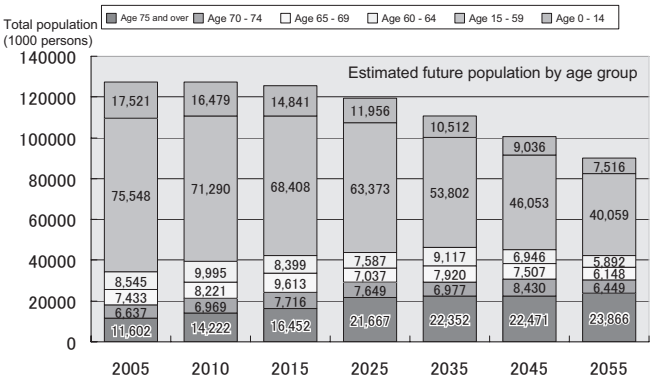
1-6 Transport Services for Everyone

Technical Chief, Oriental Consultants Co., Ltd.
Atsushi Matsubara

Social conditions have changed to the point where we need to approach transport problems by considering the elderly, the disabled, children, pregnant women, and nursing mothers as a collective majority, rather than as individual minorities. Thanks to the Transport Accessibility Improvement Act (Transport Barrier-free Act) ,the improvement of facilities is steadily progressing. However, an improvement project is often limited to a single transport mode or facility. Now that care giving and rehabilitation activities are provided more and more outside the home, the provision of transport services can stimulate not only more mobility, but also the vitality of entire neighborhoods where many people can live to even more advanced ages. Various transport services for disabled persons(e.g. social welfare transport services, electric wheelchairs etc.) are expected to be employed. Furthermore, enactment of the basic transport legislation that would be the backbone of the above is being considered. It is now time for our society, too, to get serious about the right to access transport — the right to move around.

Fig. 1 Future population by age group

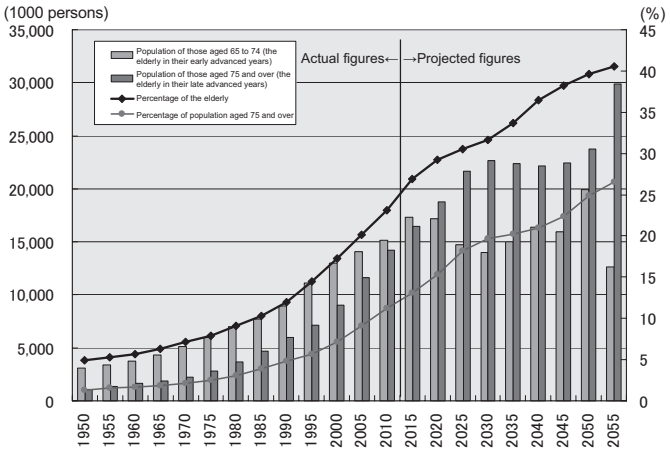
■ The total population of our country is decreasing. It is estimated that the numbers for children in particular (14 and younger) and working people (15 to 59) will decrease noticeably.



Source: Annual Report on the Aging Society (2010 edition)

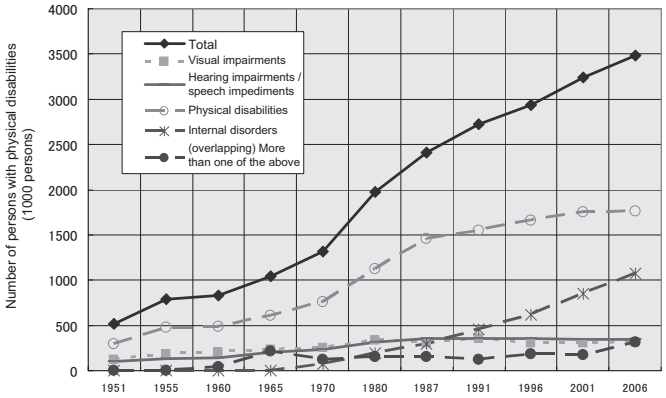
Fig. 2 Changes in the number of the elderly

■ The percentage of the elderly keeps increasing. In 2013, an estimated 25.2% of the population will be elderly (65 and over), turning the country into a "super aging" society. In particular, the population aged 75 and over will continue to grow; in 2017, the number of elderly in their late advanced years will become more than the number of the elderly in their early advanced years. The over-75 age group will occupy an even greater percentage of the elderly than it does now.



Source: Annual Report on the Aging Society (2010 edition)

Fig. 3 Changes in the number of persons with physical disabilities



Source: 2006 Survey on persons with physical disabilities (Ministry of Health, Labour and Welfare)

Table 1 Number of disabled people who stay at home

■ Not enough services have been provided to people with intellectual disabilities and mental disorders. The percentage of those who are staying at home is low; obviously, most of them have been institutionalized.

	Total	Persons who are staying at home	Persons who are institutionalized
Persons with physical disabilities	3,660,000	3,580,000	90,000
Persons with intellectual disabilities	550,000	420,000	130,000
Persons with mental disorders	3,230,000	2,900,000	330,000

Source: Survey on persons with physical disabilities (2006), Survey on persons with intellectual disabilities (2005), Survey on Social Welfare Institutions (2005), Patient Survey (2008) (Ministry of Health, Labour and Welfare)

Table 2 Getting out of the house, by type of impairment

■ While 30 to 40 percent of persons with disabilities go out almost every day, about 10% of them only go out a few times a year; and 3 to 7 percent of them do not go out at all.

Type of disabilities	Going out					Do not go out	No answer
	Almost every day	2 to 3 times per week	2 to 3 times per month	Several times per year	Sub total		
Total	35.6	29.9	16.1	9.7	91.3	5.5	3.2
Visual impairments	29.3	29.8	21.9	10.6	91.6	6.3	2.1
Hearing impairments / speech impediments	41.7	27.4	14.0	7.4	90.5	5.2	4.3
Physical disabilities	31.5	29.9	16.5	11.9	89.8	7.0	3.2
Internal disorders	42.3	30.6	14.4	6.5	93.8	3.0	3.2
							unit: %

Source: 2006 Survey on persons with physical disabilities (Ministry of Health, Labour and Welfare)

□ In accordance with the new Transport Accessibility Improvement Acy (Transport Barrier-Free Act), passenger facilities and vehicles whose average number of users per day exceeds 5000 have been steadily improved toward barrier-free, but it is still not enough.

Table 3 Barrier-free passenger facilities

	Eliminating uneven flooring	Installing textured paving blocks for people with visual impairments	Installing toilets for the disabled
Rail/tram station	71.3%	93.2%	66.3%
Bus terminal	83.7%	76.7%	58.1%
Ferry/ship terminals	87.5%	75.0%	50.0%
Passenger airport terminal	90.5%	100%	100%
Total of passenger facilities	71.6%	92.9%	66.5%

Source: Ministry of Land, Infrastructure, Transport and Tourism

Table 4 Situation of vehicles that conform to the accessibility standard

		Goal	End of FY 2008
Rail/tram vehicle		ca. 50% by 2010	41.3%
Bus	Low-floor bus	100% by 2015	41.7%
	Of the above, non-step bus	ca. 30% by 2010	23.0%
Taxi with access for persons with disabilities		ca. 18,000 vehicles by 2010	10,742 vehicles
Passenger ships		ca. 50% by 2010	16.4%
Aircraft		ca. 65% by 2010	64.3%

Source: Ministry of Land, Infrastructure, Transport and Tourism

Table 5 Changes in the number of driver license holders by age and by gender

■ The number of elderly people with driver's licenses is increasing. By contrast, the number of young license-holders is markedly decreasing.

Age	End of 2008		End of 2009		Increased/decreased rate	
	Male	Female	Male	Female	Male	Female
Age 16-19	716,653	465,342	680,811	447,224	-5.0	-3.9
Age 20-24	3,052,839	2,594,417	2,927,832	2,478,844	-4.1	-4.5
Age 25-29	3,713,648	3,321,218	3,635,774	3,250,888	-2.1	-2.1
Age 30-34	4,443,926	4,039,182	4,261,076	3,872,819	-4.1	-4.1
Age 35-39	4,814,245	4,400,236	4,874,986	4,461,714	1.3	1.4
Age 40-44	4,183,171	3,799,126	4,272,559	3,894,514	2.1	2.5
Age 45-49	3,794,949	3,369,503	3,854,374	3,447,041	1.6	2.3
Age 50-54	3,743,794	3,182,712	3,708,580	3,200,120	-0.9	0.5
Age 55-59	4,510,870	3,548,875	4,201,984	3,371,396	-6.8	-5.0
Age 60-64	4,067,659	2,858,349	4,342,694	3,155,591	6.8	10.4
Age 65-69	3,394,506	1,900,568	3,524,617	2,086,622	3.8	9.8
Age 70-74	2,524,169	966,419	2,566,794	1,053,333	1.7	9.0
Age 75-79	1,577,860	369,185	1,637,311	414,411	3.8	12.3
Age 80-84	772,285	103,559	814,278	122,898	5.4	18.7
Age 85 and over	207,011	11,566	235,749	15,111	13.9	30.7
Total	45,517,585	34,930,527	45,539,419	35,272,526	0.0	1.0

Source: Driver's License Statistics (2009 edition, National Police Agency)

Table 6 Characteristics of driving behavior of the driver with dementia

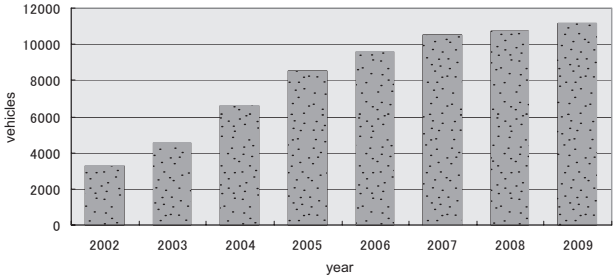
■ The number of driver's license holders with senile dementia is estimated to be about 300,000, based on the percentage of elderly with licenses and the percentage of elderly with dementia,.

	Alzheimer's disease	Pick's disease	Vascular dementia
Understanding of whereabouts	Impaired	Unimpaired	Sometimes impaired
Driving manner	• Forgets destination while driving • Becomes not very good at parking or pulling over	• Ignores traffic rules • Lack of attention to road • Drives too close to car ahead	• Distracted while driving • Slower reactions (steering, gear shifting, braking)

Source: Study on Social Support for the Elderly Drivers with Dementia (research leader: Yumiko Arai)

Fig. 4 Number of taxis with access for persons with disabilities

■ Besides buses for persons with disabilities, various transport services are being provided, such as for-fee transport for persons with disiabilities, shared taxi service, care-giving taxis, taxis for persons with disabilities, and childcare support taxis.



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

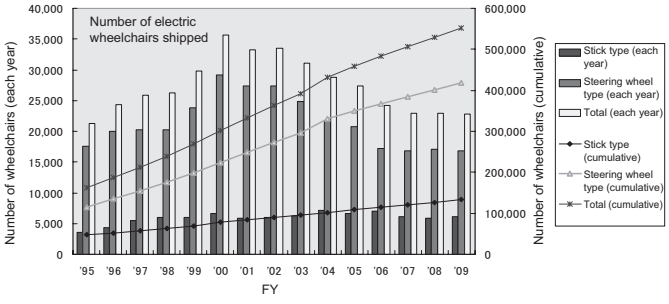
Table 7 Types of for-fee passenger transport service using private vehicles

■ The number of organizations (NPOs, etc.) operating for-fee handicap transport service was 2305 in 2008; the number of vehicles was 13,753.

(1) Transport services operated by municipalities	Transport services where there is no transport
	Municipalities' transport services for persons with disabilities
(2) For-fee transport services for persons with disabilities	
(3) For-fee transport services in depopulated areas	

Fig. 5 The Number of electric wheelchairs

■ People who use an electric wheelchair (the so-called "senior car") are increasing; there are various types of them. The number of these electric wheelchaurs shipped so far is over 550,000 (cumulative) nationwide. It should be noted that some of these are used by people who do not have driver's licenses or who do not keep to the sidewalk.



Source: Electric Wheelchair Safety Information Association

Table 8 Overseas cases for transport access right — the right to move

■ In many developed countries, the transport access right is defined in a basic law, similar to decentralization of power, together with the basic transport policy principles. . Individual transport policy measures are proceeded under them.

Country	Name of Law	Enactment
France	LOTI (Loi d' Orientation des Transports Intérieurs)	1982
U.K.	Transport Act	1985
U.S.A.	Americans with Disabilities Act	1990

1-7 The Future of the Transport Infrastructure

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Toshiyuki Okamura

In the course of national land use planning, the Comprehensive National Development Act was revised and became the National Spatial Strategy. The decision was made by the Cabinet in July, 2008 to replace the old National Development Plan with the new "National Strategies" plan (National Plan). In August, 2009, the Regional Plans (with regional blocks as units) were adopted. In the course of national planning for social infrastructure improvement (pursuant to the 2003 Act Regarding the Priority Plan for Social Infrastructure Improvement), conventional long-range plans for each sector based on administrative set up were united so that sector boundaries were transcended; the result was the Social Infrastructure Improvement Priority Plan (projected time frame: five years). Emphasis is placed on implementation of the improvement plans, which are to be effectively and efficiently expedited.

1. History of the Comprehensive National Development Plans

Pursuant to the Comprehensive National Development Act, postwar national land use planning was carried out from 1962 with the Comprehensive National Development Plan as its focus.

Table 1 Outlines of Comprehensive National Development Plans

Development Plan	Outline and goals
Comprehensive National Development Plan (1962 -)	Balanced development of all areas: aimed at balanced development by preventing urban sprawl, by correcting growth inequality between areas, and by appropriately distributing capital, labor, and technology among all regions. The concept was one of dispersed economic development of new areas.
New Comprehensive National Development Plan (1969 -)	Creation of affluent environments: aimed at preserving natural areas permanently; balancing development on a nationwide scale; reviewing nationwide land use; providing safer, more comfortable conditions suited to the cultural environment; and improving transport and communications networks. The concept was one of developing large-scale projects.
Third Comprehensive National Development Plan (1977 -)	Improving comprehensive living environment: aimed at achieving balanced land use nationwide and creating a comprehensive living environment. Harmonizing natural environments, living environments, and production environments. The concept was one of "settling down."
Fourth Comprehensive National Development Plan (1987 -)	Converting land use nationwide into a multi-polar dispersed type: to achieve well-balanced development of the national land, the basic goal was to implement multi-polar, dispersed land use; introduced the concept of regional networking to achieve that goal.
Grand Design for the 21st Century (1998-)	Building a foundation of multi-axial land use: land development with stakeholder involvement and regional cooperation; does not specify aggregate investment sums, instead shows priority areas for investment and policy direction for efficient land development.

2. Outline of National Spatial Strategy

The National Spatial Strategy plan aims at developing the nation's land by having various regional blocks do their own developing; it also aims at shaping the land into a beautiful and comfortable place to live. Characteristics of the plan are: (1) shifting from quantitative expansion and development to planning for a "mature society"; and, (2) shifting from state leadership to a two-layered planning system ("separation of powers"). The National Spatial Strategy unites the National Plan with the Regional Plans in which policies are made for each regional block. The National Plan is the plan to guide land development generally for the next ten years; it was adopted at the Cabinet meeting in July, 2008. After that, councils for regional plans, etc. were officially established in each regional block; in August, 2009, the Regional Plans for eight blocks nationwide were adopted.

Table 2 Strategic goals: the new vision for use of the nation's land under the National Spatial Strategy (National Plan)

1) Smooth interactions and cooperation with East Asia	For example, expansion projects of corporations targeting East Asian markets; building transport and information communications networks that cover land, sea, and air; promoting Japan as a tourist destination
2) Creating a sustainable area	For example, restructing of urban areas into a function - intensive compact form; regional management (to maintain functions of medical treatment, etc.); developing local industries using new scientific technology; creating beautiful farm/mountain/fishing villages that are comfortable places to live; making use of personnel from outside (who have residences in two areas); providing for areas with severe conditions
3) Formation of resilent land use for withstanding disasters	For example, promoting comprehensive counter-disaster strategies that include both "hard" and "soft" measures; preparing for disaster through intelligent land use; making it possible for transport and communications networks to be rerouted; strengthening the area's disaster preparedness (improving evacuation training, etc.)
4) Maintaining the beauty of the land for future generations	For example, creating and maintaining healthy natural cycles and ecosystem; proper use and preservation of sea areas; passing on and further generating the unique culture of the area; getting people involved in managing the land
5) Creating new concepts of what local "government" is	For example, improving living conditions with the cooperation of local communities, non-profit organizations, corporations, and local administration; exploitation and use of area resources through exclusively local initiatives and action; providing for marginal villages that are on the verge of collapse, and forming a consensus on a vision for the quality of life in the future

Data provided by Ministry of Land, Infrastructure, Transport and Tourism

Table 3 The three basic transport and information communications policies found in the National Spatial Strategy (National Plan), with examples for improving transport

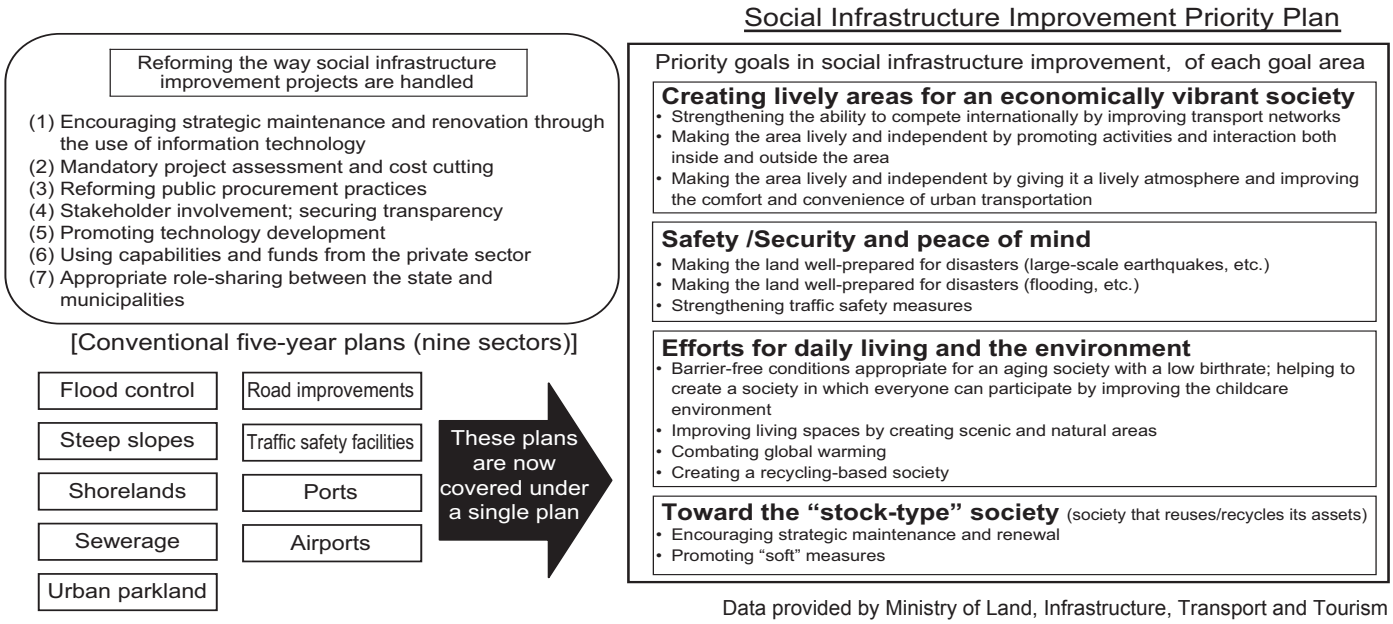
Building comprehensive and international transport and communications systems	Improving strategic airports and ports to strengthen their competitive abilities as international transport hubs (Asia Gateway concept) Taking steps to promote direct interactions with East Asia [using local airports/ports, standardizing the ITS (Intelligent Transport Systems), etc.]
Building arterial transport systems that facilitate interaction and cooperation among areas	Creating comprehensive land transport networks (regional expressways, access roads to airports/ports, Shinkansen, Central magnetic levitation train) Creating efficient sea transport networks (promoting coastal shipping, improving hinterlands of ports as bases of transport networks for multiple modes of transport) Creating domestic air transport networks (expanding Haneda Airport, reinforcing means of disaster prevention at the airport, improving local airportsas a base for their area development)
Building systems for local area transport and communications	Creating a transport system that fosters an area where the quality of life is sustainable and comfortable (compact cities, well-maintained public transportation) Creating a transport environment that sustains life and daily living (minimizes isolation of the area in the case of emergency, etc.)

Data provided by Ministry of Land, Infrastructure, Transport and Tourism

3. Social Infrastructure Improvement Priority Plan

Pursuant to the Act Regarding the Priority Plan for Social Infrastructure Improvement, the Social Infrastructure Improvement Priority Plan was adopted. In that plan, the conventional five-year plans by each sector were replaced with a single plan that united previous thirteen plans (including the nine conventional long-range plans for roads, ports, airports, etc.); the contents of the plan range from "project budgets" to "outcomes to be achieved." The current plan (2008-2012) was adopted at the Cabinet meeting of March, 2009. At the same time that the regional plans in the National Spatial Strategy were adopted (August, 2009), the regional priority social infrastructure improvement plans for ten regional blocks (including Hokkaido and Okinawa) were adopted under the Social Infrastructure Improvement Priority Plan.

Fig. 1 Outline of the Social Infrastructure Improvement Priority Plan (2008-2012)



Data provided by Ministry of Land, Infrastructure, Transport and Tourism

In regards to road improvement projects, the new five-year mid-range plan (included in the Social Infrastructure Improvement Priority Plan) was announced on December, 2008 and was approved by the Cabinet in March, 2009. This plan presents standards for selecting and focusing, including efforts to minimize costs and eliminate waste. Based on this mid-range master plan, the regional mid-range plans for roads were put together in August, 2009.

Table 4 Social Infrastructure Improvement Priority Plan (2008-2012): Priority goals for road improvement projects, numerical goals for assessment indexes, and factual figures

Policy direction	Policies	Indexes	Numerical goals for assessment indexes	
			2007	2012
Vitality	Improving arterial networks	■ Completion rate for planned ring roads in the three major metropolitan areas	53%	69%
	Solving chronic congestion	■ Time lost at railroad level crossings that are almost never open	ca. 1.32 million person-hours per day	about 10% reduction
Safety	Improving traffic safety	■ Rate of road traffic casualties	109 cases per 100 million vehicle-kilometers	about 10% reduction
Road transport safety & security for an aging society with a low birthrate	Encouraging measures to solve pedestrian & bicycle problems and residential road problems	■ Rate of preventing pedestrian/bicycle accidents that cause casualties inside the "safe walking area."	Prevent about 20% of accidents	
	Encouraging safety measures t on arterial roads	■ Rate of preventing accidents that cause casualties in dangerous traffic locations	Prevent about 30% of accidents	
		■ Number of prevented accidents with an advanced signals, etc.	Prevent about 40,000 accidents	
Quality of life & environment	Improving living environment	■ Barrier-free rates on major local route in residential areas with respect to traffic signals, etc.	83%	100%
		■ Barrier-free rate on specific roads	51%	75%
	Countermeasures against global warming	■ CO_2 emissions amount from the transport sector	254 million tons	240 to 243 million tons
Achieving smooth road transport while combating global environmental problems	Promoting smooth flow of traffic	■ Less time required due to advanced control of traffic signals	About 220 million hours saved	
		■ Amount of CO_2 emissions eliminated due to advanced control of traffic signals	Eliminate about 460,000 t- CO_2 per year	
		■ Time lost at railway crossings that are almost never open	ca. 1.32 million person-hours per day	ca. 10% reduction
Using existing road stock	Safe, secure, and well-planned road management	■ Plans decided on for repair of roads and bridges nationwide to give them a longer life	28%	ca. 100%
	Effective use of the existing expressway networks; reinforcing their functions	Rate of use of on-board ETC (Electronic Toll Collection units)	76%	85%

Data provided by Ministry of Land, Infrastructure, Transport and Tourism

1-8 Revenue Sources and its Use for Roads

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Yuichi Mohri

Pursuant to the Law Enacting Provisional Measures Regarding Revenue Sources for Road Improvement, which was enacted in 1953 in response to an urgent need to improve the outdated road system, road improvements in our country were conducted under the special funding system for road works, and through tolls. However, since the autumn of 2005, with the financial situation growing ever more severe, many discussions were held, and in April, 2009, the Act to Revise in Part the "Act Regarding Government Special Financing of Road Construction and Improvement" was adopted. Starting with fiscal year 2009, the special tax fund earmarked for road works was abolished and was transferred to the general revenue fund. Also, for social infrastructure improvement implemented by municipalities, conventional individual financial assistance was abolished in principle starting in fiscal year 2010; in its stead, it was decided to establish a block grant for social infrastructure improvement, which would give municipalities a higher degree of freedom. As for the fee system on expressways, free sections (targeting about 20% of all expressways) were to be opened as pilot projects starting June 28, 2010.

Table 1 Steps taken toward the transfer of the tax fund earmarked for road works to the general revenue fund

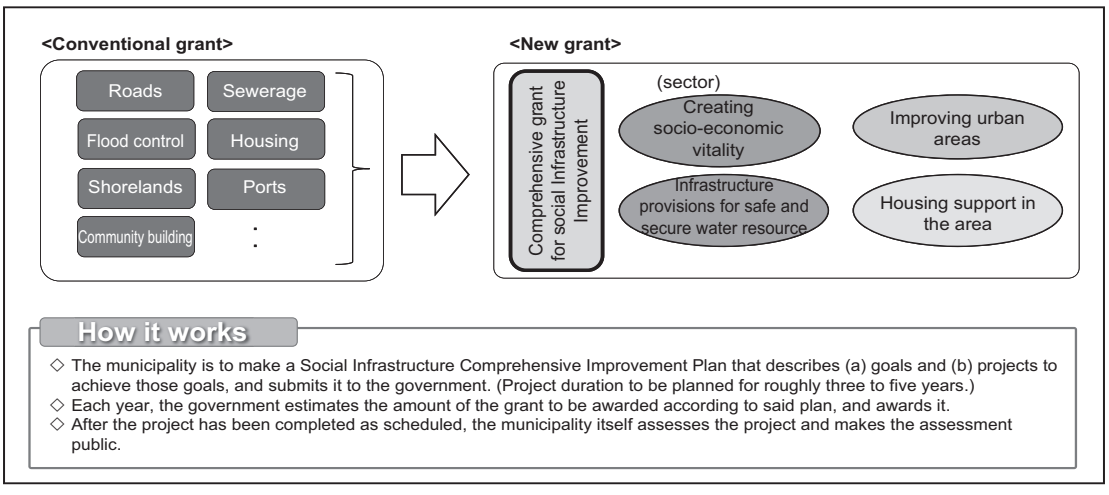
■ Beginning in the autumn of 2005, opinions about the special tax fund earmarked for road works, etc. were submitted from all sectors, and various discussions were held. Subsequently, in April, 2009, the Act to Revise in Part the "Act Regarding Government Special Financing of Road Construction and Improvement" was adopted, and the decision was made to abolish, from fiscal year 2009 onward, the practice of generally allotting an amount equivalent to the estimated amount of the income from the gasoline tax, etc. to road improvement.

Order of Prime Minister Koizumi (Nov. 4, 2005)
• Regarding the review of the tax earmarked for road works: transfer the revenue to the general revenue fund, without reducing the tax rate. Make basic policies accordingly.
Basic policies regarding the review of the tax revenue earmarked for road works (by the government and the ruling party, Dec. 9, 2005)
• The current tax rate, including the amount added as a provisional tax rate, will be maintained. Details of plans are to be based on the transfer of the tax revenue earmarked for road works to the general revenue fund.
Act regarding Promotion of Administrative Reform to Achieve Simple and Efficient Government (proclamation Jun. 2, 2006)
• The 164th Diet adopted the Promotion of Administrative Reform Act that included basic policies regarding the review of the tax revenue earmarked for road works.
Detailed plans regarding the review of the tax revenue earmarked for road works (approved at the Cabinet meeting on Dec. 8, 2006)
• Based on the transfer to the general revenue fund, the current governmental system of tax revenue earmarked for road works is to be revised.
Regarding the review of the tax revenue earmarked for road works (bythe government,and the ruling party, Dec. 7, 2007)
• Review of the tax revenue earmarked for road works, maintenance of the current tax rate level, etc.
Basic policies regarding the tax revenue earmarked for road works (approved at the Cabinet meeting on May 13, 2008)
• The tax revenue earmarked for road works is to be abolished at the time of the fundamental reform of the tax system this year. Starting from fiscal year 2009, it is to be transferred to the general revenue fund.
Regarding the transfer of the tax revenue earmarked for road works to the general revenue fund (by the government,and the ruling party, Dec. 8, 2008)
• The abolition of the tax revenue earmarked for road works: how to treat the tax rate in the relevant tax system be treated in view of the transfer to the general revenue fund.
Act to Revise in Part the "Act Regarding Government Special Financing of Road Construction and Improvement" (proclamation Apr. 30, 2009)
• The 171th Diet approved the Act that included repealing the mandatory practice of using revenue from the gasoline tax, etc. for road improvements.

Data provided by Japan Automobile Manufacturers Association, Inc.

Fig. 1 Outline and basis of the Comprehensive Grants for Social Infrastructure Improvement

■ In principle, conventional individual financial assistance to municipalities implementing social infrastructure improvement has been abolished. Instead, the Comprehensive Grants for Social Infrastructure Improvement were established in order to assist not only with the implementation of key projects, but also with improvements to the related social infrastructure, and with projects that will enhance the effects of the key projects. The grants, in other words, offer municipalities a higher degree of freedom to manage the projects and their effects.



Source: data of Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism

Table 2 Outline of road-related budget for fiscal year 2010

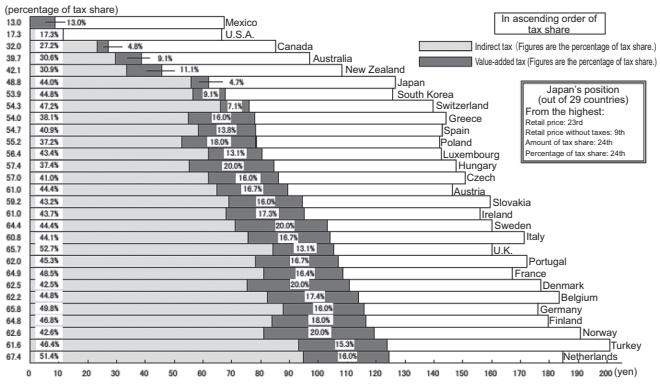
■ The budget for projects under direct government control was cut by about 20% from last fiscal year's budget. For government-assisted projects, individual financial assistance was abolished in principle; instead, the Comprehensive Grant for Social Infrastructure Improvement was established.

(unit: 100 million yen)

Project type	Project budget	Relative change from last fiscal year	Government budget	Relative change from last fiscal year
Projects under direct government control	15,048	0.84	11,394	0.90
Projects receiving government assistance	1,418	0.22	937	0.25
Toll road projects, etc.	14,633	1.02	1,027	0.97
Total	31,099	0.80	13,357	0.76

1. Includes loan redemption, etc. (government budget: 89.3 billion yen)
2. Besides items in the table, there are expenses for temporary loans for local road improvements (gov't. budget: 80 billion yen), free expressway projects (gov't. budget: 100 billion yen), and administrative costs (gov't. budget: 1.1 billion yen).
3. Some of the subsidiary road projects, the vitality grants, and other subsidiary projects are to be abolished; instead, the Comprehensive Grants for Social Infrastructure Improvement (tentative name) (gov't. budget: 2 trillion 200 billion yen) are to be established.

Fig. 2 Price with tax of one liter of gasoline in OECD countries

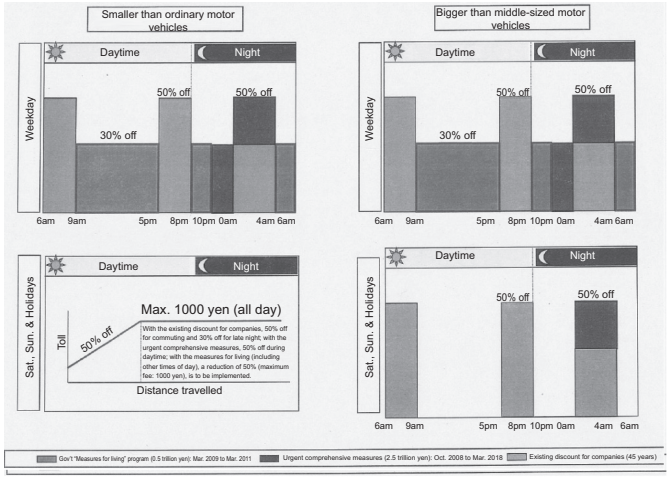


Source: Energy Prices and Taxes (the fourth quarter of 2009, IEA)

Note: 1. Japan's consumption tax is included in the value-added tax. The sales tax in the U.S.A. is not shown in the above graph.
2. Indirect taxes in Japan are the gasoline tax, local road tax, and oil and coal tax.
3. The exchange rates for yen are average exchange rate figures between July, 2009 and September, 2009.

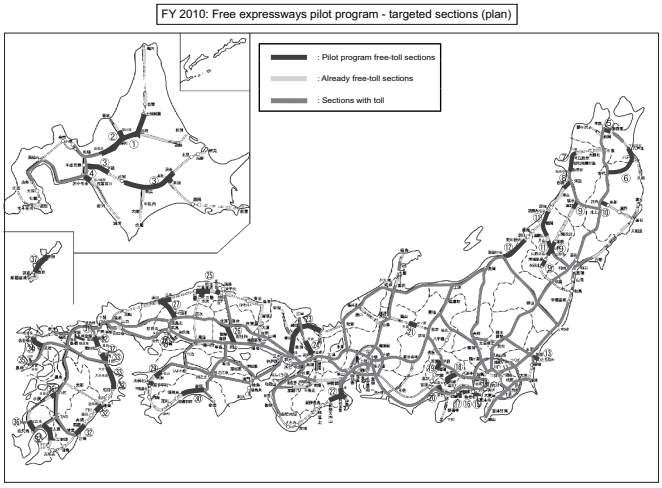
□ Various expressway toll discounts had been implemented due to (1) cost savings when expressway corporations were privatized, and (2) the driver convenience enhancement plan. Furthermore, in order to reduce freight transport costs and commodity prices and to improve the area's economy, as well as to conform to the policy that expressways should be free in principle, the free expressway pilot project started on June 28, 2010 targeting about 20% of all expressways. The economic impact it would have on the area, as well as the impact on congestion and the environment, are to be evaluated.

Fig. 3 Reduction of expressway toll vs. projected revenue sources (NEXCO rural areas)



Source: data of Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism

Fig. 4 Free expressways pilot program in FY 2010



Source: data of Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism

Table 3 Systems in Western countries for road revenue sources

	U.S.A.	Germany	Italy	France	U.K.
Special funding source systems for road works and how they works	Special funding source for roads (Highway Trust Fund) •1956 Special funding started when the federal highway system was established •1983 Public transportation account established Highway Trust Fund consists of road account & public transportation account.	Special funding source for roads •1955 Special funding source was implemented; parts of the mineral oil tax, transport tax, and motor vehicle tax would be used for road improvements. •2002 Law to charge large vehicles on the Autobahn adopted. •2005 Imposition of charge on large vehicles on the Autobahn nationwide	Partly special funding source (15% for roads, the rest, general revenue fund) •1961 Article 26, Law 59 provided that the road budget for fiscal year 1962 would be 12% of motor vehicle- related taxes. •1962- That share was supposed to be increased by 2% every year, but in effect, it has remained at 15% up to now.	All from general revenue fund •1951 Established road improvement special account with part of the gasoline tax as a revenue source •1959 Transferred to general revenue fund in accordance with the budget law •1981 Abolished road improvement special account	All from general revenue fund •1920 Established road fund (special funding source) using the National Treasury, driver's license tax, etc. as revenue sources; it was used as subsidiary money for municipalities to build & manage roads. •1955 Officially abolished road fund
Breakdown of special funding source systems for road works	⊙**National tax (1997 to up to now)** ◆Fuel tax (84% for roads, 16% for public transportation) Tire tax (all for roads) ◆Truck & trailer selling tax (all for roads) ◆Tax for heavy motor vehicle use ⊙**State tax** Different from state to state, but about the same amounts are taxed to fuel & motor vehicles; most of the states specify the use for roads.	⊙**National tax** ◆Fuel tax (mineral oil tax) (2003 to up to now) (15% for roads, 22% for environment tax, 4% for transport assistance for municipalities, 19% for financial aid for German Railways, 39% for general revenue fund) ◆Autobahn heavy truck charge (2007 to up to now) (50% for roads, 38% for railways, 12% for waterways, excl. cost to collect fees) ⊙**State tax** The motor vehicle tax (ownership tax) is a state tax. Some states (Freistaat Bayern, etc.) limit its, use of it for road improvements; but most states put it into the general revenue fund.	⊙**National tax** ◆Fuel tax (revised on Jan. 1, 2007) (15% for roads, 85% general revenue fund)		

Source: data from research of each country

2-1 Trends and Present Situation of Road Traffic Accidents

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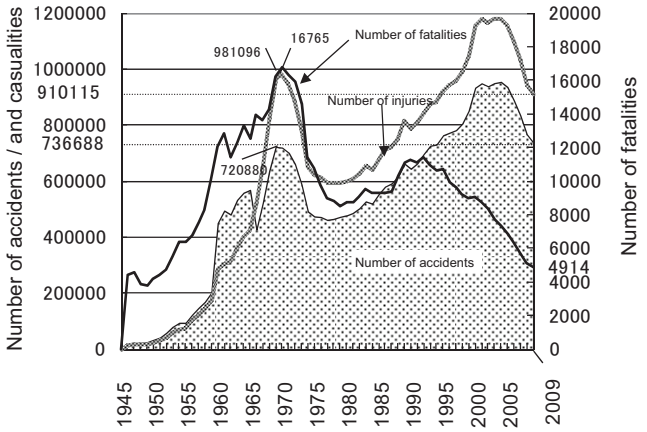
Seiji Hashimoto

After the latest peak in 1992, the number of traffic fatalities has shown a downward trend; in 2009, it dropped to less than 5000 (4914 lives lost). There has also been a continuous reduction in recent years in the number of traffic accidents and the number of casualties; obviously, various efforts made in the past have started to pay off.
A look at the details of traffic accidents By age: accidents involving young people (age 20 to 29) have noticeably decreased, and are now less than those involving people 50 to 59 years old. By means of transportation: for bicycles, which are popular as eco-friendly transportation, the number of fatalities has leveled off; but the bicycle accidents involving pedestrians are increasing; there is a need for traffic safety education that aims at better cycling practices and the managing of space for safe cycling.

Fig. 1 Changes in the numbers of fatalities and injuries from traffic accidents, and changes in the number of accidents

■ The number of fatalities from traffic accidents decreased steadily, as did the number of accidents and the number of injuries.



Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

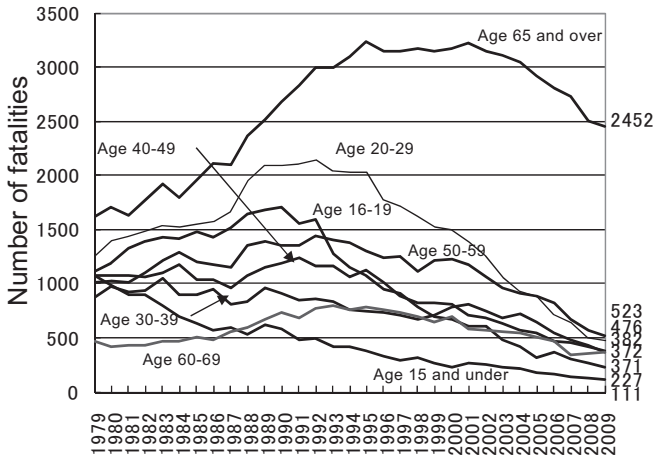
Table 1 The ten prefectures with the highest casualties: number of traffic casualties per 100,000 inhabitants and per 10,000 vehicles in 2009

Casualties per 100,000 people		Casualties per 10,000 vehicles	
Kagawa Prefecture	1461.4	Kagawa Prefecture	162.9
Saga Prefecture	1230.2	Fukuoka Prefecture	159.9
Shizuoka Prefecture	1226.5	Shizuoka Prefecture	145.6
Gunma Prefecture	1201.9	Saga Prefecture	141.5
Miyazaki Prefecture	1169.9	Osaka Prefecture	135.6
Fukuoka Prefecture	1140.8	Miyazaki Prefecture	128.0
Okayama Prefecture	1123.7	Okayama Prefecture	126.7
Yamanashi Prefecture	1000.9	Gunma Prefecture	126.6
Wakayama Prefecture	892.7	Hyogo Prefecture	125.5
Tokushima Prefecture	863.0	Tokyo Metropolis	121.9
Nationwide	717.7	Nationwide	101.1

Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

Fig. 2 Changes in number of fatalities by age group

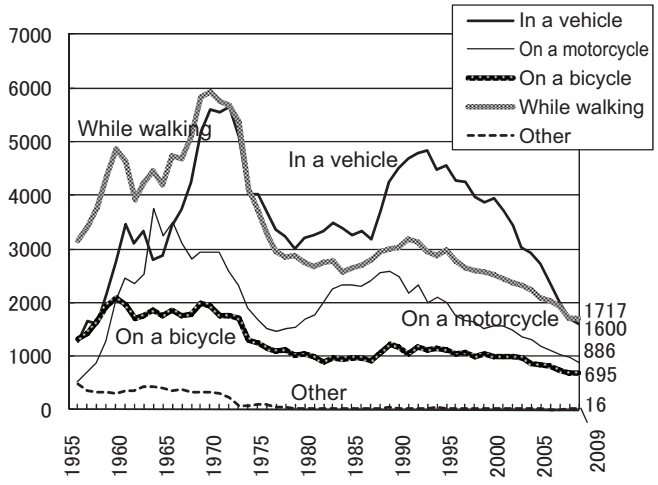
■ All in all, a downward trend is evident. The number of fatalities is high for the elderly (65 and over). It has sharply decreased for those aged 20 to 29 (which is less than that for age 50 to 59).



Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

Fig. 3 Changes in number of fatalities by transport modes

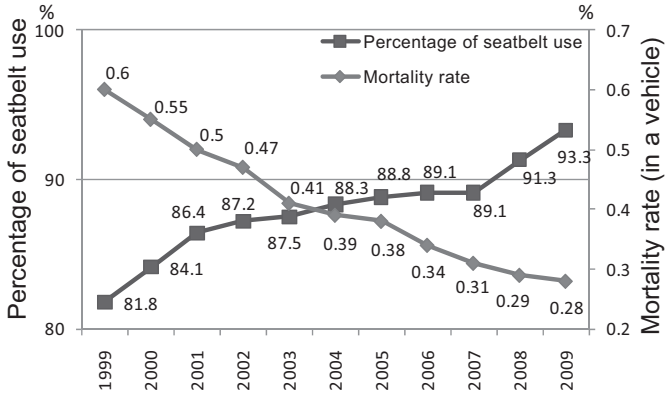
■ Fatalities “in a vehicle” decreased noticeably; and since 2008, “in a vehicle” fatalities have been less than “while walking” fatalities.



Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

Fig. 4 Changes in the percentage of seatbelt use and mortality rate

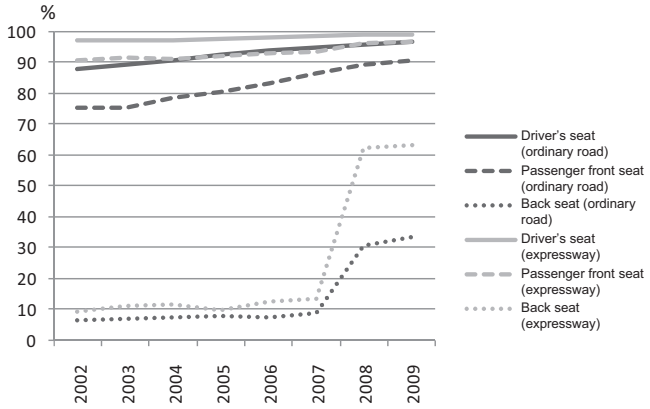
■ The more people wear seatbelts, the lower the mortality rate tends to be.



Source: White Paper on Traffic Safety in Japan 2010

Fig. 5 Changes in percentage of seatbelt use by position in vehicle

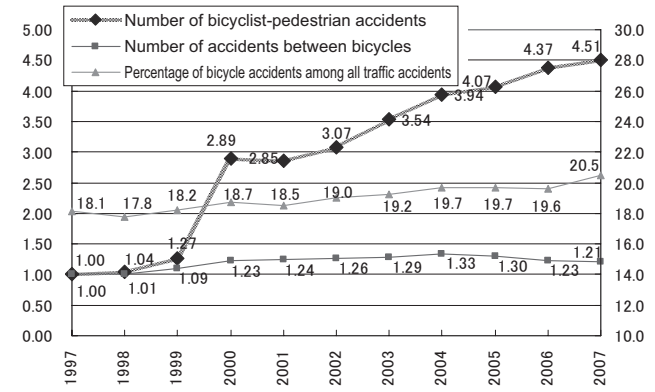
■ Thanks to revisions in the Road Traffic Law, the percentage of seatbelt use by back seat passengers is increasing both on ordinary roads and on expressways.



Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

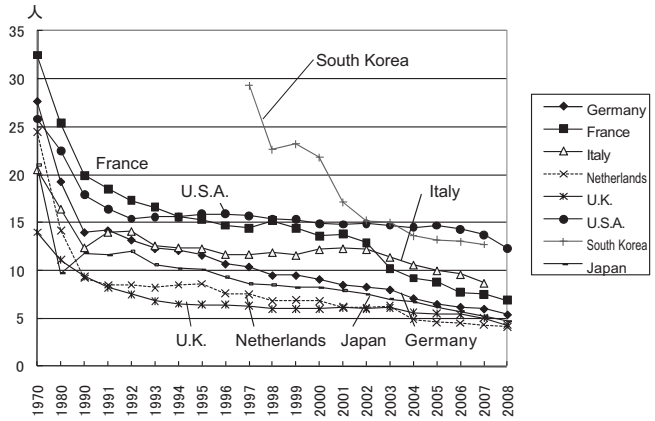
Fig. 6 Changes in incidence of bicycle accidents involving pedestrians

■ Accidents involving bicyclists and pedestrians are rapidly increasing.



Source: White Paper on Traffic Safety in Japan 2008

Fig. 7 Changes in traffic fatalities worldwide, by country (per 100,000 inhabitants)



Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

Table 2 Traffic fatalities worldwide, by situation (2008)

Situation / Country	Number of fatalities	In a car	On a motorcycle	On a moped	On a bicycle	While walking	Other
Germany	4,477	2,368	656	110	456	653	234
	100.0	52.9	14.7	2.5	10.2	14.6	5.2
France	4,275	2,205	795	291	148	548	288
	100.0	51.6	18.6	6.8	3.5	12.8	6.7
Netherlands	677	330	67	43	145	56	36
	100.0	48.7	9.9	6.4	21.4	8.3	5.3
U.K.	2,645	1,323	488	21	117	591	105
	100.0	50.0	18.4	0.8	4.4	22.3	4.0
U.S.A.	37,261	14,587	5,200	90	716	4,378	12,279
	100.0	39.1	14.0	0.2	1.9	11.7	33.0
South Korea	5,870	1,342	740	490	310	2,137	851
	100.0	22.9	12.6	8.3	5.3	36.4	14.5
Japan	6,023	1,269	637	526	971	1,976	644
	100.0	21.1	10.6	8.7	16.1	32.8	10.7

Upper figure: number of fatalities; Lower figure: percentage of total (%)
For countries that used the coefficient to convert the number of fatalities into a 30-day figure, the total may not represent the sum of each figure.

Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

Table 3 Number of traffic fatalities worldwide by age group (2007)

Age / Country	Number of fatalities	5 and under	6-9	10-14	15-17	18-20	21-24	25-64	65 and over	Unknown
Germany	4,477	35	19	48	174	436	451	2,242	1,066	6
	100.0	0.8	0.4	1.1	3.9	9.7	10.1	50.1	23.8	0.1
France	4,275	42	25	58	172	424	534	2,209	811	0
	100.0	1.0	0.6	1.4	4.0	9.9	12.5	51.7	19.0	0.0
Netherlands	677	6	2	15	32	47	60	341	174	0
	100.0	0.9	0.3	2.2	4.7	6.9	8.9	50.4	25.7	0.0
U.K.	2,645	30	23	57	160	272	270	1,333	499.0	1
	100.0	1.1	0.9	2.2	6.0	10.3	10.2	50.4	18.9	0.0
U.S.A.	37,261	497	310	540	1,596	3,187	3,940	21,579	5,533	79
	100.0	1.3	0.8	1.4	4.3	8.6	10.6	57.9	14.8	0.2
South Korea	5,870	69	56	66	189	116	319	3,436	1,615	4
	100.0	1.2	1.0	1.1	3.2	2.0	5.4	58.5	27.5	0.1
Japan	6,023	55	45	45	134	274	247	2,273	2,950	0
	100.0	0.9	0.7	0.7	2.2	4.5	4.1	37.7	49.0	0.0

Upper figure: number of fatalities; Lower figure: percentage of total (%)
For countries that used the coefficient to convert the number of fatalities into a 30-day figure, the total may not represent the sum of each figure.

Source: Traffic Statistics 2009 (Institute for Traffic Accident Research and Data Analysis)

2-2 Motor Vehicle Insurance in Japan

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Yasuo Fukuda

A noteworthy characteristic of motor vehicle insurance in Japan is its two-tiered structure. The first tier is the compulsory liability insurance program in which all motor vehicles are required by law to be enrolled; The second is a voluntary program in which the motor vehicle owner may or may not choose to enroll. The compulsory liability insurance is tied to the automobile inspection program, and almost 100% of motor vehicles are found to be enrolled in it. Coverage to provide basic compensation to victims is limited to 30,000,000 yen for death, and 40,000,000 yen for the severe after-effects of disabling injuries. This compulsory liability insurance is managed according to the general rule of "No loss, no profit"; the premium is 22,470 yen for two years for an ordinary automobile, which provides a high level of compensation with quite a low premium. The percentage of motorists enrolled in the voluntary insurance program, which provides compensation that is not provided by the compulsory liability insurance, is about 72%. With the current trend toward higher amounts of compensation for losses and damages, more drivers ought to enroll in the voluntary program.

Table 1 Obligations of those responsible for a traffic accident

■ When a traffic accident occurs, the person who caused the accident has three types of legal obligations and one moral obligation; the civil obligation is to compensate the victim(s) for the loss.

Legal obligations	
	Administrative Obligation
	(Subject to administrative disposition:) To ensure safety on the road, the public safety commission in charge takes action such as revocation / suspension of the driver's license, deduction of points, and imposition of a fine.
	Criminal liability
	If the victim died or was injured through the driver's "professional negligence": The penalty is determined depending on the extent of the negligence, the consequences of the accident, and the appropriateness of the driver's action after the accident. Penalties are imprisonment with work, imprisonment without work, and a fine.
	Civil obligation
	If the driver caused losses/damages to others from the traffic accident, (s)he must compensate the victim(s) for the loss. Compensation is regulated in the civil law and in the Automobile Liability Security Act.
Moral obligation	
Besides legal obligations, there is a moral obligation for the person who caused the accident to visit the victim and apologize sincerely.	

Source: Insurance for Loss & Damage in Daily Life (The General Insurance Association of Japan)

Table 2 Outline of the compulsory motor vehicle liability insurance

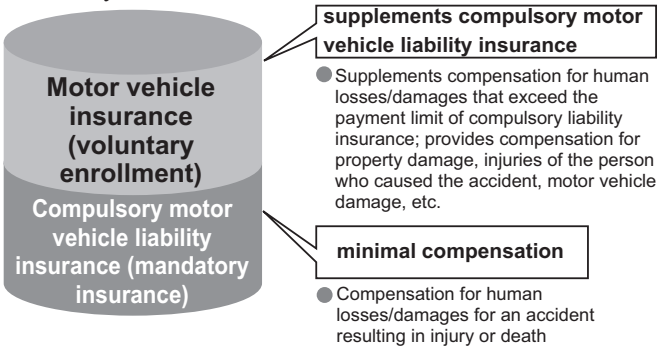
■ All motor vehicles are obliged to have compulsory liability insurance.

Outline of the compulsory motor vehicle liability insurance	
In accordance with the Automobile Liability Security Act, for the purpose of providing relief to victims of motor vehicle accidents, the compulsory motor vehicle liability insurance is designated "mandatory"; all motor vehicles are required to be enrolled. It follows that even such vehicles as mopeds must also be enrolled.	
Penalty for not having the compulsory motor vehicle liability insurance	
Imprisonment for less than one year or a fine of less than 500,000 yen	… (penalty in accordance with the Automobile Liability Security Act)
+	
Six points will be deducted; suspension of license, etc.	… (penalty in accordance with the Road Traffic Act)

Source: Fact Book 2010: Japan's Insurance against Loss (The General Insurance Association of Japan)

Fig. 1 Compulsory motor vehicle liability insurance and motor vehicle insurance

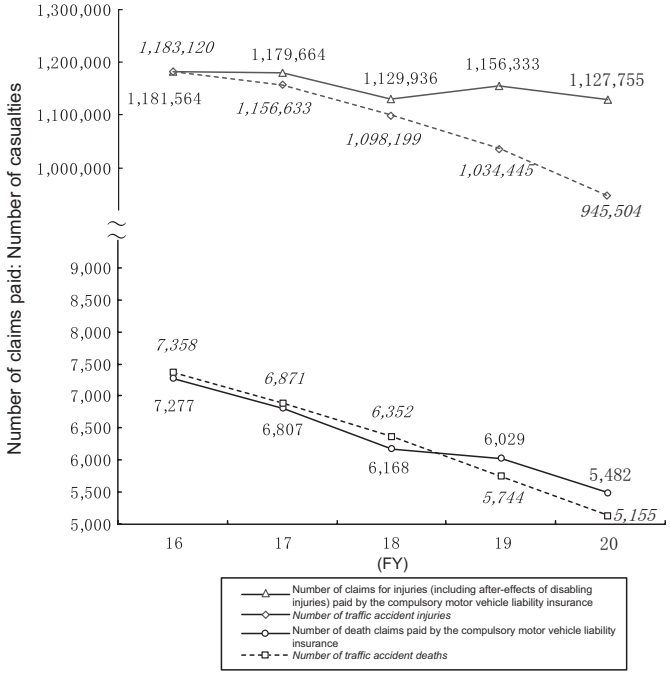
■ For traffic accidents, there are two types of insurance: (1) compulsory liability insurance (mandatory) to compensate death or injury of the accident victim(s); and (2) voluntary motor vehicle insurance that supplements the compulsory liability insurance.



Source: Fact Book 2010: Japan's Insurance against Loss (The General Insurance Association of Japan)

Fig. 2 Changes in the number of traffic accidents and the number of cases in which claims have been paid by the compulsory motor vehicle liability insurance

■ The number of traffic accident injuries is on a downward trend; but the number of claims paid by the compulsory motor vehicle liability insurance remains flat.



Source: Automobile Insurance in FY 2009 (Non-Life Insurance Rating Organization of Japan)

Table 3 Coverage and limits of the compulsory motor vehicle liability insurance

■ The compulsory motor vehicle liability insurance (mandatory insurance) covers only compensation for loss/damage to the body of the accident victim. It does not cover compensation for loss/damage to the body of the person who caused the accident or to motor vehicles of the victim or of the person who caused the accident. Also, the limits of the amount are set as follows:

Type of loss/damage	Scope of loss/damage	Limit of payment
Damage from injuries	Costs for medical treatment, costs for documentation, loss from closing a business, consolation money, etc.	1,200,000 yen
Damage from after-effects of disabling injuries	Lost profits, pain & suffering compensation, etc.	Depending on the grade of after effects from disabilities: 40,000,000 – 750,000 yen*
Loss from death	Funeral costs, lost profits, pain & suffering compensation	30,000,000 yen

*(1) When there is severe damage to the nervous system, brain, or organs of the chest and stomach and the person needs nursing care at all times or as needed: nursing care at all times: 40,000,000 yen(1st degree disability): nursing care as needed: 30,000,000 yen (2nd degree disability)

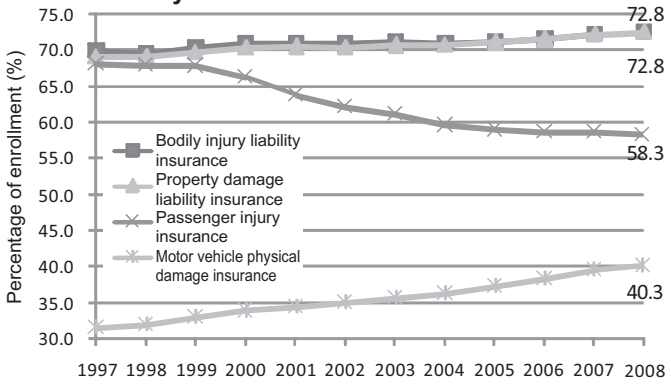
Source: Fact Book 2010: Japan's Insurance against Loss (The General Insurance Association of Japan)

Table 4 Coverage of compulsory (mandatory) vs. voluntary (supplementary) insurance

Type of damage/loss		Examples	Insurance that covers the case	
			Mandatory insurance	Supplementary insurance
Damage/loss to be compensated	Other person's body	Hit and killed a pedestrian	Compulsory motor vehicle liability insurance	Bodily injury liability insurance
		Bumped into other vehicle and caused injury to the driver.		
	Other person's property	Bumped into and damaged another vehicle.	—	Property damage liability insurance
		Bumped into someone's house gate and broke it.	—	
Injuries	Driver & passengers	Drove into a river and was injured	—	Own-fault Insurance / Passenger injury insurance / Bodily injury insurance
		Bumped into a utility pole, injuring a passenger in the driver's vehicle	—	
		After a collision with another vehicle, suffered after-effects of disabling injuries; but the driver of the other vehicle didn't have bodily injury liability insurance.	—	Uninsured motorist insurance / Bodily injury insurance
Property damage	Driver's vehicle	Drove over a cliff, totally wrecking the vehicle.	—	Motor vehicle physical damage insurance
		A signboard was blown into the vehicle, causing severe damages.		
		Vehicle stolen.		

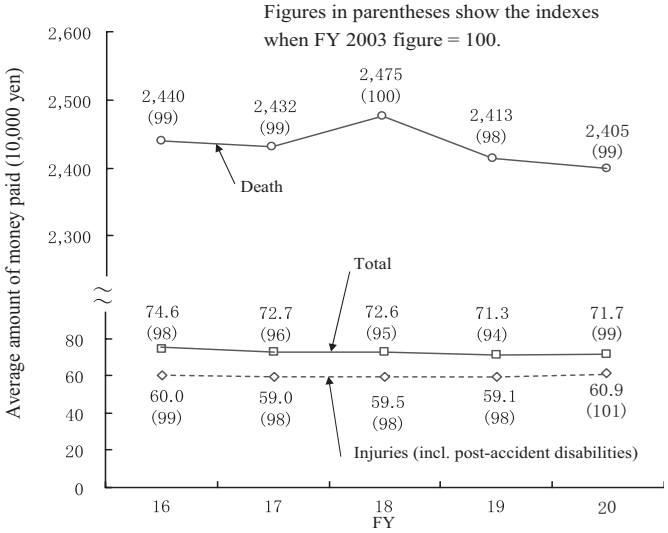
Source: Insurance for Loss & Damage in Daily Life (The General Insurance Association of Japan)

Fig. 3 Changes in the percentage of those enrolled in voluntary motor vehicle insurance



Source: Automobile Insurance in FY 2009 (Non-Life Insurance Rating Organization of Japan)

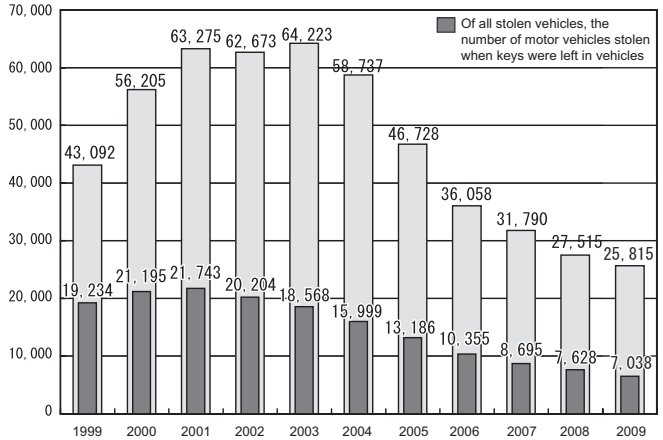
Fig. 4 Changes in the average claim paid by the compulsory liability insurance, by result of accidents (death / injuries)



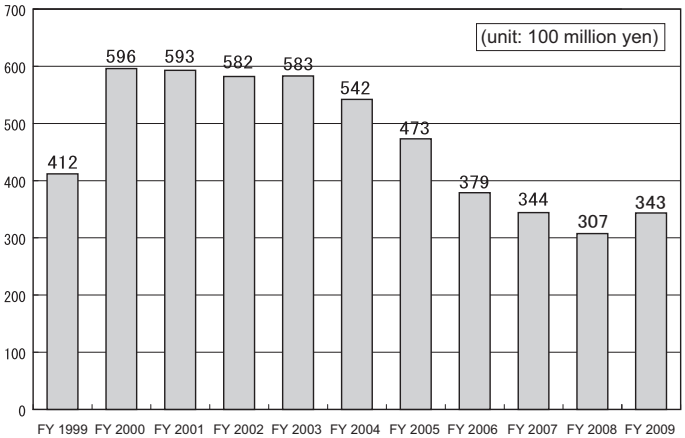
Source: Automobile Insurance in FY 2009 (Non-Life Insurance Rating Organization of Japan)

Fig. 5 Changes in the reported number of motor vehicle thefts and amounts of claims paid

■ The reported number of motor vehicle thefts is decreasing; however, the size of claims paid is not consistently decreasing.



Source: National Police Agency research on motor vehicle theft



Source: Fact Book 2010: Japan's Insurance against Loss (The General Insurance Association of Japan)

2-3 Traffic Safety Measures

Professor, Graduate School of Urban Environmental Sciences, Tokyo Metropolitan University
Takashi Oguchi

Monetary losses in Japan from traffic accidents were estimated to be 4.4 trillion yen in 2004. Furthermore, the estimated amount per person of non-monetary losses from fatal accidents (e.g., psychological loss from grieving, loss from lowered quality of life) is well over the amount of monetary losses (estimated by "WTP," Willingness to Pay approach). New safety measures being currently implemented include improving traffic safety facilities, employing better traffic control techniques, renovating road surfaces and related facilities, better control of traffic lanes, educational activities for traffic safety using the Internet, Road Traffic Act revisions (e.g., making seatbelts mandatory, strict penalties for driving under the influence), and so on. The policies presented in the Eighth Traffic Safety Basic Plan, which envisions a society where there are no traffic accidents and where people come first when it comes to traffic safety, are gradually reaching the public.

Fig. 1 Government efforts for traffic safety

■ Promotes comprehensive and meticulously planned safety measures in accordance with the Traffic Safety Measures Basic Law; promotes facilities improvements in accordance with the Social Infrastructure Improvement Priority Plan.

Traffic safety planning in accordance with the Traffic Safety Measures Basic Law

* The law is intended to promote comprehensive and carefully planned traffic safety measures (land, sea, and air).

Traffic Safety Basic Plan

- Drafted by the Central Traffic Safety Measures Council (headed by the Prime Minister)
- Provides an outline of traffic safety policies, and measures to implement them

Eighth Traffic Safety Basic Plan (approved by the Central Traffic Safety Measures Council on March 14, 2006) for FY 2006 to FY 2010

Basic policies:

1. **Steps toward a society without traffic accidents:** To build a truly fulfilling and energetic society, we need to achieve a society free of traffic accidents.
2. **A philosophy of traffic safety that puts people first:** In a civilized society whose priorities include consideration and concern for the weak, all traffic safety implementing measures need to be in harmony with the basic philosophy that gives priority to people — that enhances, in other words, the safety of the "traffic disadvantaged" (the elderly, the disabled, children, etc.).
3. **Basic implementation objectives:** To set measurable goals to be achieved in the designated period and to specify the actions that will achieve those goals. For road traffic, in particular, traffic safety measures that put people first are to be further reinforced (e.g., more sidewalk improvements on roads taken to schools, roads in residential areas, and arterial roads in city areas). To promote traffic safety activities where people come and work together.
4. **Dealing with human error in public transport:** In all public transport (land, sea, air), persons involved with transport administration and operation are to recognize once again that solving safety problems takes the highest priority; improvement is to be system-wide.

* The government's goal was set at the beginning of 2009: "In the next ten years, the number of traffic accident fatalities is to be 2500 or less." Toward that end, efforts are being made in fiscal 2010 for the next (ninth) Traffic Safety Basic Plan.

Traffic safety plans of prefectures → Traffic safety plans of municipalities

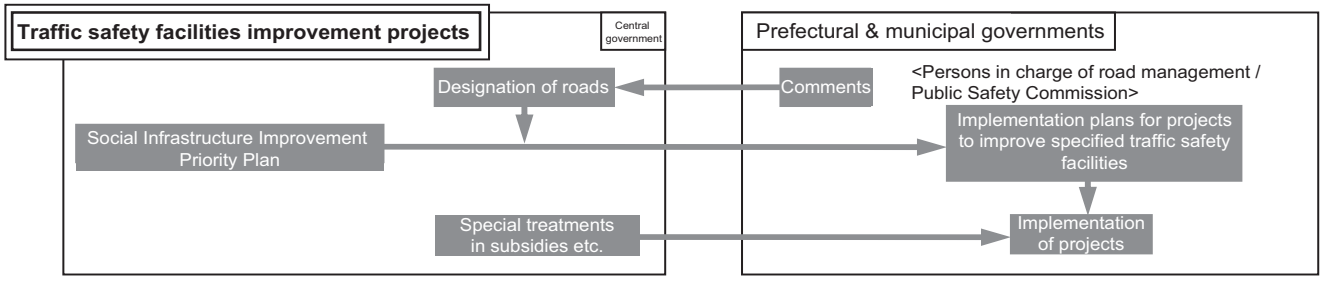


Table 1 Monetalized social losses from traffic accidents (items & amounts)

■ The monetary loss from a traffic accident is about 30 million yen per person. On the other hand, the estimated amount of loss from death as a non-monetary loss is about 230 million yen per person (estimated figure from the results of WTP analysis on reducing death risk).

Type of losses	Items of expense	Calculated amount (2004)
Human losses	Medical expenditure, loss from closing a business, consolation money, lost profits, etc.	1.5 trillion yen
Physical losses	Repair of vehicles and damaged structures, and payments for the damages	1.8 trillion yen
Losses of business operators	Loss from reduction in the amount of added value due to death, post-accident disabilities, closing business, etc.	0.1 trillion yen
Losses of public organizations	Costs for emergency transport, police reports, court, lawsuits, prosecutors, reform, insurance management, financial assistance to victims, welfare, emergency medical care system; losses from delays caused by congestion	1.0 trillion yen

Source: Research Report on Economic Analysis of Damage and Loss from Traffic Accidents (Mar., 2007, Cabinet Office Director-general for Policies on a Cohesive Society)

Fig. 2 Educational activities on the website, “Traffic Safety Map”

■ This website, created by the National Police Agency and the Ministry of Land, Infrastructure, Transport and Tourism, provides the general public with traffic accident data as well as analysis of the cause of the accidents. It has a search function for dangerous places where accidents can occur, as well as “safe walking areas” (see Fig. 4).

Data: website of the Ministry of Land, Infrastructure, Transport and Tourism; http://www.kotsu-anzen.jp/

Table 2 Safety measures introduced in the revised Road Traffic Act (Jun. 1, 2008)

■ Research in October 2008 showed that, after seatbelt use was made mandatory for backseat passengers (the driver is penalized one point for each violation), the percentage of backseat passengers using seatbelts showed a remarkable increase. However, in October 2009, a year later, there was not much improvement; the percentage of seatbelt use by backseat passengers is still low.

Seatbelt use (2008)

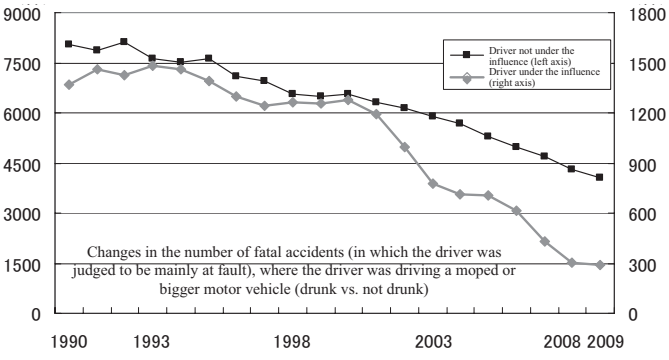
	Percentage in 2008		Percentage in 2009	
	Ordinary roads	Expressways, etc.	Ordinary roads	Expressways, etc.
Driver	95.9(+0.9)	99.0(+0.5)	96.6(+0.7)	99.2(+0.1)
Front seat passenger	89.2(+2.9)	96.4(+2.9)	90.8(+1.6)	96.9(+0.5)
Back seat passengers	30.8(+22.0)	62.5(+49.0)	33.5(+2.7)	63.4(+0.9)

Figures in parentheses show the change in percentage from the previous year.

Data: website of the National Police Agency; http://www.npa.go.jp/

Fig. 3 Effects of stricter penalties for driving under the influence

■ Stricter penalties were introduced in the 2002 and 2007 revisions to the Road Traffic Act. After each of those revisions, traffic accidents caused by driving under the influence decreased noticeably; in 2008, the figure was less than 25% of that of ten years ago.



Data: website of the National Police Agency; http://www.npa.go.jp/

Fig. 4 Maintaining "Safe Walking Areas"

■ Area-wide and comprehensive measures are now being taken that target city blocks of about one square kilometer, where there are many accidents due to motor vehicle traffic,.

Measures to improve the roads that run around the city blocks — **Intersection improvements, high-tech traffic signals**
A smooth flow of traffic on arterial roads that run around the city blocks will discourage vehicles from passing through the Safe Walking Areas.

Providing for pedestrians — **Sidewalk improvements, barrier-free pedestrian areas**
Improving pedestrian areas where people can move safely

Measures for speed zones — **Speed control in the zone, installation of speed bumps and chicane, etc.**
Creating zones that give priority to pedestrians or bicyclists.

(Speed bumps)

(Chicane)

Data: website of Ministry of Land, Infrastructure, Transport and Tourism; http://www.mlit.go.jp/road/road/traffic/sesaku/

Fig. 5 Traffic signal that separates pedestrians from motor vehicles

■ Secures the safety of pedestrians who are crossing the road by staggering the order of signals for motorists and pedestrians.

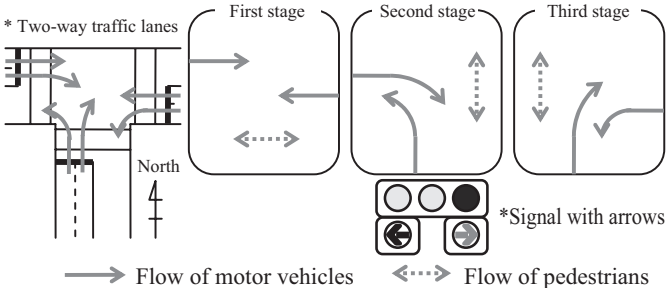
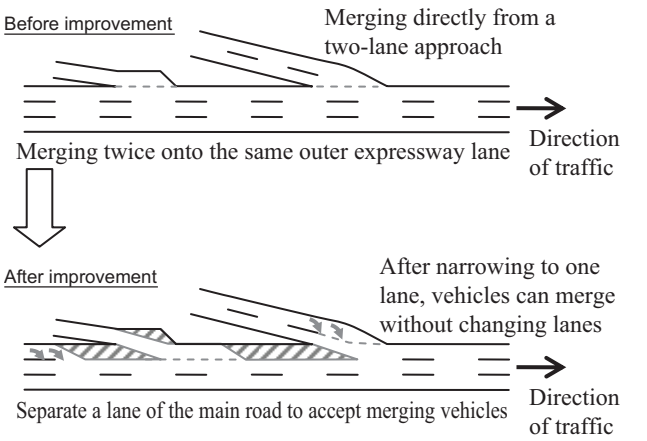


Fig. 6 Altering lane configurations for safety at traffic merging points

■ Encouraged as an effective measure against accidents at some merging points on urban expressways.



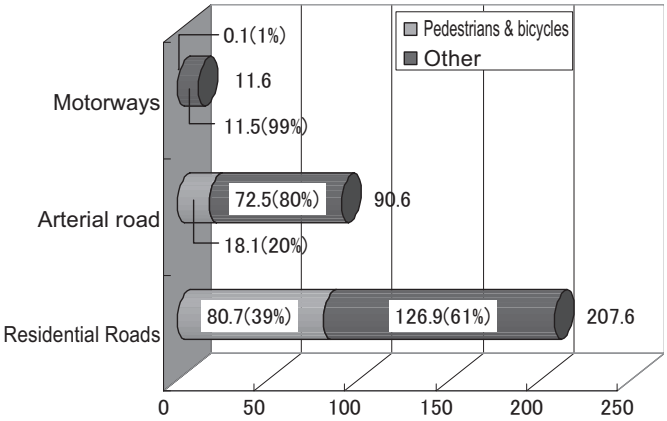
2-4 Efforts toward Traffic Calming

Associate Professor, Graduate School of Environmental Science, Okayama University
Seiji Hashimoto

The idea of promoting safety in residential areas by reducing vehicle speeds on minor roads — in other words, the idea of "Traffic Calming" — is now accepted as a matter of course. It is not easy, however, to put that idea into practice, as is apparent from the various traffic-calming methods that have been used in the past.
Along with conventional measures (e.g., speed humps, road narrowing), such new methods as ISA (Intelligent Speed Adaptation), Automatic Bollard, and Shared Space have been implemented overseas in recent years. In Japan, too, there is a need to review speed management in cities. In reviewing speed regulations,, the National Police Agency and the Ministry of Land, Infrastructure, Transport and Tourism clearly stated that the speed on residential roads should be set at 30 km per hour or less (see the box below). There is definitely a growing movement toward traffic calming.

Fig. 1 Percentage of accidents that caused casualties by type of road (2007)

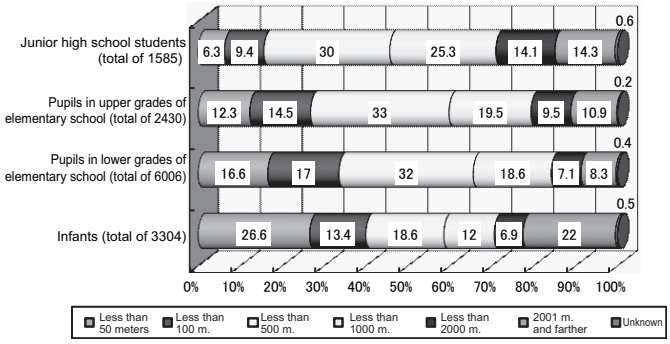
■ The number of traffic accidents (per vehicle-km) on roads in residential areas is high. The percentage of pedestrian and bicycle accidents is high, too.



Source: White Paper on Land, Infrastructure and Transport in Japan 2009

Fig. 2 Number of casualties among children pedestrians by distance from home (2009)

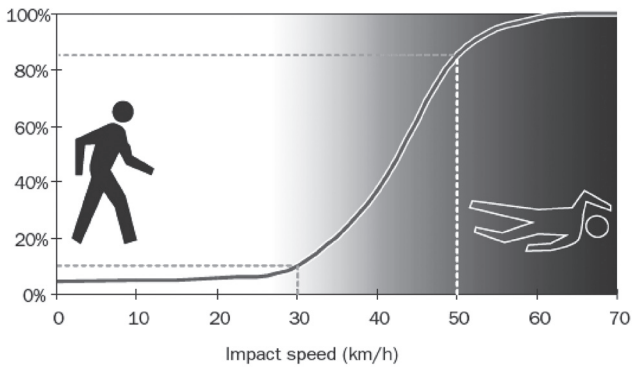
■ When children die in traffic accidents while walking, the scene of the accident is often rather close to home. Traffic safety measures need to be taken not only for highways, but also for residential roads.



Source: Traffic Statistics 2008 (Institute for Traffic Accident Research and Data Analysis)

Fig. 3 Efforts toward speed management

■ Recognizing the importance of managing speed to secure safety on roads, various countries are making efforts for speed management. For residential areas, 30 kilometers per hour is generally regarded as the optimal speed limit. In our country, too, the National Police Agency's "Report on Deciding Speed Limits" mentioned that a speed limit of 30 km per hour or less is desirable.



Source: Speed Management — A Road Safety Manual for Decision-makers and Practitioners (WHO,2008)

Report on Deciding Speed Limits (residential roads):
Targeting a speed that allows time for reaction to an unexpected incident, and that can avoid the occurrence of a serious accident, we set the speed limit at 30 km per hour or less. The extent of the regulation of this will be governed by attention to how the road is actually used in the area. At the same time, discussions are to be held with interested parties (e.g., residents, police, local governments, road authorities management) on just where the speed needs to be reduced and where the flow of traffic needs to be maintained. Also at the same time, in addition to speed control, the installation of devices (e.g., speed humps, protective barriers) should be considered.

Report on Deciding Speed Limits (National Police Agency, 2009)

■ In Germany, the speed limit is 30 kilometers per hour in cities. Separate speed limits are set for highways, where faster speeds are the rule. (Area-wide speed limit map: example from Kaiserslautern)

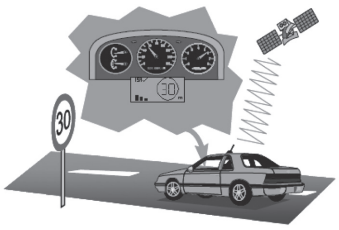
Fig. 4 Traffic calming methods

Movable rubber speed hump

- Instead of a conventional asphalt or concrete speed hump formed on site, factory-made rubber speed humps are also available. Because of their reliability and ease of installation or removal, they are often used in various places on a trial basis. Permanent use of them is also growing. (Photo: Pilot installation of two types of movable speed humps / Toyota City, Aichi Prefecture)

Intelligent Speed Adaptation (ISA)

- Use of the ISA, which automatically sets the upper speed limit of a vehicle by using ITS (Intelligent Transport Systems) technology, has been either contemplated or actually introduced, mostly in northern Europe. Methods under consideration are the satellite-linked GPS (Global Positioning System), or a speed-limit transmitter installed on a traffic sign. ISA is also being used experimentally on public roads in London.



Shared Space

- Regarding the road as a space shared among pedestrians, bicycles, motor vehicles, and so on will reduce traffic accidents, and will eliminate such devices as traffic lights, signs, and speed humps. The idea was first formed in the Netherlands and is spreading throughout the Western countries. In various places, its trial or permanent use is accelerating. (Photo: Stockholm)

Automatic Bollard

- In many cities in Europe, an automated ballard is used to restrict vehicle entry and exit to and from a residential or commercial area. It goes up and down automatically to permit only designated vehicles to proceed (e.g., public transportation, a resident's car). (Photo: Cambridge, U.K.)

Road Narrowing

- To restrict vehicle entry and exit to and from a residential or commercial area, and to reduce the speed of vehicles, part of a two-way road is intentionally narrowed to the point where vehicles need to yield to each other. An old practice in Western countries, it can also be seen in Japan. (Photo: Kamagaya City, Chiba Prefecture)

Roundabout

- A roundabout consists of an island inside an intersection, around which the traffic has to flow one way. There are many of them in Western countries. It is supposed to reduce the accidents that would otherwise occur if the intersection had traffic signals, provided that there is less than a certain amount of traffic. There is currently some movement toward shifting the regulation of traffic at intersections from signal lights to roundabouts with no signals. (Photo: Letchworth, U.K.)

2-5 The Reconsideration of Movement toward Acceptance of Bicycles

Associate Professor, Graduate School of Engineering, The University of Tokyo
Nobuaki Ohmori

People are once again looking favorably on bicycles as pollution-free and healthy vehicles. In other countries, progress has been seen in efforts to establish safe bicycle lanes, to provide bicyclists with access to public transportation, to take bicycles on public transportation vehicles, and to introduce advanced bicycle sharing systems. There are even cases in which bicycles play a significant role in building communities. The number of bicycles owned in our country is about 70 million. Following the revision of the Road Traffic Act in June, 2007, the way that bicycles run on roads is undergoing a noticeable change, with both small-scale and large-scale innovations being seen.

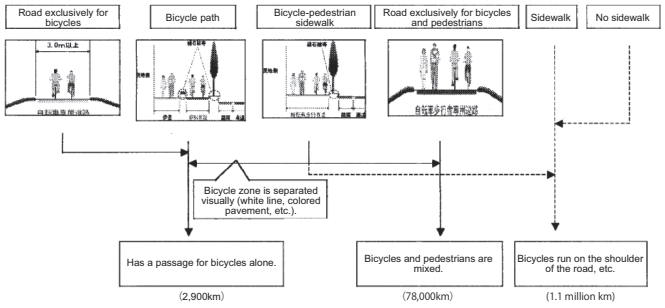
Table 1 Bicycle routes by country

Country	Year	Length of bicycle routes (km)	Percentage of total length of roads (%)	Length of bicycle routes per national land area (m/km²)	Length of bicycle routes per 1000 bicycles (m/1000 bicycles)	Length of bicycle routes per 1000 inhabitants (m/1000 inhabitants)
Netherlands	1985	14,500	8.6	349	1,317	900
Germany	1985	23,100	4.7	65	660	280
Japan	2006	7,301	**0.6**	**19**	**84**	**57**

Note: The length of bicycle routes in Japan is the total of (1) bicycle-pedestrian sidewalks (with bicycle lanes), (2) bicycle paths, (3) roads exclusively for bicycles, and (4) roads exclusively for bicycles and pedestrians.

Source: data of Ministry of Land, Infrastructure, Transport and Tourism

Fig. 1 Types of bicycle routes

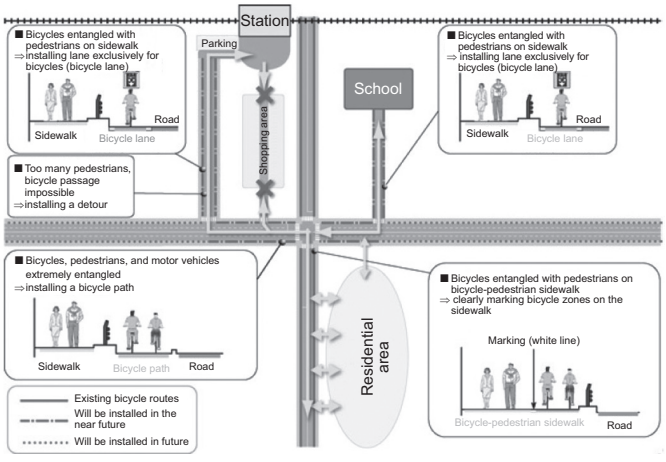


Note: Bicycle path: Path exclusively for bicycles installed adjacent to the motor vehicles road and sidewalk
Bicycle-pedestrian sidewalk: Sidewalk installed adjacent to the road, to be shared by bicycles and pedestrians
Road exclusively for bicycles, and road exclusively for bicycles and pedestrians: Separate roads for bicycle, and bicycle and pedestrian traffic
Other than the above, there are bicycle zones designated by pavement markings.

Source: data of Ministry of Land, Infrastructure, Transport and Tourism (figures for 2009)

Fig. 2 Areas to be a model in improving bicycle traffic

■ In January, 2008, ninety-eight places nationwide were designated as areas to be a model of future improvement of bicycle traffic. In each model area, "separated" spaces are installed strategically for bicycles to travel through.



Source: data of Ministry of Land, Infrastructure, Transport and Tourism

Table 2 Five rules for safe use of bicycles

(1) Travel on the carriageway as a general rule. Travel on sidewalk is a permitted exception when, • a traffic sign, etc., indicates that sidewalk use is permitted, or • bicyclists are children younger than 13, elderly aged 70 and over, or physically disabled, or • it is impossible to do otherwise considering the road traffic situation.
(2) Travel on the left side.
(3) On the sidewalk, give priority to pedestrians and ride slowly on the side next to the road.
(4) Observe safety rules. • It is not permitted to ride a bicycle when you are drunk, to have two people on one bicycle, and to ride parallel to another bicycle. Use lights at night. Observe traffic signals. Stop at the intersection, look all ways, and proceed with caution.
(5) Children are to wear helmets.

Source: data from Japan Traffic Safety Association and the National Police Agency

Fig. 3 Chigasaki City Rainwear Project

■ To keep middle school and high school students from not-using umbrellas while riding on bicycles, this citizens' project is developing attractive rainwear.

Source: Rainwear Project, official website of Chigasaki City

Fig. 4 Roads exclusively for bicycles

■ In Narita New Town, a series of bicycle roads have been installed, completely separated from pedestrians.

■ In the center of Paris, more bicycle roads are being installed.

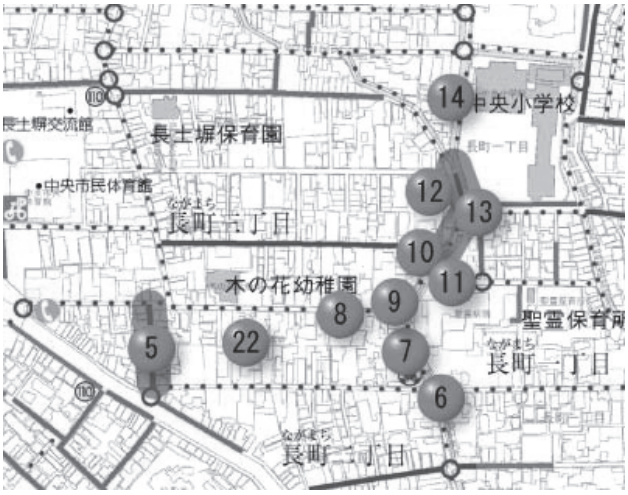
Fig. 5 Developing bicycles for three people

- For households with children, bicycles are indispensable for going out with the children. From July 1, 2009, the Road Traffic Act permits two infants to be carried on one bicycle only if the bicycle satisfies the new safety standard. (The Act also changed the standard for the human-to-motor assist ratio to 1 : 2 for electric motor assisted bicycles.)

Photographed by author

Fig. 6 Safety map for bicycles and pedestrians (Kanazawa City)

- The map was created by local residents; it shows dangerous spots.



Source: website of Kanazawa River and National Road Office

Table 3 Maintaining safety of bicycles

Place / targets	Possible measures to take
Intersections	Installing colored pavement
	Widening bicycle crossing lanes
	Ensuring space for bicycles to wait for the signal
	Improving visibility
	Installing street lights
Bus stops	Improving visibility
	Installing street lights
	Installing protective barriers
Sidewalks	Improving bicycle-pedestrian sidewalks
	Widening sidewalks
	Introducing roads exclusively for bicycles
	Installing protective barriers
	Making regulations for ordinary bicycle travel on permitted sidewalks
Parking areas	Reviewing the parking fee system
	Installing new bicycle parking areas
	Introducing legislation to make it mandatory for facilities to install bicycle parking areas
	Keeping bicycles from parking in improper areas
Road shoulders	Introducing roads exclusively for bicycles
	More enforcing of rules (e.g. stopping, obeying traffic signals) for motorists
	Installing street lights
The "transport disadvantaged" (the elderly, etc.)	Keeping bicycles from parking in improper areas
	Improving bicycle-pedestrian sidewalks
	More education for bicyclists
Comprehensive measures	Putting more emphasis on education and public relations
	More enforcing of rules (e.g. stopping, obeying traffic signals) for motorists
	More education for bicyclists

Source: data from website of Urban Economic Research Institute

Fig. 7 New developments in bicycle parking areas

- The first mechanized bicycle parking units in Mitaka City. It accommodates 180 bicycles per unit.
- On road bicycle parking areas are now possible by a new rule.

Photographed by Transportation and Urban Engineering Research Group, Yokohama National University

Source: data of Ministry of Land, Infrastructure, Transport and Tourism

Table 4 The European trend toward community bikes

- Bicycle-sharing (the "community bikes" system), which basically uses cell phones or integrated-circuit cards for renting and managing bicycles, and is good for theft prevention, efficient management, and convenience to users, has been introduced in over 100 cities, mainly in Europe (including Paris, where the system is called "Vélib'"); there are a number of operators in the business. In our country, too, since its introduction in Toyama City in March 2010, many other cities (Nagoya, Sapporo, Kitakyushu, etc.) are conducting pilot tests and are considering introducing the system. (Data from Aoki et al. (2008), Mr. Takahito Suwa, http;//bike-sharing.blogspot.com/, Urban Community Cycle Research Group (2010), and Ministry of Land, Infrastructure, Transport and Tourism.)

Business operator	Name of city (system)
JC Decaux	Over 15 cities including Paris (Vélib'), Lyon (Vélo'v), and Toyama (Cyclocity)
Clear Channel	Over 10 cities including Oslo (Oslo Bysykkel) and Barcelona (Bicing)
DB	Over 6 cities such as Berlin and Frankfurt (Call-a- bike)
Nextbike	Over 20 cities, e.g. Leipzig and Frankfurt (Nextbike)
Bicincittà	Over 20 cities including Parma (Bicincittà) and Rome (Roma'n'Bike)
Other	Copenhagen (Bycyklen), Orléans (Véló+), Taipei (YouBike), London (Barclays Cycle Hire), etc.

Fig. 8 Community bike project in Toyama City (Cyclocity)

- The service started in March, 2010. The system is the same as Vélib' in Paris. It has 15 stations and 150 bicycles. The photo was taken near the Centrum station.

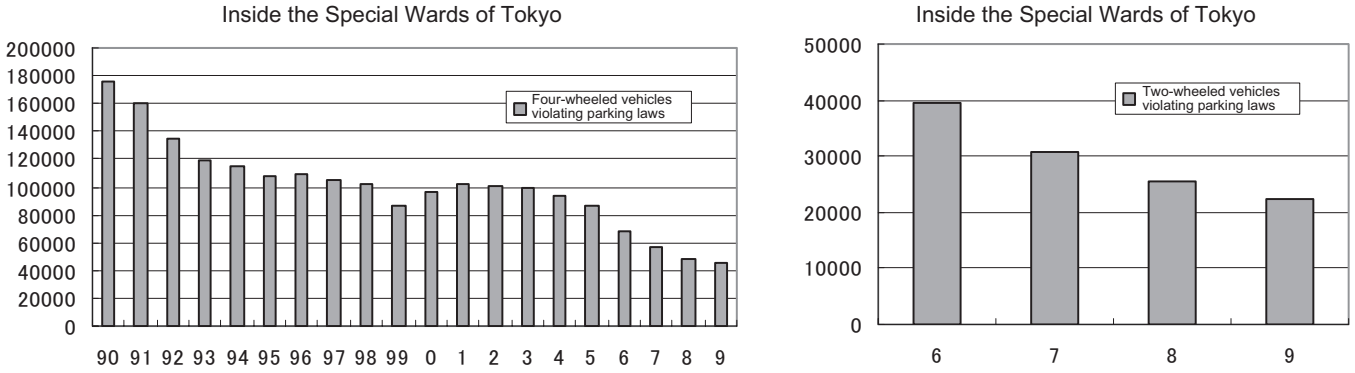
Photographed by Mauricio Matsumoto

2-6 Solving Parking Problems

Associate Professor, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology
Yasunori Muromachi

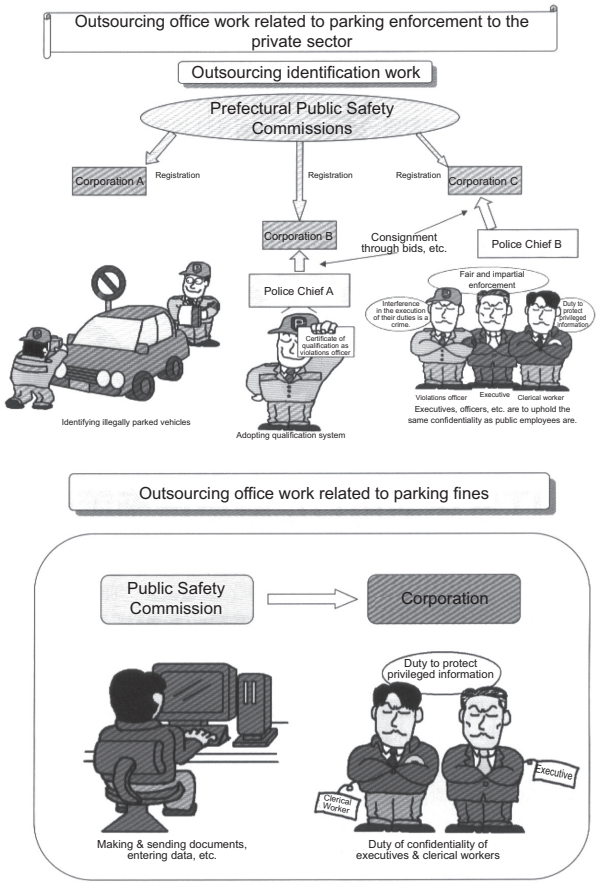
There is now better enforcement of laws against illegal parking; the number of drivers parking illegally on the street in the Special Wards of Tokyo continues to decrease. The same trend applies to motorcyclists. Steps are being taken to cope with the insufficiency of motorcycle parking areas. To assist elderly people driving around looking for parking spaces, a parking policy has been introduced that aims at creating a traffic environment friendly to elderly drivers.

Fig. 1 Changes in the number of vehicles illegally parked for a period of time on the street in the 23 Special Wards of Tokyo



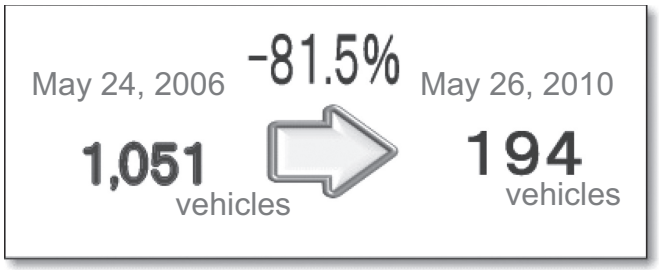
Source: National Police Agency; http://www.keishicho.metro.tokyo.jp/kotu/chusya/chusya.htm#1_4rin, 2010

Fig. 2 Outsourcing office work related to parking enforcement to the private sector, with results (Tokyo)



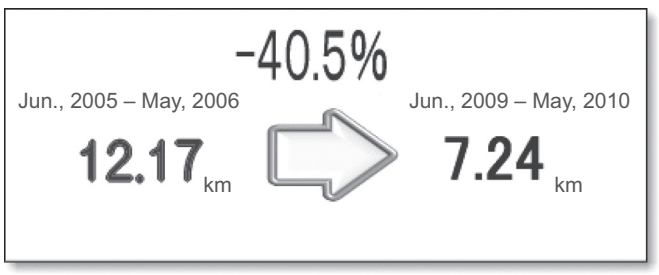
Source: JPO News Vol. 47, 2005 (Japan Parking Facilities Promotion Organization)

■ The number of vehicles illegally parked for a time on the ten major streets has decreased.



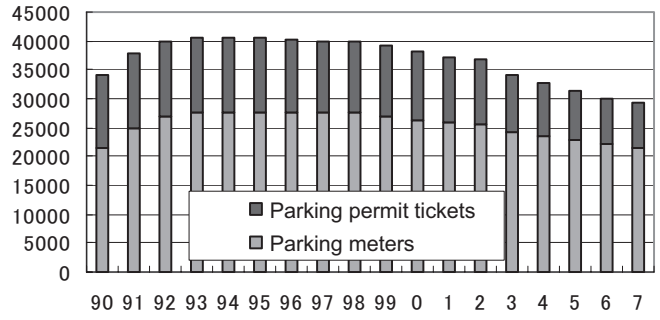
Note: The ten major streets include Harumi St., Shinjuku St., Meiji St., etc. (ca. 33 km of streets): Survey time of day: 2 p.m. to 4 p.m.

■ On the ten major streets , the length of traffic congestion within one hour has become shorter.



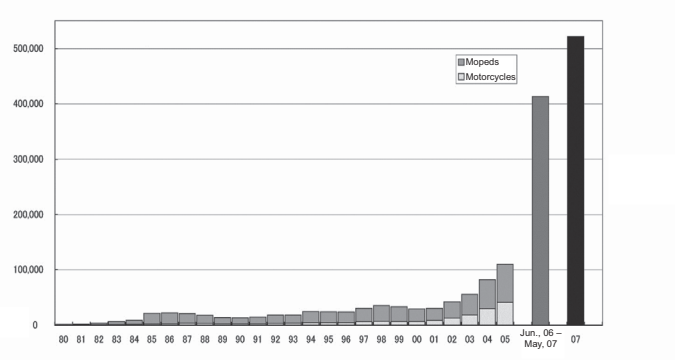
Source: National Police Agency; http://www.keishicho.metro.tokyo.jp/kotu/chusya/koka.htm, 2010

Fig. 3 Changes in the number of parking spaces (meters & permit tickets)



Source: JPO News Vol. 57, 2008 (Japan Parking Facilities Promotion Organization)

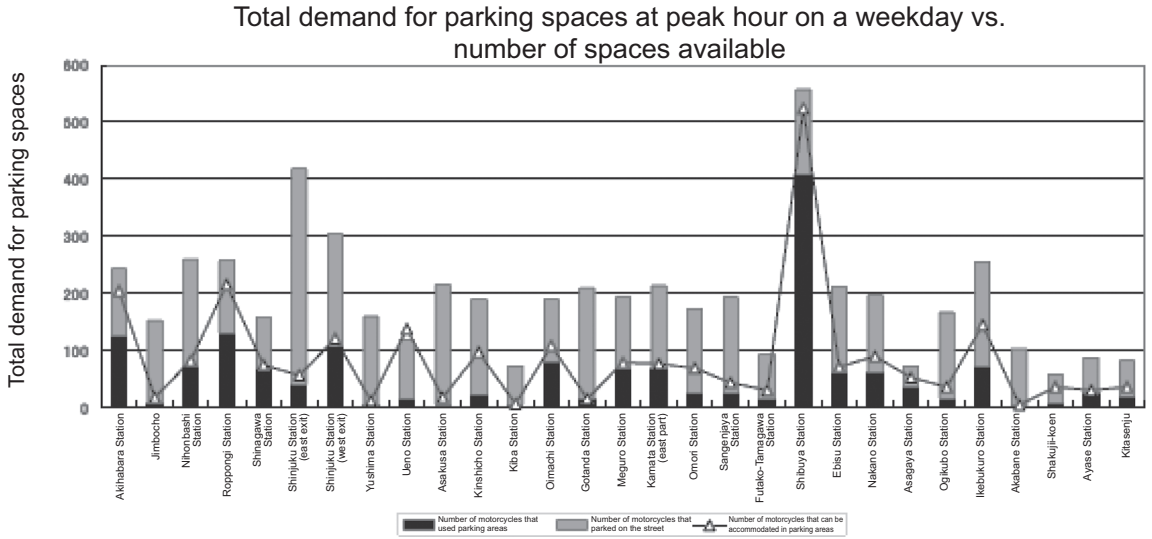
Fig. 4 Changes in the number of parking enforcement actions for mopeds and motorcycles



Source: JPO News Vol. 57, 2008 (Japan Parking Facilities Promotion Organization)

Fig. 5 Total demand for motorcycle parking spaces at peak hour on a weekday vs. number of spaces available

■ In many areas, parking spaces are insufficient to accommodate motorcycles informally parked on the street.



Source: 2008 Survey on the Realities of On-street Parking (2009, Tokyo Metropolitan Public Corporation for Road Improvement and Management)

Fig. 6 Introducing parking exclusively for senior or other special drivers.

How the system works. When facilities often used by senior or other special citizens in their daily lives (e.g., governmental facilities, welfare facilities for senior citizens, facilities for the disabled, hospitals) do not have a large enough parking area, exclusive parking spaces can be set up on the road near those facilities (designated as "Parking space for senior or other special drivers"). Seniors who display a special label are entitled to use those spaces. "Senior or other special drivers" means those who have a license to drive ordinary cars and who

- are 70 years old or older, or
- have been issued that license with the qualification that they have a hearing problem, or
- have been issued that license with the qualification that they are physically handicapped, or
- are pregnant or have given birth within the last eight weeks.

Source: National Police Agency; http://www.keishicho.metro.tokyo.jp/kotu/kourei_chusya/kourei_chusya.htm, 2010

2-7 The Second-Stage ITS — Intelligent Transport Systems

Manager in charge, ITS Japan Planning Group
Masahiro Sakakibara

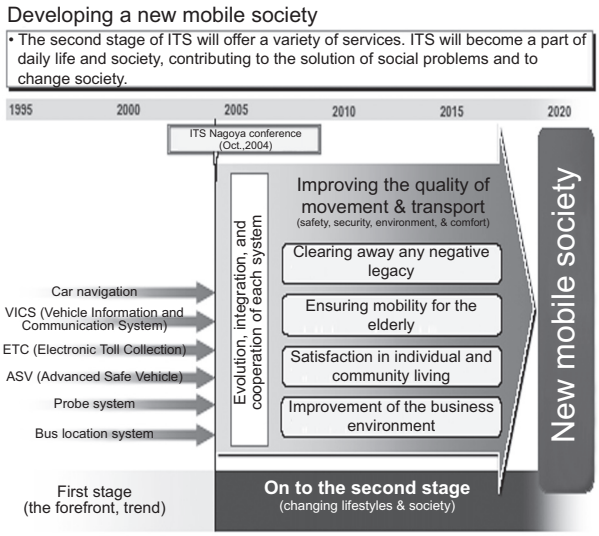
ITS (Intelligent Transport Systems) closely coordinate people, vehicles, and roads, using the latest information communications technology. The systems are designed to improve safety, efficiency, and comfort, and to preserve the environment. In Japan, first-stage practical use of the ITS came with such systems as the VICS (Vehicle Information and Communication System) and the ETC (Electronic Toll Collection). In cities, the use of more services from the latter is being promoted through the installation of an ETC device in the vehicle itself. In September, 2004, the Japan ITS Promotion Council was established by users from industrial, governmental, and academic sectors, and promotion policies for the ITS, which had entered its second stage, were announced. In January, 2006, the IT (Information Technology) Strategies Headquarters made public its New Reform Strategies, announcing among its goals the realization of a society that would rank first worldwide in road traffic safety. To achieve the goal of reducing the number of traffic fatalities to less than 5000, the "driving safety support system" (to be implemented nationwide beginning in 2010) will be installed, mainly in places where accidents occur frequently. In May 2010, in the wake of the IT New Reform Strategies, the New Information Telecommunications Technology Strategies were made public, and the Green (energy conserving) ITS was promoted. This system collects a broad range of traffic information, including "probe" information (real-time motor vehicle movements), and disseminates it. Also, as one of the "Accerelated restoration of the benefits to society" projects under Japan's long-range strategic policies (Innovation 25, adopted by the Cabinet meeting of June 1, 2007), the achievement of safe and efficient road traffic systems using information communications technology (ITS) was promoted; the project is being expedited.

Table 1 ITS promotion policies announced by Japan ITS Promotion Council

Targeted field	Overall theme	Individual theme
Safety and security	(1) Improving traffic safety	• More intelligent motor vehicles • Enhancing infrastructure • Interactions between vehicles and between vehicles and infrastructure • Supporting safety of pedestrians, bicycles, and other two-wheeled vehicles • Advanced system for rescue and emergency medical care of the injured from traffic accidents
Environment & efficiency	(2) Smoother traffic Reducing environmental impact	• Moderating traffic demand • Advanced traffic management systems • Advanced parking systems • Efficient freight transport
Comfort & convenience	(3) Increasing personal convenience	• Providing more advanced traffic information and encouraging its use • Skillfully utilizing ITS capabilities • Increasing conveniences for the elderly and disabled
	(4) Stimulating an area's economic activities	• Improving access from the area to expressways • Increasing convenience of intermodal movement in public transport
General	(5) Improving transport infrastructure Promoting international standards	• Building the ITS platform • Promoting ITS international standards

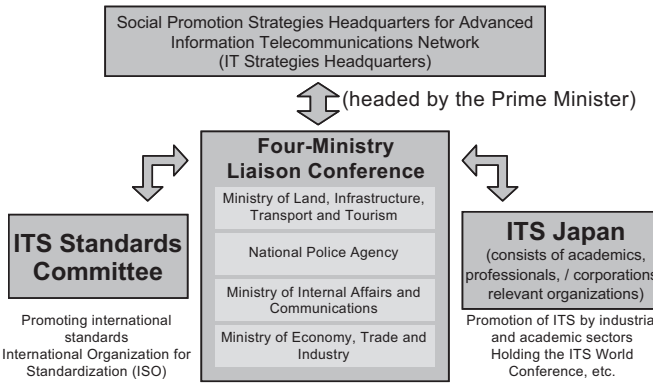
Source: Japan ITS Promotion Council (website of ITS Japan)

Fig. 2 Direction of the second stage



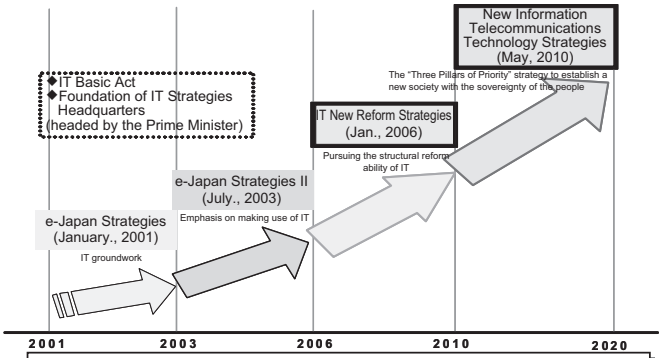
Source: Smartway Project Advisory Committee, Ministry of Land, Infrastructure, Transport and Tourism

Fig. 1 The system for promoting ITS in Japan



Source: website of Ministry of Land, Infrastructure, Transport and Tourism

Fig. 3 IT strategies of Japan: steps taken, goals, and policies



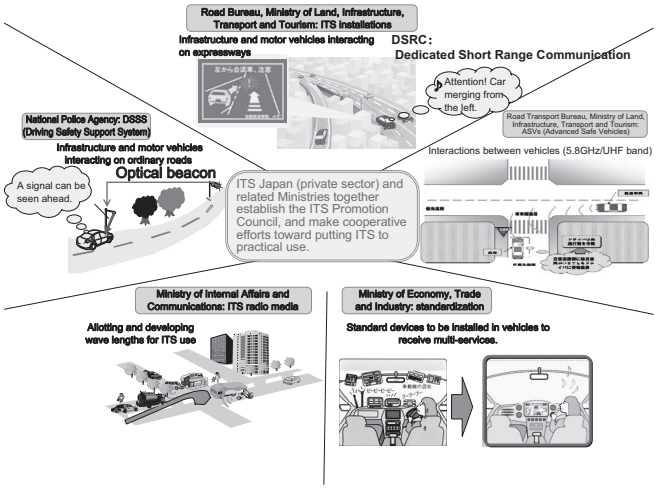
[IT New Reform Strategies]
A society that ranks the first worldwide in traffic safety — less than 5000 traffic fatalities is the goal.
1. Making practical use of a driving safety support system that interacts with infrastructure (FY2010-)
2. Promoting and spreading the FAST system that shortens the time of getting the injured from a traffic accident spot to a medical institution, etc.
3. Developing technology to prevent pedestrian accidents

[New Information Telecommunications Technology Strategies]

1. **The "Three Pillars of Priority" strategy:** (1) Achieving electronic administrative services that put people first, (2) Strengthening community bonds, and (3) Creating new markets and development worldwide
2. **Promoting "greening" (energy conservation) where people and things move:** Promoting Green ITS that collect a broad range of traffic information, including "probe" information (real-time motor vehicle movements), and disseminates it; the system can also be used to control traffic.
3. **Promoting smart grids; low carbon housing and offices:** Combining smart grid techniques with heat exchange systems, traffic systems, etc., to achieve optimal energy management in the area.

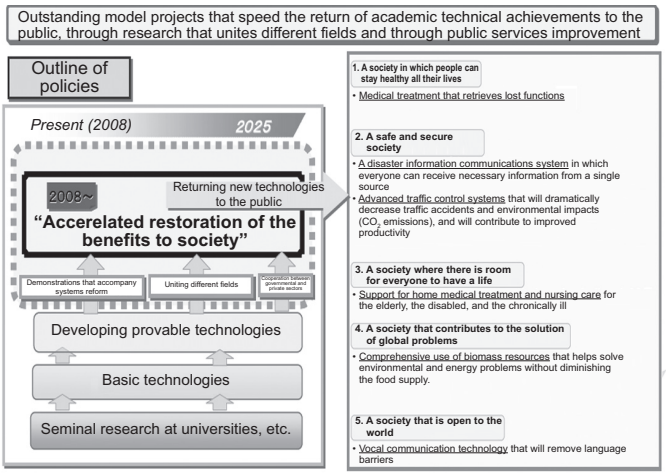
Source: website of the IT Strategies Headquarters, Prime Minister of Japan and His Cabinet

Fig. 4 Driving Safety Support System



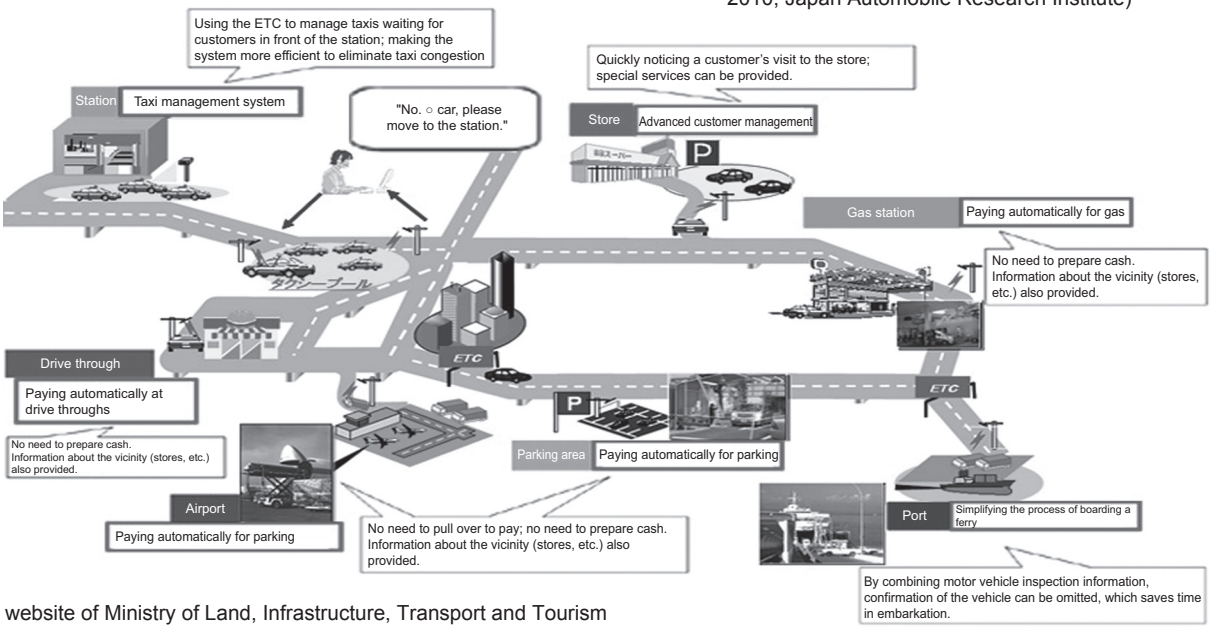
Source: Made by ITS Japan from data of the Cabinet Secretariat

Fig. 5 Innovation 25 — "Bring home the benefits" projects



Source: data of the Seventh Conference to Promote Industrial, Academic, and Governmental Cooperation (data from Mr. Okumura, member of the Council for Science and Technology Policy)

Fig. 8 Services available in town through the ETC device installed in the motor vehicle (examples)



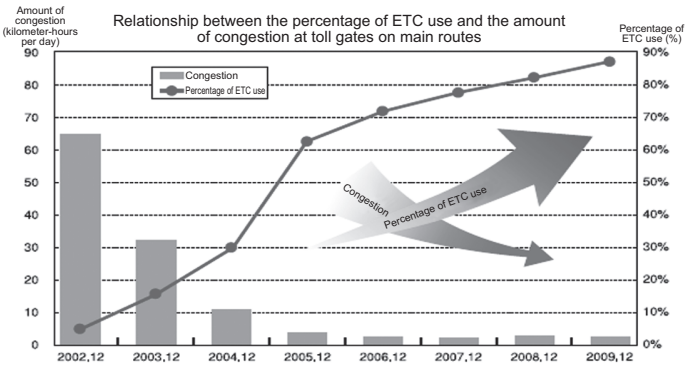
Source: website of Ministry of Land, Infrastructure, Transport and Tourism

Table 2 Number of car navigation devices, VICS units, and ETC devices installed

Item	Cumulative number	Date of calculation
Car navigation devices	41,299,000	June, 2010
VICS units	27,642,878	June, 2010
ETC devices	39,485,661	August, 2010
Percentage of vehicles using the ETC system (nationwide average)	80.9%	Aug. 27, 2010 to Sep. 2, 2010

Source: website of Vehicle Information and Communication System Center (VICS Center) and Organization for Road System Enhancement (ORSE)

Fig. 6 Relationship between the percentage of ETC use and the amount of congestion at toll gates on main routes (Metropolitan Expressway)



Source: website of Metropolitan Expressway Co., Ltd.

Fig. 7 "Bring home the benefits" projects — Model cities for ITS demonstration projects

Model cities	Outline of measures to be implemented
Toyota City	• Providing real-time road traffic information using "probe" information • Making systems for on-demand buses; introducing bus location systems for all routes; introducing a multi-purpose IC card • Introducing less polluting vehicles; introducing personal mobility
Yokohama City	• Demonstration of navigation systems; supporting eco-driving by controlling traffic signals • Introducing bus location systems, bicycle share systems, and Park & Ride • Introducing less polluting and high fuel efficiency vehicles; encouraging new personal choices among modes of transport
Aomori City	• Sharing information about current status of snow removal • Introducing bus location systems; resolving traffic bottlenecks; introducing a multi-purpose IC card • Introducing next-generation motor vehicles (official cars, city buses, rent-a-cars)
Kashiwa City	• Dynamic Park & Ride; next-generation ITS parking areas; on-demand transport; car sharing • Bicycle share systems; introducing personal mobility systems; eco-driving

Source: data from Research Report on Trends of ITS Industries (Mar., 2010, Japan Automobile Research Institute)

2-8 The Importance and the Developments of "Soft" Measure: TDM (Transportation Demand Management) and MM (Mobility Management)

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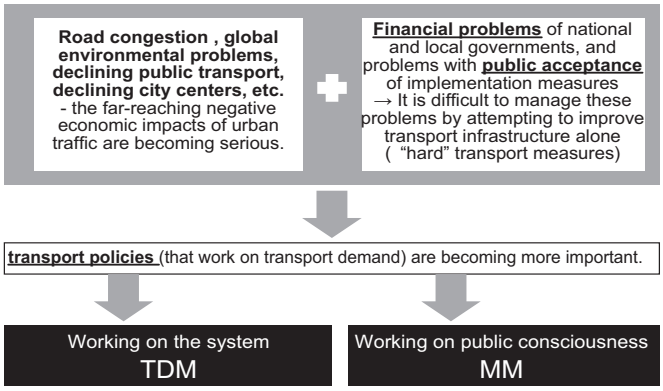
Ayako Taniguchi

Motorization has caused many problems in our society. For such problems, TDM/MM is getting more and more important. These measures attempt an appropriate balance between transport demand (individual trips) and supply (transport facilities /services) by adjusting the demand. In our country, TDM have been implemented since the '90s in various areas, and tried to improve transport services by improving transport facilities and vehicles, operating practices, fee policies,and so on. In recent years, MM is being implemented. along with various TDM measures worldwide. MM emphasizes creating a responsible awareness among each person. Such measures are becoming more important than ever as a means of easing problems involving the global environment and declining city centers.

1. Importance of TDM/MM

Fig. 1 Importance of TDM/MM



■ Definitions of terms

TDM (Transportation Demand Management): A method of solving transport problems (including traffic congestion) by adjusting the demand side, i.e., the attitude of the motor vehicle user, rather than the supply side (road improvements and so on).

MM (Mobility Management): Measures focusing on communication that encourages each person voluntarily to change his/her mobility (movement) patterns in a direction that is desirable for both the society and the person*.

* For example, changing from excess use of cars to appropriate use of public transport and bicycles.

TFP (Travel Feedback Program):One of the MM measures to encourage voluntary changes in people's consciousness and behavior toward transport through broad-based personal communication. Communication is with each person or each household, and basically involves multiple times.

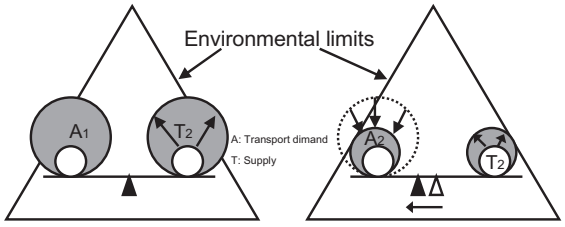
Table 1 Major events related to MM policies in Japan and changes in the number* of those events

	before 1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Events related to MM		MM-style policies introduced in magazines	Sapporo TFP pilot test Ministry of Land, Infrastructure, Transport and Tourism (former Ministry of Construction): started pilot test project	Sapporo TFP real implementation (first time in Japan) MM test on Bay Route of Hanshin Expressway	Research assistance of IATSS (International Association of Traffic and Safety Sciences) for studies on changes in attitudes and behavior		Gaining backlog of test experience Japan Society of Civil Engineers: started workshop for studies on changes in attitudes and behavior	Initial involvement of Ministry of Land, Infrastructure, Transport and Tourism (central) Kyoto Prefecture: MM promotion was included in transport demand management plan	Japan Society of Civil Engineers: workshop enhanded to become a sub- committee Guidelines of MM (Japan Society of Civil Engineers) was published	1st JCOMM (Tokyo	2nd JCOMM (Sapporo) first JCOMM Awards	3rd JCOMM (Kyoto) MM manual for offices was adopted Ministry of Land, Infrastructure, Transport and Tourism: started eco-commuting project Manual to measure the effects of MM was adopted	4th JCOMM (Oita) JCOMM incorporated	5th JCOMM (Fukuyama)
Number of events			1	2	3	6	10	14	35	66	118			

Note 1: JCOMM is the Japanese Conference of Mobility Management
2 Number of events that were reported to the office of the JOMM

Fig. 2 Paradigm shift in urban policies and the concept of TDM

■ Traditionally, increased demand for transport was managed from the supply side, that is, through facilities improvement (demand-following approach). It has shifted to an integrated package-type approach from three sides — demand (TDM), supply, and institutional framework. That approach provides attractive alternative methods of movement by taking account of environmental limits, and by changing the institutional arrangements (e.g., revised financial assistance). It also restrains demands for motor vehicle transport.



a. Traditional approach (demand-following approach)
b. New approach (intergrated package approach)

Source: Policies And Strategies Toward Sustainable Transport, International Environmental And Symbiotic Sciences (Katsutoshi Ohta, Chapter 3, 2005, Asakura Publishing)

Fig. 3 Envisioning the integrated package approach

Improving facilities (building P & R parking area)
+
Encouraging use (TFP communication)

■ The integrated package approach to achieving the goals of urban transport strategies is the appropriate combination and implementation of multiple transport measures that mutually reinforce each other — the "carrot and stick" approach. For example, the technique of building a parking area for Park & Ride (P & R): TFP communication urges people to change their consciousness, and at the same time promotes the use of P & R.

Table 2 Examples of funds that can be used for TDM and MM

Purpose	Examples of major funds
Ease congestion	• Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism: Pilot tests
Encourage the use of more public transport	• Comprehensive program to revitalize public transport • Comprehensive project for vitalization/revival of local public transport
Environment	• Road management action program for CO_2 reduction • Model area, area-wide management promotion project to create low carbon areas • EST (Environmentally Sustainable Transport) model project
Other	• Comprehensive support project for Model City Environmental Cleanup • Community-building grant • Vitality revival projects for localities, etc.

2. Examples of MM

1) Workplace transport management that targets commuters: Uji City, Kyoto Prefecture

<Outline>
- Purpose: Alleviate traffic congestion at commuting times in areas where offices are clustered
- Year of implementation: 2005-2006
- Number of targeted persons: 4400 employees of 150 companies and administrative agencies
- Implemented by national government, Kyoto Prefecture, Uji City, Chamber of Commerce, local corporations, transport businesses, non-profit organizations, etc.
- Implementation media: (1) lectures (for administrative sector and for corporations), (2) one-time use of TFP, and (3) TFP through website

Fig. 4 Public transport map for commuting: displays company names

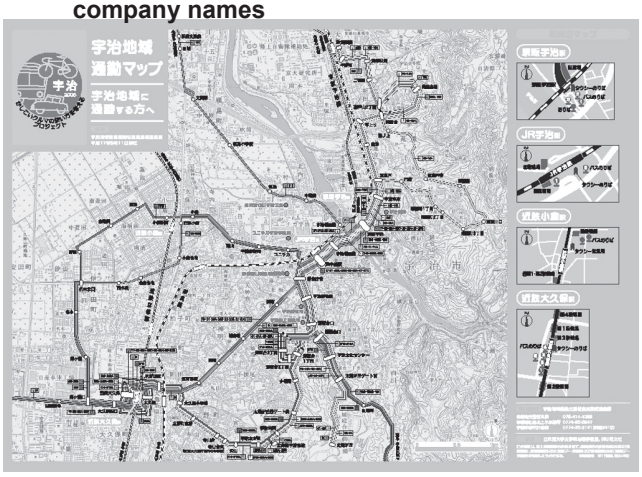
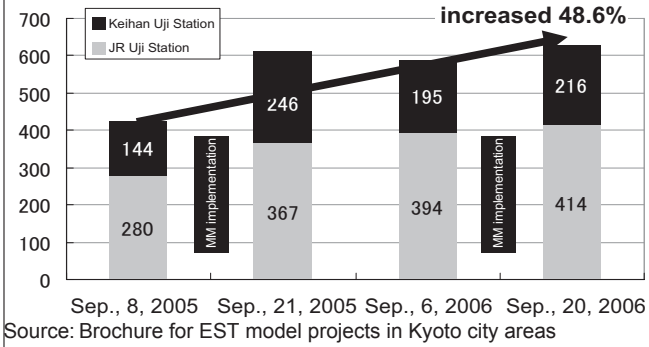


Fig. 5 Changes in the number of passengers who get off the train (those without a computer pass)



Source: Brochure for EST model projects in Kyoto city areas

3) Promotion campaign urging high school students to use more public transport

Fig. 8 Leaflet for promotion campaign urging high school students to use more public transport: Ibaraki Prefecture

- The leaflet was distributed at the freshman orientation. The percentage of sophomores using public transport was about 10% higher compared to those who had not received it (freshmen: 41.8%, sophomores: 31.6%).

2) MM to encourage students to make residential moves in such a way as to create a "compact city:" Tsukuba University

To systematically organize the traffic environment for people involved with the university, Tsukuba University began to charge its parking areas in 2003, and introduced a bus system inside the campus in 2005. Since 2006, it has continued to encourage people to use the university bus. The MM regarding residential moves was part of a promotion of the inter-school bus, and it started as a test project.

<Outline>
- Purpose: Giving incentives to choose an apartment near the bus stop
- Year of implementation: 2007 to present
- Targets: Freshmen who plan to move from Tsukuba University's student dormitory to an apartment
- Number of targets: FY 2007: about 300; FY 2008: about 600
- Implementation cost: about 1200 yen per person for the "incentive booklet" group
- Procedures: Targets were randomly divided into four groups: (1) a "control" group that was given no contact; (2) a "housing information" group to which an ordinary housing magazine was distributed; (3) a "bus focused" group to which a housing magazine was distributed in which apartments within 200 meters from a bus stop were marked with a red "convenient for bus" mark; and (4) an "incentive booklet" group that was given the same magazine as the "bus focused" group and an additional incentive booklet. The effects of the communication provided could be seen in those who ended up living near the bus stop: compared to the "control" group, the "bus focused" group had twice as many people living near the bus stop, and the "incentive booklets" group had 2.7 times as many.

Fig. 6 Distributed booklets to give incentives

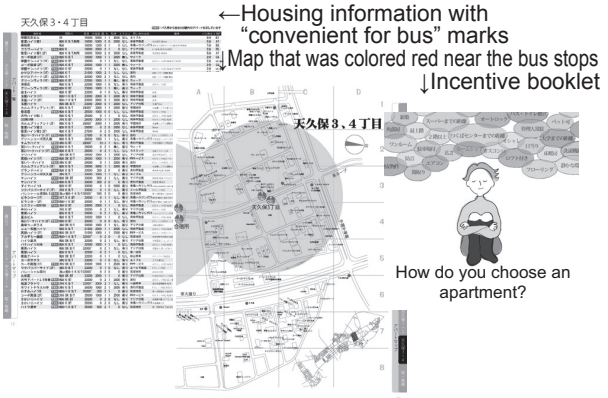
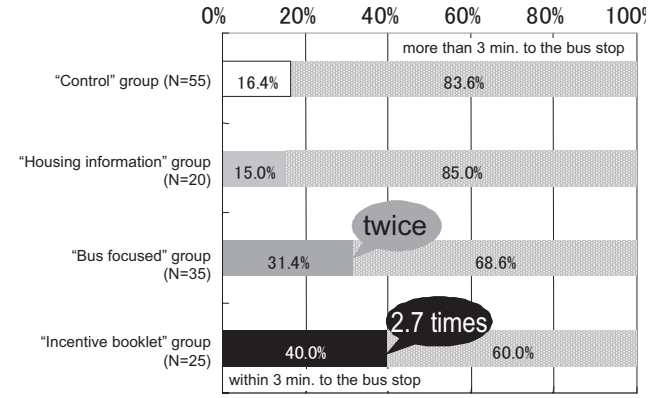


Fig. 7 Effects of MM: changes of motor vehicles share



Source: Analysis of The Effects of Persuasive Communication on Choosing Housing Based on Public Transportation Accessibility (Ayako Taniguchi, Kazuhide Asami, Satoshi Fujii, Haruo Ishida / Proceedings of Infrastructure Planning Research (CD-ROM) Vol. 37, 2008)

3-1 Efforts for Motor Vehicle Recycling

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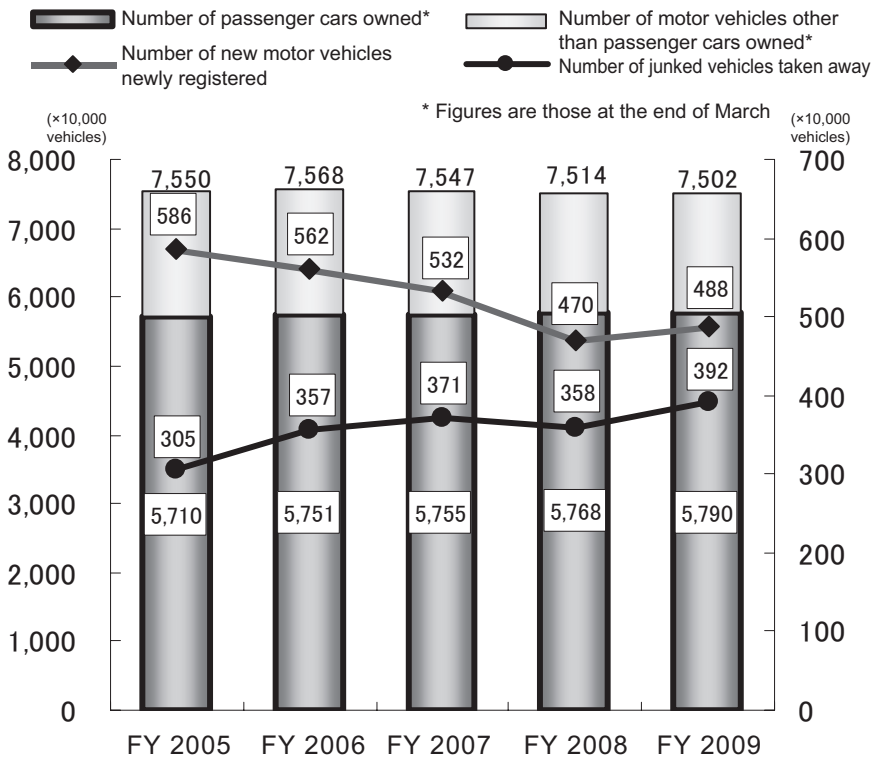
Masatoshi Nakazawa

Because of the pressing needs of recycling in order to solve the problems of proper handling of motor vehicles at the end of their useful lives, and finding the space for their final disposal — , the Automobile Recycling Law went into effect in January, 2005.
Since then, government agencies, automotive industries, and consumers have all been participating in this solution, each sector making its own effort to build a system for a recycling-oriented society.

Fig. 1 Status of junked vehicles following enforcement of the Automobile Recycling Law



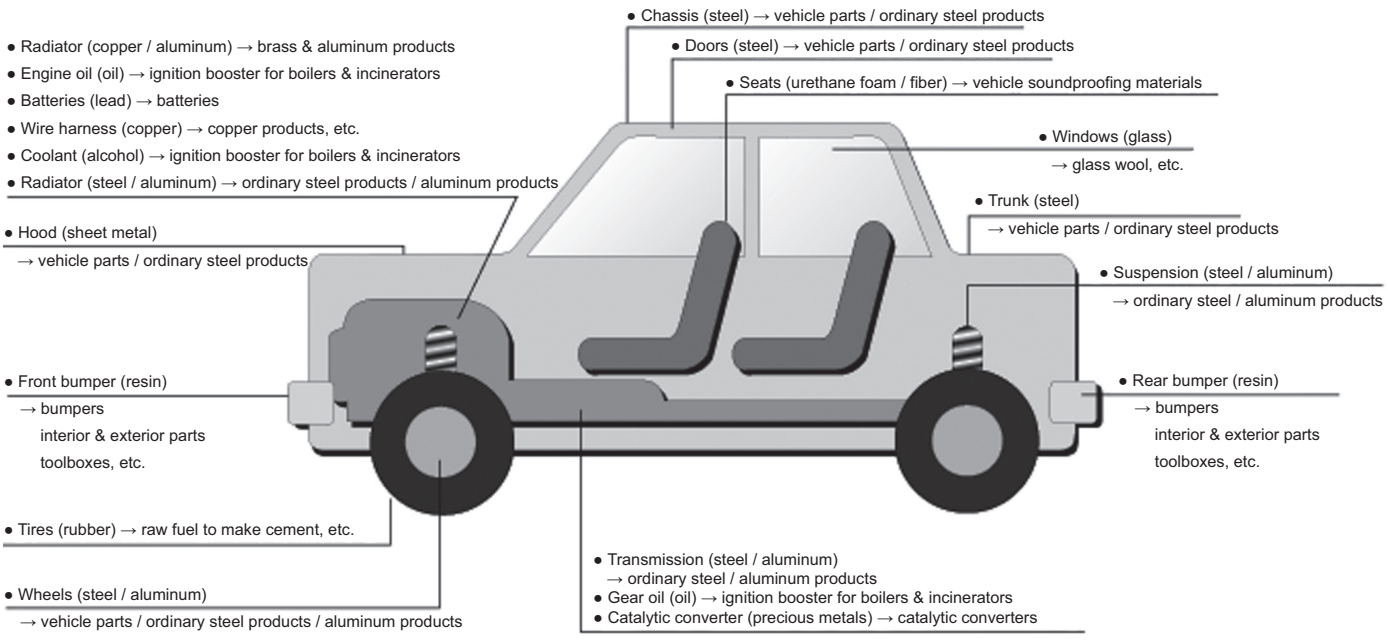
Source: data of Industrial Structure Council and Central Environmental Council

Table 1 Changes in the number of average years of use

Year	Passenger cars (ordinary & small)	Trucks (ordinary & small)
1980	8.29	7.77
1990	9.26	9.28
1995	9.43	9.60
2000	9.96	10.53
2001	10.40	10.68
2002	10.55	10.92
2003	10.77	11.23
2004	10.97	11.84
2005	10.93	11.72
2006	11.10	11.47
2007	11.66	11.92
2008	11.67	11.72
2009	11.68	13.50

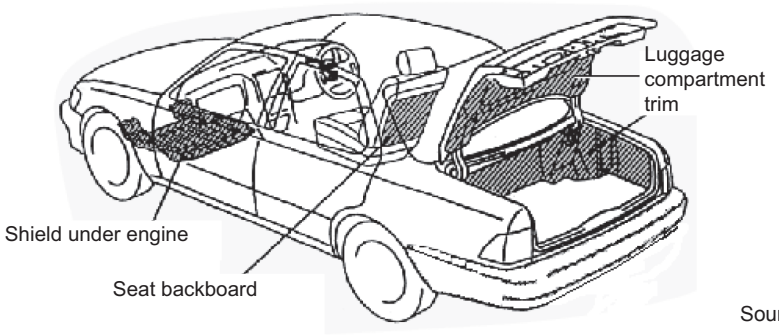
Source: Automobile Inspection & Registration Information Association

Fig. 2 Processing and recycling of junked motor vehicles: flow chart



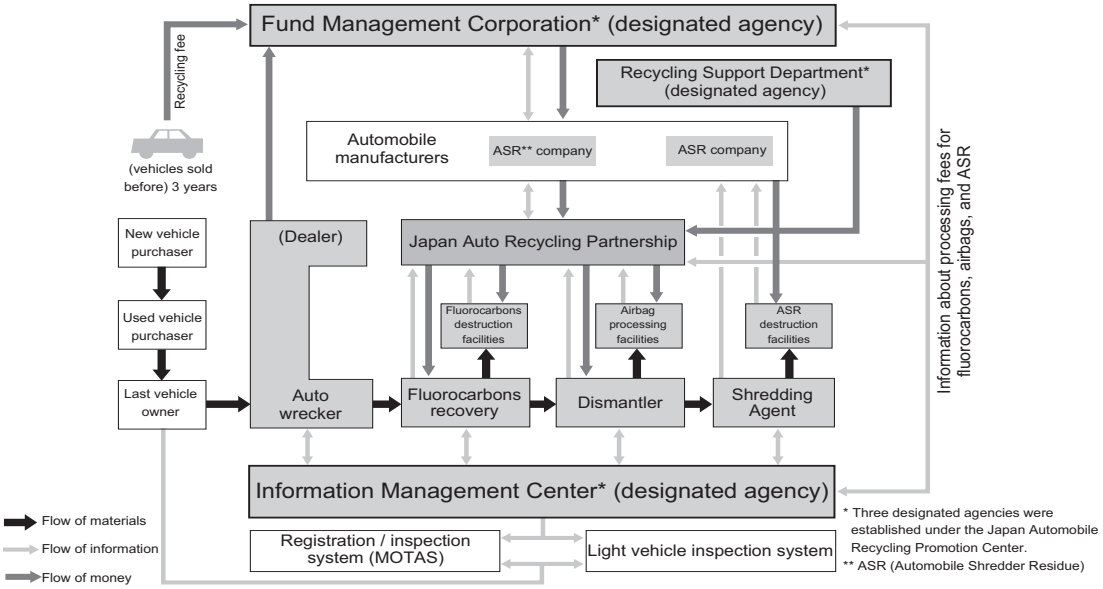
Source: Japan Automobile Manufacturers Association, Inc.

Fig. 3 Examples of auto parts made of recycled materials from discarded bumpers



Source: Toyota Motor Corporation

Fig. 4 How the Automobile Recycling Law works



Source: Japan Automobile Manufacturers Association, Inc.

Table 2 Recycling percentage of automobile manufacturers

	Recycling percentage (%)	
	Shredder residue	Airbags
Goals	70 (2015-) 50 (2010-) 30 (2005-)	85
FY 2009	77.5 – 82.1	93.9 – 94.7
FY 2008	72.4 – 80.5	94.0 – 94.9

Note: Excludes manufacturers that entrust recycling to designated recycling agents. Figures are based on information furnished by each company; significant digits are rounded differently in each case.

Source: data of Industrial Structure Council and Central Environmental Council

Table 3 Voluntary efforts to recycle cargo holds on commercial vehicles

1. Promoting the manufacture of recyclable cargo holds
(1) Improving design of vans with an aluminum refrigerator / freezer easy to dismantle; promoting appropriate processing
(2) Suggesting alternatives to materials like wood and insulation that are difficult to process properly
(3) Creating a manual for dismantling
2. Reducing the use of materials that impact on the environment
(1) lead; (2) mercury; (3) hexavalent chromium ; (4) cadmium
3. Promoting proper recycling procedures
(1) Building and expanding cooperative recycling networks
4. Promoting information sharing and educational activities
(1) Producing and distributing fliers about cargo hold recycling. (2) Providing information to dismantlers

Source: Japan Automobile Manufacturers Association, Inc.

Table 4 Reduction goals for chemicals that impact on the environment; achievements won through voluntary efforts

Chemicals to be reduced	Goals	Achievements
Lead	Starting from Jan., 2006, less than 1/10 of the amount used in 1996 (exc. batteries) • For large commercial vehicles (incl. buses), less than ¼	• Achieved with all models from Jan., 2006

Mercury	Prohibited from Jan., 2005 onward
	• However, the following parts, which are used for the purpose of traffic safety, will be excluded.
	(1) liquid display for navigation devices; (2) gauge array;
	(3) discharge headlamps; (4) room fluorescent light
		• Achieved with all models from Jan., 2003
		- How the exceptional parts are being handled:
		for (2), all models replaced with mercury-free materials;
		for (4), not used conventionally in passenger cars.

Hexavalent chromium	Prohibited from Jan., 2008 onward	• Achieved with all models from Jan., 2008
Cadmium	Prohibited from Jan., 2007 onward	• Achieved with all models from Jan., 2006

Note: (1) Reduction goals apply to new models. (2) Large commercial vehicles are those whose gross vehicular weight is more than 3.5 tons.

Source: Japan Automobile Manufacturers Association, Inc.

3-2 Traffic Noise and Measures to Control it

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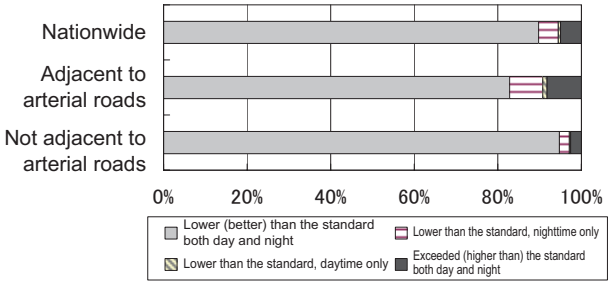
Hiroyuki Oneyama

According to an FY 2008 assessment, slightly less than 90% of the environmental standard for traffic noise was met nationwide both day and night; the score for areas adjacent to arterial roads was about 83%. The percentage has been gradually improving over the past several years; however, noise levels under special road conditions, with a multi-level structure are still high. Dealing with the problem in those cases has involved strengthening comprehensive measures that target noise sources, reduce traffic flow, alter the road structure, or change roadside conditions.

Fig. 1 Meeting the environmental standard: assessment results (overall, FY 2008)



Note: The assessment was based on the percentage of all roadside structures whose noise level readings were compared with the standard.

Note: Areas adjacent to arterial roads were defined by the distance from the edge of the road, depending on the number of the lanes on the road, as mentioned below. (Roads that bear arterial traffic are national expressways, urban expressways, national highways, prefectural roads, and municipal roads that have at least four lanes.)
- Roads that bear arterial traffic and have two or less lanes: 15 meters
- Roads that bear arterial traffic and have more than two lanes: 20 meters

Note: Areas not adjacent to arterial roads are: (1) areas that are hinterlands of the area adjacent to the road that bear arterial traffic, or (2) areas adjacent to roads other than arterial roads.

Fig. 2 Meeting the environmental standard: assessment results for highway sections with multi-level structure, FY 2008

■ Compared to the previous fiscal year, improvements have been seen in meeting the standard at highway sections with multi-level structure. However, compared to the overall results (Fig. 1), there is a high percentage of areas not meeting the standard.

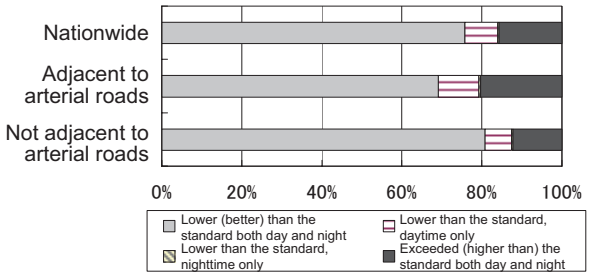
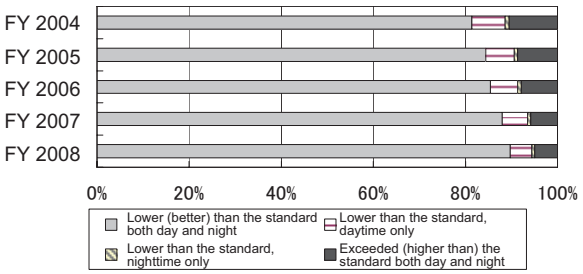


Fig. 3 Changes in meeting the environmental standard by year (overall)

■ The percentage of the environmental standard that is being met is gradually improving.



Source for Fig. 1 to Fig. 3: Traffic Noise in 2008 (Ministry of the Environment)

Table 1 Environmental standards and required limits regarding traffic noise

Classification of area		Environmental standards (Leq*)	
		Daytime	Night
General areas			
	AA areas	50	40
	A areas / B areas	55	45
	C areas	60	50
Areas facing roads			
	A areas facing road(s) with two or more lanes	60	55
	B areas facing road(s) with two or more lanes / C areas	65	60
Exceptions for areas adjacent to roads that bear arterial traffic			
	Areas adjacent to arterial roads	70	65

Classification of area		Required limits (Leq)	
		Daytime	Night
Areas facing roads			
	A areas facing road(s) with one lane / B areas facing road(s) with one lane	65	55
	A areas facing road(s) with two or more lanes	70	65
	B areas facing road(s) with two or more lanes / C areas	75	70
Exceptions for areas adjacent to roads that bear arterial traffic		75	70

AA areas: Special quiet zones

A areas: Exclusively residential

B areas: Primarily residential

C areas: Extensively residential, but also commercial / industrial

* L_{eq} = equivalent continuous sound pressure level [dB]

Fig. 4 Providing traffic noise conditions on the Internet

■ Traffic noise conditions can be viewed on the Nationwide Traffic Noise Map (survey report on traffic noise provided on the website, "Environment GIS," run by National Institute for Environmental Studies;
URL: http://www-gis.nies.go.jp/noise/car/)

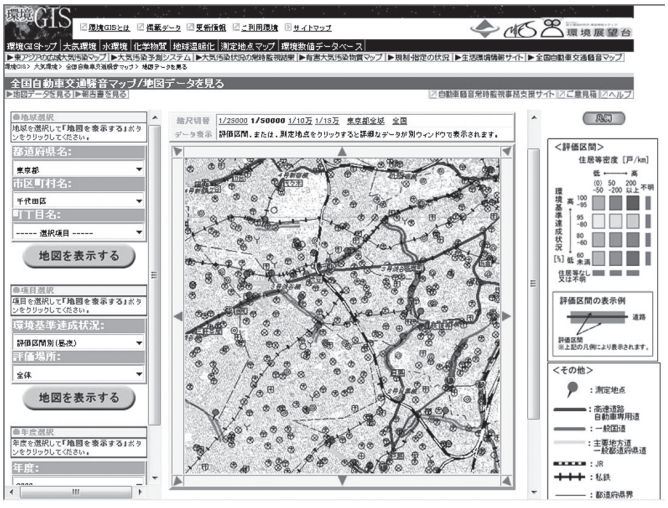
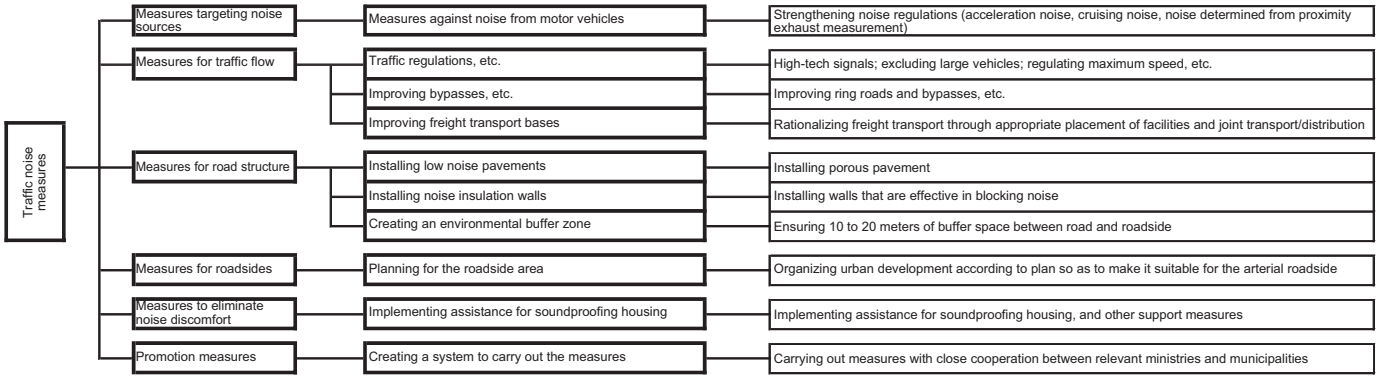


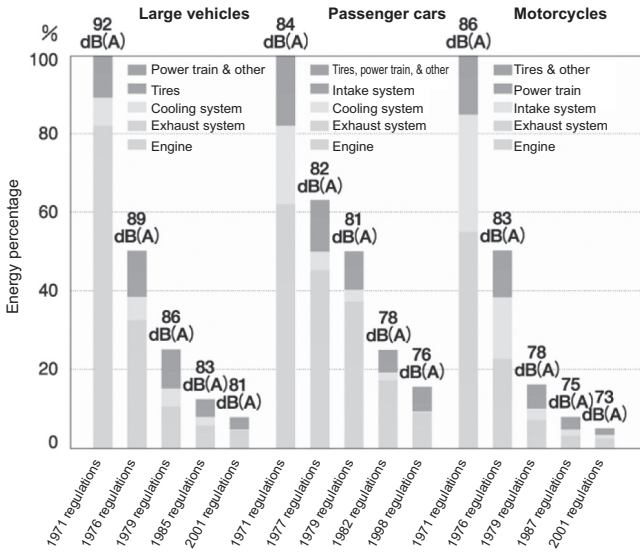
Fig. 5 Classification of measures against traffic noise, with main strategies



Source: Annual Report on the Environment in Japan 2008 (Ministry of the Environment)

Fig. 6 Composition of motor vehicle noise (acceleration noise) by source of noise, and how it has changed

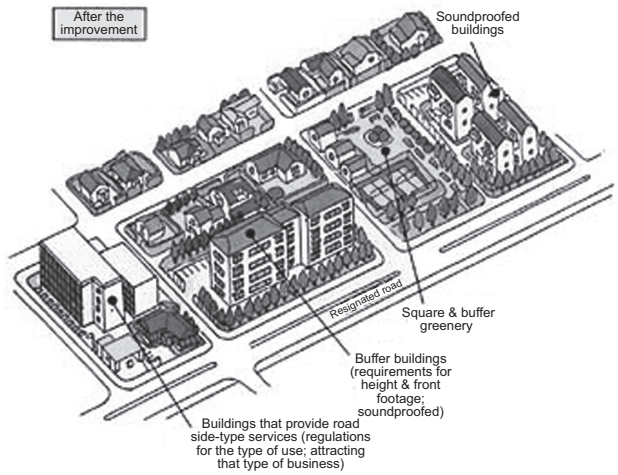
■ Noise regulations have been noticeably strengthened since 1971.



Source: website of Japan Automobile Manufacturers Association, Inc.

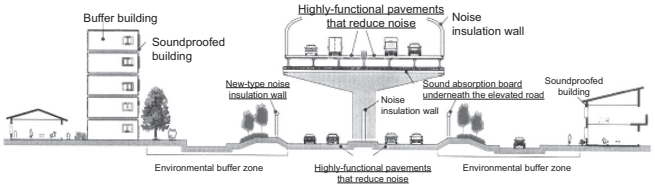
Fig. 7 Example of roadside area planning

■ Planning for the roadside area will organize urban development to accommodate arterial roadsides (e.g., planned placement of buffer buildings, spaces reserved for buffer greenery, soundproofing of buildings).



Source : website of Kobe City Urban Development Corporation

Fig. 8 Example of major measures against traffic noise and their effects

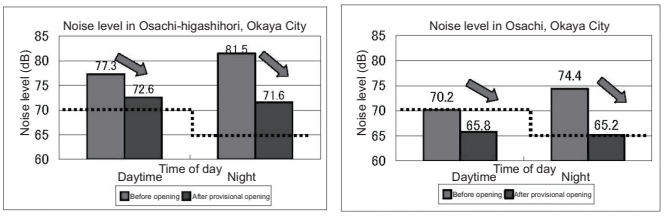


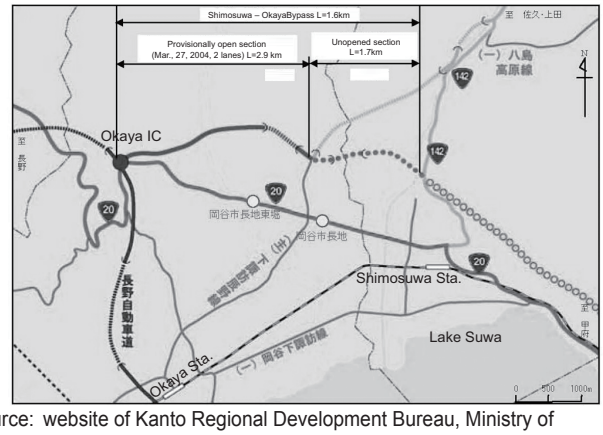
Measures	Properties	Effects
Highly-functional pavements that have noise-reduction properties	Mainly reducing vibration and noise	Ca. 3 dB
Noise insulation walls	Reducing noise by diffraction	Ca. 10 dB
Environmental buffer zone	Reducing noise by attenuation over a distance	5 – 10 dB
Sound-absorbing board underneath the elevated road	Reducing reflected noise from the elevated road	2 – 5 dB (depending on the contribution of reflected noise)

Source: website of Ministry of Land, Infrastructure, Transport and Tourism; http://www.mlit.go.jp/road/ir/data/souon/souon3.html

Fig. 9 Examples of effects of reducing noise by road improvements

■ The Shimosuwa – Okaya Bypass (partially opened) has caused a noticeable reduction in the noise level of National Highway No. 20.





Source: website of Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism; http://www.ktr.mlit.go.jp/nagano/ir/hyouka/simosuwa/pdf/simosuwa-4.pdf

3-3 Air Pollution Today and Countermeasures against It

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Yasunori Muromachi

The percentage of the environmental standard achieved for atmospheric nitrogen dioxide and suspended particulate matter has improved; it is now nearing to 100%. Between 1995 and 2008, the achievement rate for roadside air pollution monitoring stations improved from 70.5% to 95.5% for nitrogen dioxide, and from 35.2% to 99.3% for suspended particulate matter. However, there are still monitoring stations in some urban locations that have yet to show such achievements; and along with a new standard for fineer particles (e.g., PM2.5), consideration is now being given to stronger emissions regulations.

Fig. 1 Changes in the achievement rate for the nitrogen dioxide environmental standard

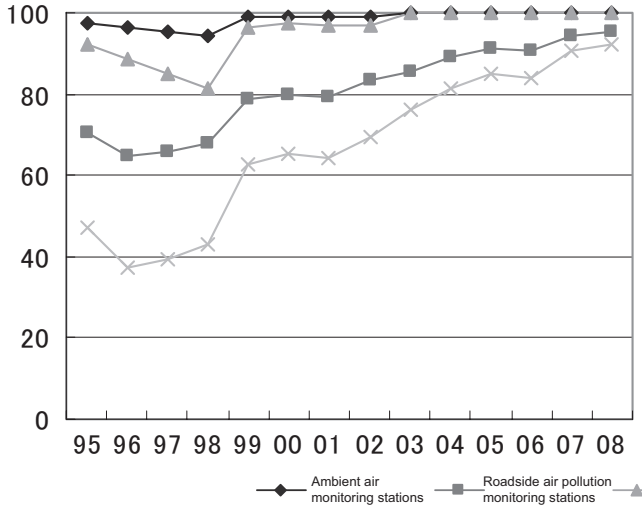
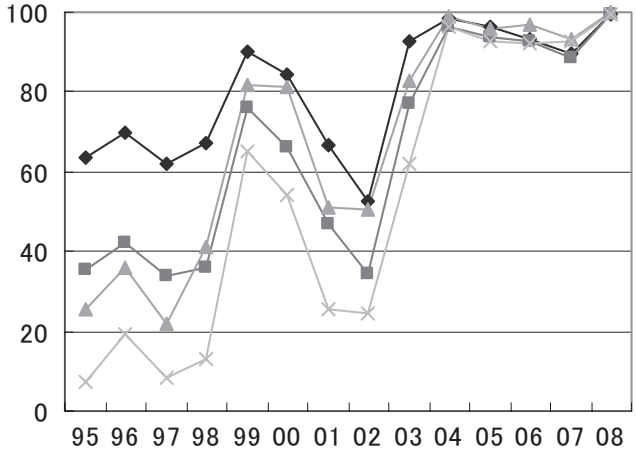


Fig. 2 Changes in the achievement rate for the suspended particulate matter environmental standard



Note: Specified areas are the areas where, pursuant to the Motor Vehicle NOX and Particulate Matter (PM) Law, measures are being taken to reduce the amounts of nitrogen oxides and particulate matter. The areas are some parts of Tokyo, Kanagawa, Saitama, Chiba, Aichi, Mie, Osaka, and Hyogo Prefectures.
Source: http://www.env.go.jp/air/osen/

Table 1 Examples of monitoring stations that didn't achieve the environmental standard (stations with highest amounts of pollutants)

■ Roadside monitoring stations: nitrogen dioxide

Monitoring station	Prefecture	City / ward / town / village	98% value (ppm)	Environmental standard
Kamiuma, Tamagawa-dori	Tokyo	Setagaya Ward	0.078	Failed to achieve
Matsubarabashi, Kannana-dori	Tokyo	Ota Ward	0.077	Failed to achieve
Yamatocho, Nakasendo	Tokyo	Itabashi Ward	0.073	Failed to achieve
Naya	Mie	Yokkaichi City	0.069	Failed to achieve
Chiba City Hall	Chiba	Chuo Ward, Chiba City	0.066	Failed to achieve
Ohira (ex Okazaki 3rd monitoring station)	Aichi	Okazaki City	0.066	Failed to achieve
Miyajima	Shizuoka	Fuji City	0.065	Failed to achieve
In front of Ikegami-Shinden Park	Kanagawa	Kawasaki Ward, Kawasaki City	0.064	Failed to achieve
Asahi	Aichi	Okazaki City	0.064	Failed to achieve
Hinode	Chiba	Funabashi City	0.063	Failed to achieve
Endomachi intersection	Kanagawa	Saiwai Ward, Kawasaki City	0.063	Failed to achieve

■ Roadside monitoring stations: suspended particulate matter

Monitoring station	Prefecture	City / ward / town / village	2% exceptional value (mg/m³)	Continuation of 2 days and longer	Environmental standard
Ohira (ex Okazaki 3rd monitoring station)	Aichi	Okazaki City	0.105	Yes	Failed to achieve
Ichikawa	Chiba	Ichikawa City	0.081	No	Achieved
Tonoki	Shizuoka	Fuji City	0.081	No	Failed to achieve
Shimo-ochiai, Shin-Mejiro-dori	Tokyo	Shinjuku Ward	0.080	No	Achieved
Ozone	Chiba	Sodegaura City	0.078	No	Achieved
Miyajima	Shizuoka	Fuji City	0.077	No	Achieved
Nakamura-minami	Ibaraki	Tsuchiura City	0.076	No	Achieved
Shimo-sueyoshi Elementary School	Kanagawa	Tsurumi Ward, Yokohama City	0.075	No	Achieved
Hiraide	Tochigi	Utsunomiya City	0.073	No	Achieved
Eitai-dori Shinkawa	Tokyo	Chuo Ward	0.073	No	Achieved

Source: http://www.env.go.jp/air/osen/

Fig. 3 Outline of regulations for types of vehicles in Motor Vehicle NOX and PM Law and special municipal ordinances

	Motor Vehicle NO_x and PM Law	Ordinance for Tokyo and three prefectures in the Kanto area	Hyogo Prefecture Ordinance
Targeted area	Some areas in 8 Prefectures (Saitama, Chiba, Tokyo, Kanagawa, Aichi, Mie, Osaka, and Hyogo)	Whole area of Saitama, Chiba, Tokyo (excl. islands), and Kanagawa	Southeast Hanshin area [Nada Ward & Higashinada Ward in Kobe City, Amagasaki City, Nishinomiya City (excl. northern part), Ashiya City, and Itami City]
Target pollutants	NOX, PM	PM	NOX, PM
Targeted motor vehicles	Motor vehicles based in the specified areas	Motor vehicles driven in the target area	Motor vehicles driven in the target area
Targeted vehicle types	Trucks, buses, special vehicles (for passenger cars, only diesels), and diesel passenger cars	Diesel trucks, buses, and special vehicles	Ordinary trucks and special vehicles whose total weight is over 8 tons; big buses with over 30-person capacity
Regulated value: NO_x	Same level as the value in the long-range regulations	No regulations	Same as those in the Motor Vehicle NOX and PM Law
PM	Weight over 3.5 tons: same level as the value in the long-range regulations Weight less than 3.5 tons: half the value in the new short-range regulations	Same level as the value in the long-range regulations (however, for Tokyo and Saitama, starting April, 2006, same level as the value in the new short-range regulations)	
Start of regulation	Oct., 2002	Oct., 2003	Oct., 2004
Grace period	As a general rule, 8 to 12 years (depending on the type of vehicle) from the first registration. Extended period for preparation (Sept., 2003 to Sept. 2005) depending on when the first registration was made.	7 years from the first registration	As a general rule, 10 to 13 years (depending on the type of vehicle) from the first registration. Extended grace period (Sept., 2004 to Sept. 2006) depending on when the first registration was made.
Compliance procedure	Motor vehicle inspection	On-the-spot inspection by "vehicle G-men", on-the-road inspection	On-the-road inspection, inspection by camera
Penalty	Imprisonment for less than 6 months or fine of less than 300,000 yen	Fine of less than 500,000 yen (violation of order and duty), publishing name of owner	Fine of less than 200,000 yen, transmitting owner's name to relevant businesses (consignors, etc.)

Source: Regulations by motor vehicle type in the Motor Vehicle NOX and PM Law (2005, Ministry of the Environment & Ministry of Land, Infrastructure, Transport and Tourism)

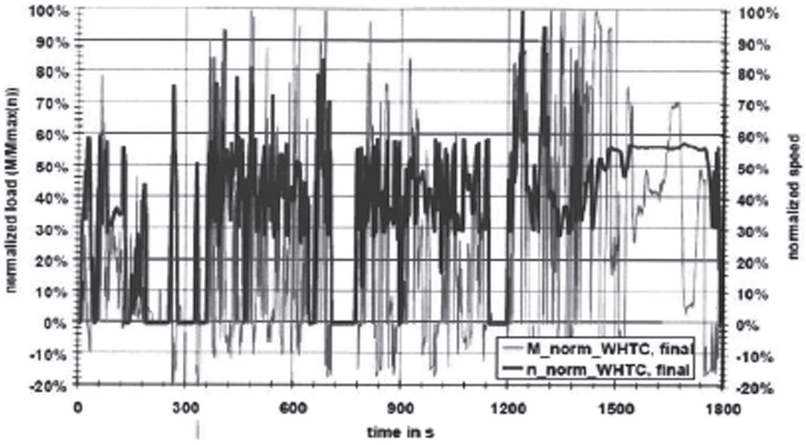
Table 2 Outline of countermeasures against motor vehicle emissions

		Detailed description		
		PM countermeasures	NOX countermeasures	CO_2 countermeasures
Measures to reduce exhaust emissions	1) Making less polluting vehicles with higher fuel efficiency	○ Promoting DPF (Diesel Particulate Filter) and oxidation catalysts ○ Lowering the sulfur content in diesel fuel ○ Enforcing laws against use of improper diesel		○ Promoting the use of vehicles that conform to energy-saving standards (through the tax system, official advisories, etc.)
		○ Imposing regulations according to the types of vehicles ○ Developing less polluting vehicles to replace big diesel vehicles		
		○ Promoting less polluting vehicles like those fueled by CNG (Compressed Natural Gas) through the tax system, exemplary use by public agencies, etc. ○ Promoting installation of fuel supply facilities for less polluting vehicles ○ Promoting fuel cell vehicles for practical use		
	2) Reducing demand for motor vehicle transport	○ Road pricing to reduce burden on environment.		○ Traffic restrictions
		○ Road pricing ○ Promoting "park and ride" ○ Improving sidewalks and bicycle routes ○ Improving train station plazas ○ Encouraging staggered working hours and flextime ○ Improving public transportation such as LRT (Light Rail Transit) and streetcars ○ Providing more information to drivers by spreading VICS (Vehicle Information and Communication System), etc. ○ Making freight distribution more efficient by organizing joint collection/delivery centers, etc. ○ Promoting rail and ship transport ○ Encouraging the campaign to shut off idling engines ○ Requesting commercial vehicles to detour		
	3) Increasing traffic capacity	○ Improving arterial road networks with ring roads, bypasses, etc. ○ Dealing with bottlenecks by installing grade-separated intersection approaches, improving railway crossings, etc. ○ Promoting ETC (Electronic Toll Collection) ○ Reducing road work ○ Enforcing parking regulations ○ Enhancing traffic safety facilities, etc.		

Source: Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism; http://www.mlit.go.jp/road/sisaku/k2.html, 2008

Fig. 4 Outline of "Future Countermeasures to Reduce Motor Vehicle Emissions (the 10th report)" (draft) — Strengthening emissions regulations for diesel trucks and busses (outline of goals to be met by 2016)

■ Introducing WHTC (World Harmonized Transient Cycle), the world wide standard test cycles etc.

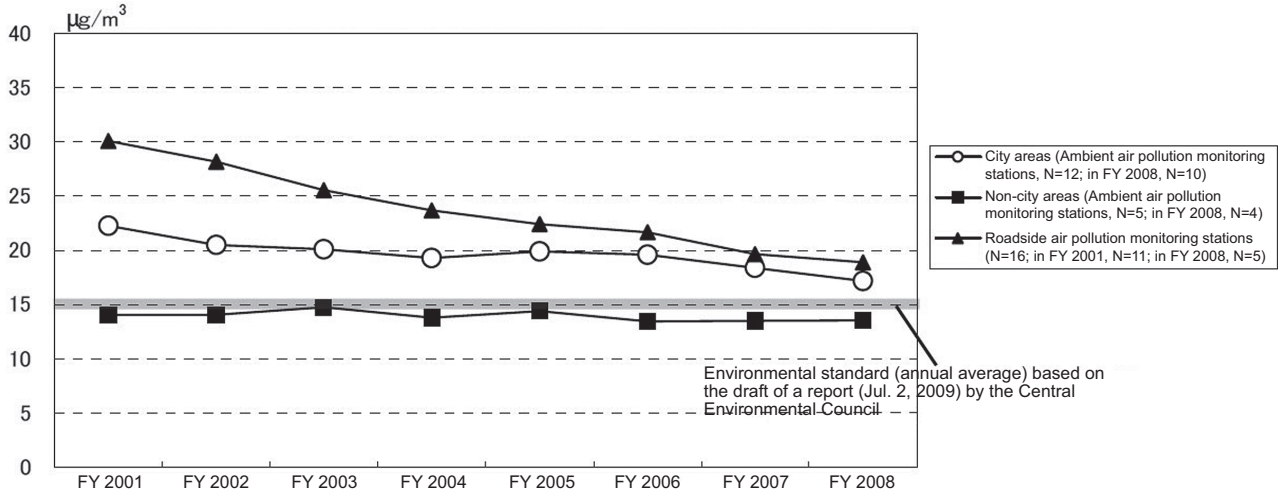


■ Time frame, goals; etc.

- Time frame: through the end of 2016. Exceptions are for tractors (through the end of 2017) and for vehicles whose total weight is less than 7.5 tons (through the end of 2018).
- Goal: the amount of NOX is to be approximately 40% less than that in the emissions regulations of 2009 (post-"new" long-range regulations); that is, 0.4 g/kWh (from 0.7 g/kWh). Goals for other pollutants (CO, NMHC, and PM) are to be the same as those in the post-"new" long-range regulations.
  Because the "cold start" factor will also be included, the goal will be harder to achieve than it looks.
- The new 2016 goal will reduce the total amount of NOX emissions by about 9% in 2020, and about 35% in 2030, which would not have been the case, had only the 2009 regulations applied.

Source: Outline of "Future Countermeasures to Reduce Motor Vehicle Emissions (10th report)" (draft) (2010, Ministry of the Environment)

Fig. 5 Relationship of the amount of minute particulate matter ($PM_{2.5}$) to the environmental standard



Source (with author's additions): Report of the Minute Particulate Matter Environmental Standard Special Committee, Air Quality Group, Central Environmental Council (Jul. 2009)

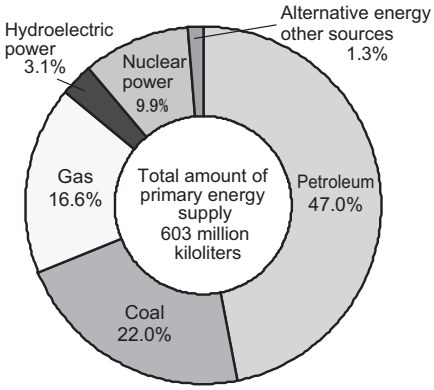
3-4 Improving Energy Efficiency

General Manager, Eco-Driving Promotion Department, The Energy Conservation Center, Japan
Masaaki Taniguchi

Transport means rely heavily on petroleum as a source of energy. From the viewpoint of preventing global warming and saving energy, improving the efficiency of energy consumption in the transport sector generally, and in motor vehicles in particular, is becoming an important challenge. Steady progress has been made in improving the energy efficiency of motor vehicles themselves, and the effects are becoming obvious (see 3-7 Development and Promotion of Environmentally Friendly Vehicles that are in Harmony with The Environment). At the same time, as roads are being improved, attention is being paid to improving how people handle motor vehicles. The four Ministries made the decision to form the Eco-driving Advocacy League, cooperating in a united effort of bureau chiefs (or their equivalents) to educate the public on a wide variety of topics related to eco-driving.
For commercial vehicles (trucks, etc.), eco-driving is being promoted thanks to the spreading of the EMS (Eco-driving Management System) and of the installation of a digital tachometer. The question remains as to how to develop an awareness of eco-driving in ordinary drivers whose practice of it is entirely voluntary.

Fig. 1 Amount of primary energy supply in Japan (FY 2008)

■ In Japan, petroleum accounts for nearly half the energy supply. Most transport meansuse petroleum as an energy source.

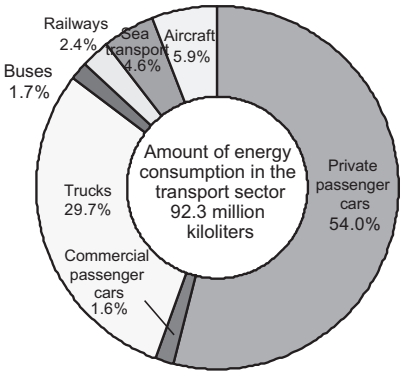


Note: Figures were converted to crude oil equivalents.

Source: Energy And Economy Statistics Handbook 2010 (The Energy Conservation Center)

Fig. 2 Amount of energy consumption by transport menas (FY 2008)

■ 87% of the energy is consumed in the motor vehicle sector. The challenge for the future is to reduce energy consumption in that area.

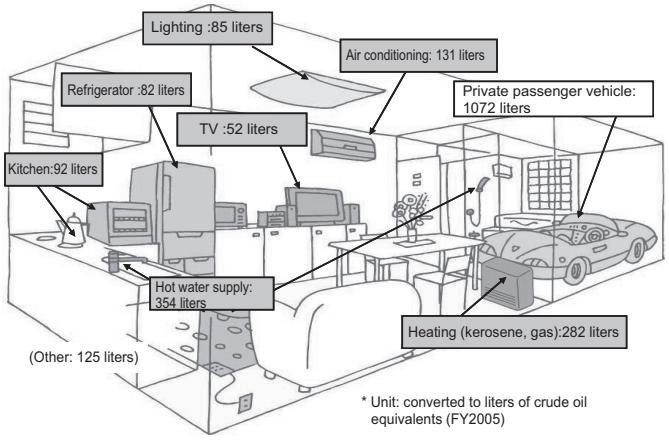


Note: Figures were converted to crude oil equivalents.

Source: Energy And Economy Statistics Handbook 2010 (The Energy Conservation Center)

Fig. 3 Annual energy consumption per household (FY 2005)

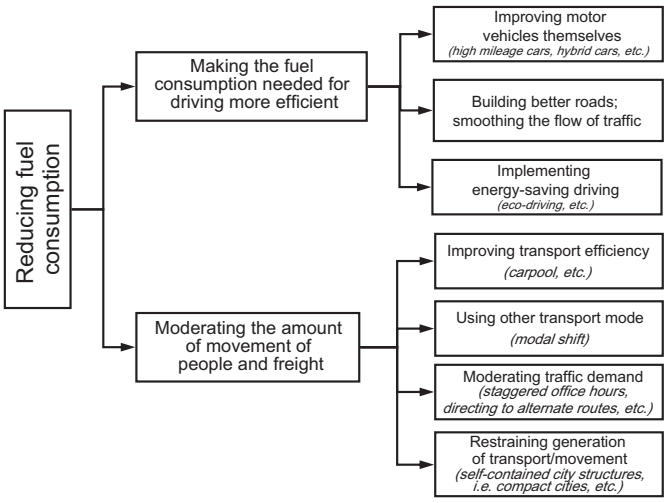
■ Nearly half the energy consumed in an ordinary household is consumed by the use of motor vehicles.



Source: Future Energy Saving Measures (Mar., 2003, Agency of Natural Resources and Energy, data updated for FY 2005)

Fig. 4 Measures to reduce motor vehicle fuel consumption

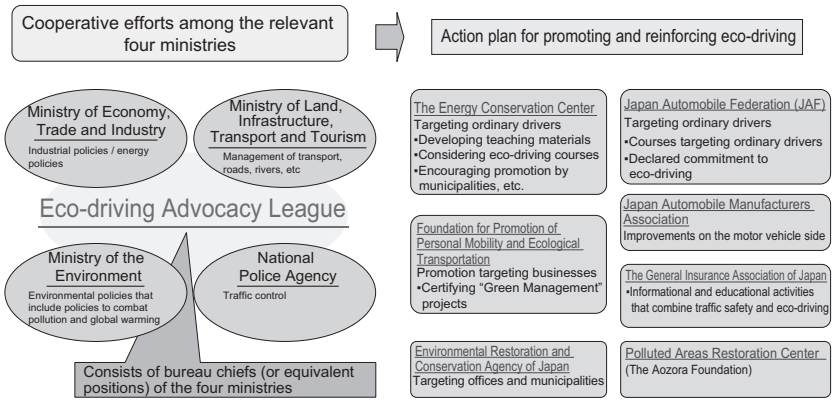
■ Measures to reduce motor vehicle fuel consumption are making use of fuel more efficient for driving, while moderating demand for it. For efficient transport, the vehicle, the road, and the motorist are each expected to play a role in contributing to the reduction.



(Chart made by The Energy Conservation Center)

Fig. 5 How eco-driving is being promoted

■ The Eco-driving Advocacy League was established in fiscal 2006. It announced its action plan whereby central and local governments and related organizations are to lay emphasis on promoting and reinforcing eco-driving.



■ Major policies of the action plan

○Reviewing the definition of eco-driving; establishing criteria (indexes) for assessing its effects
→ establishing effective and consistent terms for the definition of eco-driving, indexes of its effects, problems, contents of the trainingcourses, etc.

○Informational and educational activities for eco-driving
→ relevant people cooperate and perform various informational and educational activities, such as setting up an "Eco-driving Promotion Month (November)"

○Promoting eco-driving support devices, etc.
→ promoting "idle stop" vehicles and devices that support eco-driving such as the instant mileage meter

○Establishing an eco-driving evaluation system
→ promoting an eco-driving evaluation system by which the driver can judge his/her own eco-driving; establishing an evaluation system in which outsiders judge eco-driving

○Cooperative efforts with municipalities and related organizations
→ promoting more effectiveness by having the government and related agencies cooperate with municipalities

○Research activities to promote and reinforce eco-driving
→ doing research as a background for future eco-driving measures

Source: Eco-driving Advocacy League press material (Jun. 9, 2006)

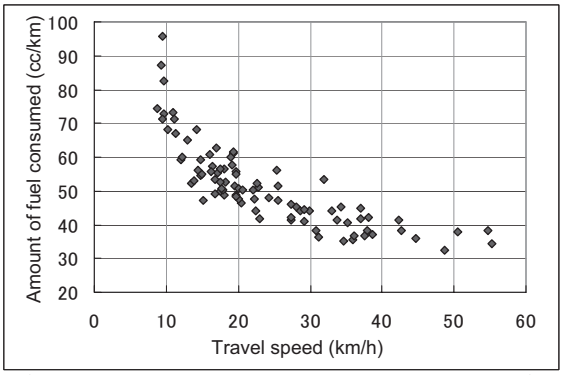
Table 1 Activities of eco-driving promotion organizations

Promotion organizations	Activities
Organization for The Promotion of Low Emission Vehicles	○Promoting the Eco-driving Management System (EMS) (Directing eco-driving program targeting transport businesses (trucks, buses, taxis, etc.); comprehensive assessment of operations and guidance) • Leasing the EMS devices; collecting and analyzing data • By FY 2009, about 89,000 EMS devices were brought into about 5100 business establishments nationwide. • Started eco-driving diagnosis project (with fees) targeting businesses that are implementing the EMS
Environmental Restoration and Conservation Agency of Japan	○Holding the eco-driving awards (Excellence awards to businesses for efforts in eco-driving activities) • Awards to corporations that own vehicles • Examining and evaluating corporation activities, their system for collecting/handling fuel efficiency data, their achievements in improving fuel efficiency, etc. • Number of businesses participating in awards: FY 2007: 1766: FY 2008: 3810: FY 2009: 9733 (increasing every year)
Foundation for Promotion of Personal Mobility and Ecological Transportation (Eco-Mo Foundation)	○Public recognition of eco-driving courses for trucks (Public recognition of courses that conform to eco-driving curriculum standards for businesses that own trucks) • Publicly recognized 14 organizations (manufacturers, truckers' associations, driving schools, etc.) • Distributing course textbooks; issuing certificates of participation • Number of participants: 2007: 10,585: 2008: 25,572: 2009: 22,826 ○Publicly recognizing eco-driving courses for ordinary motorists • From the autumn of FY 2008, it joined The Energy Conservation Center in joint recognition • The Energy Conservation Center trains instructors. The Eco-Mo Foundation distributes textbooks and provides eco-driving diagnosis software to publicly recognized organizations, and issues certificates of participation • By FY 2009, 1828 people had taken the course using actual cars ○Holding eco-driving symposium
Japan Automobile Federation (JAF)	○JAF eco-advisor system (Directing, training, and publicly recognizing those in charge of eco-driving promotion in organizations /corporations; directing training in eco-driving techniques and in using the mileage meter needed for teaching in the practical course) • By FY 2009, publicly recognized 11 organizationse course using actual cars ○Holding eco-training and courses • Held many eco-training sessions (eco-driving training with a real car) and courses at branch offices nationwide
The Energy Conservation Center	○Training eco-driving instructors (Training personnel who can teach the eco-driving course in order to promote eco-driving efforts in municipalities, etc.) • Targeting driving school teachers in the area. Issuing certificates of participation in the center's program • By FY 2009, trained 540 people as instructors ○Training personnel to encourage eco-driving (Targeting people in charge of promotion in municipalities/corporations, training personnel in lecturing) • Providing materials and DVD to be used in an app. one-hour lecture ○Producing "Smart Drive" (Based on the driving data and quantitative analysis of fuel consumption, producing and distributing a booklet that shows the techniques of eco-driving) • Used as basic data for textbooks and brochures of organizations that promote eco-driving

Source: websites of each promotion organization

Fig. 6 Reducing fuel consumption by regulating the flow of traffic

■ When travel speeds slow, the amount of fuel consumed increases because of more frequent stopping and starting and more low-speed travel. With bumper-to-bumper traffic and speeds of about 10 kilometers per hour, nearly twice the fuel is consumed compared to a smooth traffic flow of around 40 kilometers per hour.



(Traveled roads: ordinary roads in Tokyo; vehicle: 1300 cc)

Source: Smart Drive Competition 2004 (driving data of The Energy Conservation Center)

Fig. 7 Mileage meter to be installed in an automobile

■ More and more models have gauges useful for eco-driving, like the mileage meter.

Source: Japan Automobile Manufacturers Association, Inc.

3-5 Efforts to Prevent Global Warming

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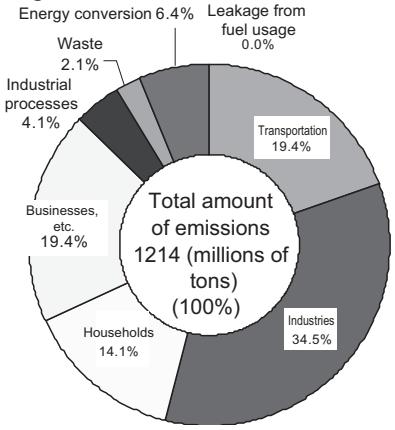
Yasunori Muromachi

The amount of Japan's greenhouse gas emissions in FY 2008 increased by 8.3% compared to that of the base year (1990) in the Kyoto Protocol, while the amount of CO2 emitted showed a 4.1% decrease from last year's figure in transport sector. Measures to reduce greenhouse gas emissions that had been taken since the Kyoto Protocol are now being reviewed; more reduction is required. Minister of the Environment suggested a middle- and long-range road map to combat global warming.

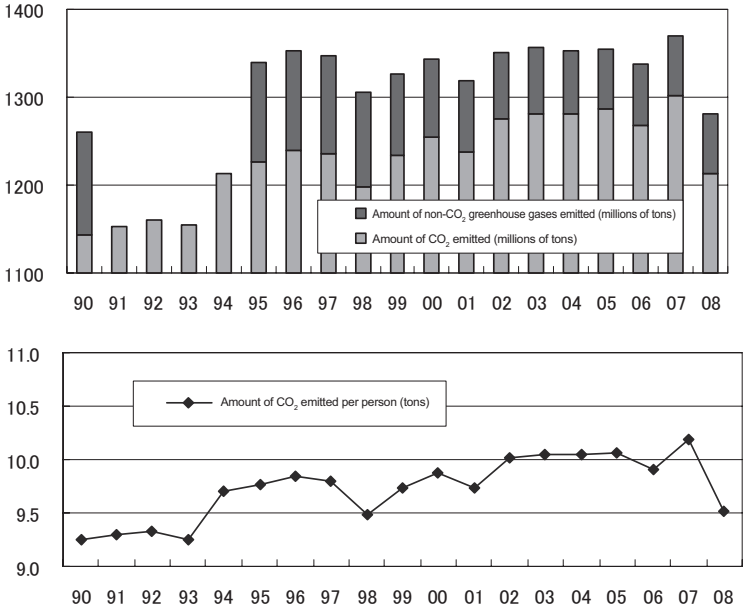
Fig. 1 Breakdown by activity sector of the amount of CO_2 emitted (FY 2008)

■ About 19.4% of the total emissions derived from the transportation sector.



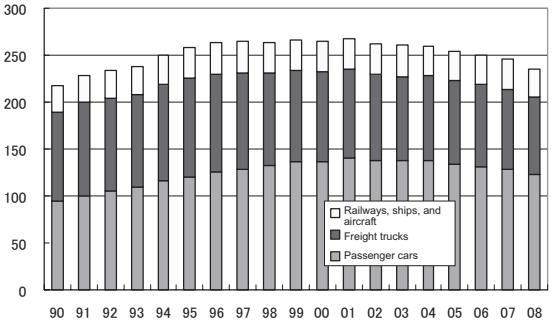
Source: http://www.env.go.jp/press/press.php, 2010

Fig. 2 Changes in amounts of greenhouse gas and CO_2 emissions in Japan



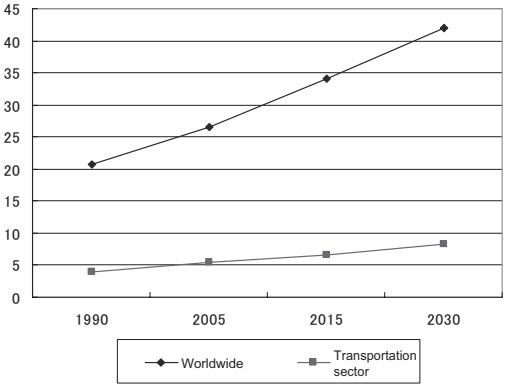
Source: http://www.env.go.jp/press/press.php, 2010

Fig. 3 Changes in the amount of CO_2 emitted by the transportation sector (millions of tons)



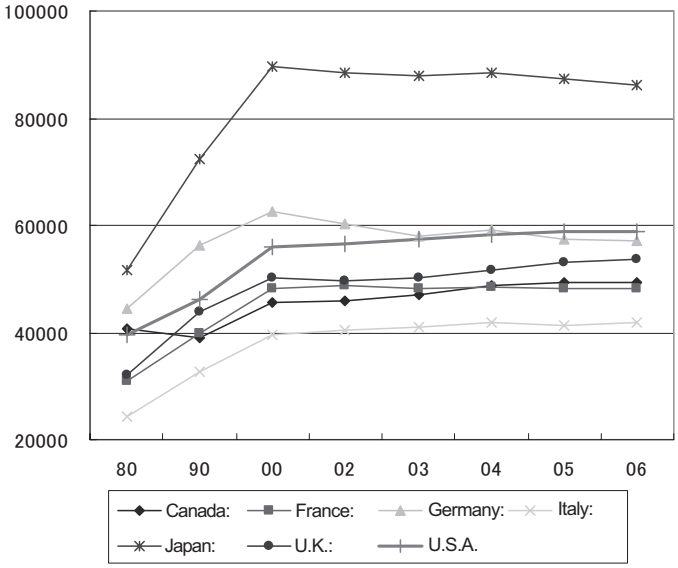
Source: http://www-gio.nies.go.jp/index-j.html, 2010

Fig. 4 Trends in the amount of CO_2 emitted worldwide or emitted by the transport sector (billions of tons)



Note: Includes bunker oil for international ships; excludes international air transport
Source: Reference Scenario in World Energy Outlook 2007 (IEA) and World Energy Outlook 2008 (IEA)

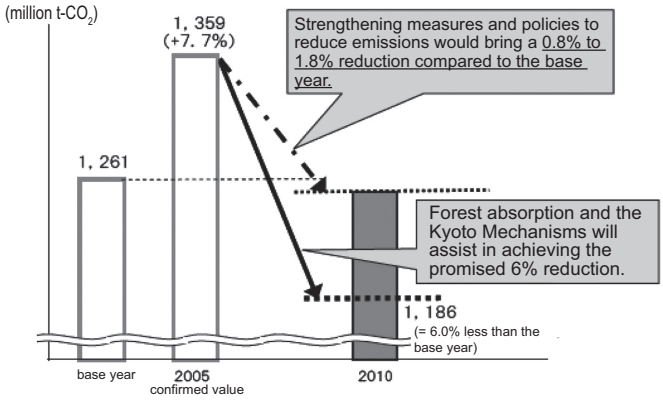
Fig. 5 Changes in the amount of oil consumed by the transportation sector in major countries (1000 tons; for U.S.A., 10,000 tons)



Source: Energy Statistics of OECD Countries, 2005-2006 (IEA) and Energy Statistics of Non-OECD Countries, 2004-2005 (IEA)

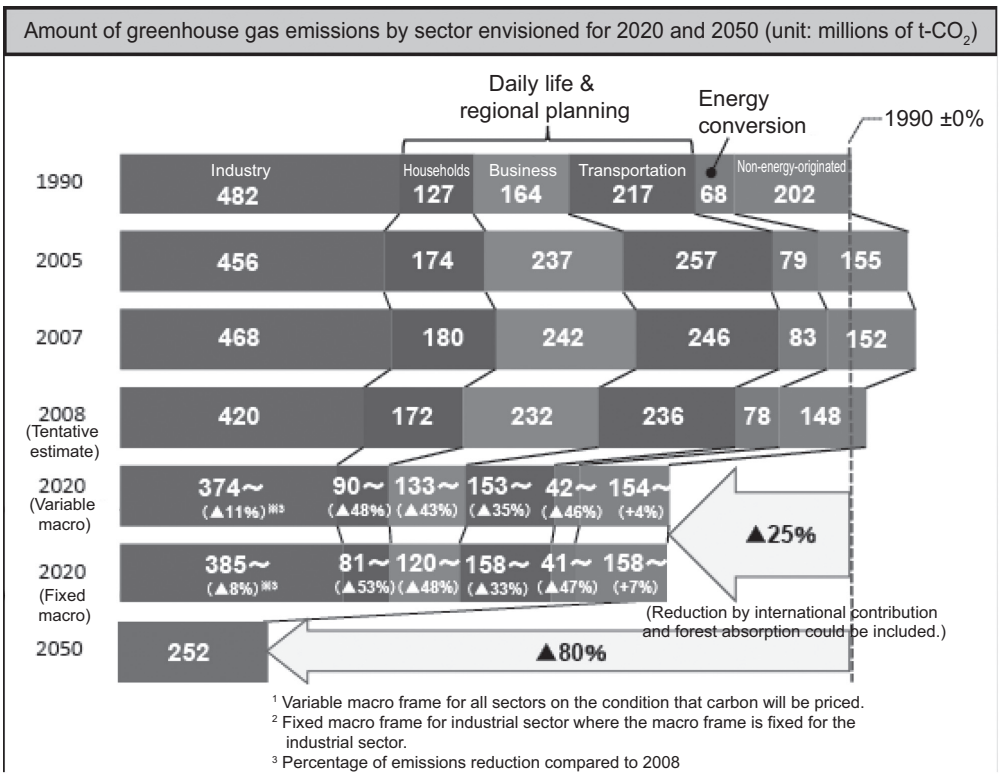
Fig. 6 Greenhouse gas emissions forecast for FY 2010

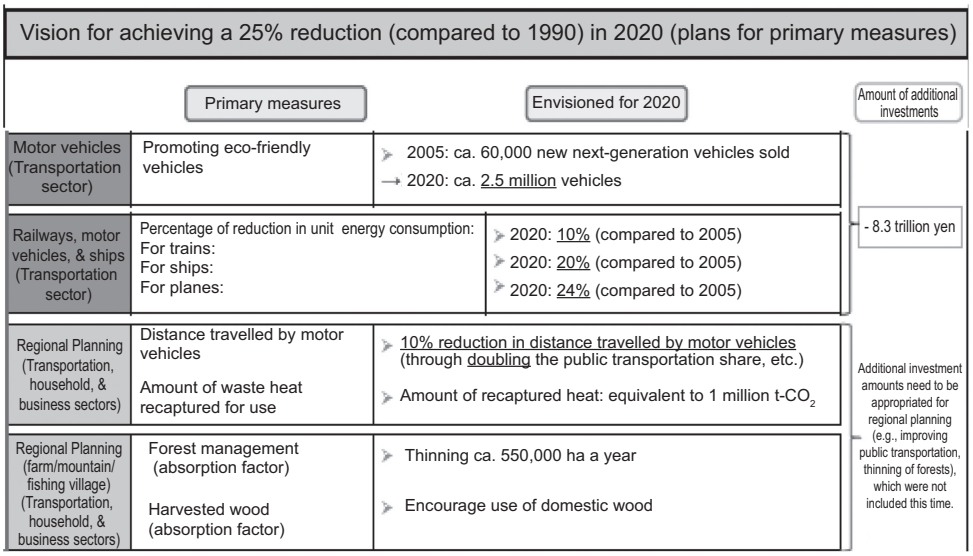
■ The final joint report of the Industrial Structure Council and the Central Environmental Council (February 2010) concluded that, with only the current measures being implemented, an estimated 22,000,000 to 36,000,000 t-CO_2 reduction will still be needed to achieve the goals of the Kyoto Protocol. However, from now on, with the utmost effort of each constituent in each sector to implement not just the current measures but also additional measures and policies, they could manage the estimated 37,000,000 t-CO_2 reduction, and even more; thus the report concluded that the Kyoto Protocol's goal of a 6% reduction could be achieved.



Source: http://www.env.go.jp/press/press.php, 2008

Fig. 7 Suggested middle- and long-range road map to combat global warming: tentative plan announced on March 31, 2010, by Sakihito Ozawa, Minister of the Environment





Source: Ministry of the Environment; http://www.env.go.jp/earth/ondanka/domestic.html#a03, 2010

3-6 Environmentally Friendly Institutional Measures

Associate Professor, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology
Yasunori Muromachi

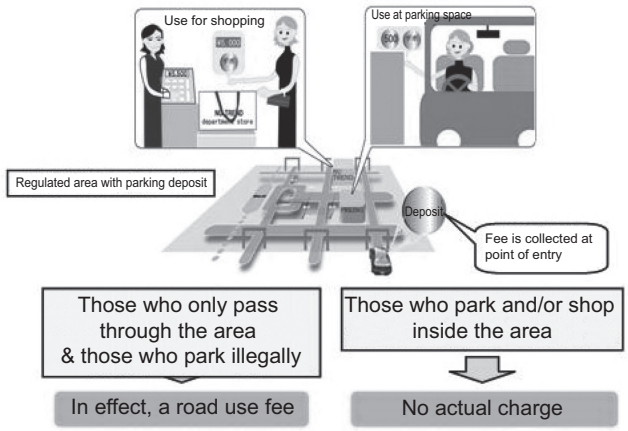
There are discussions inside Japan in regards to setting goals of global warming countermeasures for the years between 2020 and 2050. Suggestions have been made, and measures like road use fees or road pricing are proposed. There is international cooperation with developing countries to create low-carbon societies (e.g., CDM, the Clean Development Mechanism). And finally, in accordance with government guidelines, such programs as strategic environmental assessment and the creation of a Low-Carbon City have been introduced.

Fig. 1 The Nagoya City plan for a PDS (Parking Deposit System)

■ How the system would work:

1. Motorists pay a deposit when entering the regulated area.
2. Those who park inside the area will pay the parking fee from the deposit; those who do shopping can use it as a discount for purchases.
3. For those who only pass through the regulated area, the deposit functions as a road use fee.

The system achieves an uncongested flow of traffic into the city and at the same time solves the problem of illegal parking.



Source: Morikawa & Yamamoto Laboratory, Nagoya University; http://www.trans.civil.nagoya-u.ac.jp/last/research/PDS.jpg, 2008

Fig.2 Progress with the CDM (Clean Development Mechanism) in the transportation sector

■ Outline of Project 1351: Installation of low greenhouse gases (GHG)-emitting rolling stock in metro system

Date registered: December 29, 2007
Period: 2007 to 2017
Amount to be reduced: 41,160 t-CO2 per year
Procedure: Low greenhouse gas emission rolling stock equipped with regenerative brake systems is to be introduced to Delhi Metro Rail Corporation (DMRC).

Source: http://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view, 2009
http://www.apic.or.jp/plaza/oda/special/20080521-02.html, 2009

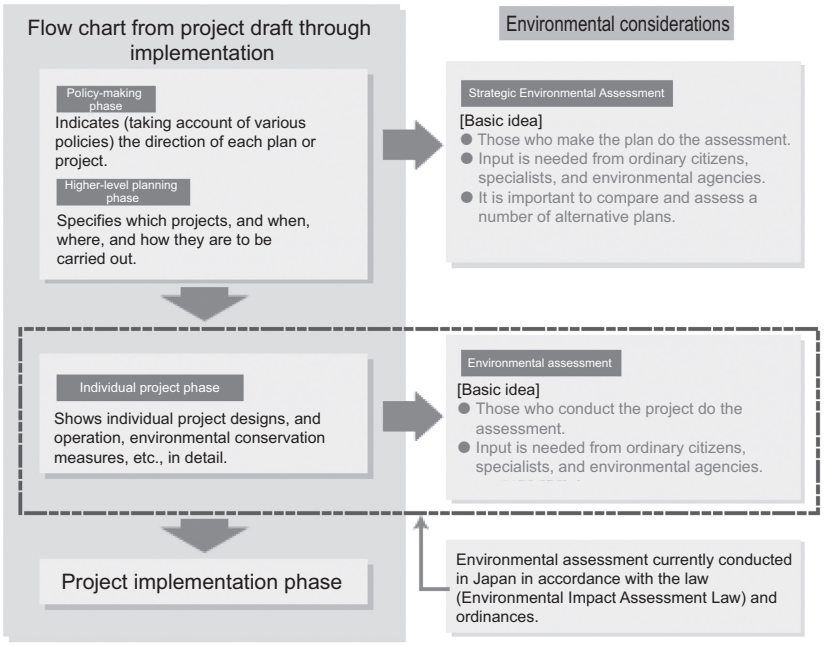
Table 1 "Fahrleistungsmodell" (cutting down vehicle-kilometers in new development) in the Canton of Bern, Switzerland

- Fahrleistungsmodell is a measure to cut down the amount of traffic (the number of trips and vehicle-kilometers) that is generated by a large-scale development project such as a new shopping center. At the same time, it aims at achieving air quality and spatial economy goals. The Canton of Bern estimates that it would achieve its conservation goals for air quality and against climate change if the growth rate of vehicle-kilometers of automobiles didn't exceed 8% (1.3 million kilometers per day) in 2015, setting 2000 as the bases year. Half of that limited growth rate has been allotted to general traffic growth in the canton; and the other half has been allotted to projects that will induce traffic on a large scale development.
- Since 2000, a project generating more than 2000 new automobile trips per day is permitted only when it conforms to space planning criteria and is allotted the number of automobile trip credits permitted for that project. For instance, the Bern Brunnen shopping mall plan obtained its allotment of 57,000 vehicle-kilometers per day (6000 trips / day × 9.5 km, the average length of a trip). After monitoring, if the permitted limit has not been maintained, the owner must employ remedies like charging for parking. And if that measure is not effective enough, the canton has the authority to impose a fine and to use the revenue for the improvements of the public transportation.

Source: Swiss Confederation, Switzerland's Fourth National Communication under the UNFCCC, 2005

Fig. 3 Guideline for introducing the SEA)

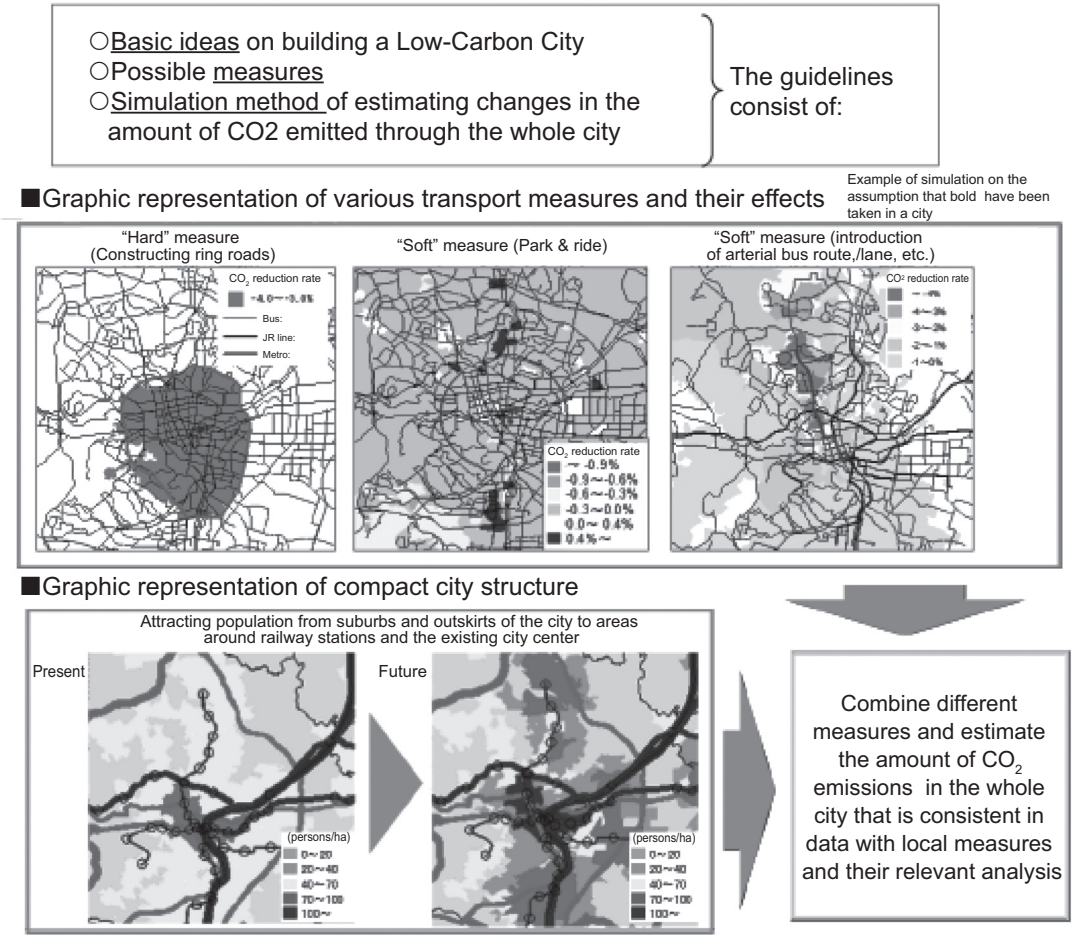
SEA (Strategic Environmental Assessment) is the environmental assessment in the strategic decision-making stage that precedes the construction of an individual project — in other words, it targets the three Ps: Policy-making, Planning, and Programming. The system permits environmental considerations to be included from an early stage, and more extensively. There have been discussions about introducing it inside and outside the country, and it is now being put into practice.



Source: Guidelines for the Strategic Environmental Assessment (SEA) (2007, Ministry of the Environment)

Fig. 4 Guidelines for building a Low Carbon City

In order to technically support the planning and implementation of "Building a Low-Carbon City" in various areas, new guidelines have been issued by the Ministry of Land, Infrastructure, Transport and Tourism; the guidelines show steps to be taken in building a Low-Carbon City, and ways to analyze outcomes.



Source: Basic guidelines for building a low-carbon city (2010, Ministry of Land, Infrastructure, Transport and Tourism)

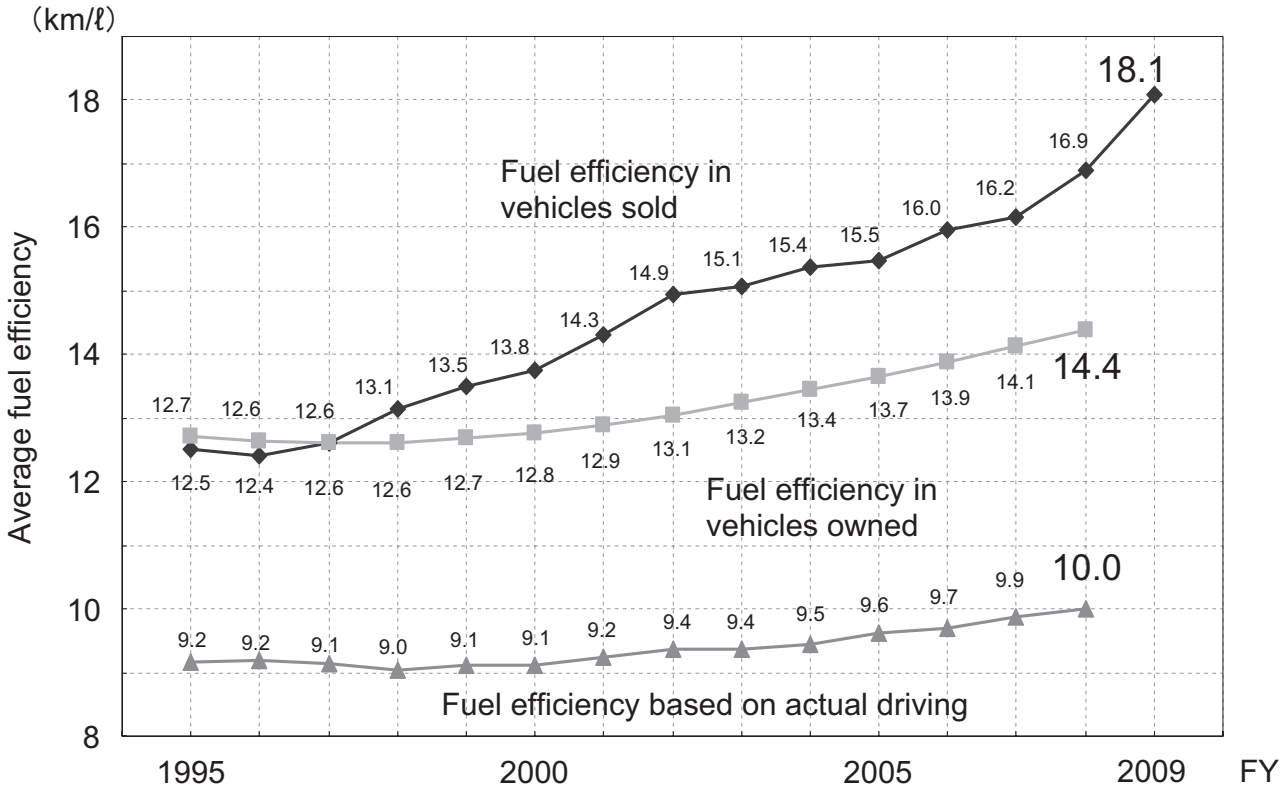
3-7 Development and Promotion of Environmentally Friendly Vehicles

Group Leader, Environment Department, Japan Automobile Manufacturers Association, Inc.
Tadashi Kotake

Taking steps against global warming, automotive manufacturers introduced various technologies to improve fuel efficiency, and achieved — long before 2010 — the fuel efficiency standard specified for that year. We continue that pace as we look toward the 2015 fuel efficiency standard. In addition, the Green tax system and subsidies have been implemented, and the development and promotion of next-generation motor vehicles are on schedule.

Fig. 1 Changes in average fuel efficiency of gasoline--engine passenger vehicles

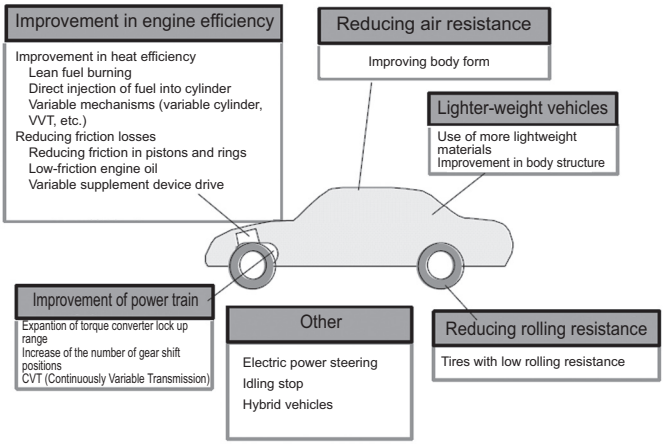
■ Fuel efficiency, as observed in both vehicles sold and vehicles owned, is increasing every year.



Note: Imported cars are not included among motor vehicles sold and motor vehicles owned.
Source: Japan Automobile Manufacturers Association, Inc.

Fig. 2 Technologies to improve the fuel efficiency of motor vehicles

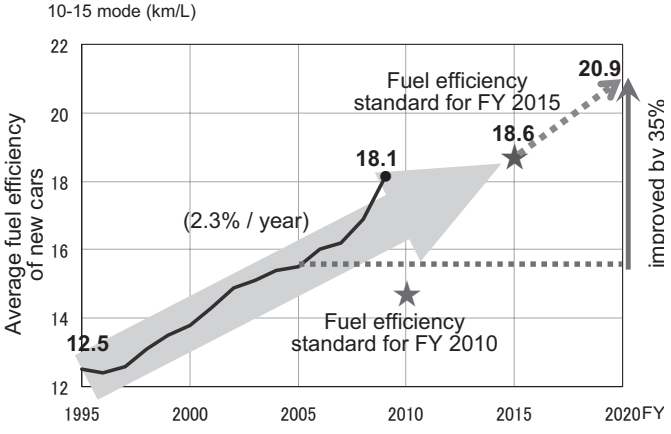
■ Improvement of fuel efficiency has been achieved step by step with the development of various technologies.



Source: Japan Automobile Manufacturers Association, Inc.

Fig. 3 Actual figures for average fuel efficiency of gasoline-engine passenger vehicles, with prospects for improvement

■ Efforts are being made toward the FY 2015 fuel efficiency standard and even further improvement.
■ Thanks to the eco-car subsidies, the average fuel efficiency increased noticeably in FY 2009.



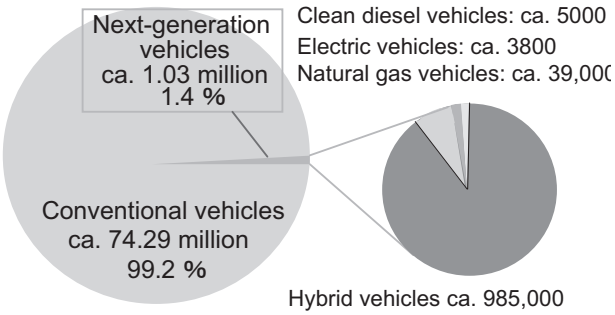
Source: Japan Automobile Manufacturers Association, Inc.

Table 1 Issues in mass marketing next-generation motor vehicles by 2020

1. It will take time to make an impact on the existing "market stock" of automobiles
   - Motor vehicle CO_2 emissions derive from the market stock.
   - Even if more new cars were sold, it will take time for the market stock to be replaced.
   - It is not likely that, by 2020 (only 12 years left), there will be a massive impact on the stock.
2. Will they be chosen by consumers?
   - Does the price of the vehicle motivate consumers to purchase?
   - Amid uncertainty in the market, the automotive businesses cannot make large investments.
3. Lead time for technical research and product development is necessary
   - Time is necessary for technical research and development for next-generation motor vehicles.
   - Time is necessary to develop a large number of models for the market.
   - Research and development personnel are needed in large numbers for the new technology.
   - It is difficult for manufactures to start developing hybrid vehicles immediately.
4. Lead time to establish a mass production system is necessary
   - Preparation and investment for assembly lines and facilities/equipment for new-generation vehicles
   - Preparation and investment for assembly lines and facilities/equipment for parts industries
   - Preparation and investment for supply system of materials manufacturers
   - When new technology is massively promoted over a short period, it is difficult to maintain quality.

Source: Japan Automobile Manufacturers Association, Inc.

Fig. 4 Number of motor vehicles owned and the breakdown for next-generation vehicles (estimate for FY 2009)



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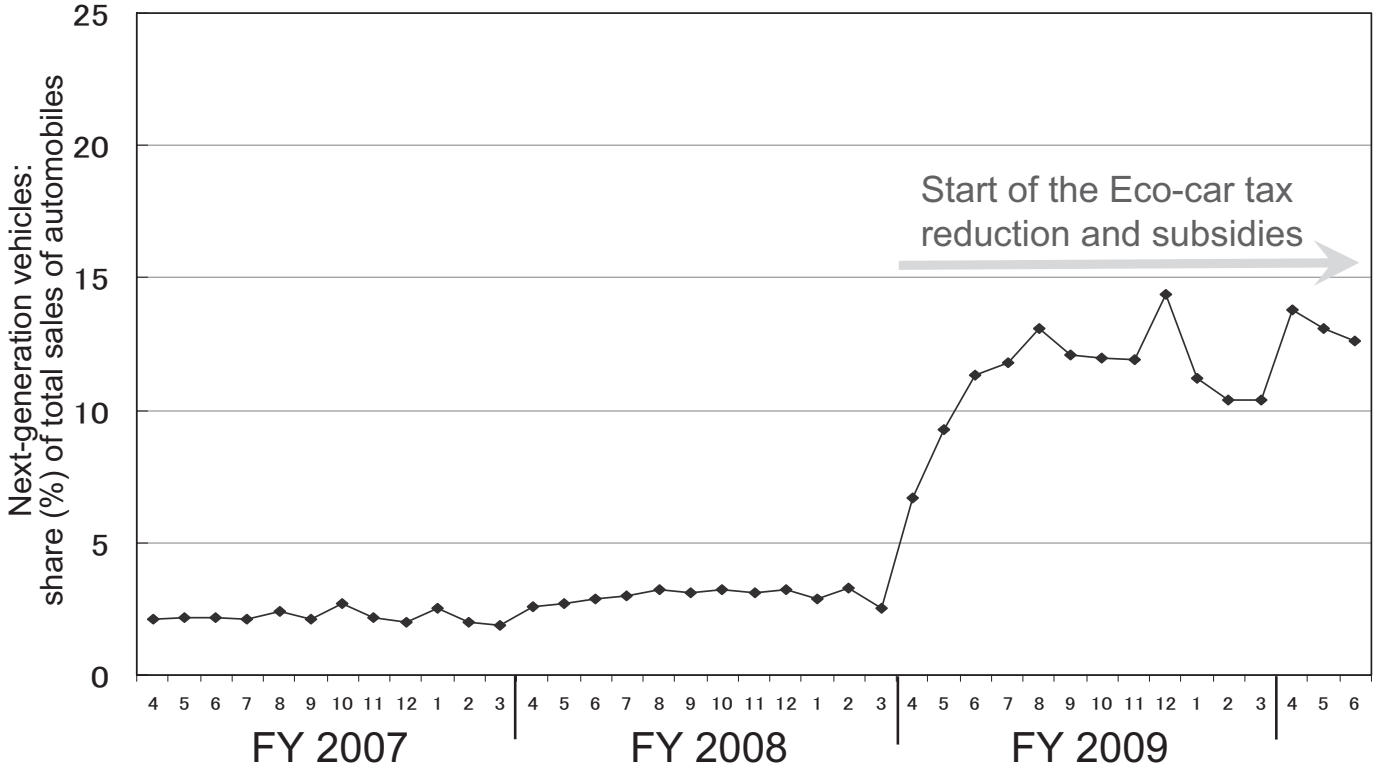
Out of 4,609,256 motor vehicles sold in Japan in fiscal 2009:

- Hybrid vehicles: 449,021 (9.7%)
- Electric vehicles: 1560 (0.03%)
- Clean diesel vehicles: 3119 (0.07%)
- Natural gas vehicles: 1744 (0.04%)
- Fuel cell vehicles: 18 (0.0004%)

Note: Next-generation vehicles: hybrid vehicles, clean diesel vehicles, plug-in hybrid vehicles, electric vehicles, natural gas vehicles, biofuel vehicles, fuel cell vehicles, and hydrogen vehicles
Source: Japan Automobile Manufacturers Association, Inc.

Fig. 5 Effects of the government's assistance for eco-cars

■ Due to the Eco-car tax reduction and subsidies of which about 600 billion yen was spent, the sales of next-generation vehicles increased, temporarily to about 10% of total sales (passenger cars only).



Note: The percentage includes imported cars. However, because they could not be included in the statistics, Kluger Hybrid and X-Trail Diesel are not included among the next-generation cars that were sold in the above period.
Source: Japan Automobile Manufacturers Association, Inc. and other sources

Table 2 Next-generation vehicles fuel initiative (May, 2007)

■ Aiming at the 2030 goal for the transport sector (80% dependence on oil and 30% improvement in energy efficiency), benchmarks (cost, performance, etc.) have been set as check points until 2030 (2010, 2015, and 2020), targeting market production at each point.

		Present	2010	2015	2020	
Using batteries	Use / form	Compact EV for electric companies	Limited use: commuter EV advanced HV**	Fuel cell vehicles; ordinary commuter EV; plug-in HV	Advanced plug-in HV	Commonplace EV
	Performance	1	1	1.5 times	3 times	7 times
	Cost to run	1	1/2	1/7	1/10	1/40
		200,000 yen/kwh	100,000 yen/kwh	30,000 yen/kwh	20,000 yen/kwh	5000 yen/kwh
Using hydrogen	Travel range	300km	400km		800km	
	Price of vehicle	20 times	3-5 times		1.2 times	
	Cost to run	Several million yen/kw	5000 yen/kw		4000 yen/kw	
Using diesel	Durability	2000 hours	3000 hours		5000 hours	
			Same exhaust gas, performance & price (incl. fuel cost) as gasoline-engine vehicles			
Using bio resources	Materials			Rice straw, etc. (leftover from lumber mills etc.)		
	Cost			100 yen/L (Biomass Nippon Comprehensive Strategies Promotion Council — Schedule for expanding production of domestic biofuel); 40 yen/L (technology innovation model)	100 yen/L (Biomass Nippon Comprehensive Strategies Promotion Council — Schedule for expanding production of domestic biofuel); 40 yen/L (technology innovation model)	
Using IT				Average speed in 3 major metropolitan areas: 1.5 times (20% less CO_2 emissions)		Average speed in 3 major metropolitan areas: twice (30% less CO_2 emissions)

Source: data of Ministry of Economy, Trade and Industry

Table 3 Next-generation Motor Vehicles Strategies 2010 (Ministry of Economy, Trade and Industry) — Promotion goals and overall strategies for encouraging the use of next-generation vehicles

■ To accelerate popular demand for next-generation vehicles, optimal marketing goals set by the government (by vehicle type, as a percentage of all new cars sold) are mentioned below. To meet those goals, the government needs to implement strong incentive measures (assisting development and purchases, tax writeoffs, infrastructure improvements, etc.).

■ In the Next-generation Motor Vehicles Strategies 2010, action plans for popularizing next-generation vehicles were made in each of the six strategic areas.

■ Automotive manufacturers primarily, but also related businesses and research institutions, are to do their best to speed development.

Government goals for next-generation vehicles

	2020
Conventional vehicles	50–80%
Next-generation vehicles	20–50%
Hybrid vehicles	20–30%
Electric vehicles Plug-in hybrid vehicles	15–20%
Fuel cell vehicles	–1%
Clean diesel vehicles	–5%

Prospects of spreading the use of next-generation vehicles (through private-sector efforts)

	2020
Conventional vehicles	80% and more
Next-generation vehicles	Less than 20%
Hybrid vehicles	10-15%
Electric vehicles Plug-in hybrid vehicles	5-10%
Fuel cell vehicles	negligible
Clean diesel vehicles	negligible

Note: For successful marketing without governmental incentive measures, the Japan Automobile Manufacturers Association estimates prospects at 10% + α

[Six strategies and major action plans]

	Overall Strategies	Batteries Strategie	Resources Strategies	Infrastructure Improvements Strategies	Systems Strategies	International Standards Strategies
	Making Japan the center of development and production of next-generation motor vehicles	Researching and developing technology to produce the world's most advanced batteries	Obtaining rare metals and building a resources recycling system	Ordinary chargers: 2 million; Rapid chargers: 5000	Export vehicles on the basis of a system (smart grid, etc.)	International standards under Japan's leadership
Major action plans	▪ Goal for promotion success of next-generation vehicles for 2020: maximum 50% ▪ Advanced environmental vehicles (next-generation vehicles + conventional vehicles that are particularly excellent in their performance for the environment): 2020: maximum 80% ▪ Diversity in fuel types	▪ Improving performance of lithium-ion batteries ▪ Developing post-lithium-ion batteries ▪ Spreading the use of electric vehicles to speed mass production ▪ Improving the market for secondary use of batteries	▪ Upper-stream Strategic procurment of resources ▪ Mid-stream Developing batteries and motors without rare metals ▪ Lower stream Building a system for recycling batteries	▪ Well-planned and intensive infrastructure improvements during market preparation period Mainly electric vehicle towns / plug-in hybrid vehicle towns ▪ Building a path toward a time of universal acceptance Electric vehicle town / Plug-in hybrid vehicle town Producing a "'Best Practices" compendium	▪ Creating new business models in electric vehicle and plug-in hybrid vehicle towns ▪ System verification in next-generation energy public demonstration projects ▪ International standardization based on the verification results; commercial development of results	▪ International standards for battery performance, safety, and evaluation methods ▪ International standards for charger connection system ▪ Encouraging administrative and private sectors to advocate standardization ▪ Training standardization personnel

Source: Compiled from the data in NEXT GENERATION MOTOR VEHICLES STRATEGIES 2010

Statistics and Data

1. Passenger and Freight Transport in Japan

1-1 Passenger transport in Japan

	Number of passengers transported x 1000 passengers (% in parentheses)					
	Motor vehicles					
		Buses	Passenger cars total			
				Commercial use	Private use	
					Registered cars	Light cars
FY1960	7 900 743 (38.9)	6 290 722	1 610 021	1 205 225	404 766	
1965	14 863 470 (48.3)	10 557 428	4 306 042	2 626 631	1 679 411	
1970	24 032 433 (59.2)	11 811 524	12 220 909	4 288 853	7 932 056	
1975	28 411 450 (61.5)	10 730 770	17 680 680	3 220 221	14 460 459	
1980	33 515 233 (64.8)	9 903 047	23 612 186	3 426 567	20 185 619	
1985	34 678 904 (64.4)	8 780 339	25 898 565	3 256 748	22 641 817	
1990	55 767 427 (71.6)	8 558 007	36 203 558	3 223 166	30 847 009	2 133 383
1991	57 555 953 (71.6)	8 581 527	37 738 091	3 177 338	31 703 753	2 857 000
1992	58 841 075 (72.0)	8 444 624	39 195 780	3 041 414	32 686 088	3 468 278
1993	59 284 686 (72.1)	8 224 853	40 120 796	2 921 600	33 126 915	4 072 281
1994	59 934 869 (72.4)	7 835 945	41 468 428	2 821 934	34 004 081	4 642 413
1995	61 271 653 (72.8)	7 619 016	43 054 973	2 758 386	35 018 454	5 278 133
1996	61 542 541 (72.9)	7 492 001	43 735 581	2 684 353	35 071 869	5 979 359
1997	62 199 844 (73.5)	7 350 681	45 117 374	2 614 960	35 869 364	6 633 050
1998	61 838 994 (73.5)	7 047 203	45 771 966	2 514 790	35 938 895	7 318 281
1999	62 046 830 (73.9)	6 864 127	46 512 934	2 465 979	35 985 722	8 061 233
2000	62 841 306 (74.2)	6 635 255	47 937 071	2 433 069	36 505 013	8 998 989
2001	64 590 143 (74.7)	6 489 964	50 005 870	2 343 721	37 683 632	9 978 517
2002	65 480 675 (75.1)	6 286 093	51 268 330	2 366 320	38 139 379	10 762 631
2003	65 933 252 (75.0)	6 191 302	51 801 525	2 351 547	37 891 573	11 558 405
2004	65 990 529 (75.1)	5 995 303	52 310 957	2 243 855	37 558 610	12 508 492
2005	65 946 689 (74.9)	5 888 754	52 722 207	2 217 361	37 358 034	13 146 812
2006	65 943 252 (74.6)	5 909 240	52 764 906	2 208 933	36 570 098	13 985 875
2007	66 908 896 (74.4)	5 963 212	53 729 659	2 137 352	36 625 025	14 967 282
2008	66 774 143 (74.2)	5 929 557	60 844 586	2 024 813	36 024 555	15 777 161

	Passenger-kilometers transported x 1 million passenger-kilometers (% in parentheses)					
	Motor vehicles					
		Buses	Passenger cars total			
				Commercial use	Private use	
					Registered cars	Light cars
FY1960	55 531 (22.8)	43 998	11 533	5 162	6 370	
1965	120 756 (31.6)	80 134	40 622	11 216	29 406	
1970	284 229 (48.4)	102 893	181 335	19 311	162 024	
1975	360 868 (50.8)	110 063	250 804	15 572	235 232	
1980	431 669 (55.2)	110 396	321 272	16 243	305 030	
1985	489 260 (57.0)	104 898	384 362	15 763	368 600	
1990	853 060 (65.7)	110 372	575 507	15 639	536 773	23 095
1991	869 337 (65.3)	108 212	595 481	16 055	548 805	30 621
1992	888 279 (65.6)	106 637	617 551	15 645	564 654	37 252
1993	889 873 (65.6)	102 909	626 979	15 166	567 999	43 814
1994	896 751 (65.9)	99 781	640 384	14 338	576 710	49 336
1995	917 419 (66.1)	97 288	664 625	13 796	594 712	56 117
1996	931 721 (66.1)	94 892	684 177	13 277	606 741	64 159
1997	944 972 (66.6)	92 900	704 127	12 818	618 615	72 694
1998	954 807 (67.1)	90 433	723 791	12 344	631 502	79 945
1999	955 563 (67.1)	88 686	733 437	12 115	632 815	88 507
2000	951 253 (67.0)	87 307	741 148	12 052	630 958	98 138
2001	954 292 (67.0)	86 351	752 529	11 802	633 326	107 401
2002	955 413 (67.0)	86 181	756 632	11 901	628 601	116 130
2003	954 186 (66.9)	86 391	755 062	11 968	620 698	122 396
2004	947 563 (66.8)	86 285	750 518	11 585	607 909	131 024
2005	933 006 (66.1)	88 066	737 621	11 485	587 657	138 479
2006	917 938 (65.4)	88 699	723 870	11 454	566 577	145 839
2007	919 062 (66.3)	88 969	724 591	11 100	559 533	153 958
2008	905 907 (64.9)	89 921	713 146	10 572	542 304	160 271

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)
Note: 1. Starting from FY 1987, motor vehicles include light motor vehicles and trucks in private use.
2. Regarding the number of passengers transported and passenger-kilometers for railways: figures from FY 1987 onward are not in sequence with those of the previous fiscal year and before because of overlaps between JR (Japan Railway) Companies.
3. For passenger ship transport, figures for FY 1970 and before include only scheduled transport services; figures from FY 1975 onward are the total of scheduled and nonscheduled transport services. Passenger-kilometers transported in FY 1965 and before were estimated by multiplying the number of passengers by 27 kilometers (the average kilometers per person transported).

Trucks in private use		Railways	Passenger ships	Aircraft	Total	
Registered trucks	Light trucks					
		12 290 380 (60.6)	98 887 (0.5)	1 260 (0.01)	20 291 270 (100.0)	FY 1960
		15 798 168 (51.3)	126 007 (0.4)	5 194 (0.02)	30 792 839 (100.0)	1965
		16 384 034 (40.3)	173 744 (0.4)	15 460 (0.04)	40 605 671 (100.0)	1970
		17 587 925 (38.1)	169 864 (0.4)	25 467 (0.06)	46 194 706 (100.0)	1975
		18 004 962 (34.8)	159 751 (0.3)	40 427 (0.08)	51 720 373 (100.0)	1980
		18 989 703 (35.3)	153 477 (0.3)	43 777 (0.08)	53 865 861 (100.0)	1985
3 454 128	7 551 734	21 938 609 (28.2)	162 600 (0.2)	65 252 (0.08)	77 933 888 (100.0)	1990
3 404 271	7 832 064	22 559 810 (28.1)	162 000 (0.2)	68 687 (0.09)	80 346 450 (100.0)	1991
3 377 578	7 823 093	22 694 082 (27.8)	157 855 (0.2)	69 687 (0.09)	81 762 699 (100.0)	1992
3 263 258	7 675 779	22 759 159 (27.7)	157 250 (0.2)	69 584 (0.08)	82 270 679 (100.0)	1993
3 159 741	7 470 755	22 597 951 (27.3)	150 866 (0.2)	74 547 (0.09)	82 758 233 (100.0)	1994
3 133 874	7 463 790	22 630 439 (26.9)	148 828 (0.2)	78 101 (0.09)	84 129 021 (100.0)	1995
3 068 844	7 246 115	22 593 304 (26.8)	148 107 (0.2)	82 131 (0.1)	84 366 083 (100.0)	1996
2 936 947	6 794 842	22 197 786 (26.2)	144 896 (0.2)	85 555 (0.1)	84 628 081 (100.0)	1997
2 707 178	6 312 647	22 013 765 (26.2)	127 665 (0.2)	87 910 (0.1)	84 068 334 (100.0)	1998
2 579 223	6 090 546	21 750 275 (25.9)	120 091 (0.1)	91 588 (0.1)	84 008 784 (100.0)	1999
2 484 914	5 784 066	21 646 751 (25.6)	110 128 (0.1)	92 873 (0.1)	84 691 058 (100.0)	2000
2 464 818	5 629 491	21 720 088 (25.1)	111 550 (0.1)	94 579 (0.1)	86 515 679 (100.0)	2001
2 406 007	5 520 245	21 561 067 (24.7)	108 846 (0.1)	96 662 (0.1)	87 247 250 (100.0)	2002
2 377 331	5 563 094	21 757 564 (24.8)	107 288 (0.1)	95 487 (0.1)	87 893 591 (100.0)	2003
2 200 539	5 483 730	21 686 454 (24.7)	100 872 (0.1)	93 739 (0.1)	87 871 594 (100.0)	2004
2 083 356	5 252 372	21 963 024 (24.9)	103 175 (0.1)	94 490 (0.1)	88 098 313 (100.0)	2005
2 021 509	5 247 597	22 243 472 (25.2)	99 168 (0.1)	96 971 (0.1)	88 382 863 (100.0)	2006
2 003 807	5 212 218	22 840 812 (25.4)	100 794 (0.1)	94 849 (0.1)	89 945 351 (100.0)	2007
1 906 546	5 111 511	22 976 100 (25.5)	99 032 (0.1)	90 662 (0.1)	89 939 937 (100.0)	2008

Trucks in private use		Railways	Passenger ships	Aircraft	Total	
Registered trucks	Light trucks					
		184 340 (75.8)	2 670 (1.1)	737 (0.3)	243 278 (100.0)	FY 1960
		255 484 (66.8)	3 402 (0.9)	2 952 (0.8)	382 594 (100.0)	1965
		288 815 (49.2)	4 814 (0.8)	9 319 (1.6)	587 177 (100.0)	1970
		323 800 (45.6)	6 895 (1.0)	19 148 (2.7)	710 711 (100.0)	1975
		314 542 (40.2)	6 132 (0.8)	29 688 (3.8)	782 031 (100.0)	1980
		330 101 (38.5)	5 752 (0.7)	33 119 (3.9)	858 232 (100.0)	1985
74 659	92 523	387 478 (29.8)	6 275 (0.5)	51 623 (4.0)	1 298 436 (100.0)	1990
75 428	90 217	400 083 (30.1)	6 195 (0.5)	55 349 (4.2)	1 330 964 (100.0)	1991
75 749	88 343	402 258 (29.7)	6 097 (0.5)	56 680 (4.2)	1 353 314 (100.0)	1992
74 647	85 338	402 727 (29.7)	6 061 (0.4)	57 118 (4.2)	1 355 779 (100.0)	1993
73 804	82 782	396 332 (29.1)	5 946 (0.4)	61 289 (4.5)	1 360 318 (100.0)	1994
73 887	81 620	400 056 (28.8)	5 527 (0.4)	65 012 (4.7)	1 388 014 (100.0)	1995
73 111	79 541	402 156 (28.6)	5 635 (0.4)	69 049 (4.9)	1 408 561 (100.0)	1996
72 034	75 911	394 933 (27.8)	5 368 (0.4)	73 243 (5.2)	1 418 516 (100.0)	1997
68 664	71 920	388 938 (27.3)	4 620 (0.3)	75 988 (5.3)	1 418 516 (100.0)	1998
64 699	68 742	385 101 (27.0)	4 479 (0.3)	79 348 (5.6)	1 424 491 (100.0)	1999
59 431	63 366	384 441 (27.1)	4 304 (0.3)	79 698 (5.6)	1 419 696 (100.0)	2000
56 218	59 196	385 421 (27.0)	4 006 (0.3)	81 459 (5.7)	1 425 178 (100.0)	2001
54 619	57 980	382 236 (26.8)	3 893 (0.3)	83 949 (5.9)	1 425 491 (100.0)	2002
54 113	58 621	384 958 (27.0)	4 024 (0.3)	83 311 (5.8)	1 426 479 (100.0)	2003
51 736	59 023	385 163 (27.2)	3 869 (0.3)	81 786 (5.8)	1 418 381 (100.0)	2004
49 742	57 576	391 228 (27.7)	4 025 (0.3)	83 220 (5.9)	1 411 397 (100.0)	2005
48 461	56 908	395 908 (28.2)	3 783 (0.3)	85 746 (6.1)	1 403 375 (100.0)	2006
48 656	56 846	405 544 (28.7)	3 834 (0.3)	84 327 (6.0)	1 412 767 (100.0)	2007
46 910	55 930	404 585 (29.0)	3 510 (0.3)	80 931 (5.8)	1 394 933 (100.0)	2008

1-2 Freight transport in Japan

	Tonnage transported x 1000 tons (% in parentheses)						
	Motor vehicles						
		Commercial use			Private use		
			Registered vehicles	Light vehicles		Registered vehicles	Light vehicles
FY 1960	1 156 291 (75.8)	380 728	380 728		775 563	775 563	
1965	2 193 195 (83.8)	664 227	664 227		1 528 968	1 528 968	
1970	4 626 069 (88.1)	1 113 061	1 113 061		3 513 008	3 513 008	
1975	4 392 859 (87.4)	1 251 482	1 251 482		3 141 377	3 141 377	
1980	5 317 950 (88.9)	1 661 473	1 661 473		3 656 477	3 656 477	
1985	5 048 048 (90.2)	1 891 937	1 891 937		3 156 111	3 156 111	
1990	6 113 565 (90.2)	2 427 625	2 416 384	11 241	3 685 940	3 557 161	128 779
1991	6 260 811 (90.5)	2 571 938	2 559 405	12 533	3 688 873	3 547 528	141 345
1992	6 101 706 (90.7)	2 516 790	2 503 720	13 070	3 584 916	3 444 392	140 524
1993	5 821 537 (90.5)	2 490 750	2 477 742	13 008	3 330 787	3 193 002	137 785
1994	5 810 374 (90.1)	2 517 955	2 504 830	13 125	3 292 419	3 152 639	139 780
1995	6 016 571 (90.6)	2 647 067	2 633 277	13 790	3 369 504	3 230 135	139 369
1996	6 177 265 (90.9)	2 778 854	2 764 245	14 609	3 398 411	3 263 236	135 175
1997	6 065 384 (90.8)	2 775 830	2 760 452	15 378	3 289 554	3 158 681	130 873
1998	5 819 881 (91.0)	2 747 332	2 731 587	15 745	3 072 549	2 943 464	129 085
1999	5 863 259 (91.0)	2 873 655	2 857 581	16 074	2 989 604	2 862 411	127 193
2000	5 773 619 (90.6)	2 932 696	2 916 222	16 474	2 840 923	2 713 392	127 531
2001	5 578 227 (90.6)	2 898 336	2 881 753	16 583	2 679 891	2 556 217	123 674
2002	5 339 487 (90.6)	2 830 173	2 813 389	16 784	2 509 314	2 389 557	119 757
2003	5 234 076 (91.3)	2 843 911	2 826 770	17 141	2 390 165	2 269 573	120 592
2004	5 075 877 (91.1)	2 833 122	2 815 502	17 620	2 242 755	2 120 129	122 626
2005	4 965 874 (91.2)	2 858 258	2 840 686	17 572	2 107 616	1 983 974	123 642
2006	4 961 325 (91.4)	2 899 642	2 881 688	17 954	2 061 683	1 937 380	124 303
2007	4 932 539 (91.4)	2 927 928	2 908 987	18 941	2 004 611	1 883 959	120 652
2008	4 718 318 (91.7)	2 808 664	2 788 513	20 151	1 909 654	1 792 088	117 566

	Ton-kilometers transported x 1 million ton-kilometers (% in parentheses)						
	Motor vehicles						
		Commercial use			Private use		
			Registered vehicles	Light vehicles		Registered vehicles	Light vehicles
FY 1960	20 801 (15.0)	9 639	9 639		11 163	11 163	
1965	48 392 (26.1)	22 385	22 385		26 006	26 006	
1970	135 916 (38.8)	67 330	67 330		68 586	68 586	
1975	129 701 (36.0)	69 247	69 247		60 455	60 455	
1980	178 901 (40.8)	103 541	103 541		75 360	75 360	
1985	205 941 (47.4)	137 300	137 300		68 642	68 642	
1990	274 244 (50.2)	194 221	193 799	422	80 023	78 358	1 665
1991	283 776 (50.7)	204 198	203 752	446	79 578	77 834	1 744
1992	281 599 (50.5)	204 844	204 405	439	76 754	75 030	1 724
1993	275 885 (51.5)	204 862	204 442	420	71 023	69 374	1 649
1994	280 587 (51.5)	209 699	209 278	421	70 888	69 231	1 657
1995	294 648 (52.7)	223 090	222 655	435	71 558	69 911	1 647
1996	305 510 (53.3)	233 255	232 797	458	72 255	70 641	1 614
1997	306 263 (52.9)	236 552	236 066	486	69 711	68 140	1 571
1998	300 670 (54.5)	235 642	235 142	500	65 028	63 483	1 571
1999	307 149 (54.8)	245 579	245 066	514	61 569	60 020	1 549
2000	313 118 (54.2)	255 533	255 012	522	57 585	56 025	1 559
2001	313 072 (53.9)	259 771	259 239	532	53 301	51 828	1 473
2002	312 028 (54.7)	262 305	261 760	545	49 723	48 308	1 415
2003	321 862 (57.1)	274 364	273 798	566	47 498	46 102	1 396
2004	327 632 (57.5)	282 151	281 555	596	45 481	44 064	1 417
2005	334 979 (58.7)	290 773	290 160	613	44 206	42 752	1 455
2006	346 534 (59.9)	302 182	301 546	636	44 352	42 853	1 499
2007	354 800 (60.9)	310 185	309 496	689	44 615	43 135	1 480
2008	346 420 (62.1)	302 816	302 092	724	43 604	42 123	1 481

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

2. Passenger and Freight Transport in Japan and Other Countries

2-1 Passenger transport in Japan and other countries (passenger-kilometers)

x 1 billion passenger-kilometers (% in parentheses)

	Survey year	Passenger cars	Buses	Railways	Coastal shipping	Aircraft	Total
Japan	2008	816.0 (58.5)	90.1 (6.5)	404.6 (29.0)	3.5 (0.3)	80.9 (5.8)	1 395.1 (100)
U.S.A	2007	7 742.6 (86.3)	238.0 (2.7)	9.3 (0.1)	–	977.8 (10.9)	8 967.7 (100)
U.K.	2007	689.0 (84.9)	51.5 (6.3)	59.7 (7.4)	–	10.0 (1.2)	812.0 (100)
France	2007	727.8 (81.0)	47.1 (5.2)	93.0 (10.3)	–	18.4 (2.0)	898.9 (100)
Germany	2007	868.7 (79.0)	65.4 (5.9)	95.3 (8.7)	–	70.9 (6.4)	1 100.2 (100)

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

Note: 1. Figures for Japan are those for the fiscal year.
2. Figures for passenger cars for the U.S.A. include motorcycles.
3. Figures for buses for U.K. are those for public transport vehicles.
4. Figures for buses for Germany are the total of all public transport including taxis and streetcars.

Railways	Coastal shipping	Aircraft	Total	
229 856 (15.1)	138 849 (9.1)	9 (0.00)	1 525 005 (100.0)	FY 1960
243 524 (9.3)	179 645 (6.9)	33 (0.00)	2 616 397 (100.0)	1965
250 360 (4.8)	376 647 (7.2)	116 (0.00)	5 253 192 (100.0)	1970
180 616 (3.6)	452 054 (9.0)	192 (0.00)	5 025 721 (100.0)	1975
162 827 (2.7)	500 258 (8.4)	329 (0.01)	5 981 364 (100.0)	1980
96 285 (1.7)	452 385 (8.1)	538 (0.01)	5 597 256 (100.0)	1985
86 619 (1.3)	575 199 (8.5)	874 (0.01)	6 776 257 (100.0)	1990
85 697 (1.2)	571 891 (8.3)	874 (0.01)	6 919 273 (100.0)	1991
82 402 (1.2)	540 410 (8.0)	854 (0.01)	6 725 372 (100.0)	1992
79 259 (1.2)	528 841 (8.2)	859 (0.01)	6 430 496 (100.0)	1993
78 948 (1.2)	555 764 (8.6)	910 (0.01)	6 445 996 (100.0)	1994
76 932 (1.2)	548 542 (8.3)	960 (0.01)	6 643 005 (100.0)	1995
73 558 (1.1)	546 909 (8.0)	1 002 (0.01)	6 798 734 (100.0)	1996
69 228 (1.0)	541 437 (8.1)	1 014 (0.02)	6 677 063 (100.0)	1997
60 369 (1.0)	516 647 (8.0)	1 015 (0.02)	6 397 912 (100.0)	1998
58 685 (0.9)	522 602 (8.1)	1 061 (0.02)	6 445 607 (100.0)	1999
59 274 (0.9)	537 021 (8.4)	1 103 (0.02)	6 371 017 (100.0)	2000
58 668 (1.0)	520 067 (8.4)	1 015 (0.02)	6 157 977 (100.0)	2001
56 592 (1.0)	497 251 (8.4)	1 001 (0.02)	5 894 331 (100.0)	2002
53 602 (0.9)	445 544 (7.8)	1 033 (0.02)	5 734 255 (100.0)	2003
52 219 (0.9)	440 252 (7.9)	1 065 (0.02)	5 569 413 (100.0)	2004
52 473 (1.0)	426 145 (7.8)	1 082 (0.02)	5 445 574 (100.0)	2005
51 872 (1.0)	416 644 (7.7)	1 099 (0.02)	5 430 940 (100.0)	2006
50 850 (0.9)	409 694 (7.6)	1 145 (0.02)	5 394 228 (100.0)	2007
46 225 (0.9)	378 705 (7.4)	996 (0.02)	5 144 244 (100.0)	2008

Railways	Coastal shipping	Aircraft	Total	
53 916 (39.0)	63 579 (46.0)	6 (0.00)	138 302 (100.0)	FY 1960
56 678 (30.5)	80 635 (46.4)	21 (0.01)	185 726 (100.0)	1965
63 031 (18.0)	151 243 (43.2)	74 (0.02)	350 264 (100.0)	1970
47 058 (13.1)	183 579 (50.9)	152 (0.04)	360 490 (100.0)	1975
37 428 (8.5)	222 173 (50.6)	290 (0.07)	438 792 (100.0)	1980
21 919 (5.0)	205 818 (47.4)	482 (0.11)	434 160 (100.0)	1985
27 196 (5.0)	244 546 (44.7)	799 (0.15)	546 785 (100.0)	1990
27 157 (4.8)	248 203 (44.3)	812 (0.15)	559 948 (100.0)	1991
26 668 (4.8)	248 002 (44.5)	804 (0.14)	557 073 (100.0)	1992
25 433 (4.7)	233 526 (43.6)	817 (0.15)	535 661 (100.0)	1993
24 493 (4.5)	238 540 (43.8)	871 (0.16)	544 491 (100.0)	1994
25 101 (4.5)	238 330 (42.6)	924 (0.17)	559 002 (100.0)	1995
24 968 (4.4)	241 756 (42.2)	962 (0.17)	573 196 (100.0)	1996
24 618 (4.3)	247 018 (42.7)	982 (0.17)	578 881 (100.0)	1997
22 920 (4.2)	226 980 (41.2)	985 (0.17)	551 555 (100.0)	1998
22 541 (4.0)	229 432 (41.0)	1 039 (0.19)	560 161 (100.0)	1999
22 136 (3.8)	241 671 (41.8)	1 075 (0.19)	578 000 (100.0)	2000
22 193 (3.8)	244 451 (42.1)	994 (0.17)	580 710 (100.0)	2001
22 131 (3.9)	235 582 (41.3)	991 (0.17)	570 732 (100.0)	2002
22 794 (4.0)	218 190 (38.7)	1 027 (0.18)	563 873 (100.0)	2003
22 476 (3.9)	218 833 (38.4)	1 058 (0.19)	569 999 (100.0)	2004
22 813 (4.0)	211 576 (37.1)	1 075 (0.19)	570 443 (100.0)	2005
23 192 (4.0)	207 849 (35.9)	1 094 (0.19)	578 669 (100.0)	2006
23 334 (4.0)	202 962 (34.9)	1 145 (0.20)	582 241 (100.0)	2007
22 256 (4.0)	187 859 (33.7)	1 078 (0.19)	557 613 (100.0)	2008

2-2 Freight transport in Japan and other countries (ton-kilometers)

x 1 billion ton-kilometers (% in parentheses)

	Survey year	Trucks	Railways	Coastal shipping	Aircraft	Pipelines	Total
Japan	2008	346.4 (62.1)	22.3 (4.0)	187.9 (33.7)	1.1 (0.2)	–	557.6 (100)
U.S.A.	2003	1 845.4 (31.4)	2 265.1 (38.5)	885.0 (15.1)	22.2 (0.4)	861.7 (14.7)	5 879.3 (100)
U.K.	2007	160.4 (81.1)	26.4 (13.3)	0.2 (0.1)	0.7 (0.4)	10.2 (5.2)	197.9 (100)
France	2007	191.4 (72.0)	42.6 (16.0)	9.2 (3.5)	1.0 (0.4)	21.7 (8.2)	265.9 (100)
Germany	2007	261.4 (57.2)	114.6 (25.1)	64.7 (14.1)	0.7 (0.2)	15.8 (3.5)	457.3 (100)

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

Note: 1. Figures for Japan are those for the fiscal year.

3. Road Traffic in Japan and Other Countries

3-1 Vehicle kilometers traveled in Japan

(unit: 1 million kilometers)

	Passenger cars (excl. light vehicles)	Buses	Sub total	Trucks in commercial use (excl. light trucks)	Trucks in private use (excl. light trucks)	Sub total	Total
FY 1960	8 725	1 994	10 719	4 377	13 068	17 445	28 164
1965	34 002	3 590	37 592	8 465	36 098	44 563	82 155
1970	120 582	5 394	125 976	15 592	84 448	100 040	226 017
1975	176 035	5 451	181 486	17 922	86 938	104 859	286 345
1980	241 459	6 046	247 505	26 883	114 664	141 547	389 052
1985	275 557	6 352	281 908	34 682	111 851	146 533	428 442
1986	285 294	6 455	291 749	37 242	112 622	149 864	441 613
1987	295 084	6 626	301 710	39 966	116 181	156 148	457 858
1988	308 629	6 737	315 366	43 475	129 448	172 923	488 289
1989	328 376	6 962	335 338	46 314	119 535	165 849	501 187
1990	350 317	7 112	357 429	48 459	122 077	170 536	527 964
1991	366 288	7 185	373 474	52 365	125 271	177 636	551 110
1992	380 102	7 068	387 170	54 370	124 734	179 105	566 275
1993	383 356	6 934	390 290	55 202	123 008	178 210	567 771
1994	391 599	6 807	398 406	57 540	120 186	177 726	576 132
1995	407 001	6 768	413 769	60 341	122 253	182 594	596 363
1996	418 980	6 706	425 686	63 135	121 362	184 496	615 939
1997	425 988	6 641	432 629	63 956	118 514	182 470	615 099
1998	427 689	6 520	434 209	63 225	116 517	179 742	613 951
1999	438 550	6 601	445 151	65 641	115 494	181 135	626 286
2000	438 204	6 619	444 823	69 204	116 728	185 932	630 755
2001	448 845	6 762	455 607	69 344	114 867	184 211	639 818
2002	445 134	6 653	451 787	70 652	111 956	182 608	634 395
2003	438 730	6 662	445 392	72 897	110 480	183 377	628 769
2004	429 260	6 665	435 925	71 607	102 804	174 411	610 336
2005	417 537	6 650	424 187	70 829	97 473	168 302	592 489
2006	405 388	6 655	412 043	73 103	95 337	168 440	580 483
2007	398 579	6 726	405 305	74 271	94 229	168 500	573 805
2008	382 499	6 568	389 067	72 148	91 015	163 163	552 230

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

3-2 Vehicle-kilometers traveled in Japan and other countries

(unit: 1 million vehicle-kilometers)

	Survey year	Passenger cars	Buses	Trucks	Total
Japan	2007	398 579	6 726	168 500	573 805
U.S.A.	2001	4 117 190	11 247	–	–
U.K	2003	393 007	5 391	86 324	484 722
Germany	2003	577 800	3 700	57 700	639 200
France	2003	425 000	2 400	121 500	548 900
Italy	1999	51 989	–	15 927	67 916
Netherlands	1999	93 185	540	16 230	109 955
Belgium	1998	95 659	60 974	–	–
Denmark	2002	38 854	219	–	–
Poland	2001	94 600	5 600	37 900	138 100
Spain	2003	204 211	3 641	32 144	239 996
Sweden	2002	44 092	1 000	13 900	58 992
China	2000	418 330	–	422 630	840 960
South Korea	1997	29 601	3 799	33 866	67 266
Hong Kong	1999	6 506	1 022	3 253	10 781
Thailand	1996	39 200	10 200	50 500	99 900

Source: Road Statistics Annual Report 2003; World Road Statistics 2005 (IRF)

4-2 Traffic volume in major cities / average travel speed at peak hours

(FY)

	Length of road surveyed (km)	Vehicle-kilometers traveled in 12 hours(x 1000 vehicle-kilometers)										Average travel speed at peak hours (km/h)						
	2005	1980	1985	1990	1994	1997	1999	2005				1980	1985	1990	1994	1997	1999	2005
								Passenger cars	Buses	Trucks	Total							
Sapporo City, Hokkaido	145.3	2 572	2 688	3 099	3 463	3 684	3 574	2 425	59	683	3 167	29.4	29.0	30.3	27.5	26.0	24.6	23.2
Sendai City, Miyagi Prefecture	139.7	–	–	2 373	2 627	2 770	2 845	2 035	39	876	2 951	–	–	19.6	24.1	26.8	22.2	22.6
Special Wards of Tokyo	171.2	5 491	5 584	5 663	5 917	6 123	6 156	2 994	62	2 212	5 269	21.4	14.8	19.1	11.6	16.7	18.0	18.2
Yokohama City, Kanagawa Prefecture	149.8	3 428	4 597	4 968	5 998	6 289	6 152	3 463	57	2 069	5 589	31.4	23.3	27.0	18.2	21.7	23.0	23.4
Kawasaki City, Kanagawa Prefecture	37.8	444	527	861	1 349	1 179	1 219	433	14	345	792	24.6	17.4	19.3	19.7	21.7	20.0	22.7
Nagoya City, Aichi Prefecture	110.3	3 181	3 408	3 629	3 785	3 783	3 671	2 203	24	1 389	3 616	25.6	19.7	19.3	13.1	19.4	19.6	20.6
Kyoto City, Kyoto Prefecture	166.5	1 923	2 070	2 292	2 339	2 280	2 276	1 493	36	708	2 238	29.7	23.8	20.2	20.9	23.0	21.6	25.4
Osaka City, Osaka Prefecture	99.2	2 177	2 893	2 945	3 434	3 218	3 216	1 682	30	1 067	2 779	21.5	19.5	18.3	20.1	19.8	17.0	15.9
Kobe City, Hyogo Prefecture	113.0	2 463	2 786	3 340	3 469	3 430	3 458	1 791	36	1 027	2 854	38.6	32.9	30.4	28.2	28.5	33.6	32.0
Hiroshima City, Hiroshima Prefecture	140.4	1 909	2 144	2 503	2 783	2 778	2 888	1 882	42	936	2 859	30.9	24.3	25.7	21.7	20.7	20.2	23.6
Kitakyushu City, Fukuoka Prefecture	149.8	3 251	3 413	3 688	3 209	3 211	3 257	2 219	45	946	3 210	33.6	26.9	26.6	23.5	24.7	25.7	22.7
Fukuoka City, Fukuoka Prefecture	80.2	1 673	1 868	2 223	2 144	2 039	1 954	1 380	30	595	2 006	24.5	18.7	22.2	17.1	15.9	18.4	18.7

Source: Road Traffic Census (Japan Society of Traffic Engineering) Note: 1. Figures are those measured on national highways.

4. Road Traffic in Japan

4-1 Traffic volume by type of road / average travel speed at peak hours

Type of road	FY	Length of road surveyed (km)	Vehicle-kilometers traveled in 12 hours (x 1000 vehicle-kilometers)					Estimated vehicle-kilometers traveled in 24 hours (x 1000 vehicle-kilometers)			Average travel speed at peak hours (km/h)
				Passenger cars	Buses	Small trucks	Ordinary trucks		Passenger cars	Trucks	
National expressways	1980	2 698.8	38 933	15 424	1 130	9 590	12 789	55 512	21 352	34 160	82.95
	1985	3 555.4	51 762	22 699	1 465	10 953	16 646	76 438	35 066	41 372	82.81
	1988	4 280.0	70 043	30 544	2 226	15 753	21 520	105 516	48 495	57 021	84.36
	1990	4 675.3	80 526	34 973	2 256	16 838	26 460	121 629	55 180	66 449	84.99
	1994	5 567.7	105 461	49 661	2 620	21 051	32 128	153 673	75 083	78 590	78.34
	1997	6 114.9	121 653	61 571	2 126	22 758	35 198	177 900	91 803	86 098	83.45
	1999	7 094.9	128 829	69 668	2 692	22 972	33 498	187 687	94 167	93 521	79.11
	2005	8 513.1	140 500	82 193	2 660	20 092	35 406	202 400	108 180	94 220	78.20
Urban expressways	1980	250.8	12 316	5 638	102	3 943	2 632	17 118	8 638	8 480	42.27
	1985	322.5	16 013	7 299	194	5 139	3 381	23 592	10 997	12 595	40.05
	1988	379.8	19 222	8 588	200	5 813	4 622	29 030	13 220	15 810	46.34
	1990	421.0	20 820	9 750	235	5 766	5 068	32 172	15 322	16 850	51.28
	1994	490.7	23 738	11 497	236	5 915	6 090	35 634	17 436	18 198	24.58
	1997	548.7	26 801	14 088	298	6 056	6 359	39 736	21 223	18 514	36.62
	1999	604.1	28 032	16 578	335	5 107	6 012	41 262	25 283	15 979	44.31
	2005	675.4	29 786	16 919	447	5 570	6 881	42 931	25 302	17 629	40.40
Expressways total	1980	2 949.6	51 249	21 062	1 232	13 533	15 422	72 630	29 990	42 640	79.42
	1985	3 877.9	67 775	29 998	1 659	16 092	20 027	100 030	46 063	53 967	76.06
	1988	4 659.8	89 265	39 132	2 425	21 566	26 142	134 544	61 714	72 830	79.07
	1990	5 096.3	101 346	44 724	2 490	22 604	31 528	153 802	70 502	83 300	80.62
	1994	6 058.4	129 198	61 158	2 855	26 967	38 218	189 307	92 518	96 789	66.55
	1997	6 663.6	148 453	75 658	2 425	28 813	41 557	217 637	113 025	104 611	75.50
	1999	7 699.0	156 861	86 246	3 026	28 079	39 510	228 949	119 450	109 500	74.50
	2005	9 188.5	170 290	99 109	3 065	25 714	42 402	245 331	133 482	111 849	73.10
National roads (government management)	1980	19 025.0	191 007	91 783	3 457	59 238	36 530	254 878	130 363	124 515	40.86
	1985	19 710.0	208 403	101 545	3 269	64 800	38 789	284 962	142 869	142 093	37.08
	1988	19 955.8	230 809	109 750	3 393	73 473	44 194	318 171	155 607	162 564	37.46
	1990	20 052.3	242 582	119 468	3 365	72 413	47 336	336 002	169 790	166 212	36.92
	1994	20 622.1	263 293	142 268	3 053	66 134	51 838	362 013	199 372	162 642	34.92
	1997	20 641.4	274 013	156 007	2 896	60 308	54 802	379 213	219 253	159 960	35.25
	1999	20 837.4	279 297	164 875	2 867	58 869	52 685	389 786	234 203	155 583	34.62
	2005	21 280.9	281 099	174 282	2 530	53 409	50 598	390 137	243 649	146 488	34.70
National roads (other)	1980	20 920.9	93 836	46 721	2 048	31 900	13 167	119 232	65 154	54 078	38.01
	1985	26 395.7	123 550	61 379	2 258	43 637	16 275	159 835	82 397	77 438	36.74
	1988	26 498.5	138 775	66 853	2 339	50 113	19 471	180 503	90 146	90 357	37.11
	1990	26 672.3	148 720	74 334	2 366	50 639	21 381	194 672	100 544	94 128	37.63
	1994	32 428.6	185 088	101 366	2 444	54 502	26 777	239 627	134 577	105 051	36.66
	1997	32 368.0	199 331	115 710	2 350	51 682	29 590	258 279	153 052	105 227	37.66
	1999	32 558.2	202 744	123 706	2 433	47 695	28 911	266 163	170 278	95 885	38.21
	2005	32 954.6	204 714	132 859	2 457	42 581	27 022	267 896	180 855	87 041	38.20
National roads total	1980	39 945.9	284 843	138 504	5 505	91 137	49 697	374 110	195 517	178 593	39.37
	1985	46 105.7	331 952	162 925	5 528	108 436	55 064	444 797	225 266	219 531	36.88
	1988	46 454.3	369 584	176 603	5 731	123 585	63 664	498 674	245 753	252 921	37.26
	1990	46 724.6	391 302	193 802	5 732	123 052	68 717	530 674	270 334	260 340	37.32
	1994	53 050.7	448 381	243 634	5 497	120 636	78 614	601 641	333 948	267 692	35.96
	1997	53 009.4	473 344	271 717	5 245	111 990	84 391	637 492	372 305	265 187	36.68
	1999	53 395.6	482 041	288 581	5 299	106 565	81 596	655 949	404 481	251 468	36.72
	2005	54 235.5	485 787	307 018	4 858	95 700	77 726	658 032	424 503	233 529	36.70
Principal local roads	1980	43 582.3	156 748	79 204	3 079	54 995	19 470	201 848	114 493	87 355	36.22
	1985	49 159.7	184 220	92 800	3 134	66 155	22 131	240 932	125 619	115 313	33.73
	1988	49 474.7	203 933	99 892	3 191	74 962	25 887	268 845	136 231	132 614	34.16
	1990	49 710.0	216 726	110 233	3 191	75 183	28 119	287 033	150 468	136 565	35.63
	1994	56 178.6	269 128	145 938	3 223	76 502	33 465	339 056	195 382	143 674	32.91
	1997	56 579.4	277 568	164 079	3 147	72 680	37 663	365 713	220 366	145 347	33.96
	1999	56 377.4	284 268	177 061	3 137	67 562	36 508	377 036	250 254	126 782	33.83
	2005	57 718.3	289 169	190 851	3 181	60 725	34 411	383 419	265 774	117 646	34.20
General prefectural roads	1980	86 583.6	165 874	85 537	3 132	60 391	16 814	210 507	121 844	88 663	–
	1985	74 198.8	162 282	82 354	2 678	61 202	16 047	210 693	110 677	100 016	34.24
	1988	75 105.3	182 240	89 735	2 707	70 644	19 153	237 563	120 969	116 594	48.40
	1990	75 730.9	195 980	99 843	2 743	72 168	21 226	253 172	133 017	120 155	33.60
	1994	64 341.2	173 097	97 566	2 100	54 768	18 663	221 357	127 801	93 556	32.11
	1997	67 635.2	193 563	115 435	2 168	53 817	22 142	249 051	151 612	97 439	33.41
	1999	67 971.2	198 329	124 321	2 195	50 310	21 502	237 908	172 310	85 598	33.01
	2005	70 599.9	199 374	133 182	2 193	44 062	19 937	259 499	182 940	76 558	33.10
Local roads total	1980	130 165.9	322 622	164 741	6 211	115 387	36 284	412 355	236 337	176 018	36.22
	1985	123 358.5	346 503	175 155	5 813	127 357	38 178	451 625	236 296	215 329	33.74
	1988	124 580.0	386 173	189 628	5 899	145 607	45 040	506 410	257 201	249 209	34.17
	1990	125 440.9	412 706	210 077	5 934	147 351	49 345	540 205	283 485	256 720	34.19
	1994	120 519.8	432 225	243 504	5 323	131 270	52 128	560 413	323 183	237 230	32.48
	1997	124 214.6	471 131	279 514	5 315	126 497	59 805	614 763	371 977	242 786	33.66
	1999	124 730.0	482 597	301 383	5 332	117 872	58 010	634 944	422 564	212 380	33.38
	2005	128 318.2	488 507	323 880	5 374	104 541	54 713	642 918	448 714	194 204	33.60
Total of national roads and local roads	1980	170 111.8	607 466	303 245	11 716	206 524	85 981	786 466	431 854	354 612	37.74
	1985	169 464.2	678 455	338 080	11 340	235 794	93 242	896 422	461 562	434 860	35.19
	1988	171 034.3	755 757	366 231	11 630	269 192	108 704	1 005 083	502 954	502 130	35.60
	1990	172 165.5	804 008	403 879	11 665	270 403	118 061	1 070 879	533 819	517 060	34.41
	1994	173 570.5	880 607	487 138	10 820	251 906	130 743	1 162 054	657 132	504 922	33.48
	1997	177 224.0	944 475	551 231	10 560	238 487	144 196	1 252 256	744 282	507 973	34.51
	1999	178 125.6	964 638	589 964	10 631	224 437	139 606	1 290 893	827 045	463 848	34.32
	2005	182 553.7	974 289	631 339	10 717	200 704	132 503	1 300 950	873 217	427 733	34.50
Overall total	1980	173 061.4	658 715	324 307	12 948	220 057	101 402	859 115	461 863	397 252	39.15
	1985	173 342.1	746 230	368 077	12 999	251 885	113 269	996 452	507 625	488 827	35.95
	1988	175 694.1	845 022	405 363	14 055	290 757	134 846	1 139 629	564 668	574 961	36.53
	1990	177 261.8	905 351	448 602	14 156	293 007	149 586	1 224 681	624 321	600 360	34.41
	1994	179 628.9	1 009 805	548 296	13 675	278 872	168 961	1 351 361	749 650	601 711	34.06
	1997	183 887.6	1 092 928	626 890	12 985	267 300	185 753	1 469 892	857 307	612 585	35.21
	1999	185 186.7	1 115 622	672 885	13 504	251 516	177 718	1 511 810	942 060	569 750	35.04
	2005	190 607.6	1 134 687	725 065	13 616	224 668	172 472	1 532 720	998 947	533 773	35.30

Source: Road Traffic Census (Japan Society of Traffic Engineering)

5. Roads in Japan and Other Countries

5-1 Length of roads in Japan

(km, at beginning of each fiscal year)

	National expressways	National highways	Prefectural roads	Principal local roads	General prefectural roads	Municipal roads	General roads total	Total
FY 1955		24 092	120 536	28 019	92 517	–	–	144 628
1960		24 918	122 124	27 419	94 705	814 872	961 914	961 914
1965	181	27 858	120 513	32 775	87 738	836 382	984 753	984 934
1970	638	32 818	121 180	28 450	92 730	859 953	1 013 951	1 014 589
1975	1 519	38 540	125 714	33 503	92 211	901 775	1 066 028	1 067 547
1980	2 579	40 212	130 836	43 906	86 930	939 760	1 110 808	1 113 387
1985	3 555	46 435	127 436	49 947	77 489	950 078	1 123 950	1 127 505
1989	4 407	46 805	128 539	50 283	78 255	930 230	1 105 574	1 109 981
1990	4 661	46 935	128 782	50 354	78 428	934 319	1 110 037	1 114 698
1991	4 869	47 000	129 040	50 388	78 652	939 552	1 115 592	1 120 461
1992	5 054	47 033	129 284	50 455	78 830	943 472	1 119 790	1 124 844
1993	5 410	53 304	123 536	44 647	78 889	948 642	1 125 482	1 130 892
1994	5 568	53 302	123 877	56 808	67 069	953 600	1 130 778	1 136 346
1995	5 677	53 327	125 512	57 040	68 472	957 792	1 136 631	1 142 308
1996	5 932	53 278	126 915	57 206	69 709	961 406	1 141 600	1 147 532
1997	6 114	53 355	127 663	57 338	70 325	965 074	1 146 092	1 152 206
1998	6 402	53 628	127 911	57 403	70 508	968 429	1 149 969	1 156 371
1999	6 455	53 685	127 916	57 354	70 562	973 838	1 155 439	1 161 894
2000	6 617	53 777	128 182	57 438	70 745	977 764	1 159 723	1 166 340
2001	6 851	53 866	128 409	57 574	70 835	982 521	1 164 796	1 171 647
2002	6 915	53 866	128 554	57 585	70 969	987 943	1 170 363	1 177 278
2003	7 196	54 004	128 719	57 673	71 046	992 674	1 175 398	1 182 594
2004	7 296	54 084	128 962	57 803	71 160	997 296	1 180 342	1 187 638
2005	7 383	54 264	129 139	57 821	71 318	1 002 085	1 185 589	1 192 972
2006	7 392	54 347	129 294	57 903	71 390	1 005 975	1 189 616	1 197 008
2007	7 431	54 530	129 329	57 914	71 415	1 009 599	1 193 459	1 200 890
2008	7 560	54 736	129 393	57 980	71 502	1 012 088	1 196 217	1 203 777

Source: Annual Report on Road Statistics (Japan Highway Users Conference)

5-2 Length of roads in Japan and other countries

(km)

	Survey year	Expressways	Principal roads	Second-class roads	Other roads	Total	Road density (expressways & principal roads)	
							by area (m/km²)	by vehicle owned (m/vehicle)
Japan	2008	7 560	54 736	129 393	1 012 088	1 203 777	164.9	0.8
U.S.A.	2004	75 377	267 776	1 651 008	4 439 111	6 433 272	37.5	1.4
Canada	2004	16 900	85 800	114 600	1 191 600	1 408 900	11.3	5.6
U.K.	2004	3 523	46 669	114 400	223 082	387 674	207.5	1.6
Germany	2004	12 044	41 139	86 809	91 428	231 420	152.4	1.1
France	2004	10 490	25 730	365 000	550 000	951 220	65.8	1.0
Italy	2003	6 621	46 009	119 909	312 149	484 688	178.9	1.5
Netherlands	2003	2 500	6 700	57 500	59 400	126 100	271.5	1.4
Belgium	2000	1 727	12 600	1 349	132 540	148 216	462.2	2.8
Denmark	2003	918	701	9 988	60 240	71 847	38.2	0.7
Switzerland	2004	1 728	18 048	51 438	0	71 214	494.4	4.8
Austria	2003	2 050	10 193	23 658	98 000	133 901	148.5	2.5
Spain	1999	10 317	24 124	139 656	489 698	663 795	68.1	7.8
Sweden	2004	1 591	15 385	82 883	325 088	424 947	41.4	3.8
Hungary	1999	438	29 630	23 199	158 152	211 419	323.3	11.0
Poland	2000	358	17 709	28 381	318 208	364 656	55.9	1.5
Egypt	2004	–	–	–	–	92 370	–	–
South Africa	2001	239	2 887	60 027	300 978	364 131	0.2	0.0
Mexico	2004	6 144	41 152	68 553	119 821	235 670	24.8	2.2
Brazil	2004	0	93 071	276 776	1 382 021	1 751 868	11.0	3.0
Argentina	1999	734	38 407	176 330	–	215 471	14.1	6.0
South Korea	2004	2 923	14 246	17 476	65 634	100 279	173.9	1.2
China	2004	34 288	33 522	231 715	1 571 136	1 870 661	7.3	–
Taiwan	2000	608	4 447	2 455	28 421	35 931	140.4	0.9
Singapore	1999	150	569	358	1 989	3 066	1 198.3	1.3
India	2002	–	58 112	863 136	2 462 096	3 383 344	19.5	4.5
Indonesia	2002	–	–	–	–	368 360	–	–
Thailand	2000	–	–	–	–	57 403	–	–
Australia	2003	–	–	–	–	810 200	–	–
New Zealand	2003	171	10 837	81 923	0	92 931	41.1	3.9

Source: World Road Statistics 2005 (Japan Road Association); Annual Report on Road Statistics (Japan Highway Users Conference); Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

Note: Only vehicles that have at least four wheels are counted as vehicles owned.

5-3 Changes in the amount of investment for road construction in Japan

(x 100 million yen)

	General road construction		Toll road construction		Independent construction by local governments		Total	
	Amount of investment	From the previous FY, increased by (%)	Amount of investment	From the previous FY, increased by (%)	Amount of investment	From the previous FY, increased by (%)	Amount of investment	From the previous FY, increased by (%)
FY 1960	1 243	8.4	281	92.1	589	26.5	2 113	20.1
1965	4 109	15.4	1 254	2.7	1 628	13.3	6 991	12.4
1970	7 784	17.9	3 100	15.0	5 095	31.9	15 979	21.4
1975	14 140	0.7	7 517	7.6	7 893	△3.1	29 550	1.3
1980	26 428	△1.6	13 067	3.3	18 795	10.5	58 290	3.2
1985	31 581	20.5	18 819	7.1	21 473	△3.9	71 874	8.7
1988	41 848	0.4	25 018	5.7	26 973	10.2	93 840	4.5
1989	43 057	2.9	25 785	3.1	31 832	18.0	100 674	7.3
1990	43 675	1.4	27 339	6.3	36 253	13.9	107 328	6.6
1991	44 685	2.3	30 311	10.6	39 647	9.4	114 643	6.8
1992	53 110	18.9	33 874	11.8	46 937	18.4	133 921	16.8
1993	63 568	19.7	36 918	9.0	50 156	6.9	150 642	12.5
1994	50 130	△21.1	36 476	△1.2	49 368	△1.6	135 974	△9.7
1995	66 131	31.9	35 677	△2.2	50 937	3.2	152 745	12.3
1996	54 572	△17.5	34 236	△4.0	53 342	4.7	142 151	△6.9
1997	51 873	△4.9	33 729	△1.5	50 958	△4.5	136 560	△3.9
1998	72 789	40.3	32 590	△3.4	48 687	△4.5	154 066	12.8
1999	63 550	△12.7	28 496	△12.6	42 956	△11.8	135 002	△12.4
2000	62 168	△2.2	25 810	△9.4	39 708	△7.6	127 686	△5.4
2001	60 690	△2.4	25 725	△0.3	36 527	△8.0	122 942	△3.7
2002	58 092	△4.3	21 692	△15.7	33 676	△7.8	113 460	△7.7
2003	50 916	△12.4	21 035	△3.0	30 521	△9.4	102 471	△9.7
2004	49 934	△2.0	18 675	△11.2	26 850	△12.0	95 459	△6.8
2005	48 343	△3.2	16 201	△13.2	23 986	△10.7	88 530	△7.3
2006	47 870	△1.0	14 277	△11.9	23 200	△3.3	85 347	△3.6
2007	46 198	△3.5	14 343	0.5	20 916	△3.9	81 457	△2.9
2008	43 631	△5.6	13 563	△5.4	22 200	6.1	79 394	△2.5
2009	23 993	△45.0	14 565	8.1	19 900	△10.4	58 548	△26.5

Source: Road Handbook (Japan Highway Users Conference)

6. Number of Motor Vehicles Owned in Japan and Other Countries

6-1 Number of motor vehicles owned in Japan

(prior to 1999, vehicles were counted at the end of December; afterward, at the end of March)

	Passenger cars	Light four-wheeled passenger cars	Trucks	Light four-wheeled trucks	Buses	Vehicles for special use	Total
1950	42 588		152 109		18 306	12 494	225 497
1955	153 325		250 988		34 421	32 572	471 306
1960	457 333	37 530	775 715	36 648	56 192	64 286	1 353 526
1965	2 181 275	393 786	3 865 478	1 405 442	102 695	150 572	6 300 020
1970	8 778 972	2 244 417	8 281 759	3 005 017	187 980	333 132	17 581 843
1975	17 236 321	2 611 130	10 043 853	2 785 182	226 284	584 100	28 090 558
1980	23 659 520	2 176 110	13 177 479	4 527 794	230 020	789 155	37 856 174
1985	27 844 580	2 016 487	17 139 806	8 791 289	231 228	941 647	46 157 261
1990	34 924 172	2 584 926	21 321 439	12 535 415	245 668	1 206 390	57 697 669
1991	37 076 015	3 217 371	21 323 397	12 427 907	248 258	1 266 953	59 914 623
1992	38 963 793	3 800 515	21 131 580	12 223 962	248 624	1 314 147	61 658 144
1993	40 772 325	4 392 208	20 881 286	12 026 161	247 794	1 361 129	63 262 534
1994	42 678 430	5 043 434	20 667 495	11 840 040	245 387	1 420 160	65 011 472
1995	44 680 037	5 775 386	20 430 149	11 642 311	243 095	1 500 219	66 853 500
1996	46 868 362	6 552 382	20 089 329	11 336 096	242 243	1 601 444	68 801 378
1997	48 610 747	7 264 826	19 652 180	10 983 683	240 354	1 500 016	70 003 297
1998	49 895 735	7 980 965	19 080 885	10 632 080	237 701	1 600 233	70 814 554
1999	51 222 129	9 166 424	18 424 997	10 158 863	235 725	1 386 036	71 268 887
2000	52 449 354	10 084 285	18 064 744	9 958 458	235 550	1 431 162	72 180 810
2001	53 487 293	10 959 561	17 726 154	9 819 281	234 244	1 429 840	72 877 531
2002	54 471 376	11 816 447	17 343 079	9 677 137	233 180	1 395 991	73 443 626
2003	55 288 124	12 663 918	17 015 253	9 600 918	231 984	1 349 798	73 885 159
2004	56 288 256	13 512 078	16 860 783	9 580 608	232 000	1 318 212	74 699 251
2005	57 097 670	14 350 390	16 707 445	9 547 749	231 696	1 293 236	75 330 047
2006	57 510 360	15 280 951	16 490 944	9 476 686	231 758	1 272 655	75 505 717
2007	57 551 248	16 082 259	16 264 317	9 380 627	230 981	1 251 465	75 298 011
2008	57 682 475	16 883 230	15 858 749	9 291 247	229 804	1 202 242	74 973 270

Source (for before 1999): survey by Ministry of Transport; later years: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)
Note: For statistics for light passenger cars owned and light trucks owned: those that had not had a vehicle inspection were erased from the data in October, 1975; data from 1975 onward are not in sequence with data of 1970 and before. Figures for 1999 onward are those collected at the end of the fiscal year; they are not in sequence with figures from before 1999.

6-2 Number of motor vehicles owned in Japan and other countries (2008)

(台)

	Passenger cars (×1000)	Number of cars per 1000 inhabitants	Buses, trucks, etc. (×1000)	Number of buses, trucks, etc. per 1000 inhabitants	Total (×1000)	Number of vehicles per 1000 inhabitants
Asia						
Japan	57 865	455.1	17 663	138.9	75 528	594.0
China	38 389	28.5	12 607	9.4	50 996	37.9
India	12 900	10.8	5 610	4.7	18 510	15.5
South Korea	12 484	258.3	4 310	89.2	16 794	347.5
Thailand	4 188	61.8	5 584	82.4	9 772	144.2
Turkey	6 797	90.8	3 394	45.4	10 191	136.2
Europe						
Austria	4 285	512.3	391	46.7	4 676	559.1
Belgium	5 087	477.8	778	73.1	5 865	550.9
Denmark	2 105	384.8	541	98.9	2 646	483.7
Finland	2 683	503.8	432	81.1	3 115	584.9
France	30 850	494.8	6 362	102.0	37 212	596.9
Germany	41 321	502.9	2 683	32.7	44 004	535.5
U.K.	31 167	506.2	4 450	72.3	35 617	578.5
Greece	5 101	457.0	1 067	95.6	6 168	552.6
Italy	36 105	603.1	4 789	80.0	40 894	683.0
Norway	2 197	456.6	547	113.7	2 744	570.2
Portugal	4 408	411.7	1 349	126.0	5 757	537.7
Spain	22 145	493.2	5 468	121.8	27 613	614.9
Sweden	4 279	462.6	524	56.7	4 803	519.3
Switzerland	3 990	527.2	375	49.6	4 365	576.8
America						
Brazil	21 884	113.0	5 597	28.9	27 481	141.8
Canada	19 612	584.2	908	27.0	20 520	611.2
Argentina	6 244	155.0	2 216	55.0	8 460	210.1
Mexico	16 827	153.5	8 485	77.4	25 312	230.9
U.S.A.	135 882	431.8	114 357	363.4	250 239	795.3
Africa						
Egypt	2 797	33.7	766	9.2	3 563	42.9
South Africa	5 275	105.3	2 215	44.2	7 490	149.5
Oceania						
Australia	11 804	554.4	2 880	135.3	14 684	689.6
New Zealand	2 386	559.3	449	105.3	2 835	664.6

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

7. Number of People Who Hold a Driver's License in Japan (end of 2009)

(人)

	Male	Female	Total	Percentage of license holders (%)
Age 15-19*	680 811	447 224	1 128 035	18.6
Age 20-24	2 927 832	2 478 844	5 406 676	78.7
Age 25-29	3 635 774	3 250 888	6 886 662	92.2
Age 25-29	4 261 076	3 872 819	8 133 895	95.6
Age 35-39	4 874 986	4 461 714	9 336 700	95.9
Age 40-44	4 272 559	3 894 514	8 167 073	94.9
Age 45-49	3 854 374	3 447 041	7 301 415	92.8
Age 50-54	3 708 580	3 200 120	6 908 700	89.6
Age 55-59	4 201 984	3 371 396	7 573 380	84.4
Age 60-64	4 342 694	3 155 591	7 498 285	78.3
Age 65-69	3 524 617	2 086 622	5 611 239	67.0
Age 70-74	2 566 794	1 053 333	3 620 127	52.2
Age 75-79	1 637 311	414 411	2 051 722	35.2
Age 80-84	814 278	122 898	937 176	22.0
Age 85 and over	235 749	15 111	250 860	6.8
Total	45 539 419	35 272 526	80 811 945	63.4

Source: Driver's License Statistics (2009 edition, License Division, Traffic Bureau, National Police Agency); Monthly General Statistics Data (Ministry of Internal Affairs and Communications

* A driver's license can be obtained only from the age of sixteen up. However, because population statistics are calculated over five-year intervals, the first item is shown as "Age 15-19."

8. Traffic Accidents in Japan

8-1 Number of traffic accidents, fatalities, and injuries

	Number of traffic accidents		Number of fatalities	Number of injuries	The number of all traffic accidents, that occurred on expressways (National & designated expressways)		
		Number of fatal accidents				Number of fatal accidents	Number of fatalities
1950	33 212		4 202	25 450	–	–	–
1955	93 981	–	6 379	76 501	–	–	–
1960	449 917	–	12 055	289 156	–	–	–
1965	567 286	11 922	12 484	425 666	–	–	–
1970	718 080	15 801	16 765	981 096	–	–	–
1975	472 938	10 165	10 792	622 467	–	–	–
1980	476 677	8 329	8 760	598 719	3 623	155	175
1985	552 788	8 826	9 261	681 346	4 741	223	250
1989	661 363	10 570	11 086	814 832	8 337	386	439
1990	643 097	10 651	11 227	790 295	9 060	401	459
1991	662 388	10 547	11 105	810 245	9 756	449	522
1992	695 345	10 891	11 451	844 003	9 785	402	449
1993	724 675	10 395	10 942	878 633	11 127	395	451
1994	729 457	10 154	10 649	881 723	11 628	366	402
1995	761 789	10 227	10 679	922 677	11 304	375	416
1996	771 084	9 517	9 942	942 203	11 673	359	413
1997	780 399	9 220	9 640	958 925	11 914	353	397
1998	803 878	8 797	9 211	990 675	12 029	326	366
1999	850 363	8 681	9 006	1 050 397	12 986	296	323
2000	931 934	8 707	9 066	1 155 697	14 325	327	367
2001	947 169	8 414	8 747	1 180 955	14 726	336	389
2002	936 721	7 993	8 326	1 167 855	14 083	290	338
2003	947 993	7 456	7 702	1 181 431	13 992	306	351
2004	952 191	7 084	7 358	1 183 120	13 797	272	329
2005	933 828	6 625	6 871	1 156 633	13 775	249	285
2006	886 864	6 147	6 352	1 098 199	13 803	234	262
2007	832 454	5 587	5 744	1 034 445	12 674	222	244
2008	766 147	5 025	5 155	945 504	10 965	174	193
2009	736 668	4 773	4 914	910 115	11 112	161	178

Source: Traffic Statistics (Institute for Traffic Accident Research and Data Analysis)

8-2 Number of fatalities by age group and by circumstances of accident (2009)

Age group	Situation	In a vehicle			On a motorcycle			Mopeds	Total	On a bicycle	While walking	Other	Total
					Motorcycles								
		Driver	Passenger	Subtotal	Driver	Passenger	Subtotal						
15 and under	Fatalities	0	28	28	1	0	1	5	6	36	41	0	111
	(increased/decreased by*)	0	-6	-6	0	0	0	-1	-1	6	-14	-1	-16
Age 16–19	Fatalities	47	42	89	56	9	65	47	112	17	9	0	227
	(increased/decreased by*)	6	-3	3	-14	-2	-16	-14	-30	-5	-2	0	-34
Age 20–24	Fatalities	94	39	133	95	3	98	28	126	12	21	0	292
	(increased/decreased by*)	-12	8	-4	-3	0	-3	2	-1	1	7	-1	2
Age 16–24	Fatalities	141	81	222	151	12	163	75	238	29	30	0	519
	(increased/decreased by*)	-6	5	-1	-17	-2	-19	-12	-31	-4	5	-1	-32
Age 25–29	Fatalities	74	17	91	52	1	53	7	60	10	22	1	184
	(increased/decreased by*)	-6	-4	-10	-9	-1	-10	-3	-13	-6	2	1	-26
Age 30-39	Fatalities	133	20	153	114	2	116	21	137	25	57	0	372
	(increased/decreased by*)	-25	-12	-37	-9	0	-9	-8	-17	2	-1	0	-53
Age 40-49	Fatalities	142	13	155	93	1	94	21	115	30	81	1	382
	(increased/decreased by*)	-13	-8	-21	4	1	5	-4	1	-8	-7	0	-35
Age 50-59	Fatalities	183	28	211	38	1	39	42	81	71	159	1	523
	(increased/decreased by*)	-41	-5	-46	-8	0	-8	-2	-10	12	0	-1	-45
Age 60-64	Fatalities	128	20	148	16	0	16	31	47	49	125	2	371
	(increased/decreased by*)	14	-8	6	1	0	1	7	8	-3	0	2	13
Age 65-69	Fatalities	91	32	123	9	0	9	26	35	83	166	2	409
	(increased/decreased by*)	-12	4	-8	3	0	3	-15	-12	-19	4	0	-35
Age 60-69	Fatalities	219	52	271	25	0	25	57	82	132	291	4	780
	(increased/decreased by*)	2	-4	-2	4	0	4	-8	-4	-22	4	2	-22
Age 70–74	Fatalities	104	43	147	14	1	15	45	60	103	193	2	505
	(increased/decreased by*)	-4	2	-2	5	1	6	-13	-7	2	-22	-1	-30
Age 75 and over	Fatalities	194	128	322	21	0	21	86	107	259	843	7	1538
	(increased/decreased by*)	-12	27	15	-9	0	-9	-13	-22	-4	29	0	18
Age 70 and over	Fatalities	298	171	469	35	1	36	131	167	362	1036	9	2043
	(increased/decreased by*)	-16	29	13	-4	1	-3	-26	-29	-2	7	-1	-12
Total	Fatalities	1190	410	1600	509	18	527	359	886	695	1717	16	4914
	(increased/decreased by*)	-105	-5	-110	-39	-1	-40	-64	-104	-22	-4	-1	-241

Source: Traffic Statistics (Institute for Traffic Accident Research and Data Analysis) * Compared with previous year

9. Number of Traffic Fatalities in Japan and Other Countries

	Survey year	Population (×1000)	Number of fatalities	Number of fatalities per 100,000 inhabitants	Number of fatalities per 10,000 motor vehicles owned	Number of fatalities per 100 million vehicle-kilometers
Japan	2008	127 648	5 155	4.0	0.68	0.8
U.S.A.	2003	290 810	42 643	14.7	1.85	4.6
Canada	2003	31 630	2 778	8.8	1.52	5.1
U.K.	2003	59 329	3 658	6.2	1.25	5.2
Germany	2003	82 541	6 613	8.0	1.39	5.2
France	2003	59 762	6 058	10.1	1.70	1.9
Italy	2002	57 646	6 736	11.7	1.92	
Netherlands	2003	16 222	1 028	6.3	1.52	2.4
Belgium	2001	10 376	1 394	13.4	2.55	–
Denmark	2003	53 872	432	0.8	1.90	1.5
Austria	2003	8 090	931	11.5	2.11	5.4
Switzerland	2003	7 350	255	3.5	0.63	3.9
Spain	2003	41 101	5 399	13.1	2.35	–
Poland	2003	38 196	5 640	14.8	4.17	–
Sweden	2003	8 956	529	5.9	1.17	2.3
Portugal	2003	10 444	1 546	14.8	3.24	–
Norway	2003	4 562	280	6.1	1.16	2.5
Ukraine	2002	48 356	5 982	12.4	9.01	–
Malaysia	1995	24 774	6 286	25.4	9.99	–
South Korea	2001	47 912	7 212	15.1	4.94	8.7
Hong Kong	2001	6 816	173	2.5	3.30	–
Australia	2000	19 881	1 621	8.2	–	–

Source: World Road Statistics (IRF)
Note: 1. For Italy, the number of fatalities is for those who died within a week; for Canada, it varies from province to province.
For other countries, the number refers to those who died within 30 days.

10. Implementation of Traffic Safety Facilities in Japan

(at the end of each fiscal year)

				FY 1985	FY 1990	FY 1995	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Traffic control centers			(number of cities)	74	74	75	75	75	75	75	75	75	75	75	75	75
Traffic information devices	Traffic information boards			-	1 604	2 175	-	-	-	-	-	-	-	-	-	-
	Roadside communication terminals			-	192	274	-	-	-	-	-	-	-	-	-	-
Traffic signals	Centralized control units			32 585	43 019	50 556	56 502	57 908	59 174	60 871	61 935	64 055	66 037	67 231	68 785	70 371
	Synchronized control system	Automatic traffic-actuated units		5 576	4 682	4 585	4 155	4 023	3 830	3 619	3 489	2 824	2 293	2 225	1 957	1 141
		Programmed multi-stage units		12 814	14 355	17 340	19 877	20 218	20 904	21 389	21 909	22 108	22 653	23 233	23 700	23 676
		Push-button units		1 164	801	1 213	935	963	914	941	901	932	1 106	1 131	1 187	1 193
	Independent control system	Traffic-actuated control	Full traffic-actuated units	1 120	984	959	895	867	827	813	800	786	802	771	749	745
			Semi traffic-actuated units	6 640	7 788	10 110	11 243	11 535	12 018	12 487	12 620	12 804	13 032	13 149	13 321	13 996
			Bus-actuated units	238	101	165	156	154	153	149	139	130	127	123	121	121
			Train-actuated units	228	162	180	174	177	185	183	190	195	183	179	180	185
		Fixed-cycle units (including programmed multi-stage units)		35 577	41 200	45 282	48 304	48 802	49 183	51 032	51 433	51 474	51 087	50 921	50 769	50 984
		Push-button units		23 113	20 713	23 083	25 204	25 696	26 092	27 482	27 897	28 070	28 200	28 599	28 774	29 135
		Single flashing units		465	1 829	4 319	5 541	5 670	5 781	6 007	6 080	6 181	6 250	6 295	6 354	6 409
	Total units			119 520	135 634	157 792	172 986	176 013	179 061	184 973	187 393	189 559	191 770	193 857	195 897	197 956
Lights	For vehicles			-	720 725	885 383	979 502	1 001 623	1 019 420	1 057 940	1 082 980	1 109 483	1 125 659	1 146 167	1 169 963	1 189 368
		(LED lights)								22 880	61 634	103 247	144 013	180 265	217 764	275 265
	For pedestrians			-	524 122	634 959	744 649	764 976	771 651	812 943	834 178	850 274	869 188	884 349	899 928	912 899
		(LED lights)								974	15 014	29 582	46 461	64 445	88 129	126 541
Traffic signs	Variable signs			23 089	24 109	23 259	29 936	30 186	29 152	28 583	28 236	27 078	27 526	23 353	22 667	21 912
	Fixed signs	Large signs		420 640	500 347	582 255	622 062	617 279	615 787	622 328	649 683	630 888	642 270	628 255	623 709	624 671
		Roadside signs		9 705 165	10 020 616	10 379 062	11 002 134	10 183 538	9 915 947	9 767 724	9 849 332	9 533 123	9 422 368	9 297 292	9 346 943	9 420 018
Road markings	Crosswalks		(number of)	719 548	801 464	890 723	952 344	967 355	981 599	1 010 924	1 033 769	1 043 062	1 054 219	1 064 369	1 080 358	1 092 226
	Solid lines		(km)	110 465	116 248	115 898	125 914	125 838	135 767	125 436	125 502	126 745	131 141	127 660	128 169	128 375
	Graphic markings		(number of)	3 238 374	3 913 961	3 995 149	4 043 239	3 945 511	4 063 430	4 221 541	4 298 653	4 467 654	4 506 671	4 531 593	4 571 460	4 609 045

Source: Traffic Statistics (Institute for Traffic Accident Research and Data Analysis) Note: Programmed multi-stage units also include single-stage units.

11. Parking Facilities in Japan

11-1 Changes in parking capacity

(vehicles; at fiscal year's end)

	Urban planning parking facilities	Officially designated parking facilities	Mandated parking facilities	On-street parking areas	Total	Parking spaces per 10,000 vehicles
FY 1960	1 313	9 908	2 830	6 576	20 627	89.5
1965	8 948	53 597	39 448	2 189	104 182	143.7
1970	18 120	124 429	123 997	750	267 296	147.0
1975	33 781	287 457	276 285	2 400	599 923	211.2
1980	48 627	458 053	403 355	2 339	912 374	240.3
1985	56 535	598 808	559 709	2 033	1 217 085	263.3
1989	68 175	746 265	772 371	1 519	1 588 330	287.3
1990	73 092	774 504	863 955	1 417	1 712 968	296.6
1991	74 768	812 509	949 909	1 353	1 838 539	307.0
1992	79 176	861 694	1 041 567	1 577	1 984 014	322.0
1993	85 012	924 983	1 129 575	1 363	2 140 933	338.1
1994	88 716	965 275	1 198 266	1 377	2 253 634	346.2
1995	93 431	995 735	1 297 958	1 381	2 388 505	356.1
1996	96 655	1 021 554	1 386 157	1 333	2 505 699	364.5
1997	103 651	1 078 381	1 500 673	1 280	2 683 985	384.3
1998	109 998	1 121 228	1 599 165	1 279	2 831 670	400.6
1999	113 681	1 161 653	1 681 266	1 279	2 957 879	413.2
2000	115 696	1 225 194	1 771 028	1 275	3 113 193	429.4
2001	118 220	1 272 190	1 858 895	1 275	3 250 580	444.1
2002	119 353	1 302 474	1 942 707	1 222	3 365 756	456.3
2003	119 535	1 333 159	2 015 404	1 217	3 469 315	467.5
2004	119 472	1 372 876	2 104 894	1 172	3 598 414	479.6
2005	120 091	1 415 252	2 212 069	1 386	3 748 798	495.5
2006	120 575	1 450 858	2 325 538	1 216	3 898 187	514.1
2007	121 336	1 482 645	2 429 997	1 100	4 035 078	533.6
2008	120 775	1 549 878	2 514 807	1 357	4 186 817	543.5

Source: Annual Report of Motor Vehicle Parking (Japan Parking System Manufacturers Association Incorporated)

Note: 1. Urban planning parking facilities that are also officially designated parking facilities are included in the number of urban planning parking facilities. Mandated parking facilities that are also officially designated parking facilities are included in the number of mandated parking facilities.

2. The number of vehicles owned includes light vehicles.

11-2 Number of parking meters and parking permit ticket devices installed

(at the end of March)

	Parking meters	Parking permit ticket dispensing devices		Total	
		Number	Number of vehicles allowed to park	Number	Number of vehicles allowed to park
1986	14 157	0	-	14 157	14 157
1987	14 737	0	-	14 737	14 737
1988	15 903	498	4 334	16 401	20 237
1989	17 569	968	8 299	18 537	25 868
1990	19 039	1 333	10 793	20 372	29 832
1995	27 627	1 635	13 043	29 262	40 670
1996	27 682	1642	12 926	29 324	40 608
1997	27 636	1630	12 748	29 266	40 384
1998	27 561	1 602	12 467	29 163	40 028
1999	27 488	1 587	12 329	29 075	39 817
2000	26 988	1 574	12 320	28 562	39 308
2001	26 341	1 540	12 216	27 881	38 557
2002	25 828	1 520	11 931	27 348	37 759
2003	24 308	1 416	10 684	25 724	34 992
2004	23 284	1 381	10 409	24 665	33 693
2005	22 929	1 329	9 976	24 258	32 905
2006	22 453	1 321	9 421	23 774	31 874
2007	22 453	1 321	9 421	23 774	31 874
2008	21 930	1 291	9 168	23 221	31 098
2009	21 589	1 291	9 147	22 880	30 736

Source: Annual Report of Motor Vehicle Parking (Japan Parking System Manufacturers Association Incorporated)

11-3 Parking Facilities in Major Cities

2009	Urban planning parking facilities		Officially designated parking facilities		Mandated parking facilities		On-street parking areas		Total	
	Number of facilities	Number of parking spaces	Number of facilities	Number of parking spaces	Number of facilities	Number of parking spaces	Number of facilities	Number of parking spaces	Number of facilities	Number of parking spaces
Sapporo City, Hokkaido	3	758	181	32 242	2 821	161 027	1	27	3 006	194 054
Sendai City, Miyagi Prefecture	2	380	169	27 522	748	44 659	2	49	921	72 610
Saitama City, Saitama Prefecture	2	616	59	9 121	46	7 394	-	-	107	17 131
Wards of Tokyo	47	17 562	402	77 790	19 226	528 281	-	-	19 675	623 633
Yokohama City, Kanagawa Prefecture	6	3 082	188	39 817	6 372	281 446	-	-	6 566	324 345
Kawasaki City, Kanagawa Prefecture	1	366	72	11 146	995	47 609	-	-	1 068	59 121
Nagoya City, Aichi Prefecture	14	4 832	356	71 329	2 978	158 293	-	-	3 348	234 454
Kyoto City, Kyoto Prefecture	5	1 594	160	27 206	609	31 492	-	-	774	60 292
Osaka City, Osaka Prefecture	10	4 482	684	51 836	6 664	243 494	-	-	7 358	299 812
Kobe City, Hyogo Prefecture	13	3 830	172	41 515	971	58 600	-	-	1 156	103 945
Hiroshima City, Hiroshima Prefecture	6	2 381	182	24 375	1 362	31 235	14	727	1 564	58 718
Fukuoka City, Fukuoka Prefecture	8	3 082	269	46 178	2 645	101 465	-	-	2 922	150 725

Source: Annual Report of Motor Vehicle Parking (Japan Parking System Manufacturers Association Incorporated)

12 Travel Time in Daily Activities of Japanese People

12-1 Changes in time spent for daily activities of Japanese People (average of whole nation, average of doers)

(hours : minutes)

			Sleep	Eat	Personal care	Medical treatment / recuperation	Work	Study	Housework	Going to work	Going to school	Other travel	Community involvement	Conversation / social interactions	Leisure	Mass media contact	Rest	Other / unknown
1980	Weekday	Male	8:05	1:31	0:59	1:33	8:17	7:46	1:13	1:14	1:04	0:56	-	1:35	1:42	6:35	0:54	-
		Female	7:40	1:36	1:07	1:28	6:27	8:09	5:00	0:59	1:05	0:55	-	1:28	1:36	7:18	0:55	-
	Saturdays	Male	7:10	1:32	0:58	1:29	7:23	6:20	1:27	1:10	1:02	1:07	-	2:13	2:27	6:56	0:58	-
		Female	7:46	1:37	1:08	1:33	5:53	6:26	4:59	0:55	1:05	1:05	-	1:50	1:55	7:18	0:58	-
	Sundays	Male	9:04	1:36	0:58	2:00	6:02	3:54	1:54	1:01	1:01	1:23	-	2:51	3:19	7:49	1:11	-
		Female	8:37	1:41	1:06	1:56	5:13	3:48	4:58	0:54	0:57	1:18	-	2:20	2:32	7:30	1:07	-
1985	Weekday	Male	7:54	1:31	0:59	2:00	8:41	8:08	1:08	1:10	1:04	0:52	-	1:32	1:55	6:14	0:50	-
		Female	7:33	1:36	1:09	1:27	6:33	8:14	4:53	0:56	1:05	0:52	-	1:34	1:50	6:56	0:52	-
	Saturdays	Male	8:05	1:34	0:57	1:46	7:49	6:08	1:26	1:08	1:00	1:00	-	2:13	2:39	6:44	0:56	-
		Female	7:42	1:38	1:09	1:43	5:59	6:14	4:48	0:51	1:00	1:00	-	1:53	2:07	7:05	0:56	-
	Sundays	Male	8:58	1:36	0:57	3:08	6:38	4:01	1:51	0:58	1:02	1:21	-	2:45	3:42	7:33	1:09	-
		Female	8:28	1:42	1:07	2:35	5:27	3:40	4:48	0:48	1:05	1:15	-	2:21	2:49	6:56	1:04	-
1990	Weekday	Male	7:51	1:33	0:56	2:03	8:41	7:52	1:19	1:13	1:05	1:00	-	1:43	1:59	3:57	0:51	0:54
		Female	7:28	1:37	1:09	1:49	6:40	7:59	4:38	0:57	1:08	0:56	-	1:46	1:48	4:22	0:49	0:54
	Saturdays	Male	7:59	1:36	0:57	2:24	7:43	6:23	1:41	1:08	1:01	1:15	-	2:16	2:43	4:40	0:55	1:11
		Female	7:34	1:39	1:11	1:54	6:02	6:18	4:45	0:52	1:04	1:09	-	2:05	2:05	4:35	0:53	1:11
	Sundays	Male	8:49	1:38	1:00	3:09	6:32	4:12	2:04	1:04	1:03	1:29	-	2:51	3:34	5:17	1:01	1:29
		Female	8:20	1:41	1:13	2:38	5:22	4:08	4:44	0:55	0:55	1:22	-	2:33	2:43	4:41	0:57	1:13
1995	Weekday	Male	7:36	1:29	0:58	3:06	8:58	7:53	1:42	1:23	1:10	-	2:05	1:37	2:36	4:22	1:00	1:10
		Female	7:21	1:34	1:10	2:12	6:50	7:53	4:43	1:02	1:12	-	2:00	1:32	2:18	4:48	1:03	1:16
	Saturdays	Male	8:00	1:34	0:59	3:37	7:51	5:38	2:16	1:11	1:07	-	3:16	2:20	4:11	5:07	1:14	1:25
		Female	7:35	1:38	1:10	2:10	6:19	5:17	5:02	0:58	1:08	-	2:39	2:08	3:23	5:05	1:05	1:17
	Sundays	Male	8:34	1:36	0:59	5:34	6:44	3:58	2:35	1:10	1:03	-	3:58	2:50	4:31	5:43	1:21	1:28
		Female	8:08	1:41	1:11	3:09	5:46	4:05	4:48	0:57	1:09	-	3:20	2:22	3:54	5:05	1:10	1:28
2000	Weekday	Male	7:35	1:30	0:58	2:57	9:09	7:52	1:45	1:21	1:06	-	2:25	1:33	2:48	4:21	1:02	1:23
		Female	7:17	1:37	1:13	2:03	6:56	7:29	4:40	1:09	1:04	-	2:08	1:30	2:27	4:56	1:08	1:28
	Saturdays	Male	7:50	1:36	0:58	2:29	8:18	5:57	2:19	1:16	1:11	-	4:13	2:35	4:08	5:00	1:10	1:17
		Female	7:33	1:41	1:14	3:40	6:08	5:17	4:58	1:02	1:04	-	2:54	2:04	3:04	5:01	1:11	1:22
	Sundays	Male	8:23	1:38	0:59	4:46	6:47	4:36	2:37	1:08	1:17	-	3:45	2:51	4:30	5:46	1:19	1:24
		Female	8:03	1:44	1:14	5:47	5:27	3:40	4:53	0:59	0:59	-	3:00	2:13	3:40	5:22	1:13	1:30
2005	Weekday	Male	7:31	1:34	1:00	2:18	9:11	7:56	2:03	1:24	1:08	-	2:25	1:50	2:50	4:28	1:09	1:25
		Female	7:16	1:38	1:16	2:22	7:04	7:36	4:48	1:06	1:10	-	2:10	1:37	2:22	4:55	1:07	1:25
	Saturdays	Male	7:55	1:42	1:02	2:34	8:14	4:44	2:39	1:13	1:03	-	3:26	2:25	4:07	5:27	1:17	1:25
		Female	7:42	1:46	1:14	2:13	6:18	5:08	4:55	1:05	1:23	-	2:44	2:11	3:18	5:26	1:10	1:30
	Sundays	Male	8:23	1:41	1:03	4:29	6:35	4:19	2:52	1:15	1:25	-	3:53	3:03	4:36	6:00	1:24	1:41
		Female	8:08	1:47	1:16	4:42	5:36	3:44	5:05	1:08	1:02	-	2:54	2:16	3:37	5:24	1:13	1:30

Source: How Time Is Spent in Japan (NHK Broadcasting Culture Research Institute)

Note: 1. Total hours of all activities do not add up to 24 hours because when two activities are done simultaneously, each of them is separately included in the table.
2. The survey method was changed starting from 1995 so that the data of 1995 onward cannot be directly compared with the data of 1990 and before.
3. Under "Conversation / social interactions," only social interactions are included in the data for 1980 and 1985.
4. "Mass media contact" for 1980 and 1985 is the total of time spent for newspapers, books, magazines, TV, and radio.
5. "Rest" for 1980 means both relaxing and resting.

12-2 Travel time by different population segments (weekdays, average time spent by the doer, total of both) (hours : minutes)

		1985			1990			1995		2000			2005		
		Going to work	Going to school	Other	Going to work	Going to school	Other	Going to work	Going to school	Going to work	Going to school	Other	Going to work	Going to school	Other
Whole nation		1:05	1:05	:52	1:07	1:06	:58	1:15	1:11	1:16	1:05	1:26	1:16	1:05	1:26
by gender	Male	1:10	1:04	:52	1:13	1:05	1:00	1:23	1:10	1:21	1:06	1:23	1:21	1:06	1:23
	Female	:56	1:05	:52	:57	1:08	:56	1:02	1:12	1:09	1:04	1:28	1:09	1:04	1:28
Male: by age group	10 ～ 15	:23	:49	:43	:35	:50	:41	:51	:54	:15	:52	1:25	:15	:52	1:25
	16 ～ 19	1:02	1:26	:53	:56	1:22	:53	1:02	1:31	:43	1:31	1:13	:43	1:31	1:13
	20s	1:09	1:56	:51	1:09	1:38	1:01	1:18	1:45	1:16	1:46	1:04	1:16	1:46	1:04
	30s	1:05	:45	:46	1:10	:46	:53	1:20	:44	1:18	1:17	:57	1:18	1:17	:57
	40s	1:12	:00	:54	1:16	:46	1:06	1:22	1:22	1:20	:40	1:15	1:20	:40	1:15
	50s	1:15	:00	1:06	1:17	:42	1:05	1:30	:31	1:26	:51	1:29	1:26	:51	1:29
	60s	1:17	:00	1:06	1:16	1:48	1:18	1:25	:32	1:28	:49	1:31	1:28	:49	1:31
	70 and over	:59	:00	:51	1:00	1:50	1:05	1:20	1:15	1:10	:15	1:52	1:10	:15	1:52
Female: by age group	10 ～ 15	:00	:52	:41	:34	:52	:37	:39	:55	-	:50	1:14	-	:50	1:14
	16 ～ 19	:55	1:30	:47	1:02	1:29	:52	:59	1:34	:57	1:26	1:21	:57	1:26	1:21
	20s	1:14	1:50	:53	1:13	1:40	:58	1:14	1:42	1:20	1:05	1:20	1:20	1:05	1:20
	30s	:46	:00	:48	:50	:31	:50	1:00	:53	1:14	1:02	1:10	1:14	1:02	1:10
	40s	:49	2:00	:56	:48	:35	1:00	:55	:48	1:01	:40	1:26	1:01	:40	1:26
	50s	:58	:00	:55	:55	:51	1:02	:59	:55	1:03	:39	1:19	1:03	:39	1:19
	60s	1:00	:00	:59	:56	:31	1:07	1:05	:47	1:12	:35	1:37	1:12	:35	1:37
	70 and over	:45	:00	:55	:55	1:00	1:04	:55	1:10	:58	-	1:57	:58	-	1:57
By occupation	Farmer / fisher / forest worker	:40	:00	:44	:46	:29	:57	1:12	:35	1:04	-	1:42	1:04	-	1:42
	Self-employed	:52	:00	:52	:53	1:05	1:05	1:09	:42	1:18	1:00	1:27	1:18	1:00	1:27
	Sales or service person	1:04	3:00	:51	1:02	:51	1:00	1:09	1:11	1:17	:37	1:30	1:17	:37	1:30
	Blue-collar worker (skilled / unskilled)	1:01	1:30	:41	1:02	:48	:48	1:10	:45	1:12	:36	1:21	1:12	:36	1:21
	Office worker / technical expert	1:13	:00	:46	1:15	:46	:52	1:21	:49	1:20	:53	1:02	1:20	:53	1:02
	Management & administration	1:24	:00	:59	1:28	1:27	1:16	1:37	1:17	1:23	1:15	:56	1:23	1:15	:56
	Professional or free-lance worker, or other	1:13	:00	1:24	1:12	:58	1:06	1:13	:48	1:18	1:00	1:16	1:18	1:00	1:16
	Housewife	:50	3:00	:57	:51	:48	1:06	:58	:50	1:03	:25	1:30	1:03	:25	1:30
	Unemployed	-	-	-	1:11	:58	1:14	1:12	1:10	1:27	1:15	1:53	1:27	1:15	1:53
By size of city	Tokyo area	1:29	1:07	:57	1:32	1:17	1:08	-	-	1:39	1:13	1:32	1:42	1:19	1:32
	Osaka area	1:17	1:08	:57	1:20	1:09	:57	-	-	1:28	1:11	1:34	1:25	1:24	1:34
	City of a half million or more	1:02	1:00	:56	1:03	1:04	:57	-	-	1:11	:55	1:21	1:12	1:07	1:21
	City of 100,000 or more and less than 500,000	:58	1:03	:49	:59	:59	:54	-	-	1:05	1:02	1:10	1:05	0:58	1:10
	City of less than 100,000	:56	1:03	:47	:55	1:03	:56	-	-	:55	:54	1:26	1:03	0:58	1:26
	Town / village	:54	1:07	:49	:56	1:06	:56	-	-	1:05	1:13	1:27	1:06	1:06	1:27

Source: National Time Use Survey (NHK Broadcasting Culture Research Institute)
Note: The survey method was changed starting from 1995 so that the data of 1995 onward cannot be directly compared with the data of 1990 and before.

13 Transport and Communications Expenditures of Japanese Households

13-1 Transport and communications expenditures of households (monthly average; working-class, nationwide) (yen)

	1990	1995	2000	2005	2006	2007	2008	2009	
Consumption expenditures	331 595	349 663	341 896	296 790	285 057	289 821	291 498	283 685	100.0%
Food	79 993	78 947	75 174	64 282	62 502	63 541	64 548	62 868	22.2%
Housing	16 475	23 412	21 716	23 713	22 461	22 171	22 510	21 797	7.7%
Utilities	16 797	19 551	21 282	18 004	18 538	18 233	19 239	18 124	6.4%
Furniture / housework supplies	13 103	13 040	11 268	8 634	8 154	8 395	8 718	8 732	3.1%
Clothing & shoes	23 902	21 085	17 195	13 374	13 105	13 444	13 068	12 607	4.4%
Health maintenance / medical treatment	8 670	9 334	10 901	10 240	9 614	9 949	9 896	9 970	3.5%
Transport / communications	33 499	38 524	43 632	43 296	41 464	42 358	43 531	42 567	15.0%
Transport & motor vehicle related expenditures	27 072	31 419	33 118	31 372	29 494	29 965	31 070	29 909	10.5%
Transport	7 543	8 064	7 873	8 090	7 322	7 701	7 526	6 896	2.4%
Railway fares	2 730	2 654	2 453	2 533	2 231	2 402	2 284	2 172	0.8%
Railway passes	1 877	2 269	2 198	2 311	2 121	2 297	2 311	2 037	0.7%
Bus fares	423	356	326	342	309	321	333	335	0.1%
Bus passes	463	474	395	400	391	348	369	329	0.1%
Taxi fares	671	545	460	406	384	372	363	472	0.2%
Airplane fares and other	1 379	1 766	2 041	2 099	1 887	1 961	1 866	1 550	0.5%
Vehicle related expenditures	19 529	23 355	25 245	23 282	22 172	22 264	23 544	23 013	8.1%
Purchase of motor vehicle, etc.	6 842	7 734	8 847	6 187	5 680	5 532	6 004	6 489	2.3%
Purchase of bicycle	369	337	342	199	199	264	317	271	0.1%
Maintenance of motor vehicle	12 319	15 284	16 055	16 896	16 293	16 469	17 222	16 253	5.7%
Communications	6 426	7 104	10 514	11 924	11 970	12 392	12 461	12 658	4.5%
Education	16 827	18 467	18 261	13 934	13 868	14 213	13 956	14 351	5.1%
Cultural matters / entertainment	31 761	33 221	33 796	31 332	30 024	31 444	31 018	31 288	11.0%
Other expenditures	90 569	94 082	88 670	69 979	65 328	66 073	65 015	61 382	21.6%

Source: Family Income And Expenditure Survey: Annual Report (Ministry of Internal Affairs and Communications)
Note: Individual transport expenditures are estimated by dividing total transport expenditures (monthly average) by the annual share for each item.

13-2 Changes in consumer prices for transport and communications

(annual average; figures for 1995 are set as 100)

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Overall consumer prices	93.5	100.0	101.5	100.8	99.9	99.6	99.6	99.3	99.6	99.6	101.0	99.6
Transport / communications	99.0	100.0	97.8	97.0	96.4	96.5	96.3	96.6	96.9	97.0	98.9	94.1
Transport	93.5	100.0	105.6	105.9	105.7	105.9	106.1	106.1	105.8	105.9	106.9	106.1
Railway fares (excl. Japan Railway)	86.8	100.0	110.7	110.9	110.9	111.0	111.0	111.2	111.4	111.6	111.8	111.8
Railway fares (Japan Railway)	100.0	100.0	103.2	103.2	103.2	103.0	102.8	102.8	102.8	102.8	102.8	102.8
Bus fares	88.8	100.0	105.5	105.5	105.4	105.4	105.4	105.3	104.9	104.9	105.1	105.7
Taxi fares	82.2	100.0	106.3	106.3	106.3	106.2	106.2	106.2	106.2	106.9	112.5	113.1
Air fares	100.3	100.0	102.4	104.9	103.6	105.0	108.4	108.3	105.4	105.8	113.2	114.6
Toll road fares	95.2	100.0	103.7	103.7	104.0	104.3	104.4	104.4	104.4	104.4	103.4	95.7
Motor vehicle related expenditures	100.1	100.0	95.2	96.0	95.6	95.6	95.7	98.5	100.9	101.8	105.2	96.7
Motor vehicles	100.4	100.0	101.0	100.4	99.8	99.6	99.2	99.7	99.6	99.8	99.8	99.0
Maintenance of motor vehicles	100.0	100.0	93.1	94.4	94.0	94.2	94.5	98.1	101.2	102.4	106.7	95.8
Gasoline	110.4	100.0	91.0	91.9	88.8	91.1	96.8	107.4	117.0	120.6	134.8	104.2
Rent for parking spaces	82.0	100.0	101.6	101.4	101.0	100.8	100.6	100.3	100.1	100.1	99.5	99.0
Parking fees	87.7	100.0	99.1	98.7	98.3	96.8	96.5	95.4	94.1	93.5	92.8	92.6
Communications	105.8	100.0	93.4	87.7	86.4	86.3	85.2	79.5	76.6	75.0	75.0	74.7
Postage	81.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Fixed telephone charge*	110.0	100.0	93.7	86.4	85.2	85.2	84.2	75.0	75.0	75.2	75.1	75.2
Shipping fees	89.8	100.0	101.8	101.8	101.8	101.8	101.8	101.8	101.4	101.8	101.8	96.9

Source: Annual Report on Consumer Price Index (Ministry of Internal Affairs and Communications)

* The "Fixed telephone charge" for 1990 and 1995 means the charge per telephone call.

13-3 Monthly transport / communications expenditures per household by size of city or by city area (average of all households, 2009)

	All cities	Cities of 50,000 or more	City size				Metropolitan areas			
			Big cities	Middle-size cities	Small cities A	Small cities B & towns / villages	Kanto (Tokyo area)	Chukyo (Nagoya area)	Keihanshin (Kyoto, Osaka, & Kobe area)	Metropolitan area
Consumer expenditures	253 720	254 467	253 010	257 460	252 204	249 403	269 897	264 313	254 058	239 209
Food	59 258	59 676	61 059	59 351	58 340	56 835	64 884	61 093	61 114	54 193
Housing	18 402	19 533	21 743	19 691	16 446	11 833	22 246	19 115	18 782	17 293
Utilities	18 435	18 093	16 761	18 517	19 235	20 424	17 675	18 975	17 848	17 337
Furniture / housework utensils	8 448	8 321	7 666	8 606	8 776	9 186	8 368	9 921	8 296	7 535
Clothing & shoes	10 572	10 871	11 895	10 774	9 683	8 842	12 042	11 675	10 799	10 495
Health maintenance / medical treatment	10 891	10 892	10 802	11 191	10 603	10 878	11 309	10 466	11 128	10 239
Transport / communications	32 910	32 125	30 262	32 436	34 086	37 476	33 136	36 161	30 438	33 941
Transport	5 433	5 770	7 333	5 194	4 538	3 471	8 092	4 977	6 211	5 287
Vehicle related expenditures	17 191	16 178	13 406	16 894	18 759	23 086	14 647	21 200	14 370	19 161
Purchase of motor vehicle, etc.	4 431	4 001	3 173	4 322	4 621	6 939	3 276	4 915	3 980	6 968
Purchase of bicycle	181	185	192	188	171	158	215	216	244	163
Maintenance of motor vehicle	12 579	11 992	10 041	12 384	13 967	15 989	11 156	16 068	10 147	12 031
Communications	10 286	10 177	9 523	10 348	10 790	10 920	10 397	9 985	9 857	9 493
Education	9 112	9 423	9 592	9 141	9 591	7 311	11 043	10 487	10 246	8 459
Cultural matters / entertainment	28 396	29 021	30 387	29 118	27 114	24 757	33 866	29 830	28 716	24 499
Other expenditures	57 296	56 513	52 843	58 634	58 332	61 861	55 329	56 589	56 690	55 218

Source: Annual Report of Family Income and Expenditure Survey (Ministry of Internal Affairs and Communications)

[City size] Big city: population of one million and over

Middle-size city: population between 150,000 and less than one million

Small city A: population between 50,000 and less than 150,000

Small city B: population is less than 50,000

14. Energy Consumption in Japan and Other Countries

14-1 Energy consumption by transport modes in Japan

	FY 1975	FY 1980	FY 1985	FY 1990	FY 1995	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Passenger transport	1 022 945	1 369 843	1 385 122	1 985 737	2 476 551	2 717 299	2 782 434	2 795 345	2 756 506	2 665 859	2 586 265	2 507 213	2 500 800
Railways	125 037	135 000	131 484	164 051	176 358	166 970	167 923	165 581	163 406	179 872	182 650	162 751	164 169
JR (national railway)	80 079	84 474	79 326	102 307	108 377	99 415	99 948	96 973	95 700	105 225	107 243	95 305	95 900
Private railways	44 958	50 526	52 158	61 744	67 981	67 555	67 975	68 608	67 706	74 648	75 407	67 446	68 268
Buses	60 112	64 130	65 135	71 707	72 586	70 731	70 798	69 576	69 625	67 644	66 500	66 465	66 280
Commercial buses	47 051	49 563	50 693	55 842	57 893	56 954	56 686	56 489	57 173	55 659	54 698	53 776	54 140
Private buses	13 060	14 567	14 442	15 865	14 693	13 777	14 112	13 086	12 452	11 985	11 802	11 824	12 140
Passenger cars	722 847	1 028 722	1 061 164	1 367 624	1 791 336	2 063 530	2 141 700	1 873 054	2 109 722	2 023 640	1 946 533	1 896 971	1 897 230
Commercial passenger cars	78 614	87 488	85 270	84 935	85 437	82 595	81 417	82 562	81 225	76 356	75 041	74 326	72 333
Private passenger cars	644 233	941 233	975 894	1 282 689	1 705 899	1 980 934	2 060 283	1 790 492	2 028 497	1 947 284	1 871 492	1 822 645	1 824 896
Private trucks	0	0	0	232 870	243 293	206 019	200 696	198 643	197 500	192 048	185 921	180 026	177 032
Passenger ships	59 944	63 544	57 809	65 595	77 526	78 052	69 491	70 068	77 628	69 778	69 926	60 965	60 965
Aircraft	55 005	78 447	69 530	83 930	115 409	131 997	134 826	138 021	138 625	132 876	134 735	140 035	135 125
Freight transport	946 926	1 127 303	1 076 987	1 324 299	1 498 355	1 515 008	1 492 364	1 468 543	1 421 515	1 336 057	1 302 466	1 297 884	1 267 464
Railways	28 633	23 651	14 526	12 809	12 349	10 493	10 697	10 710	10 461	11 172	11 273	10 314	9 851
JR (national railway)	28 047	23 107	14 191	12 516	12 181	10 349	10 583	10 585	10 348	11 061	11 162	10 206	9 747
Private railways	586	544	335	293	167	144	114	125	113	111	110	109	104
Passenger cars	692 666	917 959	946 550	1 170 796	1 338 406	1 349 975	1 327 208	1 309 264	1 267 274	1 190 345	1 156 380	1 151 368	1 123 847
Commercial passenger cars	188 289	284 358	352 884	503 833	649 926	712 097	706 816	714 284	705 946	670 274	656 397	665 867	646 827
Private passenger cars	504 377	633 642	593 707	666 963	688 480	637 878	620 392	594 980	561 328	520 071	499 983	485 501	477 020
Coastal shipping	219 768	175 521	102 391	123 405	125 540	130 807	132 535	126 852	121 002	111 613	111 611	112 376	109 157
Aircraft	5 860	10 172	13 521	17 330	22 060	23 733	21 924	21 716	22 776	22 927	23 202	23 827	24 610
Total of passenger & freight transport	47 058	2 497 146	2 462 109	3 310 035	3 974 906	4 232 307	4 274 799	4 263 888	4 178 021	4 001 917	3 888 730	3 805 097	3 768 265

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

14-2 Energy consumption in Japan and other countries (2008)

	Japan	U.S.A.	Germany	U.K.	France
Energy consumption per person (oil-equivalent; tons / person)	3.88	7.50	4.08	3.40	4.16
Oil consumption per person (oil-equivalent; tons / person)	1.68	2.80	1.35	1.10	1.30
Total energy consumption (oil-equivalent; x 1 million tons)					
As primary energy	495.84	2 283.72	335.28	208.45	266.50
As final consumption	318.81	1 542.25	235.67	142.85	165.50
Breakdown of final energy consumption (oil-equivalent; x 1 million tons)					
Industrial sector	86.79	295.40	55.25	29.65	33.37
(%)	(27.2)	(21.1)	(23.4)	(20.8)	(20.2)
Transport sector	78.03	601.42	54.10	43.22	44.54
(%)	(24.5)	(42.9)	(23.0)	(30.3)	(26.9)
Commercial & residential sector	117.20	506.23	102.14	60.91	73.87
(%)	(36.8)	(36.1)	(43.3)	(42.6)	(44.6)

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)

15. Travel in Japan

15-1 Number of trips made per person by trip purpose

(unit: number of trips per person per day)

Purpose / City area	Going to work / school	Going home	Business	Other	Total
Tokyo metropolitan area (weekdays)	0.56	1.00	0.23	0.61	2.40
Keihanshin (Kyoto-Osaka-Kobe) metropolitan area (weekdays)	0.54	1.01	0.30	0.67	2.51
Chukyo (Nagoya) metropolitan area (weekdays)	0.58	1.08	0.29	0.62	2.57
Keihanshin (Kyoto-Osaka-Kobe) metropolitan area (holidays)	0.10	0.80	0.05	1.01	1.96

Note: Data for Tokyo are from the fourth survey (1998); for Keihanshin (weekdays & holidays), from the fourth survey (2000); and for Chukyo, from the fourth survey (2001).
Source: Road Handbook2006 (Japan Highway Users Conference)

15-2 Number of trips made per person by trip purpose and by automobile ownership

(unit: number of trips per person per day)

No. of trips / percentages / Trip purpose	Number of trips made per person			Percentages (%)		
	Owning a car	Not owning a car	All households	Owning a car	Not owning a car	All households
Going to work / school	0.58	0.39	0.54	22.2	18.3	21.5
Going home	1.05	0.86	1.01	40.0	40.7	40.1
Business	0.33	0.18	0.30	12.5	8.4	11.8
Other	0.66	0.69	0.67	25.2	32.6	26.6
Total	2.62	2.12	2.51	100.0	100.0	100.0

Note: Data are from the fourth survey (2000) for Keihanshin metropolitan area (weekdays).
Source: Road Handbook 2006 (Japan Highway Users Conference)

15-3 Comparison of trip purposes by city type (%)

(Unit: %)

			Going to work	Going to school	Business	Going home	Personal matters
Weekdays	Nationwide	1987	13.3	9.5	12.6	40.6	24.0
		1992	14.3	8.5	10.4	40.9	25.9
		1999	15.7	7.2	9.3	41.5	26.2
		2005	15.8	7.1	8.3	41.7	27.1
	Three major metropolitan areas	1987	13.9	10.1	10.9	41.3	23.7
		1992	14.7	8.8	9.1	41.5	25.9
		1999	15.8	7.0	8.7	41.9	26.5
		2005	16.3	6.9	7.2	42.3	27.2
	Local city areas	1987	12.6	8.9	14.1	40.0	24.3
		1992	13.9	8.3	11.7	40.2	25.9
		1999	15.6	7.4	10.0	41.2	25.8
		2005	15.3	7.3	9.4	41.0	27.0
Holidays	Nationwide	1987	3.4	2.3	4.3	41.9	48.2
		1992	3.0	2.0	1.7	41.8	51.5
		1999	3.9	0.7	1.8	41.5	52.1
		2005	4.0	0.9	2.9	41.1	51.2
	Three major metropolitan areas	1987	3.2	2.2	3.5	42.4	48.7
		1992	2.8	1.9	1.3	42.3	51.7
		1999	3.6	0.5	1.6	41.6	52.7
		2005	3.8	0.6	2.5	41.6	51.4
	Local city areas	1987	3.6	2.3	4.9	41.4	47.8
		1992	3.2	2.0	2.1	41.3	51.4
		1999	4.2	1.0	1.9	41.3	51.5
		2005	4.1	1.2	3.3	40.5	50.9

Sources: Survey on Personal Trips in Cities Nationwide and Survey on Traffic Characteristics in Cities, Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

15-4 Comparison of transport mode by citytype (%)

(Unit: %)

			Railways	Buses	Motor vehicles	Motorcycles	Walking & other
Weekdays	Nationwide	1987	12.1	3.9	33.6	22.9	27.4
		1992	14.2	3.9	38.7	19.2	24.1
		1999	14.0	3.2	42.1	19.3	21.4
		2005	13.8	2.8	44.7	18.5	20.3
	Three major metropolitan areas	1987	22.4	3.3	26.3	19.7	28.3
		1992	25.6	3.2	29.0	16.9	25.2
		1999	23.9	2.8	33.4	18.2	21.7
		2005	23.3	2.5	33.7	18.5	22.0
	Local city areas	1987	2.5	4.5	40.5	25.9	26.7
		1992	2.9	4.5	48.2	21.4	22.9
		1999	3.3	3.8	51.4	20.4	21.1
		2005	3.6	3.0	56.4	18.5	18.5
Holidays	Nationwide	1987	7.7	3.2	45.6	21.8	21.8
		1992	8.0	2.6	53.4	17.5	18.6
		1999	7.8	2.1	59.6	15.8	14.7
		2005	7.5	1.7	63.0	13.2	14.7
	Three major metropolitan areas	1987	14.5	3.0	37.6	20.6	24.2
		1992	15.0	2.4	44.4	16.8	21.4
		1999	13.3	2.2	52.2	16.0	16.4
		2005	12.6	1.7	53.9	14.3	17.6
	Local city areas	1987	1.9	3.3	52.4	22.7	19.7
		1992	1.9	2.7	61.2	18.1	16.1
		1999	2.2	2.1	67.2	15.5	13.0
		2005	2.1	1.7	72.6	12.0	11.6

Sources: Survey on Personal Trips in Cities Nationwide and Survey on Traffic Characteristics in Cities, Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

15-5 Number of trips per person by city type

		Weekdays			Holidays		
		Nationwide	Three major metropolitan areas	Local city areas	Nationwide	Three major metropolitan areas	Local city areas
Gross (unit: trips)	1987	2.63	2.52	2.74	2.13	1.94	2.32
	1992	2.51	2.46	2.56	2.03	1.84	2.22
	1999	2.34	2.37	2.32	1.90	1.86	1.93
	2005	2.31	2.31	2.31	1.85	1.82	1.88
Net (unit: trips)	1987	3.04	2.91	3.17	3.06	2.94	3.18
	1992	2.94	2.84	3.04	3.01	2.86	3.16
	1999	2.77	2.75	2.79	2.84	2.78	2.90
	2005	2.76	2.72	2.81	2.86	2.79	2.93
Percentage of travelers (%)	1987	86.3	86.3	86.2	69.3	65.9	72.8
	1992	85.4	86.6	84.2	67.2	64.2	70.2
	1999	84.6	86.0	83.1	66.6	67.0	66.3
	2005	83.6	85.0	82.1	64.6	65.1	64.2

Sources: Survey on Personal Trips in Cities Nationwide and Survey on Traffic Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)
Gross: Trips per person (persons = both those who went out and those who did not) Net: Trips per person (of persons who went out) Percentage of travelers: Percentage of people who made a trip on that day

15-6 Percentage of the main transport mode by trip purpose(nationwide)

			Railways	Buses	Motor vehicles	Motorcycles	Walking & other
Weekdays	Going to work	1987	24.3	5.7	40.9	20.9	8.2
		1992	26.3	5.2	45.1	16.7	6.7
		1999	24.6	3.8	47.6	16.6	7.5
		2005	24.8	3.0	47.4	17.6	7.2
	Going to school	1987	13.2	3.2	5.4	19.6	58.6
		1992	17.6	3.4	7.2	19.0	52.8
		1999	17.0	2.7	7.8	19.2	53.3
		2005	18.3	2.4	8.6	19.9	50.8
	Business	1987	7.0	1.6	71.0	12.8	7.6
		1992	8.3	1.1	76.3	8.2	6.1
		1999	9.3	1.2	75.1	8.4	6.0
		2005	8.3	1.0	75.8	8.2	6.8
	Going home	1987	12.5	4.1	28.7	24.8	29.9
		1992	15.0	4.2	34.2	20.8	25.8
		1999	14.5	3.5	38.8	20.7	22.6
		2005	14.5	2.9	41.6	19.7	21.3
	Private matters	1987	6.9	4.0	29.6	27.6	32.0
		1992	7.5	3.8	37.5	22.5	28.7
		1999	7.6	3.4	41.7	22.5	24.8
		2005	6.8	3.0	47.7	19.8	22.8
	All purposes	1987	12.1	3.9	33.6	22.9	27.4
		1992	14.2	3.9	38.7	19.2	24.1
		1999	14.0	3.2	42.1	19.3	21.4
		2005	13.8	2.8	44.7	18.5	20.3
Holidays	Going to work	1987	16.7	5.9	44.7	22.5	10.2
		1992	16.3	5.1	51.4	19.3	7.8
		1999	15.6	3.8	52.9	18.9	8.7
		2005	16.7	2.7	53.4	18.4	8.8
	Going to school	1987	9.6	3.7	5.8	23.2	57.7
		1992	11.4	1.7	7.0	23.5	56.3
		1999	12.3	3.3	17.5	34.4	32.4
		2005	17.9	3.1	17.9	33.2	27.9
	Business	1987	5.5	1.7	62.0	19.5	11.4
		1992	4.7	0.6	80.4	8.4	6.0
		1999	6.8	0.9	72.3	12.4	7.6
		2005	6.8	1.3	67.1	13.2	11.6
	Going home	1987	7.9	3.4	43.0	23.4	22.3
		1992	8.1	2.9	50.7	19.2	19.0
		1999	8.0	2.3	57.5	17.3	14.9
		2005	7.7	1.8	61.1	14.5	14.9
	Private matters	1987	7.0	2.9	48.4	20.4	21.3
		1992	7.3	2.3	56.6	16.1	17.8
		1999	7.0	1.9	61.9	14.2	15.0
		2005	6.4	1.5	65.9	11.3	14.9
	All purposes	1987	7.7	3.2	45.6	21.8	21.8
		1992	8.0	2.6	53.4	17.5	18.6
		1999	7.8	2.1	59.6	15.8	14.7
		2005	7.5	1.7	63.0	13.2	14.7

Sources: Survey on Personal Trips in Cities Nationwide and Survey on Traffic Characteristics in Cities Nationwide (Ministry of Land, Infrastructure, Transport and Tourism)

15-7 Transport used by trip purpose (percentages of of the main transport mode) (%)

City area	Purpose \ Transport	Railways	Buses	Motor vehicles	Motorcycles	Walking & other	Total
Tokyo metropolitan area (weekdays)	Going to work	53.0	2.0	24.0	13.0	7.0	100.0
	Going to school	31.0	2.0	7.0	11.0	49.0	100.0
	Going home	31.0	3.0	27.0	17.0	22.0	100.0
	Home to place of business	32.0	2.0	39.0	16.0	11.0	100.0
	Between workplace and place of business	26.0	1.0	58.0	6.0	8.0	100.0
	Home to private destination	12.0	4.0	34.0	23.0	27.0	100.0
	Other private matters	21.0	3.0	32.0	15.0	29.0	100.0
	All purposes	30.0	3.0	29.0	16.0	22.0	100.0
Keihanshin metropolitan area (weekdays)	Going to work	34.5	2.2	36.4	20.1	6.8	100.0
	Going to school	23.8	4.0	3.6	16.0	52.6	100.0
	Going home	19.3	2.8	30.1	23.5	24.2	100.0
	Business	11.0	1.8	57.1	13.0	16.6	100.0
	Personal	9.4	3.3	32.2	25.9	29.2	100.0
	All purposes	18.2	2.8	32.9	21.9	24.0	100.0
Chukyo metropolitan area (weekdays)	Going to work	15.5	1.5	66.4	11.3	5.4	100.0
	Going to school	17.0	1.1	11.9	17.1	52.8	100.0
	Going home	9.9	1.4	54.4	15.5	18.8	100.0
	Business	3.8	0.4	81.3	7.2	7.3	100.0
	Personal	4.1	1.4	60.5	16.2	17.8	100.0
	All purposes	9.2	1.3	57.9	14.2	17.4	100.0
Keihanshin metropolitan area (holidays)	Going to work	25.5	1.9	41.4	22.6	8.7	100.0
	Going to school	23.8	2.0	9.6	33.3	31.3	100.0
	Going home	11.5	1.7	48.5	19.9	18.2	100.0
	Business	7.7	3.5	62.8	13.1	12.4	100.0
	Personal	9.0	2.2	52.8	16.1	19.7	100.0
	All purposes	10.8	2.0	50.4	18.0	18.5	100.0

Note: Data for Tokyo are from the fifth survey (2008); for Keihanshin (weekdays & holidays), from the fourth survey (2000); and for Chukyo, from the fourth survey (2001).
Sources: Road Handbook 2006 (Japan Highway Users Conference); data from the fifth survey on person-trips in the Tokyo metropolitan area

16 Basic Transport Data for Major World Cities (2000, 52 cities)

Cities	Population	Gross product of the area per person	Motor vehicle ownership		Annual average distance traveled by private cars	Energy consumption for transport	Shares of transport modes			Average number of trips	Average travel time for private cars
			Passenger cars	Motorcycles			Public transport	Walking & bicycles	Private cars		
	(x 1000 persons)	(euro/person/year)	(vehicles/1000 persons)	(vehicles/1000 persons)	(km/vehicle/year)	(Megajoules/person/year)	(%)	(%)	(%)	(trips/person/day)	(min.)
Amsterdam	850	34100	336	16.9	8750	11100	14.7	51.4	33.9	2.9	23
Athens	3900	11600	385	64.1	7500	13100	27.9	8.15	63.9	1.61	30
Barcelona	4390	17100	424	65.5	6710	11000	18.8	34.3	46.9	1.85	24.6
Berlin	3390	20300	328	23.5	7760	10700	24.6	36.2	39.3	3.05	21
Bern	293	35500	425	66.2	8370	15700	21.2	38.5	40.2	3.27	24
Bilbao	1120	20500	392	19.2	7040	9910	16	48.6	35.4	1.95	26.8
Bologna	434	31200	634	102	5090	10100	14.4	29.1	56.6	3.18	25
Brussels	964	23900	497	17.9	8980	18800	13.6	27.5	58.9	2.82	22
Budapest	1760	9840	329	7	7200	10000	43.5	23.4	33.1	2.85	27
Chicago	8180	40000	513	20.5	19800	43600	6.3	6.2	87.5	2.91	27.4
Clermont-Ferrand	264	24200	519	30.3	8000	14700	6.3	33	60.7	3.6	14
Copenhagen	1810	34100	315	18.9	14800	15800	12.1	39	48.9	3	20
Dubai	910	22000	243	3.73	18100	18100	6.7	16	77.3	2.56	15
Dublin	1120	35600	377	12.2							
Geneva	420	37900	508	85.9	8070	19200	15.3	33.5	51.2	3.68	21
Gent	226	26700	421	28	10700	16700	4.78	29.9	65.3	2.51	
Glasgow	2100	20600	345	5.42	12800	17000	10.6	23.5	65.9	2.96	17
Graz	226	29600	468	48.6	9040	14900	18.4	35.2	46.4	3.7	18
Hamburg	2370	38800	510	25.9	7550	14400	15.7	36.9	47.4	3.19	25
Helsinki	969	36500	361	15.5	9000	12800	27	29	44	3.1	15
Hong Kong	6720	27600	50.6	4.03	8960	4850	46	37.8	16.2	2.57	24
Krakow	759	7010	225	11.2	6030	6140	39.6	32.7	27.7	1.97	
Lille	1100	21800	413	23.6	7500	11100	6.1	30.7	63.2	3.59	16
Lisbon	2680	17100	432	25.5	5000	9220	27.5	24.5	48	1.61	25
London	7170	36400	343	14.3	9140	14700	18.8	31.1	50.2	2.65	24
Lyons	1180	27100	489	25.5	6770	12500	13	32.7	54.3	3.37	19
Madrid	5420	20000	478	29.5	8530	15100	22.4	26.1	51.4	2.71	22
Manchester	2510	22400	434	10.1	9320	14600	9.35	22.6	68.1	2.84	15
Marseilles	800	22700	406	19.4	8910	13300	11.4	34.5	54.1	3.02	20
Melbourne	3370	22800	578	20.4	13900		6	18	76	3.72	
Milan	2420	30200	594	50.1							
Moscow	11400	6060	189	4.04	9510	8530	49.3	24.4	26.3	2.67	27
Munich	1250	45800	542	42.1	9560	19700	21.9	37.5	40.6	3.2	30
Nantes	555	25200	546	28.9	7260	14200	12.8	23.3	63.9	3.12	16
Newcastle	1080	18400	320	8.52	12700	15100	16.1	26.8	57.1	2.52	16.4
Oslo	981	42900	418	40.7	10700	16500	15.4	25.5	59.1	3.18	15
Paris	11100	37200	439	58.6	8220	14600	18	35.6	46.4	2.81	22
Prague	1160	15100	536	45.2	4950	11800	43.3	21.1	35.6	3.71	19
Rome	2810	26600	689	81	5530	15400	20.2	23.6	56.2	2.19	32
Rotterdam	1180	28000	356	18.3	9290	11800	9.71	41.9	48.3	2.74	22
Sao Paulo	18300	6420	238	21.8	4780	7560	29	37.4	33.6	1.78	30
Sevilla	1120	11000	406	35.1	5000	7450	10.4	41.6	48	1.85	23
Singapore	3320	28900	123	39.7	19500	14200	40.9	14	45.1	2.87	23
Stockholm	1840	32700	397	13	8700	17800	21.6	31.4	47.1	2.77	21
Stuttgart	2380	32300	566	43.8	10200	20700	11	30.1	58.9	3.28	18
Tallinn	399	6880	399	3.08							
Tunis	2120	2000	88.2	20.6							
Turin	1470	26700	637	52.4	4550	9000	21.1	24.8	54	1.82	26
Valencia	1570	14300	466	42.2	5460	9250	12.4	46.2	41.3	2.09	
Vienna	1550	34300	414	42.2	5230	9040	34	30	36	2.7	21
Warsaw	1690	13200	380	18.9	5730	9090	51.6	19.8	28.6	2.26	24
Zürich	809	41600	495	58.5	8650	18400	23	30.5	46.4	3.18	22

Note: 1. "Energy consumption for transport" is the energy consumed per person in private passenger transport.
2. "Average number of trips" is the average number of trips per person per day for all means of transport including walking.
3. "Fare balance rate" is the percentage of operating expenses paid by fares.

Source: data from MOBILITY IN CITES. UITP database (2006, modified)

Public transportation indexes		Motor vehicle indexes		Average travel speed			Annual use		Population density in city areas		Central Business District employment
Annual supply	Fare balance rate	Length of roads	Central Business District parking areas	Private cars	Railways	Buses	Private cars	Public transportation	Population	Employment	
Capacity: person-kilometers/person	(%)	(m/1000 persons)	(vehicles/1000 employed persons)	(km/hour)	(km/hour)	(km/hour)	(person-kilometers/ person)	(person-kilometers/ person)	(persons/ha)	(persons/ha)	(%)
8150	32.9	2.8	258	33			4110	1220	57.3	32.7	19
3590	65.7	2.3	225	29	34.2	16	4620	890	65.7	26.7	17.4
5710	71.4	2.1	405	34	42.1	19.7	4290	1400	74.7	31.3	12.5
13100	42.6	1.6		36	32.8	19.5	8540	1840	54.7	25.2	
16200	48.4	3.9	89.7	32	38.3	20.2	5290	2670	41.9	30.2	15.2
6310	51.9	4.4	86.7	38	37.2	21.9	3710	1150	51.9	21.1	11.8
3520	42.4	2.5	181	21		14.5	4460	642	51.6	27.6	29.9
8850	26.6	1.9	289	30	35.2	21.8	6140	1400	73.6	50.4	26.3
11100	72.4	2.4	95.8	22.3	25.7	16.2	3010	3640	46.3	25.2	10.2
4330	42.3	4.8	116		39.7	18.3	11300	700	15.4	8.2	10.4
2130	43.2	3.4	726	32	0	18.3	5110	423	44.5	22.3	14.5
9890	68.1	3.9	176	50.2	51.6	21.6	7140	1630	23.5	13.1	10.2
1590	113	3.1	188	62		28.5	7280	527	33.6	20.6	21.4
5250	88.6	4.3			33.8	14.6		785	25.9	15	
4250	41.8	4.9	97.6	30	29.1	18.7	5770	724	49.2	27.7	19.2
6080	31.1	5.5			19.4	24.8	5520	959	45.5	29.4	
7020	65.2	5.8	152	36	37.3	27	6330	978	29.5	12.8	16.7
4720	74.6	4.4	78.7	39	13.3	15.1	5410	1580	31	21.5	19.4
9860	57.8		85.5	28	37.6	20.8	5520	1570	33.9		
10300	58.6	3.6	384	45	43.7	26	4250	2200	44	26.9	16.1
16100	157	0.28	22.5	28	36.2	18.6	1180	3700	286	138	9.89
7310	86.3	1.5			19.5	17.8	1990	1920	58.4		
3330	47.2	3.5	383	30	37.5	18.3	4150	472	55	22.6	6.8
7030	59	0.89	400	25	34.1	17.4	2780	2030	27.9	11.1	46.3
15100	81.2	2.0	85.2	26.2	41.1	18	4400	2520	54.9	34.7	21.8
3570	39.4	2.5	191	30	31	17.6	4350	776	40	19.1	15.5
11200	61.3	4.9	187	36.3	40.7	21	5590	2330	55.7	23.2	34.6
4300	96	3.7	188	41	38.3	17.2	5700	561	40.4	18.2	10.4
3940	53.9	1.6	335	25	31.5	17.6	5153	581	58.8	22.1	23.4
4780			323	43	34.0	23.1	10300	1060	13.7	6.2	12.4
8560	41.7				27.8	15		1650	71.7	38.3	
17400	56.9	0.41	30	30	40.3	16.6	3100	5340	161	70	12.2
15500	64.4	1.8	132	30	42.1	23	6750	2910	52.2	39.1	33
4030	38.7	5.4	538	33	19.6	19.9	5010	642	34.7	15.9	19.6
7250	99.2	4.1	174	47	35.5	19	5630	976	42.5	18.1	18.4
9670	63	5.9	87.9	45	48	29	6130	1780	26.1	16.4	14
12800	45.5	2.0	183	34	39.5	17.1	4900	2170	40.5	18.8	14
16100	30.5	2.9	45.9	30	29.6	25.9	3920	4460	44	29.5	37.2
7910	28.5	2.8	178	24	36.3	15.4	5560	2610	62.6	24.4	22.6
4580	39.4	4.1	119	28	32.4	21	4370	836	41.4	17.2	18.9
8020		2.0		20	36.8	15	1990	2170	85.8	37.2	11.3
2200	71.7	2.0	347	25	67	14.7	2640	422	51.1	15.5	22.2
14300	126	0.94	165	35	44.9	19	5170	4070	102	63	16.4
17300	54.3		153	35	41.5	18	4760	2450	18.1	9.4	13.7
7260	61.2	1.2	187	45	45.8	26.1	7630	1070	35.3	19.4	7.85
6710	44	2.2			22.6	18		1400	41.9	19.8	
2840	76.5				21.4	11		1670	92.2		
3520	29.9	2.7	778	33.4			3570	930	46.1	20	11.8
3610	59.5	2.9			43.5	14.7	3530	507	50.2	25.6	
11900	48.5	1.8	224	28	28.7	19	2950	2350	66.9	36.1	12.1
8920	46.4	1.7	62.3	34.9	25.4	21.5	3030	3270	51.5	30.3	58
20800	50	4.7	127		46	19.1	6230	2460	44.5	30.2	12.2

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