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# TRANSPORT POLICY

## IN PERSPECTIVE: 2015

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Preface

Automobile and road transport have advanced rapidly in the last half century in Japan, and contributed greatly to the advancements of our socio-economic system. Our lifestyles and the economy have been enjoying the benefits brought about by the mobility provided by automobiles in all aspects of our society. But, at the same time, over-reliance on automobile has caused serious social and environmental problems such as traffic accidents, air pollution, greenhouse gas emissions and social disparity.

Faced with these challenges, we are reaching a major turning point for a matured transport society with major technological innovations in automobile and road traffic including EV/FCV and a connected and autonomous vehicle or "Auto Sapience" system created by advanced ICT, ITS, etc. These innovations in the next generation vehicle systems will be most beneficial to us as they will provide much safer, less polluting and user friendly mobility for all when Japanese society faces depopulation and rapid aging, and it needs to solve many existing problems and to move towards a more equitable, inclusive, healthy and efficient transport system that support a vibrant and sustainable society.

The Japan Research Center for Transport Policy was founded in 1971 as a private non –profit organization involving transport academics and practitioners active in universities, research organizations and private industry. Since then, the Center has been carrying out interdisciplinary research focused on road transport and proposing transport policies that will contribute to the beneficial development of Japanese society.

Every year since the year 2000, with the full support of the Japan Automobile Manufacturers Association, we have published a booklet in Japanese, "Research on Automobiles and Transport – Environment and Policy" annually, which introduce the general trends in policy and research concerning automobiles and road traffic in Japan, with basic statistics. This is a translation of the major parts of the 2015 booklet with additional introduction for overseas readers who are interested in the transport policy of Japan. We hope that this booklet will be useful in understanding Japanese experiences.

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 who have given their valuable time in writing or editing articles, or who have provided important data for inclusion in the booklet.

September 2015

Katsutoshi Ohta, Adviser
Chairman, Editorial Committee
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TRANSPORT POLICY IN PERSPECTIVE 2015

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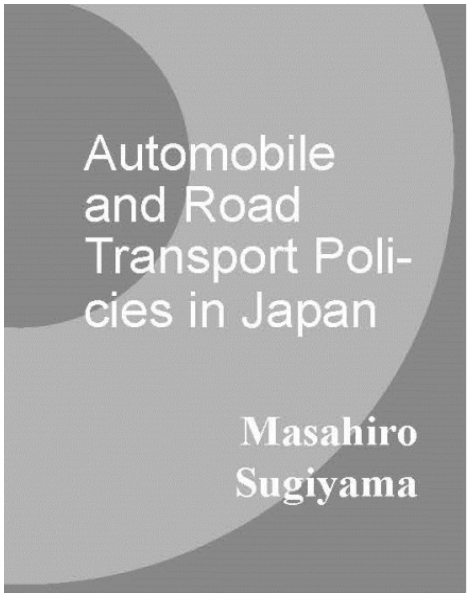
As of April 2015




Japanese Transport Trends for Past

| | | | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Transport volume[1] | Passengers (×100 million passenger-kilometers) | Total | 13356 | 14000 | 14285 |
| | | Motor vehicles for private use | 7924 | 8389 | 8522 |
| | | Motor vehicles for commercial use | 739 | 757 | 746 |
| | | Railways | 3951 | 4044 | 4144 |
| | | Maritime | 30 | 31 | 33 |
| | | Aviation | 712 | 779 | 841 |
| | Freight (×100 million ton-kilometers) | Total | 4286 | 4109 | 4229 |
| | | Motor vehicles | 2327 | 2117 | 2159 |
| | | Railways | 200 | 205 | 211 |
| | | Coastal shipping | 1749 | 1778 | 1849 |
| | | Aviation | 10 | 10 | 10 |
| Number of motor vehicles owned* (×1000)[1] | | Total | 75596 | 79625 | 80273 |
| | | Trucks | 15009 | 14852 | 14749 |
| | | Buses | 226 | 226 | 227 |
| | | Passenger cars | 58729 | 59357 | 60051 |
| | | Special vehicles | 1645 | 1655 | 1670 |
| | | Two-wheeled vehicles | 3502 | 3536 | 3576 |
| | | Light motor vehicles | 30253 | 30253 | 31074 |
| Driving license holders** (×1000)[2] | | Total | 81488 | 81860 | 82076 |
| | | Male | 45437 | 45464 | 45430 |
| | | Female | 36051 | 36396 | 36646 |
| Traffic accidents[3] | | Number of accidents (×1000) | 692 | 665 | 629 |
| | | Fatalities within 30 days | 4411 | 4373 | 4113 |

* Figures as of the end of March (registered vehicles + light motor vehicles)
** Figures as of the end of December
References for data:
1) Transport volumes: Annual Statistical Report on Motor Vehicle Transport, and Transport-related Statics Data Collection Annual Statistical Report on Air Transport, Annual Statistical Report on Railway Transport, and Annual Statistical Report on Coastwise Vessel Transport, and Transport-related Statistic Data Collection.
2) Motor vehicle ownership: Automobile Inspection & Registration Inspection Association
3) License holders and accidents: Traffic Statistics

## 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 the sea. The geographical feature of Japan 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. Japan's 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 population. Japan's mountainous geography limits the habitable area. The population tends to be concentrated in city areas, where traffic congestion countermeasures are needed. By contrast, in rural areas, many towns are facing depopulation and ensuring transport services (due to the withdrawal of conventional public transport, etc.) in depopulated rural areas is becoming an urgent problem to be solved. 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 the 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 share of domestic transport by transport mode, motor vehicles took high percentages for both passenger and freight transport. Passenger transport excluding the transport of motor vehicles for private use for the fiscal year 2012 assigned the biggest share (78.9% of passengers, and 72.5% of passenger-kilometers) to railways. motor vehicles came in the second with figures of 20.8% and 13.6%, respectively. For maritime transport, the figures were unavailable and for aviation, 0.3% and 14.0 % respectively.

For freight transport in the same year, 91.4% of the tonnage and 51.3% of ton-kilometers were completed by motor vehicles. Those figures are 0.9% and 5.0% for railways, 7.7% and 43.4% for coastal shipping, and 0.0% and 0.2% for aviation; so the percentage of motor vehicles share was the highest. With alteration of the method of investigation and aggregation in the fiscal year 2010, the share of motor vehicles passenger transport decreased drastically from the shares of 65.5% and 57.2% respectively in the fiscal year 2009. The shares of railways in the same year were 34.3% and 35.7%.

Historically, the ship and railway have been major modes in the first stage of modern transport in Japan. It was after World War II that motor vehicles and aircraft came into popular use. In the fiscal year 1960 (more than half century ago), for passenger transport, the percentage of railway share was 60.6% for the number of passengers and 75.8% in passenger-kilometers — considerably higher than the percentage of motor vehicles share (38.9% for the number of passengers and 22.8% in passenger-kilometers). But in freight transport, the share in tonnage was 75.4% even in the fiscal year 1960. However, in ton-kilometers for the same year, it was only 14.9%; 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 percentage of coastal shipping share was close to 50% until it yielded first place to motor vehicles in the fiscal year 1985. 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, there are passenger vehicles 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. 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) to transport passengers (or freight) on request. Private use vehicles are defined as passenger vehicles other than those used for commercial use. A

Arterial road network of Tokyo region with 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 the combined lists of "motor vehicles registered" and "light motor vehicles."

In freight transport statistics, motor vehicles are divided into those for commercial use and those for private use. Recently, both in terms of tonnage and in terms of ton-kilometers, there has been an upward trend in commercial use percentages. This is because commercial transport, which has a higher load factor, is now offering customized services that make it competitive with private transport.

## 2. Transition of Japan's transport policies

One of the biggest changes in policies regarding roads, which are playing an important 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., gasoline tax) had been used for road improvement, to the general revenue fund (more about those in Chapter 4). Here, 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, exercised uniform management at nationwide. Due to the inefficiency of the nationwide organization and the mismanagement of the public corporation, an enormous deficit had accumulated. The major reform that was finally brought about was the regional division and privatization of Japanese National Railways in April 1987. Honshu was divided into three areas (East, Central, and West Japan) served by three railway companies; one company was allotted to each island of Hokkaido, Shikoku, and Kyushu. The management form of the companies was decided upon as joint stock.

Traditionally, private railway companies, mainly in metropolitan areas, played a greater role in Japan compared to 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 for passenger transport service 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 people can buy commercial goods through multi-purpose magnetic tickets (SUICA, etc.) in those facilities. That separation system was also implemented for the super express railway train, Shinkansen when the Japanese National Railways was reformed.

Hokuriku Shinkansen

Source: Institute of Transportation

The freight railway company was created as a single company for the whole country. It didn't own railroad tracks, or the separation system of operation and infrastructure was adopted.

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 industry since World War II. After further mergers of the core companies among those six groups, there are now three major companies — Nippon Yusen Kaisha, MO Lines, and Kawasaki Lines. These three major companies account for about 70% of the total income in ocean shipping.

In 2013, the Japanese merchant marine fleet transported 10.3% of the world's cargo by volume. However, when it comes to the nationality of a ship, the number of 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 ranking of ports in Japan is getting lower and lower. In terms of the volume of containers handled, the Port of Tokyo dropped to the world's 28th in 2014. The Japanese government is attempting to get out of this situation by pushing for the improvement of the ports in the Tokyo-Yokohama and the Osaka-Kobe areas, utilizing their favorable 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 with a view to promote 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 (bankrupted in 2015), 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. In reality then-existing companies were the 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 consisted of the two major companies. Finally, Japan Airlines, which had been suffering from deficit after the merge, fell into bankruptcy in January 2010; it is now reorganized and re-listed on Tokyo Stock Exchange.

As of April 2014, there are 82 airports that conform to the Airport Law. The three airports that are used for international air transport —Narita, Shin-Kansai, and Chubu — are structured as joint stock companies. Tokyo (Haneda) international airport is 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 yearly slot number 220,000. Tokyo (Haneda), which has been used for domestic transport, has four runways (3000, 3000, 2500, and 3120 meters) and total slot 350,000 per year. From October 2010, an international flight service was also reopened. Ultimately, the total yearly number of slots at Narita and Haneda airports together is projected to be 747,000 plus max. 79,000.

## 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 8.7% of the total work force. Income from shipment of its products is 17.8% of the total income from all shipments. The automobile industry shares less than 30% of all capital investment, and its share in the research and development is 21.4%; it is indeed the driving force of Japan's economy. Led by Toyota, Nissan, and Honda, there are 14 motor vehicle manufacturers.

Until 2008 more than 10 million four-wheels vehicles had been produced per year, but

in 2009 the number of the vehicles produced fell to 7.9 million, then after recovered to 9.8 million in 2014. Since 2005, the number of motor vehicles owned has been over 75million. Though its recent trend is downward, still the number of passenger cars is increasing slightly; as of December 2012, it was 58 million. In 2009, the number of people who had a driver's license was 82 million that signified Japan entered an era in which everybody drives.

Though Japan's automobile industry are now facing the severe situation, 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 successful in reducing greenhouse gas emission and regional air pollution. By 2013, the average mileage of a gasoline-powered motor vehicle had been improved to 21.3 kilometers per liter; the reduced amount of emissions conforms to the world's strictest regulatory standard. Japanese FCV MIRAI was set to be sale in December 2014. 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 cannot by themselves reduce the number of traffic accidents, still the annual number of fatalities (4113 persons in 2014) has decreased for 14 years running.

MIRAI

Source : TOYOTA

On the negative 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 2015, the mot 8.7% (8.3 billion yen) of the total revenue from taxes. The purchaser's initial tax burden is heavy as per international standards (motor vehicle tax, motor vehicle tonnage tax, and motor vehicle purchase tax).

Motor vehicle transport policies are trending toward deregulation. Private motor vehicles are by far the biggest number of motor vehicles owned (in 2012 percentage breakdown of motor vehicles in private use: passenger cars: 99.7% of ordinary cars, 99.2% of small cars; buses: only 20.6% of ordinary buses, but 80.0% of small buses; trucks: 63.3% of ordinary trucks, 98.0% of small trucks). Although business activities are not permitted to use private motor vehicles, such illicit activities still exist. 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.

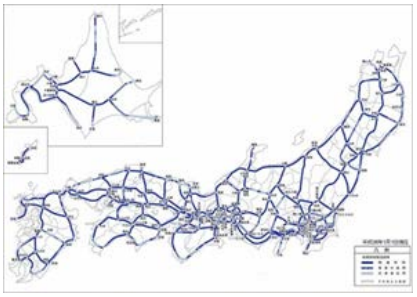
As for commercial motor vehicles that provide transport services, in 1998, the Ministry of Transport (reorganized as the present Ministry of Land, Infrastructure, Transport and Tourism) announced its intentions to basically abolish the regulations and entrust market mechanism in supply-demand adjustment. Pursuant to that policy, access to the business shifted from a licensing system to a permit system. As far as fare regulations were concerned, but bus business is only required to provide advance notification of fare changes.

With the taxi business, the authorization system remains, but the criteria for authorization are now limited to the upper and lower 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 for the business is self-regulation through competition in the market

## 4. Japan's road policies

Because Japan really had no era of coach transport and there was an abrupt shift from transport on foot to motor vehicles, there were insufficient road capital stocks to accommodate automobile transport. The situation of those days is characterized in the

Expressway network



Source: Ministry of Land, Infrastructure, Transport and Tourism. Tohoku Regional Development Bureau

Arterial road network of Tokyo region with 9 radial and 3 ring roads


Source: Ministry of Land, Infrastructure, Transport and Tourism. Kanto Regional Development Bureau

report of the Watkins Commission (1956), which made a feasibility study for the (requested by the Japanese government, which was inquiring the expressway plan). In expressway between Nagoya and Kobe 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 policies. 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.

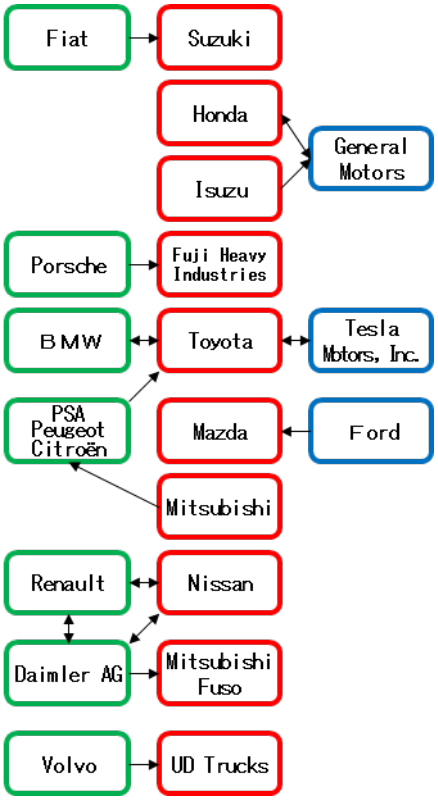
Toll roads were built and managed by four public corporations that included the Japan Highway Public Corporation (founded in 1956). As part of new initiative program, started in 2002, for streamlining special public corporations, privatization of these corporations was considered. In 2005, the four road-related 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. Now those experiments come to end.

As of May 2015, the total length of Japan's expressways is 8,190 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).

Nevertheless, in the face of those advantages, the financial authorities acted 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

**Partnership between Japanese, U.S. and European Automakers**



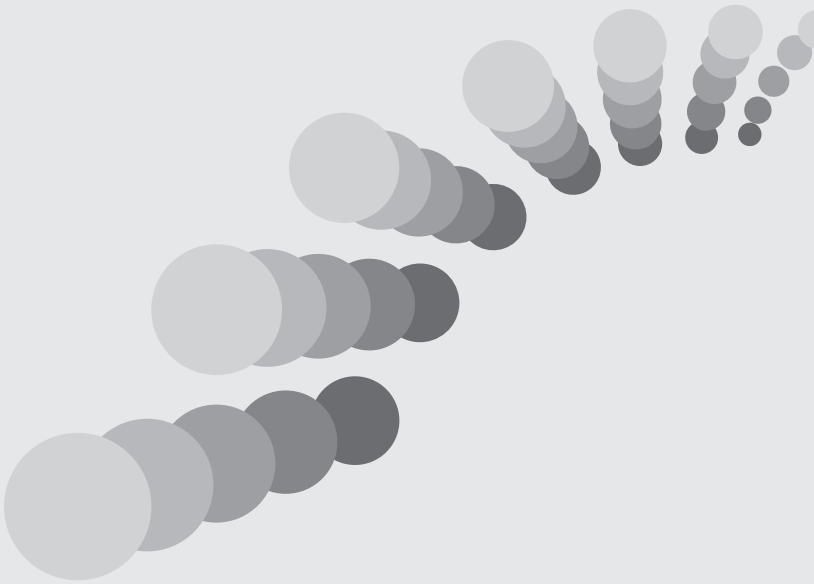

Source: Editing based on JAMA information

transferred to the general revenue fund for the fiscal year 2009. The political process of extremely complicated; 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 has been 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.

# Transport Today



# 1-1 Mobility Changes in Quality and Quantity

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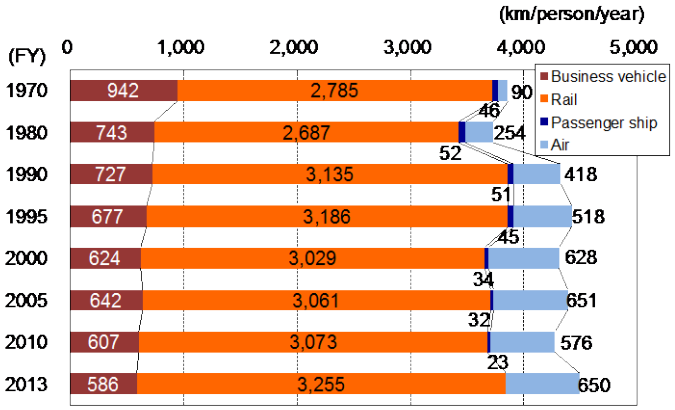
**Kiyoshi Takami**

This section shows the basic statistics on the recent trends of passenger and freight transport. Regarding the passenger transport, the distance traveled per capita has risen and fallen in a cyclic manner, and the per capita vehicle-kilometers travelled by private cars has begun to increase again after remaining flat briefly. From the latest nationwide person trip survey, interesting trends are observed such as increases in the trip generation rate of the elderly and in the car modal shares for the elderly and females, rise in the number of private trips, and decrease in the car modal share for young males.. Regarding the freight transport, both tonnage and ton-kilometer transported per capita have decreased for the last several decades.

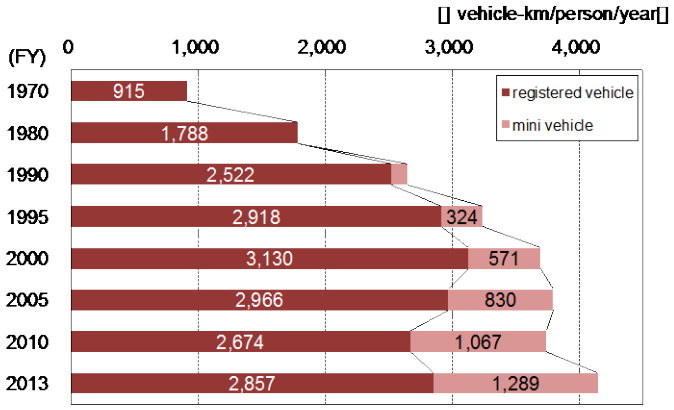
□ The distance traveled per capita by commercial vehicles and passenger ships has been decreasing for a long time, while that by rail recorded the highest in FY 2013. On the other hand, the per capita vehicle-kilometers travelled by private cars began to increase again recently, after it stopped increasing in the latter half of 2000s.

**Fig. 1 Annual distance traveled per capita**




Note: Corrected and estimated values are included. Data on the passenger ship in FY 2013 is missing.
Data source: Transportation-related statistics (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 2 Annual per capita vehicle-kilometers traveled by private cars**




Note: Statistics on light vehicle did not exist before FY 1986. Corrected and estimated values are included.
Data source: Transportation-related statistics (Ministry of Land, Infrastructure, Transport and Tourism)

□ The freight tonnage and ton-kilometers transported have been decreasing since 1990s and 2000s, respectively. In regards to the latter, ton-kilometers by freight vehicles turned downward and those by coastwise vessels turned upward around FY 2010.

**Fig. 3 Annual freight tonnage transported per capita**

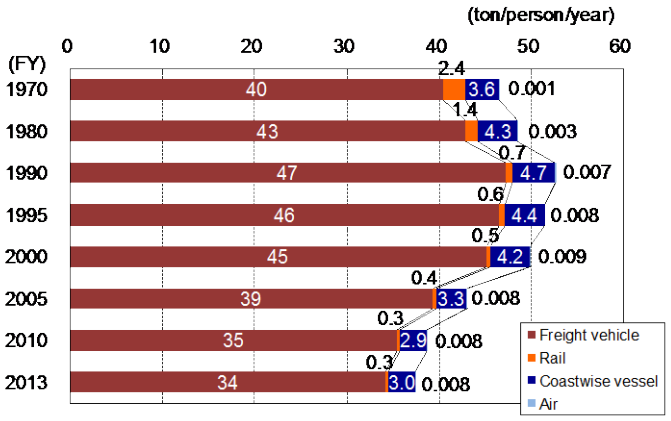
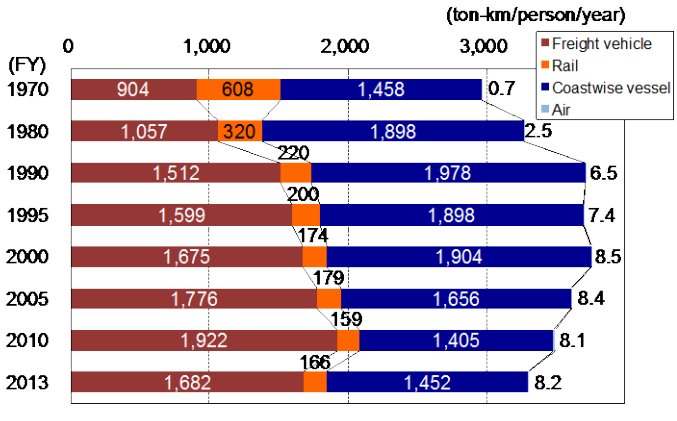


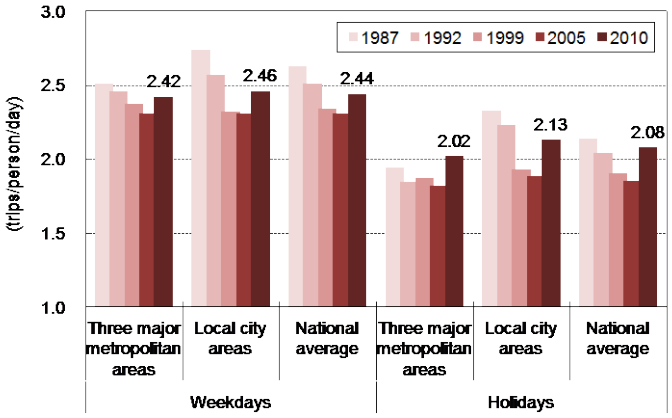

**Fig. 4 Annual freight ton-kilometers transported per capita**




Note: Freight vehicles do not include private light vehicles in any year, and include business mini vehicles since FY 1987. Corrected and estimated values are included.
Data source: Transportation-related statistics (Ministry of Land, Infrastructure, Transport and Tourism)

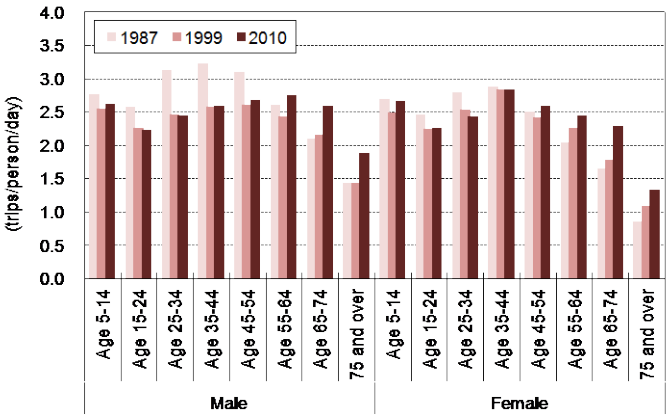
□ Regarding the travel behavior characteristics, it is striking that the trip generation rate of the elderly has been increasing, while that of the young to middle-aged shows an opposite trend. Car modal shares of the aged and the female have been rising especially in local city areas, in contrast to that of the young male showing the downward trend.

**Fig. 5 Trip generation rate**



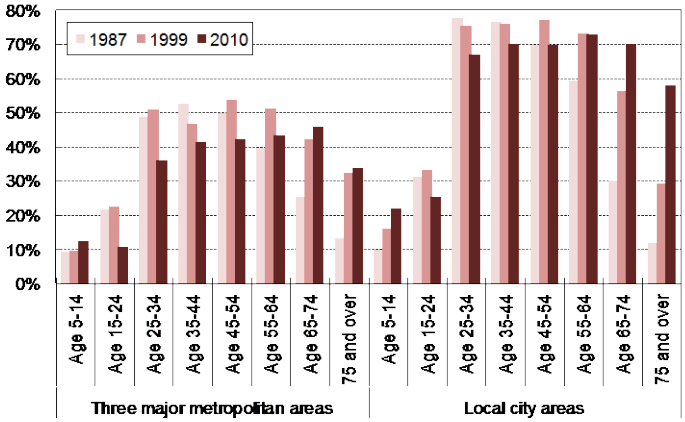

Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 6 Trip generation rate by age-group (nationwide, weekdays)**



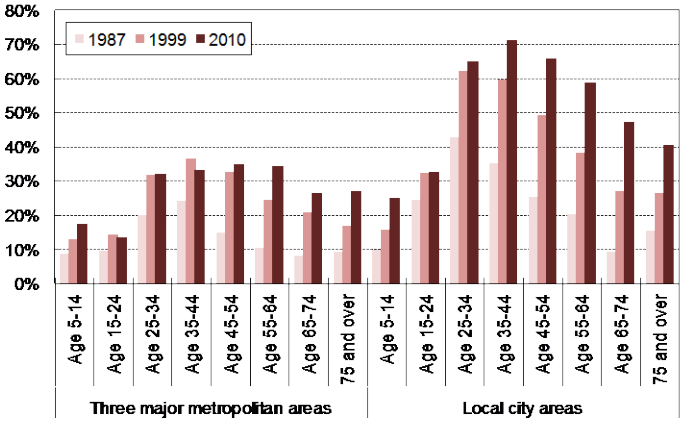

Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 7 Modal share of car by age-group (male, weekdays)**



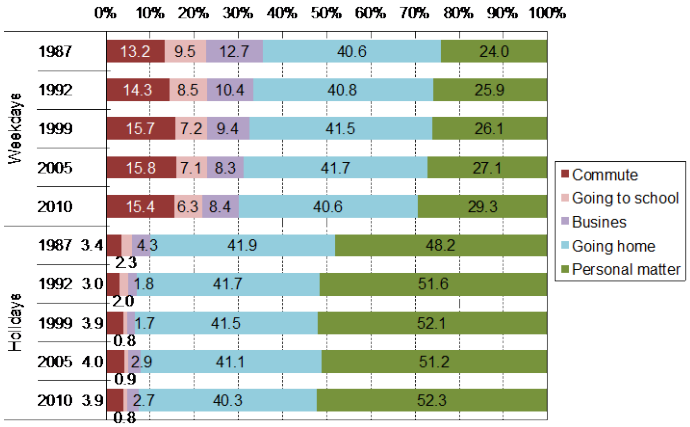

Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 8 Modal share of car by age-group (female, weekdays)**



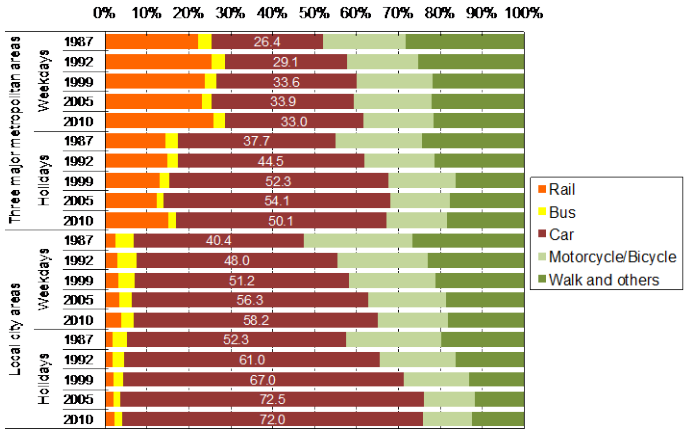

Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 9 Composition of trip purposes (nationwide)**




Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

**Fig. 10 Modal share (representative modes, all purposes)**




Data source: Nationwide Person Trip Survey (Ministry of Land, Infrastructure, Transport and Tourism)

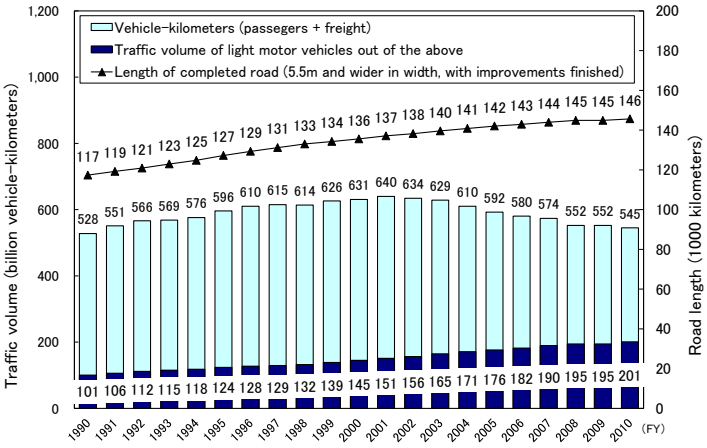
# 1-2 Road Network Today

Director, Transportation Research and Planning Division,
The Institute of Behavioral Sciences
Tsutomu Yabe

Thanks to the steady road maintenance and improvement, a firm growth in the length of roads in Japan has been seen. However, the road networks still do not seem to be sufficient for traffic demand. As a result, the average traffic speed on roads remains unchanged at a lower level. A case in point: in city centers of Tokyo and Osaka, and in DID (Densely Inhabited District) areas, there is still chronic traffic congestion. Given that background, road network improvements (e.g., ongoing ring road improvement plans in the major metropolitan areas) are obviously will play significant role. In January 2015, the road subcommittee proposal of Panel on Infrastructure Development has put together a policy (Fundamental policy for "Smart use of infrastructure" with a focus on expressways) for the effective and efficient use of the expressway network and the fare structure within the metropolitan areas.

## Fig. 1 Changes in traffic volume and road length

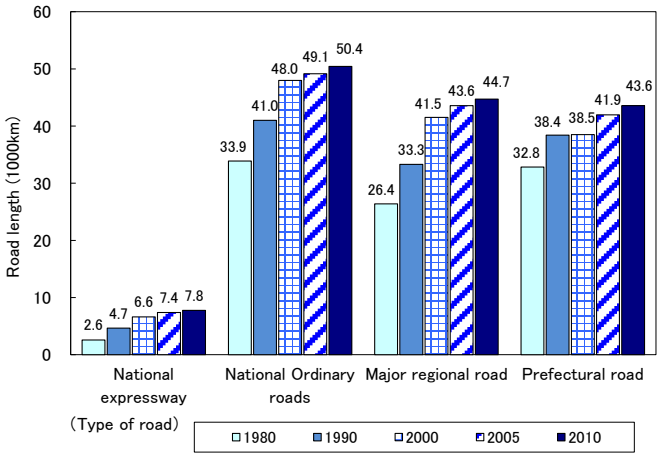
■ Traffic volume in vehicle-kilometers, is on a downward trend after peaking in 2001; but the traffic volume of light motor vehicles is on an upward trend. Road length nationwide is steadily increasing.




Source: Transportation-related Statistics Data Collection (Transport Research and Statistics Office, Information Policy Headquarters, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

## Fig. 2 Changes in the length of completed roads by road type

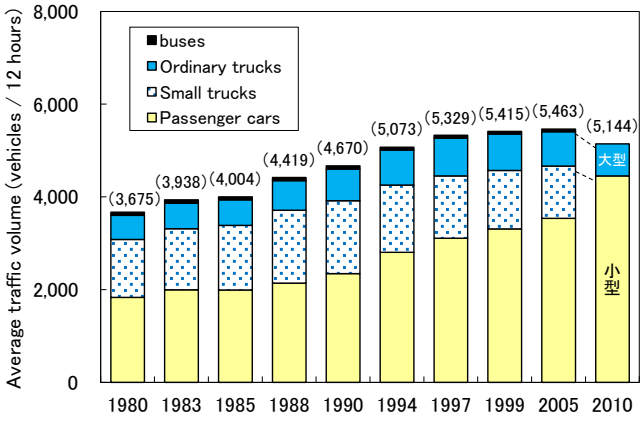
■ For all types of roads, the length of completed roads (i.e., with improvements completed) is increasing steadily.




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

## Fig. 3 Average 12-hour traffic volume on ordinary roads by vehicle type

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



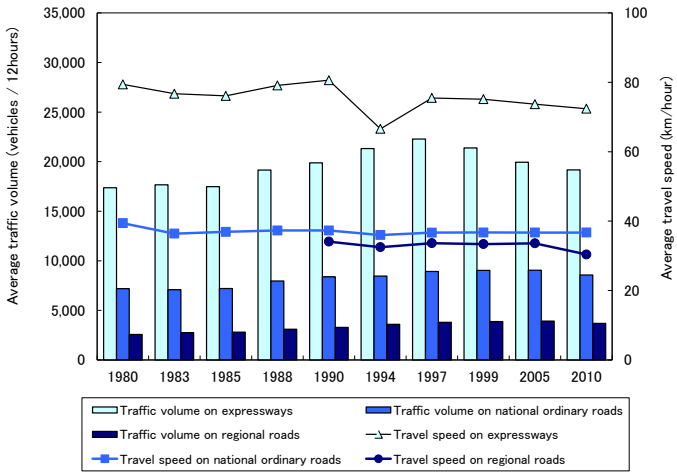

Note: Figures in parentheses are the average traffic volume of all types of vehicles

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

Note: For 2010, the types of vehicles are Small (Passenger cars and Small trucks) and Large (Ordinary Trucks and Buses)

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

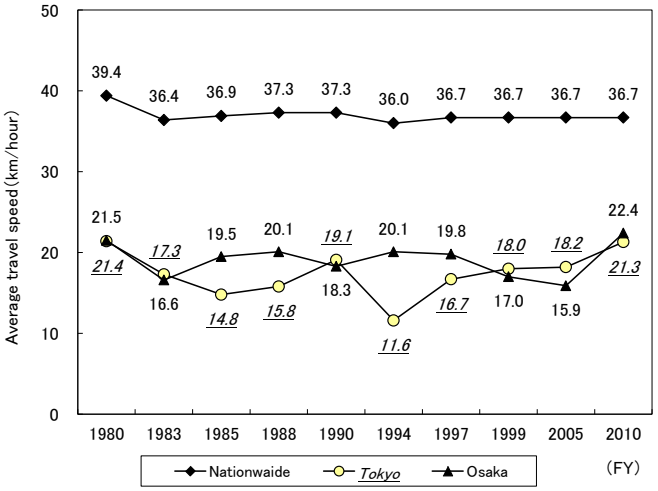
■ The average traffic volume on expressways has been on a downward trend since 1997, partly because the newly constructed ones have less traffic. However, traffic is on an upward trend for national ordinary roads and regional roads. The average travel speed on the either type of road remains almost at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




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

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

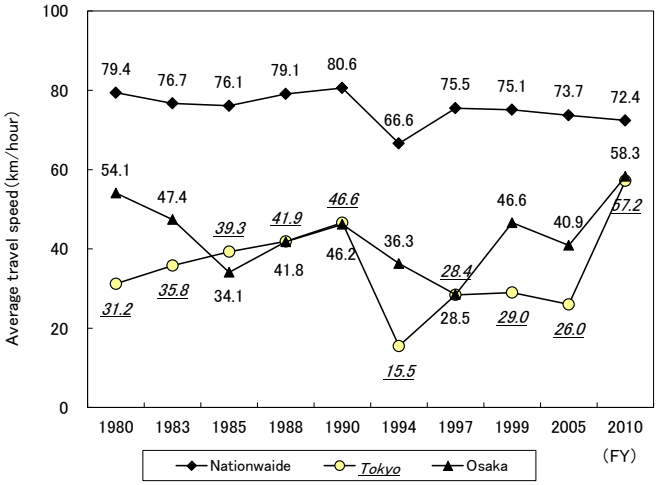
■ There have been almost no changes in the nationwide average. The average travel speed in the wards of Tokyo and in Osaka City is about half of the nationwide average; there is still severe traffic congestion.




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

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

■ The nationwide average has been on a slightly downward trend. Though there had been changes in the average speeds in the wards of Tokyo and in Osaka City, both of the speed levels remain lower than the nationwide average.




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

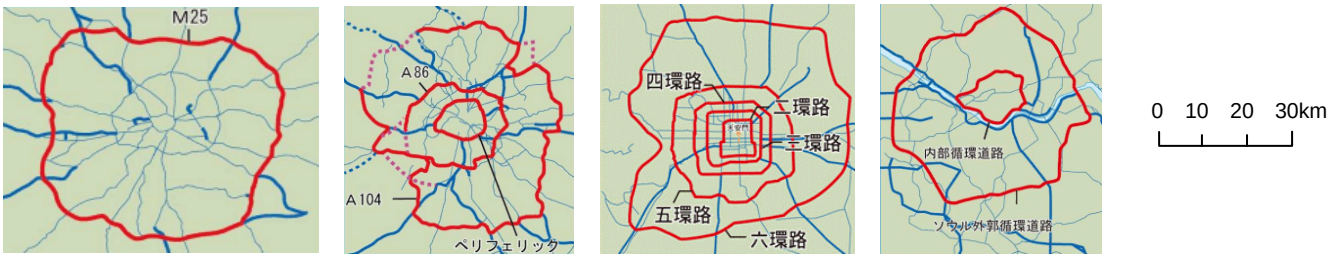
Note: For expressways in Tokyo and Osaka, the Metropolitan Expressway and Hanshin Expressway include segments managed by NEXCO.

## Fig. 7 National comparison of expressway network conditions

■ Many cities have implemented ring roads, and the construction is completed in London, 90% done in Paris. For major cities in Asia (Beijin, Seoul), it is almost completed as well.
In Tokyo, to make alternative expressway routes, the policy for "Smart use of infrastructure" with a focus on expressways is being introduced (e.g. metropolitan expressway Shinagawa-line, Ken-O expressway).

(Tokyo) (Osaka) (Nagoya)


(London) (Paris) (Beijing) (Seoul)




Source: Website of Ministry of Land, Infrastructure, Transport and Tourism, Kanto Regional Development Bureau (July, 2015)

# 1-3 Road Freight Transport Today

Professor, School of Commerce,
Senshu University
**Eiichiro Iwao**

Road freight transport today has several features. For ordinary trucks in commercial use, the freight transport ton-kilometers have been on a downward trend in recent years. However, the freight tonnage transported had increase from 2009 to 2011.On the other hand, ordinary trucks in private use, the freight transport ton-kilometers and the freight tonnage transported have decreased in recent years. 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 the road freight transport is shifting from private trucks to commercial trucks.

Also, package and mailing delivery, as well as regular parcel post delivery, are increasing. This indicates that small-lot freight transport is on the rise.

□ Freight transport ton-kilometers of ordinary trucks in commercial use has decreased from 2007. The total freight tonnage had increased up to 2009. However, in 2012, it started to decline.

**Fig.1 Changes in freight ton-kilometers by vehicle type**

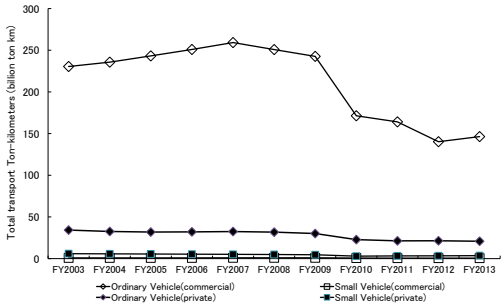
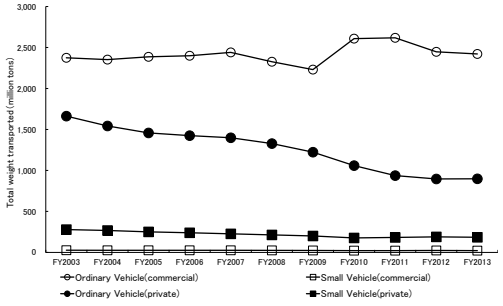


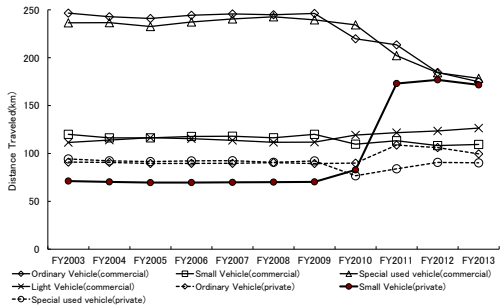

**Fig.2 Changes in the freight tonnage by vehicle type**




Note: It does not include data of Hokkaido District Transport Bureau and Tohoku District Transport Bureau for March and April 2011

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

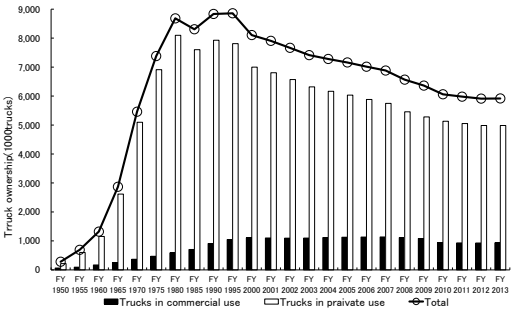
**Fig.3 Changes in distance traveled per day worked per vehicle by vehicle type(private vs. commercial)**




Note: ditto. Note of Figure 1

Source : ditto. Source of Figure 1

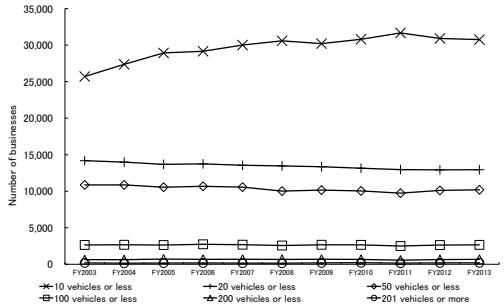
**Fig. 4 Changes in private and commercial truck ownership**




Note: ditto. Note of Figure 1

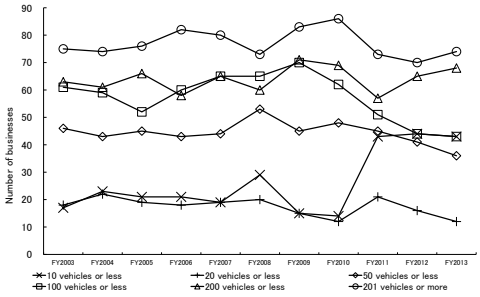
Source：Transportation-related Statistics Data collection(Information Policy Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

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




Source：ditto. Source of Figure 4

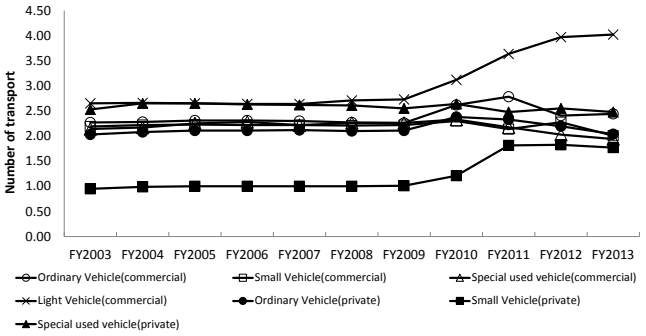
**Fig. 6 Number of freight businesses by the number of vehicles owned (general freight services)**




Source：ditto. Source of Figure 4

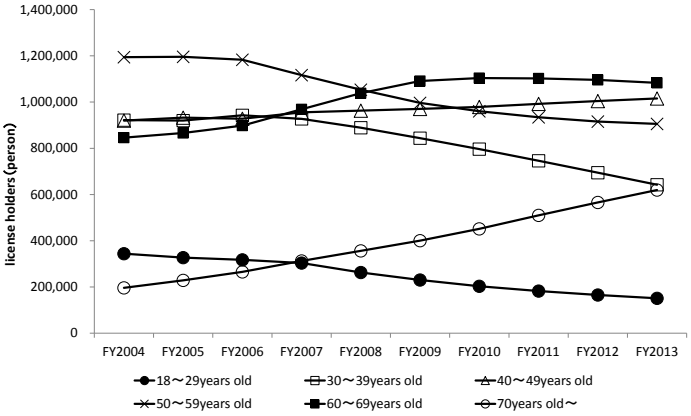
■Number of transport per light commercial truck per day has increased since 2009.

**Fig.7 Changes in the number of transport per truck per day**



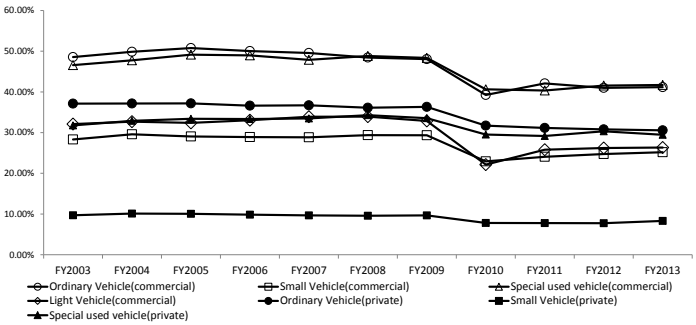

Note: ditto. Note of Figure 1
Source：ditto. Source of Figure 1

**Fig.8 Changes in the license holders of large size vehicles**



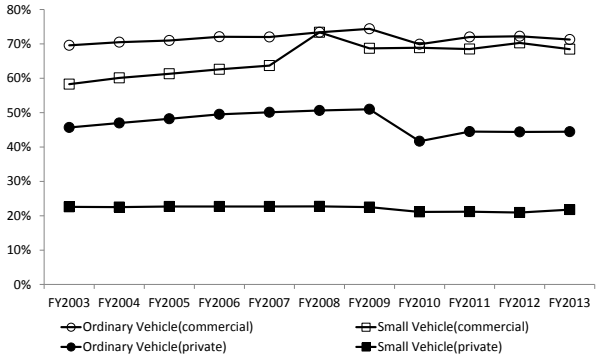

Source：Driver's license statistics (National Police Agency)

**Fig.9 Changes in loading ratio by vehicle type(private vs. commercial)**




Note: ditto. Note of Figure 1
Source：ditto. Source of Figure 1

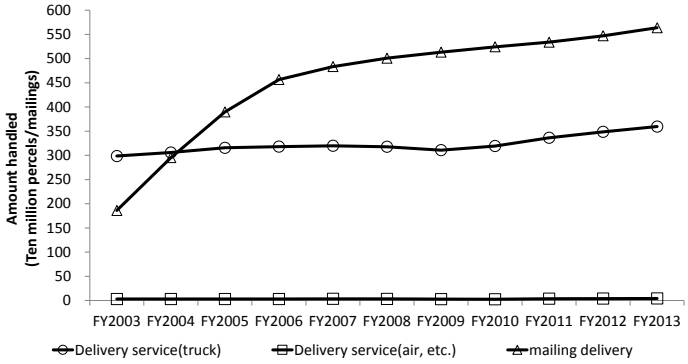
**Fig.10 Changes in the ratio of actual travel distance by vehicle type (private vs. commercial)**




Note: ditto. Note of Figure 1
Source：ditto. Source of Figure 4

■Delivery service volume by trucks had declined from 2007 to 2009 and has increased subsequently. In addition, the growth rate of mailing delivery volume has decrease since 2006.

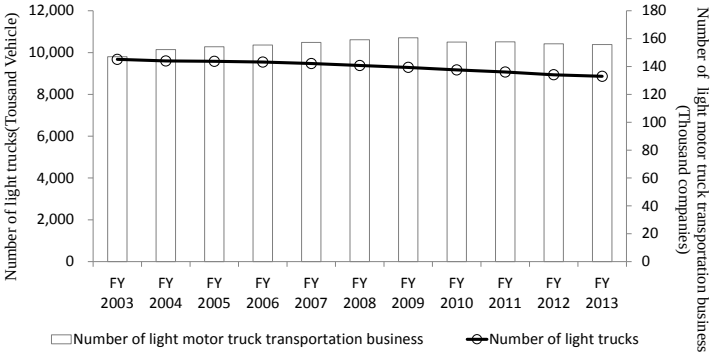
**Fig.11 Changes in the amount of package and mailing delivery, as well as regular parcel post delivery**




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

■The number of light trucks has decreased since 2003. On the other hand, the number of light motor truck transportation businesses had increased from 2003 to 2009. However, it was on a downward trend subsequently

**Fig12.Changes in the Number of light trucks and light motor truck transportation business**




Source：ditto. Source of Figure 4

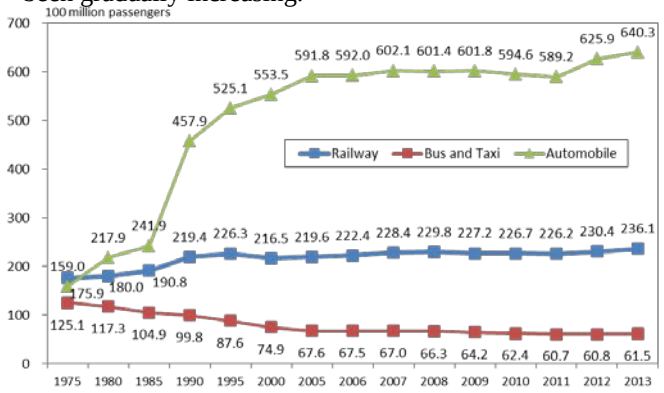
# 1-4 Public Transport Today

Associate Professor, the Faculty of Economics
Ryutsu Keizai University
**Kazuya Itaya**

In recent years, downward trend in the use of public transportation tends to stop. On the other hand, the use of private cars is on a recovery trend. From the statistical data, it can be said that the mobility in Japan has improved overall. In the three major metropolitan areas the utilization of railway is increasing. But the congestion rate of trains has continued to decline. In the Chukyo(Nagoya) and Kansai(Osaka) areas, congestion is being relieved. On the other hand, the bus business has become unprofitable for a long time. Therefore community buses have continued to increase. As a whole, the public transport safety has been maintained.

**Fig. 1 The number of passengers of railways and buses**

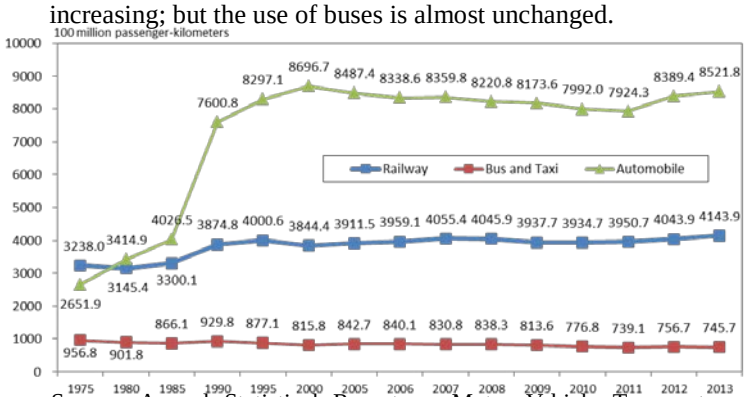
■In the last two years, the use of railways and buses has been gradually increasing.




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

**Fig. 2 Railway and bus passenger-kilometers**

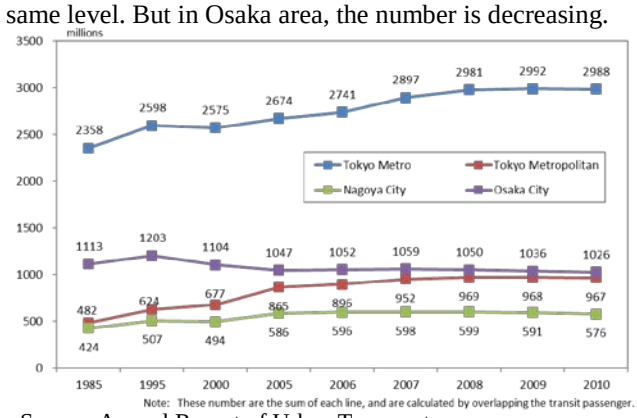
■In recent years, the use of railways has been gradually increasing; but the use of buses is almost unchanged.




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

**Fig. 3 The number of subway passengers in the three metropolitan**

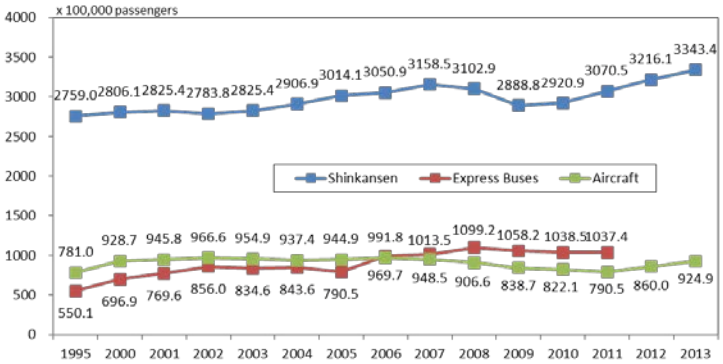
■In Tokyo and Nagoya areas, the number remains at the same level. But in Osaka area, the number is decreasing.




Source: Annual Report of Urban Transport

**Fig. 4 The number of intercity passengers, by mode**

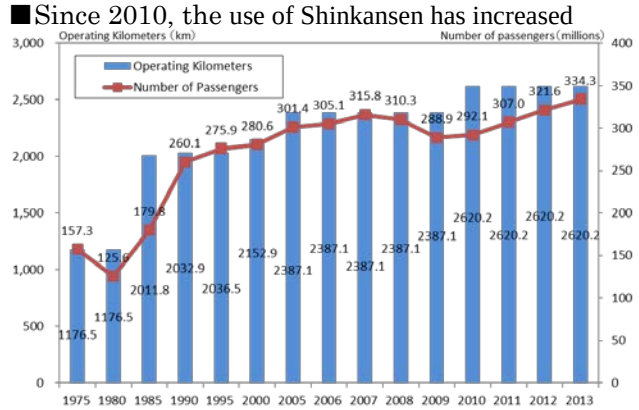
■The use of Shinkansen, aircraft and express buses continues to increase.




Source: Annual Statistical Report on Railway Transport; Annual Statistical Report on Air Transport, Bus Business in Japan

**Fig. 5 Operating kilometers and number of passengers of Shinkansen**

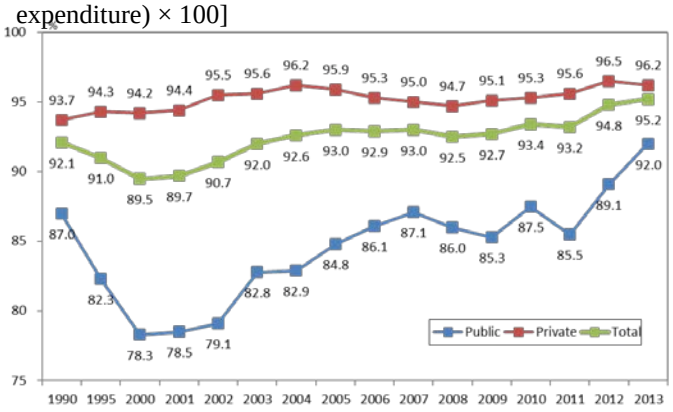
■Since 2010, the use of Shinkansen has increased




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

**Fig. 6 Bus industry income vs. expenditures**

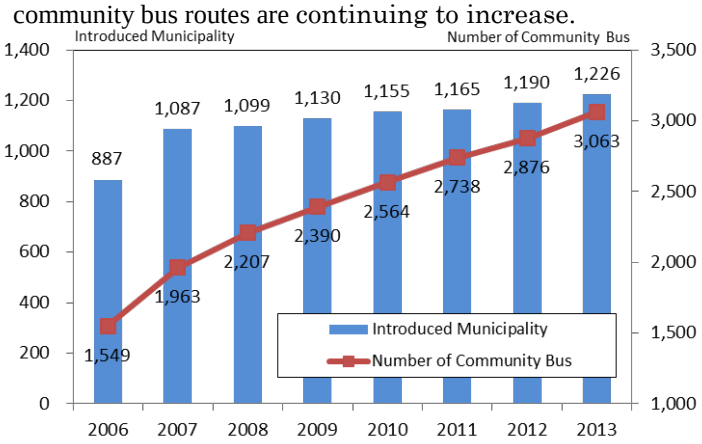
■In the past 20 years, the balance ratio overall has never exceeded 100. [Balance ratio = (current income / current expenditure) × 100]




Source: Bus industry income and expenditures

**Fig. 7 Trend of community bus**

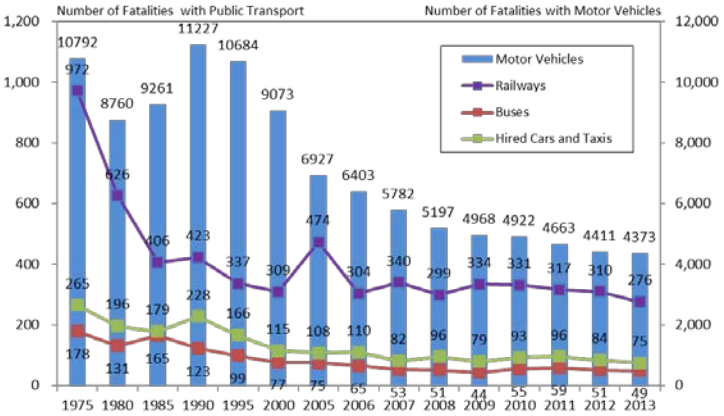
■Mainly in the areas where bus operators withdrew, the community bus routes are continuing to increase.




Source: White Paper on Transport Policy 2015, Fig1-57

**Fig. 8 The number of traffic fatalities with public**

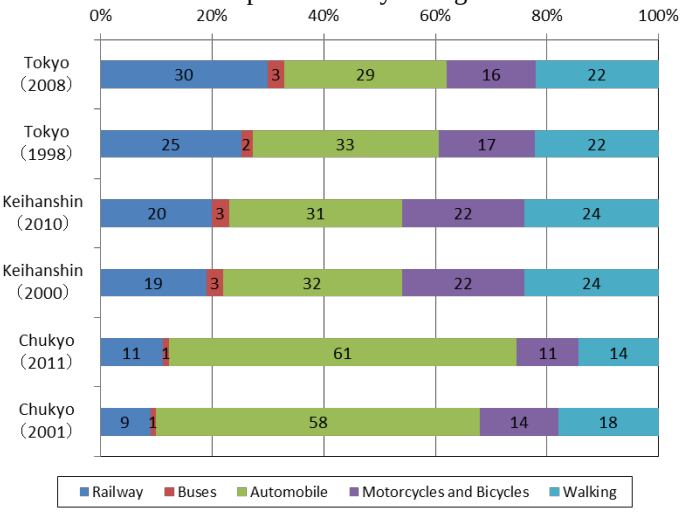
■The numbers of fatalities with buses, hired cars, and taxis continue to decrease. Compared to the number of traffic fatalities with motor vehicles (4373 in FY 2013), public transport safety is outstanding.




Source: (Railway and Automobile): White Paper on Traffic Safety in Japan, (Bus, Hired Car and Taxi): Statistics on Traffic Accidents of Motor Vehicles for Business Use

**Fig. 9 Modal share in the three metropolitan areas**

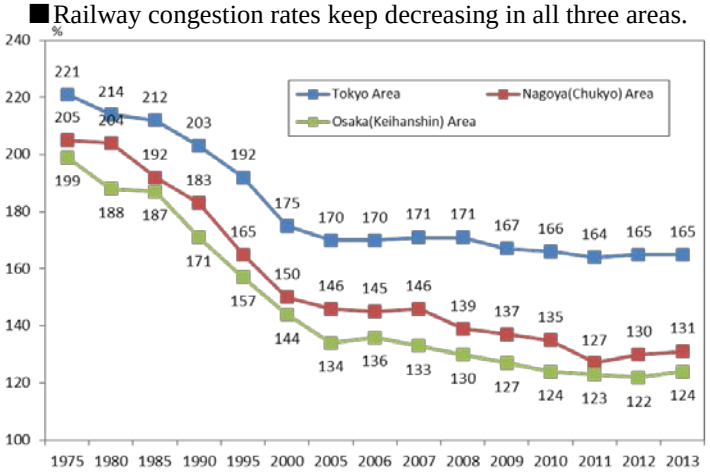
■The use of railway tends to increase and automobile tends to decrease compared to ten years ago in each area.




Source: Urban Area Person Trip Survey Results in Tokyo, Osaka (Keihanshin) and Nagoya (Chukyo) Area

**Fig. 10 Railway congestion rates in the three metropolitan areas**

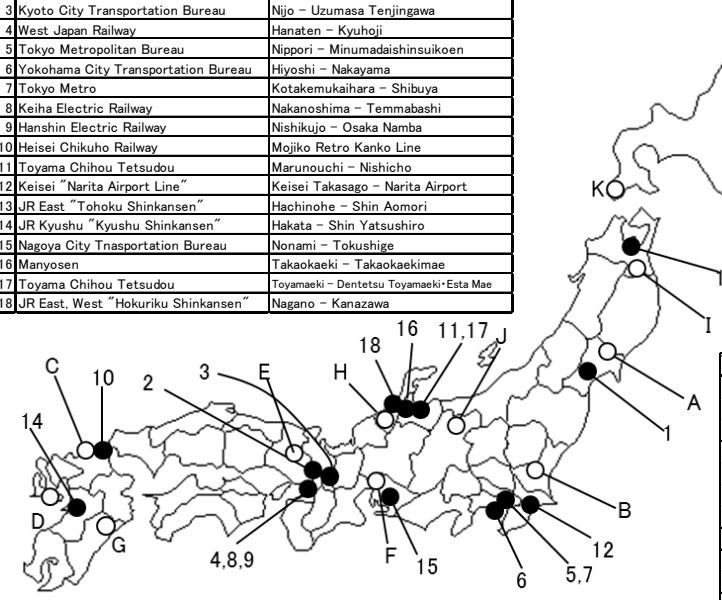
■Railway congestion rates keep decreasing in all three areas.




Source: Railways 2015: the numbers

**Fig. 11 Newly-established / discontinued railway lines**

| | 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 Metropolitan Bureau | Nippori – Minumadaishinsuikoen |
| | 6 | Yokohama City Transportation Bureau | Hiyoshi – Nakayama |
| | 7 | Tokyo Metro | Kotakemukaihara – Shibuya |
| | 8 | Keiha Electric Railway | Nakanoshima – Temmabashi |
| 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 "Narita Airport Line" | Keisei Takasago – Narita Airport |
| | 13 | JR East "Tohoku Shinkansen" | Hachinohe – Shin Aomori |
| 2011 | 14 | JR Kyushu "Kyushu Shinkansen" | Hakata – Shin Yatsushiro |
| | 15 | Nagoya City Tnasportation Bureau | Nonami – Tokushige |
| 2014 | 16 | Manyosen | Takaokaeki – Takaokaekimae |
| 2015 | 17 | Toyama Chihou Tetsudou | Toyamaeki – Dentetsu Toyamaeki・Esta Mae |
| | 18 | JR East, West "Hokuriku Shinkansen" | Nagano – Kanazawa |




■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 2015

Newly-established lines：●

Discontinued lines：○

Source: Author's investigation

| | No. | Name and Section of Discontinues 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 |
| 2012 | I | Towada Kanko Dentetsu | Misawashi – Towadashi |
| | J | Nagano Electric Railway | Yashiro – Suzaka |
| 2014 | K | JR Hokkaido | Kikonai – Esashi |

# 1-5 Recent Trends in New Urban Transport Systems

Professor, Graduate School of Urban Innovation, Yokohama National University
**Fumihiko Nakamura**

New technology has been meeting with the diverse needs of mobility and the responses to policy issues. Vehicle design with advanced technology has been applied to several cases in LRT and BRT. BHLS (Bus with High Level of Service) has been popular in EU. One-way car sharing with electric vehicles has been demonstrated. Bicycle sharing systems have also been innovated to enhance management efficiency. Ropeway systems and escalators have been applied for mobility needs in hilly urbanized areas.

Table 1. Summary of Trends in New Urban Transport Systems

| Modes | Environment, Safety | Social Welfare, Social Inclusion | Planning, landscape |
|---|---|---|---|
| LRT and trams | Low floor and low emission | | No catenary tram |
| BRT and buses | Fuel cell, EVs | Low floor, community buses | Designers' involvement |
| Bicycles | Bicycle sharing | | |
| Automobiles | Car sharing | | |
| Pedestrian support | Personal mobility | | |
| others | | Ropeways, escalators, elevators | |

Fig.1 Catenary-less Tram (Angers, France) (http://www.angers.fr/actualites/photos/)

Fig 2 Catenary-less Tram(Kaohsiung, ROC) (trial run as of July,2015)


Fig.3 Well Designed BHLS vehicle(Nancy, France)

Fig.4 Car-sharing station map ■Stations in Downtown Tokyo (http://www.carsharing360.com/site.html)



Fig.5 One-way EV car-sharing demonstration in Yokohama (http://www.smart-j.com/smaco/)。




Fig.6 One-way EV car-sharing (Auto-lib') (Paris, France)

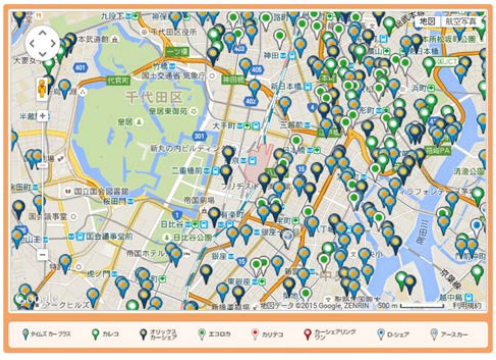



Fig.7 Access elevator of one Condominium opened for public (Briria-City project,Yokohama)) ■ ¥50 for one-ride, paid only by SUICA and Pasmo (altitude 60m)


Fig.8 EV bus (made in China) in London

Fig.9 EV bus(made in China) in Kyoto
(http://www.byd.com/news/news-198.html)

■Batteries on upper spaces on front wheels


Fig.10 Hybrid-bus in Curitiba (Br)

Fig.11 EV minibus in Luag Phanbang (Laos)) (made by Japanese Manufacturer in The Philippines) (photos by Dr.Kunihiro Sakamoto)

Fig.12 Bicycle sharing system with rack-less station (COGOO in Yokohama National University)
(Photos by Ms.Hanako Kaminokado)

Fig.13 Bicycle-sharing for children (Velib,Paris)
(http://blog.velib.paris.fr/en/ptit-velib/)


Fig.14 Segway for tourism Demonstration in Tateyama (Chiba)
(photo by Prof.Tomoyuki Todoroki)

Fig.15 & 16. Hilly low-income area mobility in Medellin,Colombia
(Ropeways (left) and Escalators (right)

# 1-6 Toward Universally User-friendly transportation

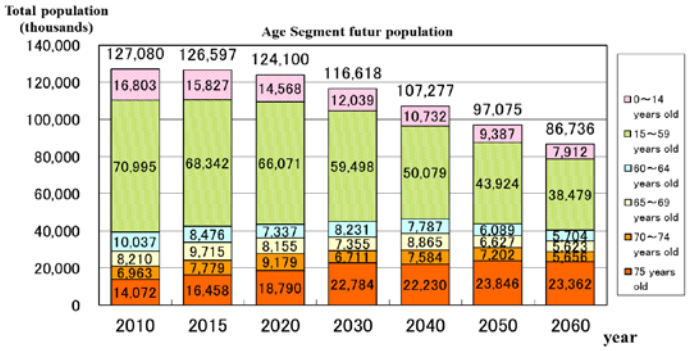
Foundation Promoting Personal Mobility and Ecological Transportation

**Atsushi Matsubara**

Concerning the social situation in which the number of the physically challenged and the elderly is increasing, the formulation of an universally user friendly transport system is strongly believed to be effective for facilitating outings (that ensures better maintenance of good health so that contribute to reduction of medical and health care costs) and maintaining the vitality of communities. Amid increasing the number of the elderly driving accidents, the number of the elderly who voluntarily returned their driving licenses has increased rapidly. Hence, securing the mobility of the elderly has become a challenge. Although, there is a large expectation for personal mobility, possible solutions have been discussed. For example, the case of using golf carts as a way of utilizing existing means of mobility. As a turning point of measures for persons with disabilities, the "Act on the Elimination of Discrimination against Persons with Disabilities" will come into force on April 1, 2016. The development of relevant guidelines has been carried out hastily.

**Fig. 1 Future population by age group**

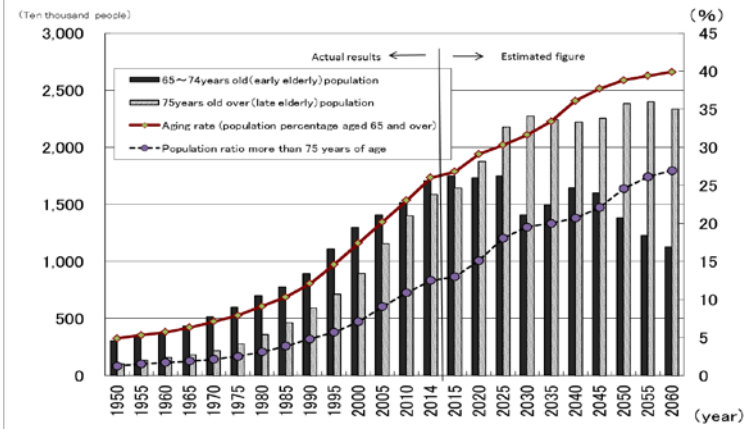
■Japan has been experiencing a population decrease for a long time..




Source: Annual Report on the Aging Society: 2015

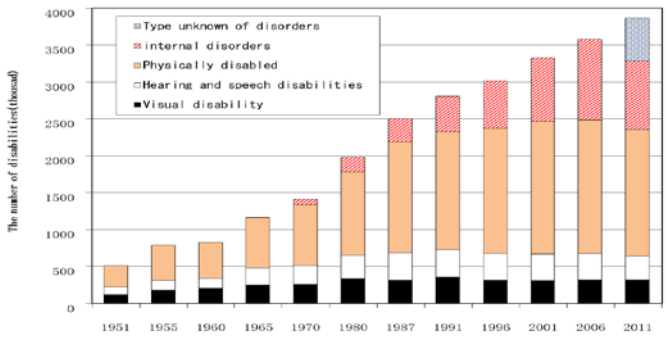
**Fig. 2 Transition of the number of the elderly people**

■The ratio of people over 65 years against total population is 26% in Japan.




Source: 2015 version of "Aging Society White Paper"

**Fig. 3 The number of the persons with disabilities**



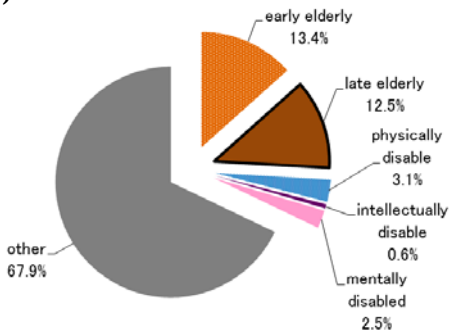

Source: MHLW "in 2011: Survey on the difficulty of life (nationwide home handicapped Survey)"

**Table 1 The number of persons with disabilities at home**

| | Total number | Home's | Facility residents |
|---|---|---|---|
| Physically disabled | 3.94 million people | 3.86million people | 0.07million people |
| Intellectually disabled | 0.74million people | 0.62million people | 0.12million people |
| Mentally disabled | 3.20million people | 2.88million people | 0.32million people |

Source: MHLW " Survey on persons with physical disability" (2006), " Survey on persons with intellectual disability" (2005), " Health Care and Welfare Measures for People with Physical Disabilities" (2013)

**Fig. 4 Breakdown of of Japan's total population (127 million people)**




Including multiple disabilities, the overlap of elderly people and handicapped

Source: Annual Report on the Aging Society: 2015, "2006 Persons with Disabilities Survey", " Survey on persons with intellectual disability" (2005), " Health Care and Welfare Measures for People with Physical Disabilities" (2013)

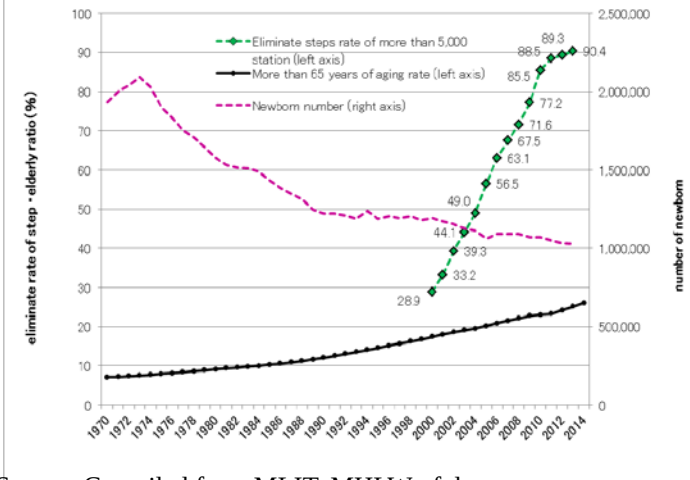
**Table 2 The compliance of standards stipulated in the Transportation Barrier-Free Law**

| | FY 2020 year target | FY 2013 year | Changes from previous year |
|---|---|---|---|
| Railway vehicle | About 70% | 59.5% | 3.7Point increase |
| Low-floor bus | About 70% | 43.9% | 2.9Point increase |
| Welfare taxi | About 28,000cars | 13,978cars | 122cars Increasing |
| Passenger ship | About 50% | 28.6% | 4.1Point increase |
| Aircraft | About 90% | 92.8% | 3.6Point increase |

Source：Compiled from MLIT documents

**Fig. 5 The elimination rate of differences in levels at railway stations**

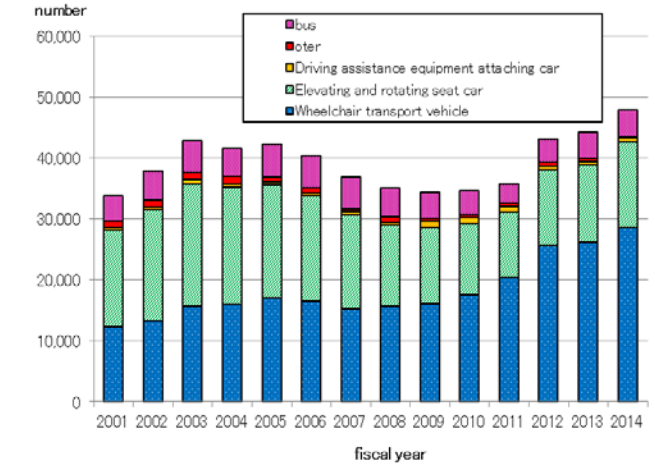
■ Japan's population is aging along with the declining birthrate. Barrier elimination measures have been implemented in the railway stations. The barrier elimination rate is holding steady at 90%..




Source: Compiled from MLIT, MHLW of documents

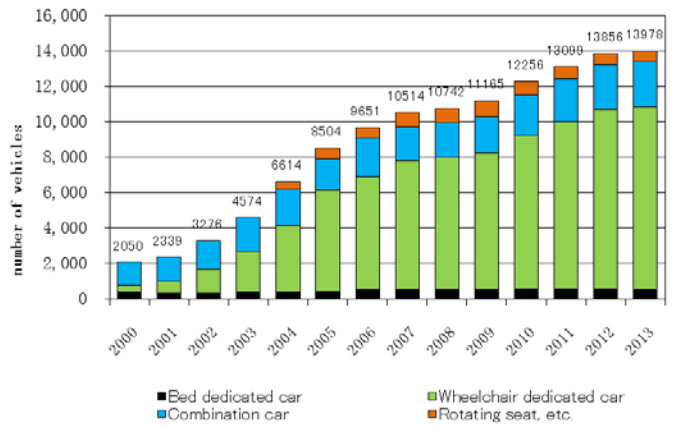
**Fig.6 Trends in the sales of welfare vehicles**

■ The sales of welfare vehicles have updated the maximum number of the past.




Source: Compiled from JAMA documents

**Fig. 7 The number of the welfare taxi**




Source：Compiled from MLIT document

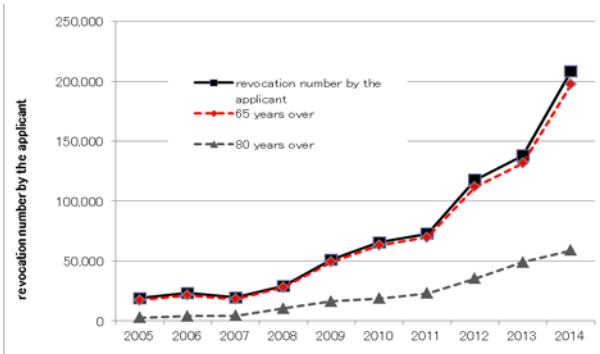
**Table 3 The number of driver license holders by gender and age group**

■ The number of elderly (older than 85) license holders has increased and young license holder have decreased.

| age | 2012 year-end | | 2013 year-end | | 2014 year-end | | 25-26 increase or decrease | |
|---|---|---|---|---|---|---|---|---|
| | man | woman | man | woman | man | woman | man | woman |
| 16～19 | 622,717 | 420,705 | 619,814 | 421,073 | 589,821 | 398,995 | -4.8 | -5.2 |
| 20～24 | 2,670,407 | 2,260,417 | 2,608,167 | 2,212,705 | 2,592,702 | 2,203,596 | -0.6 | -0.4 |
| 25～29 | 3,391,731 | 3,016,663 | 3,294,638 | 2,923,116 | 3,176,756 | 2,811,533 | -3.6 | -3.8 |
| 30～34 | 3,842,294 | 3,498,378 | 3,746,543 | 3,409,564 | 3,671,376 | 3,340,050 | -2.0 | -2.0 |
| 35～39 | 4,618,328 | 4,239,935 | 4,439,665 | 4,076,932 | 4,258,200 | 3,911,443 | -4.1 | -4.1 |
| 40～44 | 4,691,331 | 4,307,671 | 4,787,012 | 4,404,728 | 4,848,704 | 4,466,368 | 1.3 | 1.4 |
| 45～49 | 4,029,832 | 3,670,104 | 4,138,815 | 3,785,029 | 4,229,297 | 3,880,065 | 2.2 | 2.5 |
| 50～54 | 3,706,830 | 3,297,218 | 3,731,217 | 3,343,220 | 3,791,510 | 3,419,943 | 1.6 | 2.3 |
| 55～59 | 3,700,484 | 3,134,417 | 3,647,968 | 3,140,491 | 3,615,288 | 3,157,328 | -0.9 | 0.5 |
| 60～64 | 4,585,396 | 3,573,030 | 4,329,188 | 3,457,864 | 4,035,760 | 3,288,108 | -6.8 | -4.9 |
| 65～69 | 3,563,431 | 2,412,677 | 3,813,644 | 2,704,937 | 4,076,811 | 2,992,346 | 6.9 | 10.6 |
| 70～74 | 2,820,247 | 1,383,096 | 2,985,683 | 1,590,165 | 3,098,451 | 1,747,309 | 3.8 | 9.9 |
| 75～79 | 1,875,068 | 610,264 | 1,901,037 | 661,449 | 1,945,498 | 724,050 | 2.3 | 9.5 |
| 80～84 | 979,343 | 194,567 | 1,031,418 | 224,585 | 1,071,203 | 254,744 | 3.9 | 13.4 |
| 85～ | 339,821 | 31,444 | 388,982 | 40,363 | 428,868 | 50,100 | 10.3 | 24.1 |
| total | 45,437,260 | 36,050,586 | 45,463,791 | 36,396,221 | 45,430,245 | 36,645,978 | -0.1 | 0.7 |

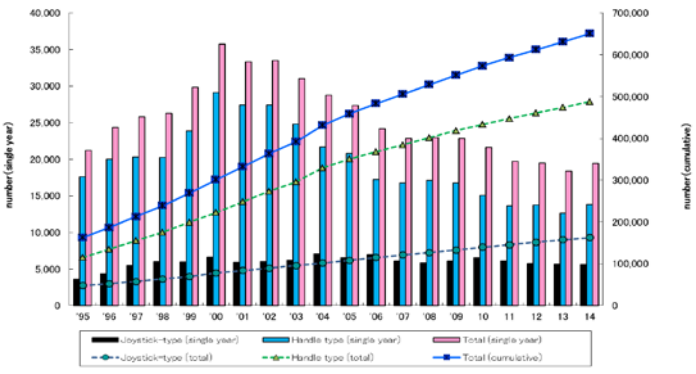
Source：National Police Agency "driver's license statistics 2014 version"

**Fig. 8 The number of persons who voluntarily return their driver's licenses**




Source：National Police Agency "Driver's License Statistics 2014 version"

**Fig. 9 Electric wheelchair shipments**




Source：Electric Wheelchair Safety Promotion Association material

**Fig. 10 Example of using a golf cart to for mobility in town**

■ Wajima city in Ishikawa and Otsuchi chou in Iwate have started to use golf carts with number plates for the mobility of the elderly.(Photo by Professor Minoru Kamata, the University of Tokyo)

# 1-7 The Future of the Transport Infrastructure

Director-General,
The Institute of Behavioral Sciences
Yuichi Mohri

The Basic Act on Transport Policy(Law No.92 of 2013), which establishes responsibilities of the state, local governments and stipulates the basic principles for transport policy and basic matters to realize them, was enacted on November 27, 2013. In addition, based on the Basic Act on Transport Policy, Transport Policy Basic Plan (plan period: 2014～2020) was approved in the Cabinet meeting on February 13, 2015.

The Road Committee of the Panel on Infrastructure Development submitted recommendations for the full-scale maintenance of aging roads on April 14, 2014. In addition, the Committee developed an interim report, which emphasizes efforts for “smart use of roads” regarding expressways on July 28, 2015.

The present conditions of the traffic

Figure 1: Summary of The Basic Act on Transport Policy

■At first, in the Basic Act on Transport Policy, the importance of appropriately satisfying the basic demand of national public for transport is recognized; basic ideas about the transport measure the government need promoting are established such as "realization of the rich life of the people", "enhancement of the international competitiveness", "improvement of the local vitality", and "the correspondence to a large-scale disaster".

In addition, the necessary content of basic measures about the transport for enforcement is established to realize the basic ideas.

Source: Ministry of Land, Infrastructure, Transport, and Tourism, Road Bureau HP http://www.mlit.go.jp/sogoseisaku/transport_policy/sosei_transport_policy_tk1_000010.html

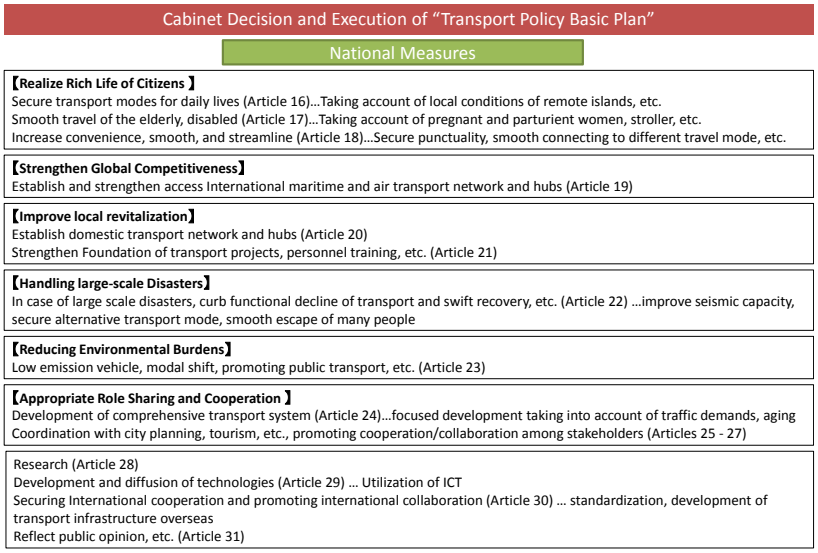



Figure 2: Summary of The Transport Policy Basic Plan

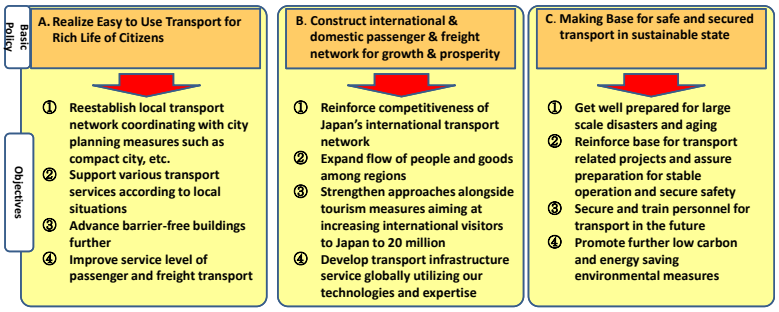
■Based on the Basic Act on Transport Policy, The Transport Policy Basic Plan stipulates transport measures that the government should implement comprehensively and systematically. The Basic Plan is comprised of the following contents:

○Basic directions of the policies on transport. The following three "Basic Policies" are stated based on the Basic Act on Transport Policy.

A. Realization of user-friendly transport that contributes to the rich life of the people

B. Building up the international and domestic passenger transport and logistics networks that create the foundation for growth and prosperity

C. Creation of a foundation of sustainable, secure and safe transport.




○Targets of the policies on transport. Description of the targets with intended achievements within the plan period pursuant to the Basic Act on Transport Policy. In addition, quantitative indicators are set up to assess the level of achievement of the targets.

○The measures on transport that the government should implement comprehensively and systematically. Description of existing measures that need further efforts as well as future measures to be discussed for each target.

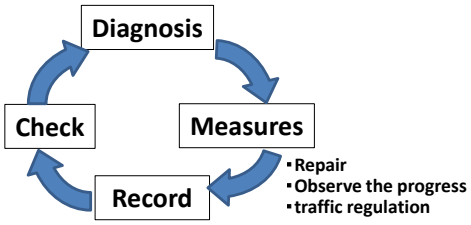
Source: The Road Committee of the Panel on Infrastructure Development,, Transport and Tourism (http://www.mlit.go.jp/sogoseisaku/transport/sosei_transport_tk_000057.html).

Figure 3: Recommendations for full-scale maintenance of aging roads

■For starting the full-scale maintenance cycle for aging roads, it needs to facilitate maintenance of municipal roads by focusing on the following 2 components.

1) Establishment of a maintenance cycle (clarification of the responsibilities of road administrators)

2) Establishment of a mechanism to facilitate the maintenance cycle




Source: The Road Committee of the Panel on Infrastructure Development, Ministry of Land, Infrastructure, Transport and Tourism (http://www.mlit.go.jp/road/road_fr4_000029.html).

Figure 4: Smart use of roads

■In the efforts for " smart use of roads" , it is demonstrated that the function of the whole road network should be utilized to the maximum extent in terms of time and space by the operative improvement or small improvement of existing roads, mainly expressways. As a main concrete action, smooth, safe, usability and regional alliances as well as application of ETC2.0 are listed. In the measure to push forward to support the efforts for the smart use of roads, the following three elements are presented, 1) Reinforcement of the network, 2) Securing the effective and efficient function of roads, 3) Detailed understanding of road traffic conditions. Particularly, existing two traffic lane sections should be improved to 4 traffic lanes, but also some different ways such as effective overtaking lane setting or 3 traffic lanes use as countermeasures for low-speed vehicles should also be considered.

| | |
|---|---|
| Smooth | ① Cancellation of the bottleneck by concentrated measures based on scientific analysis<br>② Shift to the full-scale transportation demand management applied ETC2.0 |
| Safe | ③ Function differentiation with residential road by the further inflection promotion of expressway<br>④ Traffic regulation time is shortest by important points of the preparation depends on becoming it and reinforcement of the cooperation |
| Usability | ⑤ Improvement of the services such as guidance and the rest corresponding to the latest society needs<br>⑥ Activation of passenger and freight flow by the seamlessness of multi modes of transport |
| Regional alliances | ⑦ Reinforcement of the access function with the area by the direct connections with an expressway and facilities |

Source: Council for Social Infrastructure Road Subcommittee Infrastructure in Ministry of Land, Infrastructure, Transport and Tourism document http://www.mlit.go.jp/report/press/road01_hh_000266.html

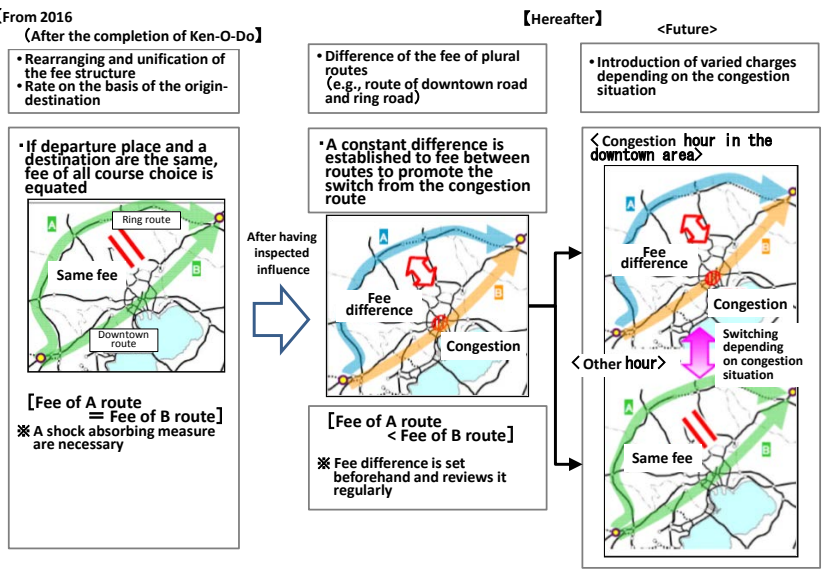
Figure 5: Fee structure to use the expressway of the metropolitan area smartly

■In the interim report (draft) for the "smart use of roads", the fee structure for future expressways in metropolitan area to fulfill the function of expressways to the maximum extent are shown. For the establishment of "a new fee structure for the current 3 ring roads, the following rational fee structures for smart use of roads are arranged.

1) Fair fee structure depending on the degree of use of roads (distance-based toll rate system)

2) Simple and seamless fee structure beyond main management entities (rate to ensure a "seamless" system between main management entities)

3) Strategic fee structure for the optimization of traffic flow (rate to realize effective and flexible use of roads)




Source: Council for Social Infrastructure Road Subcommittee Infrastructure in Ministry of Land, Infrastructure, Transport and Tourism document http://www.mlit.go.jp/report/press/road01_hh_000266.html

# 1-8 Funding Japan's Highways Following the Tax-Earmarking System

Professor, Faculty of Business and Commerce, Keio University

**Kazusei Kato**

It has been over 5 years since Japan's system of funding its highways through tax-earmarking ended in 2009; however, automobile users are still burdened with various taxes. In FY 2014, the total revenue generated from automobile-related taxes was 6.3 trillion yen. Highway expenditure has remained constant, yet the total number of toll road projects is increasing steadily.

**Table 1 Automobile-Related Taxes**

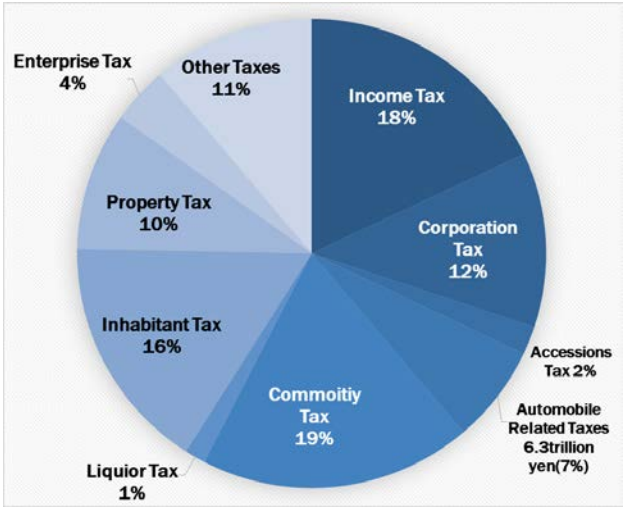
Japan's system, whereby certain tax revenues were earmarked for highway expenditure ended in March 2009. All of the relevant taxes remain in place; however, their respective revenues are decreasing.

| Tax Items (Government) | Founding Year | Earmarked for Highway in 2008 | Main Rules | Temporary Tax Rate (FY 2008) | Temporary Tax Rate (FY 2015) | Revenue (FY 2008) | Revenue (FY 2015) |
|---|---|---|---|---|---|---|---|
| Automobile Acquision Tax (Local) | 1968 | All | 3% of Acquisiton Cost (private) | 5% of Acquisiton Cost (private) | 3% of Acquisiton Cost (private) | 402.4 | 109.6 |
| Motor Vehicle Tonnage Tax (National) | 1971 | 77.5% of National Tax Revenue (=2/3 of Total Revenue) | 2,500 yen per 0.5t | 6,300 yen per 0.5t | 4,100yen per 0.5t (less than 13years) | 554.1 | 374 |
| Motor Vehicle Tonnage Transfer Tax (Local) | 1971 | 1/3 of Total Revenue | 593/1000 of the revenue from the tax is credited to the General Accounts of the Central Government(above). The remaining 407/1000 is granted to local Governments. | | | 360.1 | 256.7 |
| Gasoline Tax (National) | 1954 | All | 24.3 yen/L | 48.6yen/L | 48.6yen/L | 2729.9 | 2466 |
| Liquefied Petroleum Gas Tax (National) | 1966 | 1/2 of Revenue | 17.5 yen/kg | -- | -- | 14 | 10 |
| Local Gasoline Tax (Local) | 1955 | All | 4.4 yen/L | 5.2yen/L | 5.2yen/L | 299.8 | 263.8 |
| Liquefied Petroleum Gas Transfer Tax (Local) | 1966 | 1/2 of Revenue | 1/2 of the revenue from the tax is credited to the General Accounts of the Central Government. The remaining 1/2 is granted to local Governments. | | | 14 | 10 |
| Light Oil Delivery Tax (Local) | 1956 | All | 15.1yen/L | 32.1yen/L | 32.1yen/L | 991.4 | 938.3 |
| Total (billion yen) | | | | | | **5365.7** | **4428.4** |

**Note:** Some general taxes are excluded from Table 1, such as: consumption tax when a vehicle is purchased, vehicle prefecture taxes and light-vehicle municipal taxes.

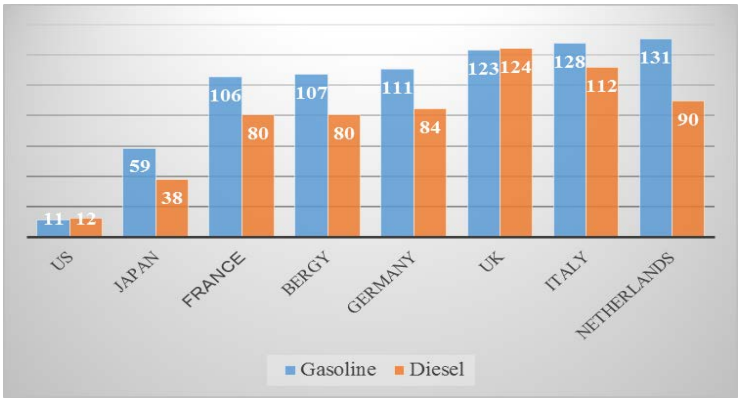
**Sources:** Ministry of Finance (MOF), Ministry of Internal Affairs and Communication (MIC) and Japan Automobile Manufacturers Association, Inc.

**Fig.1 Tax Revenue and Automobile-Related Taxes (FY 2014)**




Budget); and MIC, *Revenue Estimates of Local Taxes and Local Transfer Taxes*

**Fig.2 Motor Fuel Tax Rates for Selected Countries**

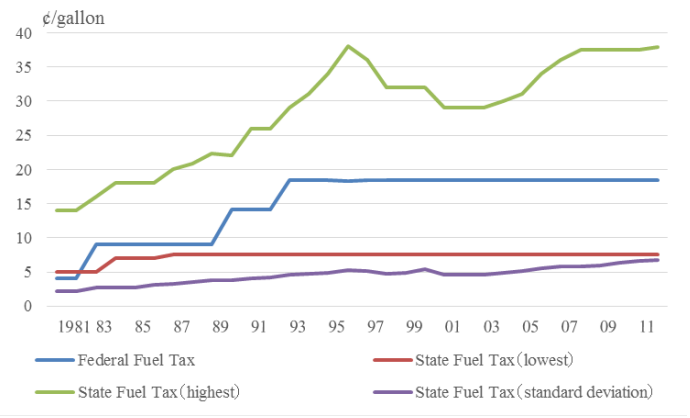



**Note:** The US figure includes the weighted average of individual state taxes

**Source:** US Department of Transportation (USDOT), Federal Highway Administration, Policy and Governmental Affairs, Office of Highway Information, *December 2014 Monthly Motor Fuel Reported by States*

□As shown in Fig. 3, the US federal gas tax, which is mostly earmarked for highway funding after achieving a balanced budget in 1998, remains fixed at 18.4¢/gallon. The state gas taxes (weighted average) show a decreasing trend after 1995, before increasing again in the last 5 years. The standard deviation is widening. However, the highway funding resource is insufficient and some states are reviewing distance-based charges.

### Fig.3 Gasoline Tax Trends in the US



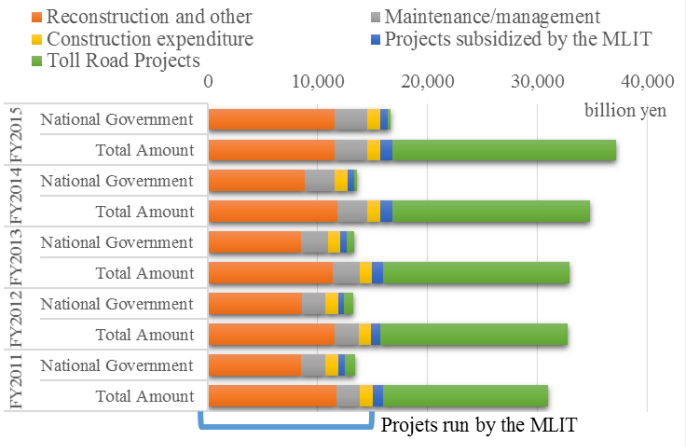

**Source:** USDOT, *Highway Statistics* (Table MF-205).

### Table 2 US Vehicle Miles Traveled Fee Scenarios

| Needs Scenario | Charge on All Miles | Charge Federal-Aid-Highway Only | Equivalent Fuel Taxes(¢/gallon) | | Required Annual HTF |
|---|---|---|---|---|---|
| | (¢/Mile) | (¢/Mile) | Gasoline | Diesel | (billions) |
| Maintain Current Levels Scenarios | | | | | |
| 2008 Highway Trust Fund Revenues | 1.2 | 1.4 | 18.3 | 24.3 | 36.4 |
| 2008 Federal Program Level | 1.8 | 2.1 | 27 | 39.2 | 53.6 |
| Base Case Needs Scenarios | | | | | |
| Need to Maintain | 2.6 | 3 | 39 | 59.9 | 77.6 |
| Need to Improve | 3.2 | 3.7 | 48.4 | 75.9 | 96.2 |

**Source:** The National Surface Transportation Infrastructure Financing Commission (2009), *Paying Our Way,* p.135.

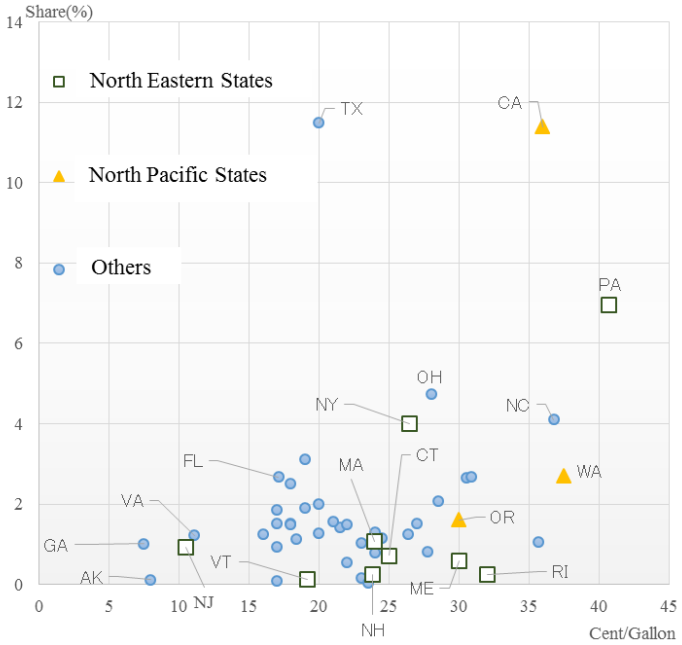
### Fig.5 Japan's Recent Highway Budgets




**Note:** Additional investments include the "Comprehensive and Safety Subsidy" (1084 billion yen) and the 135 billion yen national recovery and reconstruction program following the Great East Japan Earthquake.

**Source:** MLIT, *Budget Highlights for Road.*

### Fig.4 US State Gasoline Tax Rates and Share of Total Revenue




**Note:** US data include federal and state taxes.

**Source:** USDOT, *Highway Statistics 2014*, (Table MF－33SF)

### Table 3 Correcting the Expressway Charging System

| Normal Section (yen/km) | | | |
|---|---|---|---|
| Honshu-Shikoku Bridge Expwy (on shore) | 28.08 | National Expressway | 24.6 |
| Hiroshima-Iwakuni Road | 34.0 | | |
| Hanwa Expwy (Kainan-Arita) Chuo Expwy Enasan Tunnel Tokai-Hokuriku Expwy Hida Tunnel Kan-Etsu Expwy Kan-Etsu Tunnel | 39.36 | | |
| Kanmon Expwy | 64.0 | | |
| **Metropolitan Area (yen/km)** | | | |
| National Expwy (metropolitan area) | 29.52 | 29.52 | |
| **Special Section (yen/km)** | | | |
| Tokyo-Wan Aqua-Line | 179.28 | Isewangan Expressway | 108.1 |
| Honshu-Shikoku Bridge Expwy (Strait) | 252.72 | | |
| Honshu-Shikoku Bridge Expwy (Akashi-Kaikyo Bridge ) | 404.35 | | |

**Source:** Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) (2014), *New Toll System* (in Japanese)

### Table 4. Japan's Stricter Preferential Taxation Rules for Ecologically-Friendly Cars

Japan's FY 2015 tax system revision includes a tightening of the tax breaks for eco-friendly cars.

| Criteria | | Automobile Acquisition Tax | Motor Vehicle Tonnage Tax |
|---|---|---|---|
| FY 2020 Standard | more than 20% | No Tax | Exempt |
| | more than 10% | 100%→80% | 100%→75% |
| | attainment | 100%→60% | 100%→50% |
| FY 2015 Standard | more than 10% | 80%→40% | 75%→25% |
| | more than 5% | 60%→20% | 50%→25% |

# 2-1 Trends and Present Situation of Road Traffic Accidents

Associate Professor Okayama University

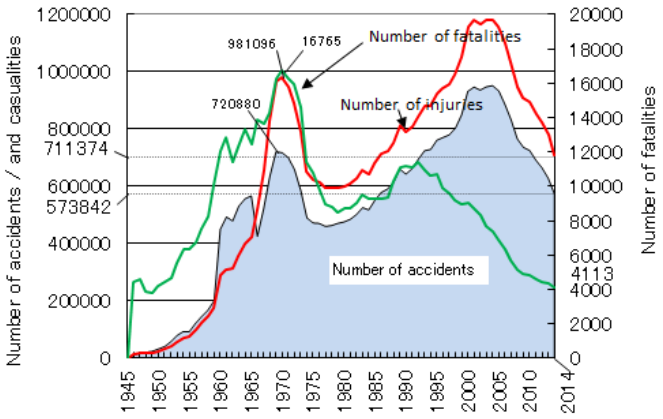
Seiji Hashimoto

After the latest peak in 1992, the number of traffic fatalities has shown a downward trend; in 2014, it dropped to 4113, continuing 6 years less than 5000. There has also been a continuous reduction in recent 14 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 (aged 20 to 29) have noticeably decreased, and are now less than those involving people 40 to 49 years old. But, the ratio of accidents involving the elderly (aged 65 and over) have been increased to more than half of whole accidents.

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

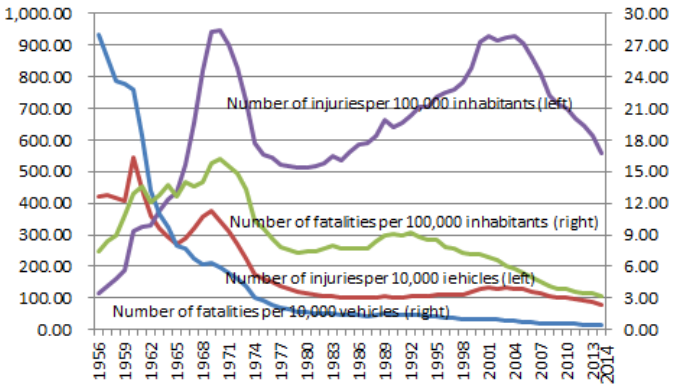
■The number of fatalities from traffic accidents decreased steadily, as did the number of accidents and the number of injuries




Source: White Paper on Traffic Safety in Japan 2015

Fig. 2 Changes in the numbers of fatalities and injuries from traffic accidents, by the number of inhabitants and vehicles

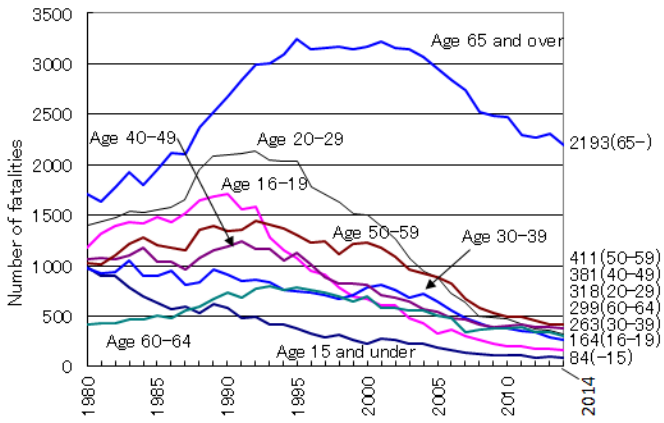
■The number of fatalities per 10,000vehicles are stable in low level.




Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

Fig. 2 Changes in number of fatalities by age group

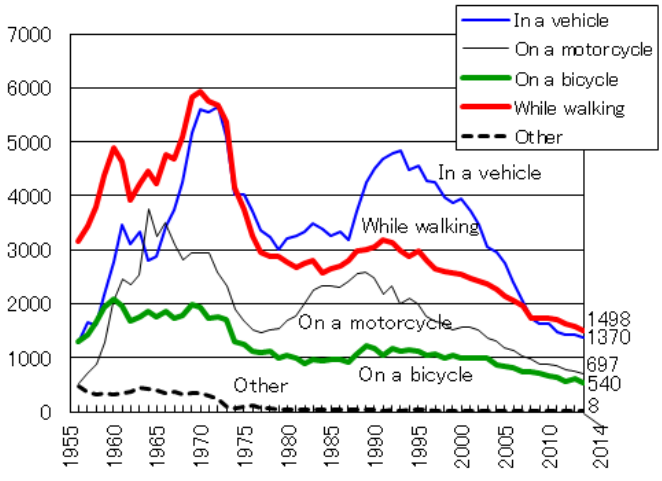
■All in all, a downward trend is evident. The number of fatalities is high for the elderly (65 and over). It has sharply decreased for those aged 20 to 29 (which is less than that for age 40 to 49)




Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

Fig. 4 Changes in the number of traffic fatalities

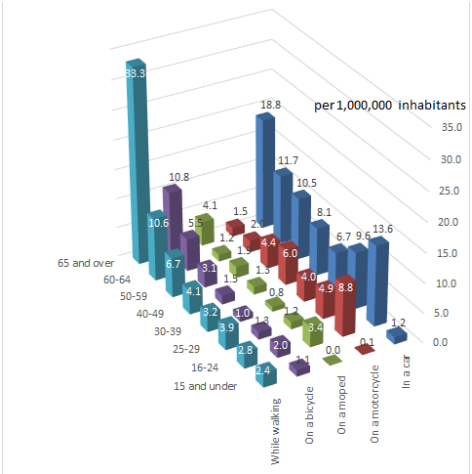
■Fatalities “in a vehicle” decreased noticeably; and since 2008, “in a vehicle” fatalities have been less than “while walking” fatalities.




Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

Fig. 5 Traffic fatalities by situation and by age group

■Elderly(aged 65 and over) traffic fatalities are the worst in the situation of “While walking”, ”On a bicycle”, “On a moped”, and “In a car”



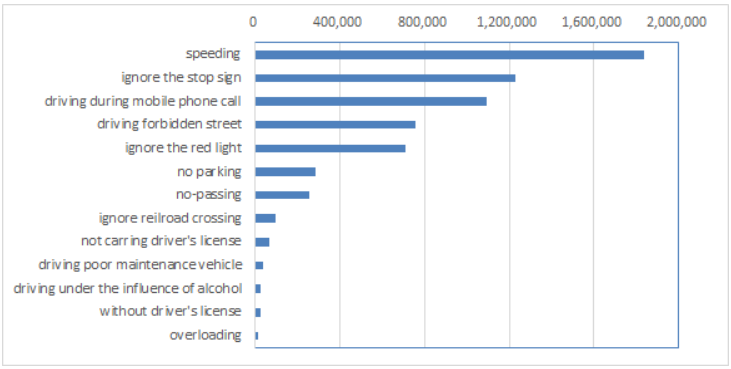

(person)

| Situation / Age | While walking | On a bicycle | On a moped | On a motorcycle | In a car |
|---|---|---|---|---|---|
| 15 and under | 2.4 | 1.1 | 0.0 | 0.1 | 1.2 |
| 16-24 | 2.8 | 2.0 | 3.4 | 8.8 | 13.6 |
| 25-29 | 3.9 | 1.3 | 1.2 | 4.9 | 9.6 |
| 30-39 | 3.2 | 1.0 | 0.8 | 4.0 | 6.7 |
| 40-49 | 4.1 | 1.5 | 1.3 | 6.0 | 8.1 |
| 50-59 | 6.7 | 3.1 | 1.9 | 4.4 | 10.5 |
| 60-64 | 10.6 | 5.5 | 1.2 | 2.0 | 11.7 |
| 65 and over | 33.3 | 10.8 | 4.1 | 1.5 | 18.8 |

Source: White Paper on Traffic Safety in Japan 2015

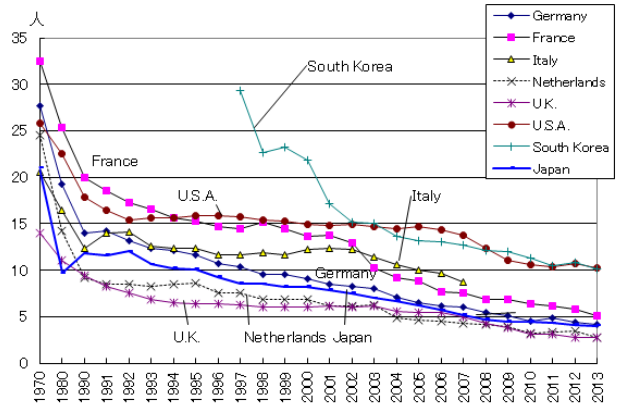
Fig. 6 Number of crackdown on traffic violation (announcement, referral)

■Speeding is the most common traffic violation




Source: White Paper on Traffic Safety in Japan 2015

Fig. 7 Changes in traffic fatalities worldwide, by country (per 100.000 inhabitants)




Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

Table 1 Traffic fatalities worldwide, by situation (2013)

| Situation / Country | Number of fatalities | In a car | On a motorcycle | On a moped | On a bicycle | While walking | Other |
|---|---|---|---|---|---|---|---|
| Germany | 3,339 | 1,588 | 568 | 73 | 354 | 557 | 199 |
| | | 47.6 | 17.0 | 2.2 | 10.6 | 16.7 | 6.0 |
| France | 3,268 | 1,612 | 631 | 159 | 147 | 465 | 254 |
| | | 49.3 | 19.3 | 4.9 | 4.5 | 14.2 | 7.8 |
| Netherlands | 476 | 183 | 29 | 23 | 112 | 51 | 78 |
| | | 38.4 | 6.1 | 4.8 | 23.5 | 10.7 | 16.4 |
| U.K. | 1,770 | 819 | 337 | 4 | 113 | 405 | 92 |
| | | 46.3 | 19.0 | 0.2 | 6.4 | 22.9 | 5.2 |
| U.S.A. | 32,719 | 11,977 | 4,494 | 174 | 743 | 4,735 | 10,596 |
| | | 36.6 | 13.7 | 0.5 | 2.3 | 14.5 | 32.4 |
| South Korea | 5,092 | 1,195 | 541 | 289 | 281 | 1,982 | 804 |
| | | 23.5 | 10.6 | 5.7 | 5.5 | 38.9 | 15.8 |
| Japan | 5,152 | 1,081 | 502 | 357 | 813 | 1,864 | 535 |
| | | 21.0 | 9.7 | 6.9 | 15.8 | 36.2 | 10.4 |

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)

Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

Table 3 Number of traffic fatalities worldwide by age group (2013)

| 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 | 3,339 | 19 | 13 | 26 | 89 | 246 | 247 | 1,698 | 999 | 2 |
| | | 0.6 | 0.4 | 0.8 | 2.7 | 7.4 | 7.4 | 50.9 | 29.9 | 0.1 |
| France | 3,268 | 44 | 24 | 29 | 102 | 253 | 383 | 1,745 | 688 | 0 |
| | | 1.3 | 0.7 | 0.9 | 3.1 | 7.7 | 11.7 | 53.4 | 21.1 | 0.0 |
| Netherlands | 476 | 3 | 2 | 3 | 14 | 32 | 49 | 206 | 140 | 27 |
| | | 0.6 | 0.4 | 0.6 | 2.9 | 6.7 | 10.3 | 43.3 | 29.4 | 5.7 |
| U.K. | 1,770 | 13 | 7 | 21 | 48 | 153 | 195 | 924 | 409.0 | 0 |
| | | 0.7 | 0.4 | 1.2 | 2.7 | 8.6 | 11.0 | 52.2 | 23.1 | 0.0 |
| U.S.A. | 32,719 | 470 | 268 | 411 | 923 | 2,208 | 3,314 | 19,396 | 5,671 | 58 |
| | | 1.4 | 0.8 | 1.3 | 2.8 | 6.7 | 10.1 | 59.3 | 17.3 | 0.2 |
| South Korea | 5,092 | 38 | 33 | 28 | 87 | 119 | 191 | 2,763 | 1,833 | 0 |
| | | 0.7 | 0.6 | 0.5 | 1.7 | 2.3 | 3.8 | 54.3 | 36.0 | 0.0 |
| Japan | 5,152 | 40 | 41 | 21 | 95 | 171 | 180 | 1,833 | 2,771 | 0 |
| | | 0.8 | 0.8 | 0.4 | 1.8 | 3.3 | 3.5 | 35.6 | 53.8 | 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)

Source: Traffic Statistics 2014 (Institute for Traffic Accident Research and Data Analysis)

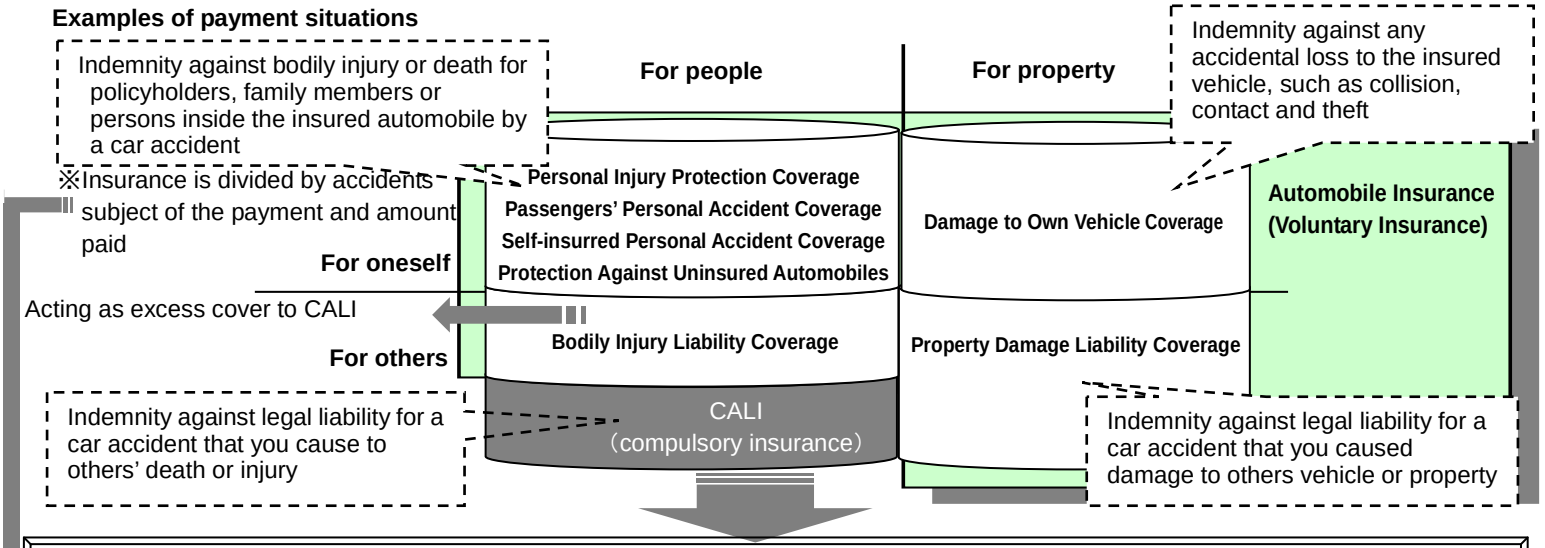
# 2-2 Automobile Insurance System In Japan

General Insurance Rating Organization of Japan
Automobile Insurance Department
Manager, Research and Analysis Section
Fuhito Tanabe

There are two main indemnifications in Japanese automobile insurance system, which are Compulsory Automobile Liability Insurance (CALI) and Voluntary Automobile Insurance. CALI provides basic indemnification for victims. When the amount of loss is more than the limits of CALI, Voluntary Automobile Insurance will be paid additionally. It is an excess cover to CALI.
In order to charge premiums fairly between policyholders, Voluntary Automobile Insurance has more classifications than CALI and premium sets adequately.

**Figure 1　Compulsory Automobile Liability Insurance(CALI) and Voluntary Automobile Insurance**

■There are Compulsory Automobile Liability Insurance(CALI) which indemnifies for victims against an accident resulting in injury or death, and Voluntary Automobile Insurance which acts as excess cover to CALI in automobile insurance system. Various products are offered by putting together the coverage of Voluntary Automobile Insurance below.




A valid CALI certificate must be presented at each vehicle inspection which ensures that every automobile is insured by CALI (※1 compulsory insurance). Furthermore, it is stipulated that premium rates shall be as low as possible under ※2 no-loss, no-profit rule and CALI indemnifies within ※3 the limits of insurance.

※1　compulsory insurance
No automobile (including motorized bicycle) shall be operated unless a contract for CALI.

※2　no-loss, no-profit rule
Under the Act, it is stipulated that premium rates shall be as low as possible within the range of compensating reasonable costs of insurance business under the efficient management.

※3　the limits of insurance
The limits of insurance currently in force are as follows.

| Types of damage | The items of loss | The limits of insurance per victims |
|---|---|---|
| **For bodily injury** | -Hospital fees<br>-Documentation fees<br>-Loss of earnings due to absence from work<br>-Damages for pain and suffering etc. | ¥ 1.2 million |
| **For permanent disability** | -Loss of future earnings<br>-Damages for pain and suffering etc. | ¥750 thousand ～40 million depending on the grade |
| **For death** | -Funeral expenses<br>-Loss of future earnings<br>-Damages for pain and suffering | ¥ 30 million |

| | Accidents subject of the payment | | Amount paid |
|---|---|---|---|
| | Accidents while being inside the automobile | Other accidents | |
| **Personal Injury Protection Coverage** | ○* | | Actual amount of damage (calculate according to the standards under policy conditions) |
| **Passengers' Personal Accident Coverage** | ○ | × | Will be paid the insured amount which is not depending on actual amount of damage |
| **Self-insured Personal Accident Coverage** | ○(only self-insured personal accident) | × | Will be paid the amount under policy conditions which is not depending on actual amount of damage |
| **Protection Against Uninsured Automobiles** | ○*<br>Will be paid only if<br>-insured is killed or has sustained permanent disability<br>-an automobile is not insured against bodily injury liability etc. | | Will be paid the amount which is excess to CALI and Bodily Injury Liability Coverage within others' amount of legal liability for an accident. |

＊Only "accidents while being inside the insured automobile" can be the subject of the payment depending on the contents of the contract.

## Figure 2　Risk classification for CALI and Voluntary Insurance

■There are two types of risk classification. One is depending on characteristics and another is depending on coverage.

[CALI]

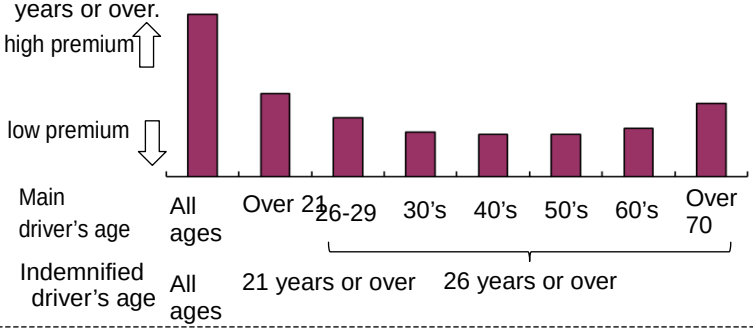
| | Classification |
|---|---|
| Charac-teristics | Area<br>(Ex. mainland, Okinawa, etc.) |
| | Vehicle Use & Type<br>(Ex.passenger car, freight car, private car, business car, etc.) |
| Coverae | Term<br>(Ex. 5 days, 1-37 months, 48 or 60 months depending on term of automobile inspection) |

[Voluntary automobile insurance]

| | Classification (Example*) |
|---|---|
| Charac-teristics | Vehicle Use & Type<br>(Ex.passenger car, freight car, private car, business car, etc.) |
| | Vehicle Model Code<br>(9 classification depending on model code) |
| | New vehicle/ Old vehicle |
| | Main Driver's Age<br>(Can be classified only when 26 years old or over) |
| | Bonus-Malus<br>20 grades according to claim history, the number of accidents, whether there was a contract previously<br>Grade from 7 to 20 are divided into two, claim free and claim made |
| Coverage | Insured Amount, Deductible |
| | All ages / 21 years or over / 26 years or over<br>(3 classifications depending on indemnified drivers' age) ※4 |
| | Family / the insured, and husband or wife / All drivers<br>(3 classifications depending on the extent of indemnified drivers) |

＊It shows main classification of Reference Loss Cost Rates above, and insurance companies set their own classifications.

※4　Premium change depending on the age as it shows below. Premium for person of advanced age is quite high. The smaller coverage is, the lower premium is. Also, over 90% of drivers is 26 years or over.




## Table1　Examples of judicial precedent for large amount of compensation by car accident

■Almost every policyholder set their insured amount of Liability Coverage to no limit because there are some judicial precedents more than 100 million yens.

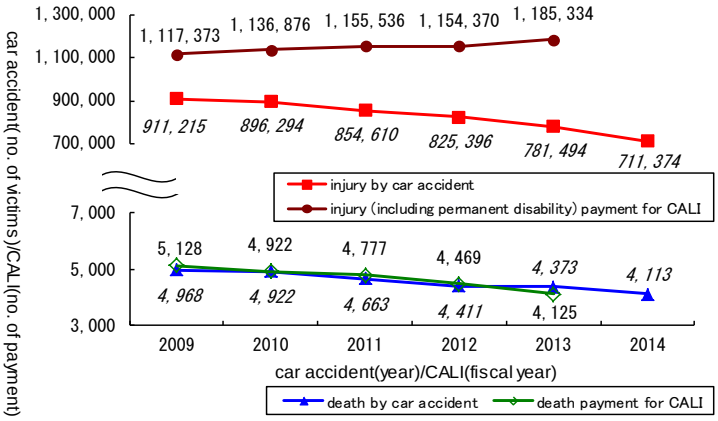
The % of insured amount to no limit for Bodily Injury Liability Coverage is 99.4%, and for Property Damage Liability Coverage is 91.5%.

(Million yen)

| Accidents | | | |
|---|---|---|---|
| Injury or death | | Property damage | |
| Amount of damages | Date of judgment | Amount of damages | Date of judgment |
| ¥528.53 | 1/11/2011 | ¥261.35 | 19/07/1994 |
| ¥397.25 | 27/12/2011 | ¥135.8 | 17/07/1996 |
| ¥395.1 | 18/02/2011 | ¥120.37 | 18/07/1980 |

## Figure 3　The change of the number of death and injury by car accidents and the number of payment for CALI

■Although the number of death and injury by car accident decreases gradually, the number of payment for bodily injury increases and for permanent disability stays almost the same.



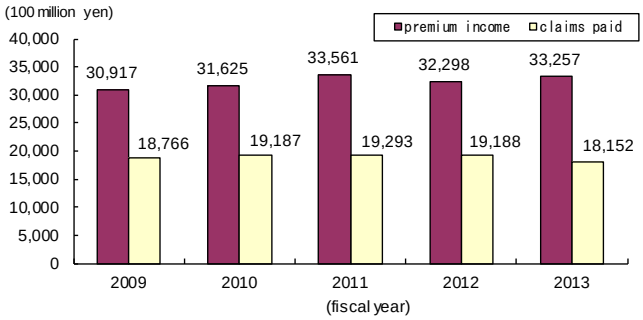

・fiscal year represents the period starting on April 1 of the year and ending on March 31 of the following year

Source:

-Disclosure document from General Insurance Rating Organization of Japan

-National Police Agency "Traffic accidents situation(2014)"

## Figure 4　The change of the premium income and claims paid for automobile insurance(voluntary insurance)




・not including Personal Injury Protection Coverage

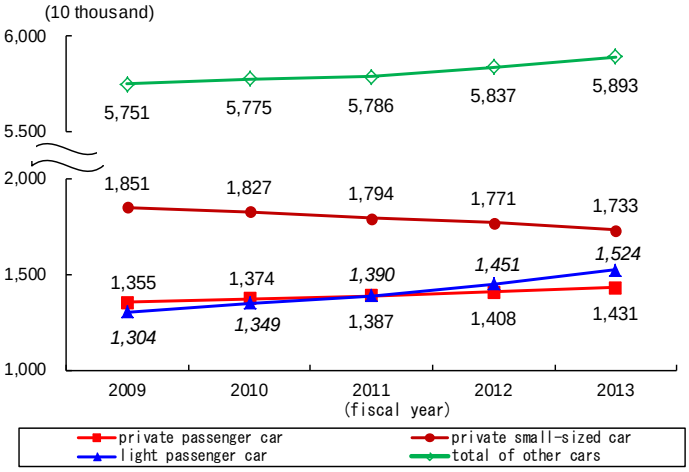
・including expense loading in premium income

Source:

Disclosure document from General Insurance Rating Organization of Japan

## Figure 5　Change of the number of insured cars for Voluntary Automobile Insurance

■While the number of cars owned increases, especially the number of light passenger cars insured increases.




・It shows the number of Bodily Injury Liability Coverage

Source:

Disclosure document from General Insurance Rating Organization of Japan

# 2-3 Traffic Safety Program

Professor, Akita University
Hidekatsu Hamaoka

Causes of traffic accident are widely distributed and these are influencing each other. Moreover, occurrence of traffic accident is rare; it is hard to identify the cause. To decrease the number of traffic accident, many countermeasures were conducted such as to install the all considerable measures into the blackspots and to inform the location of blackspots to the driver. As a result of these countermeasures, number of fatalities was decreased below 5000. Now, under the Basic Principles of 9th Fundamental Traffic Safety Program, road management authority is strengthening to apply various countermeasures that focuses on the pedestrian safety especially for the elderly person to realize the most safe road environment in the world.

## Table 1 Basic Principles of 9th Fundamental Traffic Safety Program

Basic Principles of 9th Fundamental Traffic Safety Plan (FY2011-15) was designed on 31st March, 2011.

**1. Achieving a Society with No Traffic Accidents**
In order to build a truly prosperous and vibrant society, it is crucial to ensure the safety and security of the people.

**2. Traffic Safety Concept of Prioritizing People**
By showing consideration to the elderly, the disabled, and children, the concept of "prioritizing people" in the traffic safety policy should be implemented in every possible measure.

**3. Three Components Forming the Traffic Society**
This program sets objectives to be attained for the following respective traffic sectors: "road traffic," "railway traffic," "traffic at railway crossings," "maritime traffic," and "air traffic" and clarifies the measures that should be taken for achieving these objectives with respect to the three components of traffic society formulating various measures, and vigorously promote these measures with the understanding and cooperation of citizens.

**4. Utilization of IT**
Since the use of IT counteracts inadvertent human errors, and can be furthermore expected to make a significant contribution to road safety, the usage of ITS and AIS is being actively promoted.

**5. Enhancement of Rescue and Emergency Activities and Victim Assistance**
It is essential to perform rescue and emergency medical care activities when traffic accidents occur, as well as aim for further improvement of support for victims in the area of traffic safety as well.

**6. Promotion of Participation and Collaborative Traffic Safety Activities**
In order to actively promote proactive road safety Activities of citizens, it is essential to create a system, in which people can participate from the planning stage according to the characteristics of the local regions

**7. Effective and Efficient Implementation of Measures**
Due to the difficult financial situation, we should be conscious on focusing on measures that strive to achieve the maximum effect while maintaining budget execution efficiency, depending on the actual situation with local traffic.

**8. Further Ensuring the Safety of Public Transportation**
We should strive to enhance and strengthen the security check, and transportation safety management evaluation.

Source: Cabinet Office

## Table 2 Effort to install bicycle safety measures

Bicycle accidents become a social problem due to improper usage of bicycle. Major offences are as follows;

1. Red light running 2. Illegal usage of passage 3. Over speeding at the pedestrian road 4. Violation of passage 5. Roadblock to pedestrian 6. Irruption to closed railroad crossing 7. Unsafe movement at the intersection 8. Roadblock to prioritized vehicle 9. Unsafe movement at the roundabout 10. Violation of stop sign 11. Illegal usage of the pedestrian road 12. Using bicycle with defective brake 13. Drunk driving 14. Unsafe driving

Source: National Police Agency

## Table 3 Traffic enforcement and speed regulation to contribute reducing traffic accident effectively

Recommendations to conduct traffic enforcement by utilizing the result of traffic accident and to reconsider the principle to set the maximum speed were reported.

**Recommendation to conduct traffic enforcement and to set maximum speed**

**Common understanding to organize recommendation**
- Necessity to manage maximum speed

**Maximum speed setting to avoid traffic accident**
- Reconsideration of maximum speed at the road
- Share the concept to manage maximum speed
- Measures to lead to safe driving attitude
- Reconsideration of maximum speed at the expressway

**Traffic enforcement to avoid traffic accident**
- Traffic enforcement of speed violation to avoid traffic accident
- Inform the concept to manage traffic enforcement

**Measures to promote steadily to avoid traffic accident**
- Strengthening traffic enforcement of hazardous violation and crazy drivers
- Cooperation with city planning
- Promote traffic education except drivers
- Evaluation of company's effort to avoid traffic accident

Source: National Police Agency

## Table 4 Strengthened penalties to the aggravated drivers

Penalties were strengthened due to the traffic accident by the aggravated drivers such as drunk driving and unlicensed driver

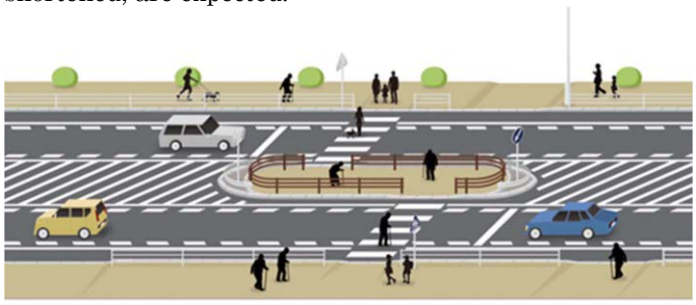
**Legislation relates to the aggravated action causing the serious accident**

1. Transfer from the Penal Code: Dangerous Driving Causing Death or Injury
2. Add a new category in the same weight of punishment as the Penal Code: Dangerous Driving Causing Death or Injury
3. Institute new Penal Code: Dangerous Driving Causing Death or Injury that have light punishment
4. Institute new punishment for escaping from the traffic accident site
5. Transfer from the Penal Code: Death or Serious Accident through Negligence
6. Institute heavy punishment to the unlicensed driver causing traffic accident

Source: Ministry of Justice

Figure 1 Countermeasure to increase pedestrian safety

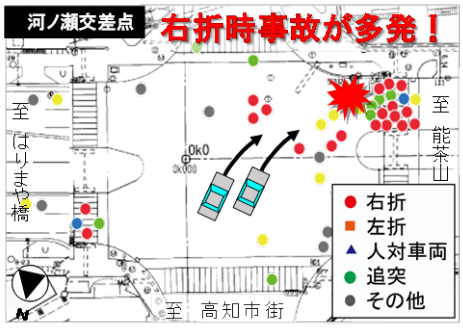
Many traffic accidents occurred at unsignalized intersection in the road section. As the countermeasure for this traffic accident, two-step crossing method by utilizing the traffic island is demonstrated. Benefits, such as crossing pedestrian could confirm the approaching vehicle easily and crossing distance at one time would be shortened, are expected.

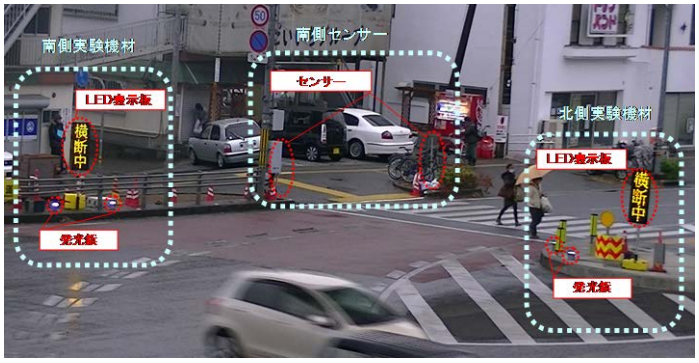


Source: Miyazaki Office of River and National Highway

Figure 2 Inform the existence of crossing pedestrian or bicyclist by the lighting raised marker

To decrease the pedestrian/bicycle accident at the intersection, system that inform the existence of pedestrian/bicycle to the right-turning vehicle is developed.




Source: Kochi National Highway Office

Figure 3 Installing roundabouts

Roundabout that has island in the center is a kind of intersection. It is easy for the driver to run through the roundabout because of the simple rule to pass. Effect of decreasing the traffic accidents is extremely high, therefore roundabout is commonly installed in the European countries. In Japan, roundabout is expected to be installed widely with the change of legislation about roundabout.

Intersection at Nobe-town, Suzaka-city, Nagano

(Before roundabout)

(After roundabout)

Source: Suzaka City Office

Figure 4 Prevent backward movement at expressway

Reverse run in the expressway could bring to serious accident. Various countermeasures such as antirollback system, road marking to show the traveling direction, and so on, were installed at the exit of the service area and the parking area.


逆走防止装置

Warning sign to backward movement

路面に矢印を表示

Arrow marking

Source: East Nippon Expressway Company

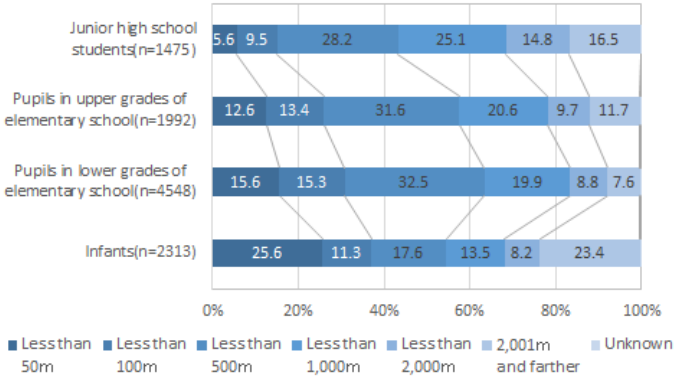
# 2-4 Efforts toward Traffic Calming

Associate Professor, Okayama University
Seiji Hashimoto

In Japan, accidents on pupils' way to school motivate to improve the safety in residential area. The importance of the idea of traffic calming is now generally accepted. But, It is not easy to realize the idea. Despite efforts of local gov., traffic calmed areas are not so common.
These days, area-wide traffic calming measures such as ZONE 30 are installed in many cities and in some area, new approaches such as Shared Space are tried to install. Efforts toward traffic calming in Japan have been steadily promoting.

Fig. 1 Percentage of accidents of children (aged 15 and under) while walking by the distance from home (2013)

■Many accidents of children while walking happened near their house.




Source: Traffic Statistics 2013 (Institute for Traffic Accident Research and Data Analysis)

Fig. 2 First rising bollard in public street in Japan

■First rising bollard on public street in Japan was installed in Niigata City, in October, 2014

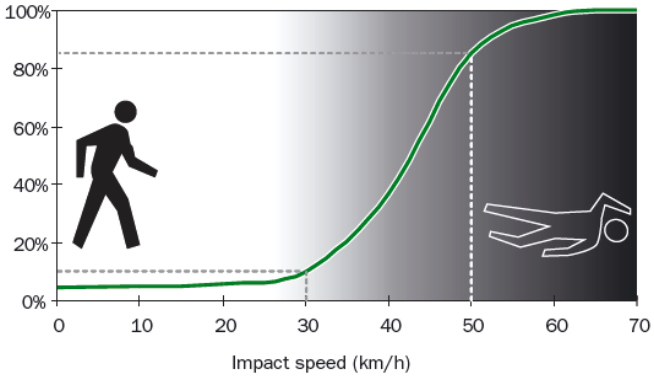
Photo by Prof. Hisashi Kubota, Saitama Univ.

□Speed Management is important in order to make the streets safe. On residential areas, area-wide 30km/h speed limit is the target in many countries, so, Japanese government also tried to install ZONE 30. 3,000 zones will be assigned for ZONE 30 areas until 2016.

Fig. 3 Outline of ZONE 30


Source: Website of Ministry of Land, Infrastructure, Transport and Tourism (http://www.mlit.go.jp/)

Fig. 4 Probability of fatal injury for a pedestrian colliding with a vehicle




Sauce: Speed Management – A Road Safety Manual for Decision-makers and Practitioners

□In order to make residential areas safer, Japanese Gov. make a study about the standard shape of traffic calming devices such as road humps and narrowing. In addition, some local gov. tried to make Shared Spaces that are safety measure without traffic signs, sidewalks, and so on.

Fig. 5 Road Hump, Road Narrowing (Bunkyo-ku, Tokyo)
■Road Humps reduce the vehicle speed well. Now the standard shape of road humps are considered by Japanese Gov. in order to overcome the weak point - vibration and noise.

Fig. 7 Narrowing to reduce the rat running (Manchester, UK)
■On two-way street, narrowings reduce the number of rut running vehicles.


Fig. 8 Road Space Reallocation
■ Road Space Reallocation toward cycle-friendly, walkable streets

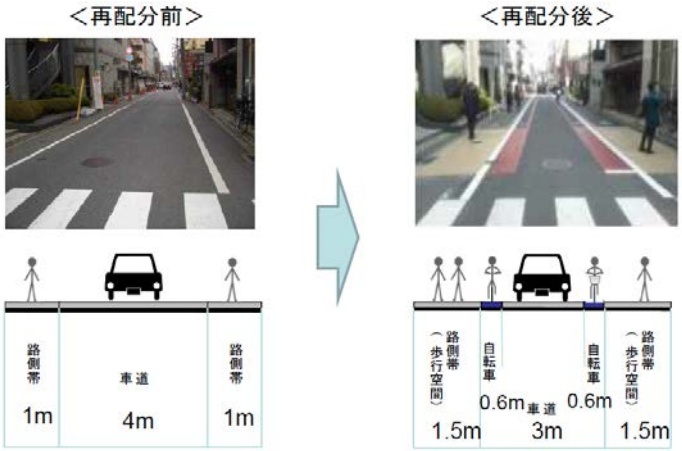



Fig. 6 Narrowing (Katsushika-ku, Tokyo)
■Narrowings reduce the vehicle speed. Now the standard shape of narrowings on two-way streets are considered by Japanese Gov. in order to reduce the number of rat running.

In order to reduce through traffic ,traffic restraint measures are installed at the entrance point in the direction of the through traffic.

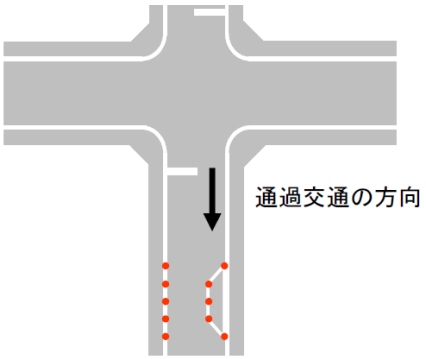



Fig. 9 Japanese Style Shared Space in Izumo

■ On Shinmondori-street that is the approach of Izumo Shrine, Shared Space taking into consideration Japanese law was built in 2013.

Average vehicle speed：37km/h → 28km/h

# 2-5 Progress of Bicycle Transport

Associate Professor, Osaka City University
**Nagahiro Yoshida**

Recently, the modal share of commuter cycling has been increasing in urban areas though it has been decreasing on a national level. Under these situations, some national legal policies and technical guidelines related to bicycle infrastructure have been updated in order to realize that "bicycles are legal road vehicles, therefore cyclists must ride on roadways". In response to these changes, some cities try to encourage cyclists to use their bicycles as a primary mode of transport. Some cities have already adopted a bicycle plan that introduced bicycle lanes or shared lane markings on roadways. In terms of cycle tourism, Shimanami Kaido has become one of the most popular cycling routes in Japan. It contains many convenient facilities for tourists including a bicycle rental service, tourist stops, and navigation signs and markings.

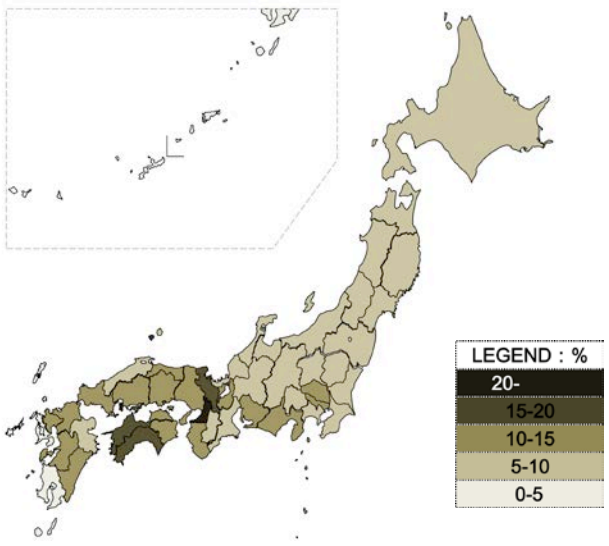
**Fig. 1 Recent changes of bicycle related policy and technical guideline**

■In the last decade, national legal policies and technical guidelines related to bicycle infrastructure had been updated.

| Year | Contents |
|---|---|
| 2007 | Amendment of the Road Traffic Act; adding lines to clarify the conditions of bicycle riding on pavements |
| 2008 | MLIT and NPA; designation of 98 model districts realizing bicycle ways |
| 2011 | Amendment of the Traffic Signs Ordinance; introduction of one-way regulation for bicycle track or path<br>NPA administrative circular "Promotion of general measures for realizing favorable bicycle traffic system" |
| 2012 | MLIT and NPA;issued of "Technical guideline for realizing safer and more comfortable bicycle infrastructure" |
| 2013 | Amendment of the Road Traffic Act; bicycle right-of-way changed left-hand side of road only |
| 2015 | Implementation of Amendment of the Road Traffic Act; introducing safety education program for offenders<br>JSTE; publication of technical guideline "Design guidance for junctions considering bicycle traffic" |

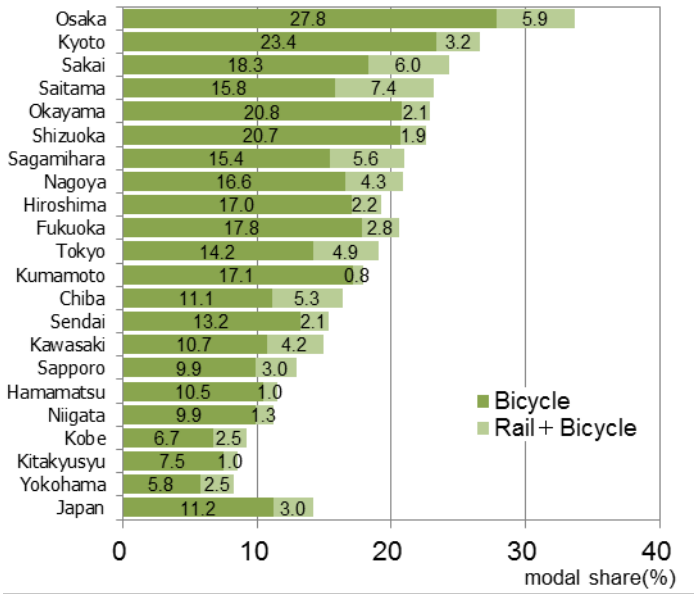
**Fig. 2 The modal share of commuter cycling of major cities (2010)**

■The modal share of commuter cycling in the population census showed that prefectures including metropolitan areas or located in western part of Japan have higher rates.




Source : Population Census in 2010

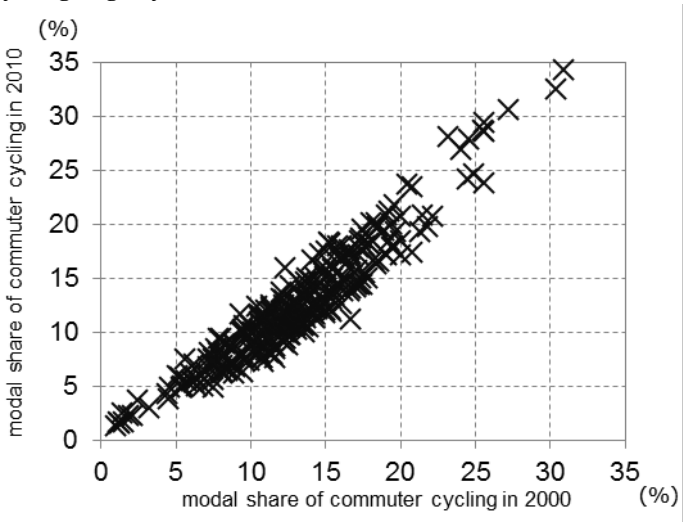
**Fig. 3 The modal share of commuter cycling by major city (2010)**




Source : Population Census in 2010

**Fig. 4 The modal share of commuter cycling by city (2010)**

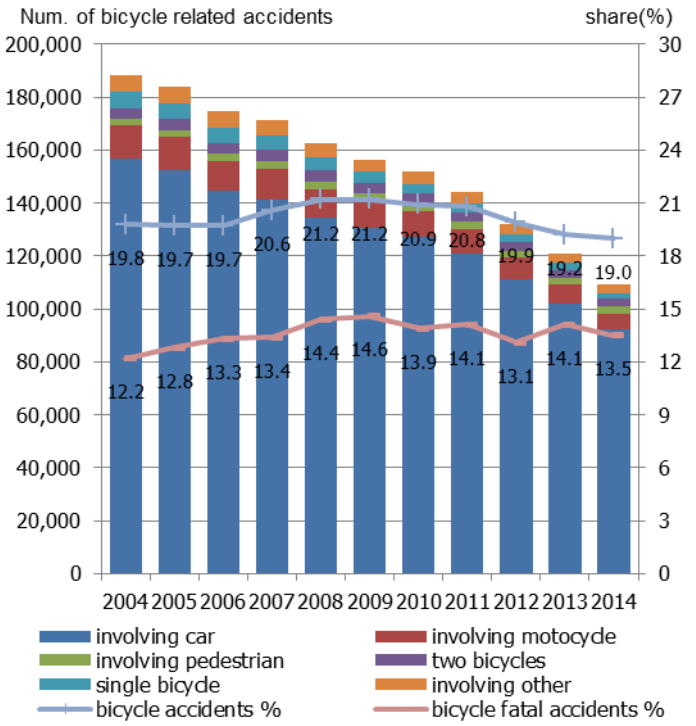
■Among 289 cities with population over 100 thousands, the modal share of commuter cycling between 2000 and 2010 has increased in 105 cities (36%), decreased in 178 cities (62%), and not changed in 6 cities (6%). In total, the share of cycling slightly fell from 12.2% in 2000 to 11.6% in 2010.




Source : Population Census in 2000 and 2010

**Fig. 5 Trends of bicycle related accidents**

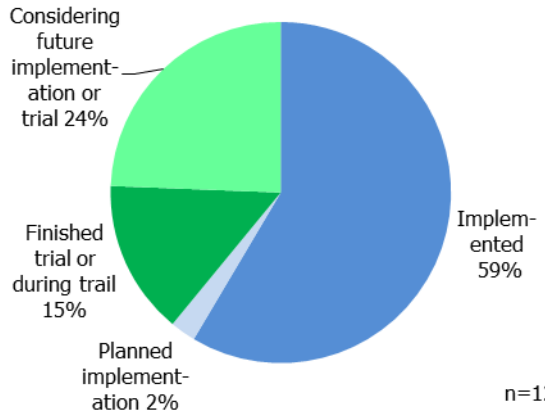
■In the last decade, the number of bicycle related accidents has decreased since 2004, and in 2014, the most common accident is car-involved that shares 84%. Among total traffic accidents, the share of bicycle related accidents decreased by 19% in 2014. However, for the number of fatal accidents, bicycle alone accidents almost doubled compared with 2004.




Source: NPA "The state of bicycle involved accidents" (2015)

**Fig. 6 Current situation of bicycle sharing system**

■As of the end of Nov. 2014, bicycle sharing systems were implemented in 72 cities (59%) among 123 cities. The main purpose of the implementation was offering other transport option for tourists, complementing to public transport services, or vitalization of local area.




Source : MLIT "About Bicycle-sharing System"(2015)

**Fig.7 The latest bikeways and parking facilities**

■Some local governments updated bicycle plans to introduce the latest bikeway facilities including bicycle lanes or shared lane markings on roadways as well as mechanical parking facilities utilizing land space.

(Osaka City) (Kagoshima City)

Shared lane markings indicating direction and position

(Kyoto City) (Yokohama City)

Parking facilities utilizing land spaces

**Fig. 8 Progress in cycle tourism**

■In European countries, cycle tourism grew in popularity and extensive cycle networks through countries were developed. In Japan, Shimanami Kaido (70 km) attracts cycling tourists all over the world. The informative infrastructure including navigation signs and markings along the routes is well developed. Other local areas also try to develop different types of cycling tours or events aiming at vitalization.


14 EUROVELO routes in EU and the route sign along route 6 in Nantes

Source : http://www.eurovelo.com/

Blue-line in Shimanami Kaido Cycling Event in Sorachi, Hokkaido

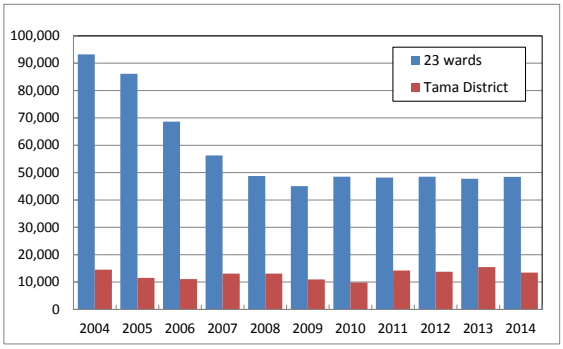
# 2-6 Movements of Parking Lot Policies: Problems and countermeasures of urban parking lots

Associate Professor,
Nihon University
Masaharu Oosawa

In Japan, 20% of inner-city areas are occupied by parking lots, and 20% of urban areas are occupied by roads. In other words, about 40% of the country's urban areas are used for cars. Since the establishment of the Parking Lot Act in 1957, parking lots have been aggressively developed in Japan, with the aim of smoothing road traffic, and recently, parking lots supply has exceeded demand in some areas. On the other hand, as a result of changes in the country's socioeconomic conditions, vacant lots have become increasingly used as tentative parking lots and are now scattered throughout urban areas, creating traffic issues at the local level. Introduction of restrictions on parking lot locations is currently under consideration. The era of trying to secure sufficient parking lots is now behind us. Parking lots have been consolidated under the 2012 Low Carbon City Act, and the optimization of parking lot locations was institutionalized by the 2014 amendment to the Special Measures Concerning Urban Renewal Act. These developments marked the start of new developments related to parking lots.

Figure 1. Changes in the momentary number of four-wheeled vehicles parked illegally on streets of Tokyo

■ Illegal parking had been on the decline but increased in the 23 wards in 2010 and the Tama District in 2011. Illegal parking has remained at the same levels.




Source: Created by the author using data from the Metropolitan Police Department (www.keishicho.metro.tokyo.jp/kotu/chusya/chusya.htm).

Figure 2. Changes in the momentary number of motorcycles parked illegally on streets in the 23 wards of Tokyo

■ Illegal parking has been on the decline since 2006.

Source: Created by the author using data from the Metropolitan Police Department (www.keishicho.metro.tokyo.jp/kotu/chusya/chusya.htm).

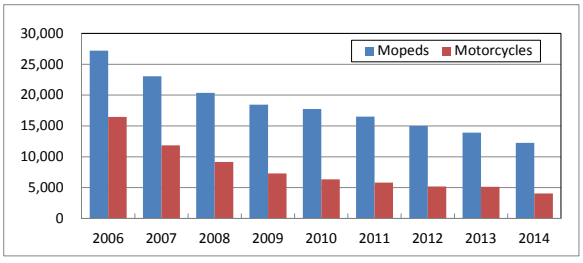



Table 1. Classification of parking lots nationwide under the Parking Lot Act

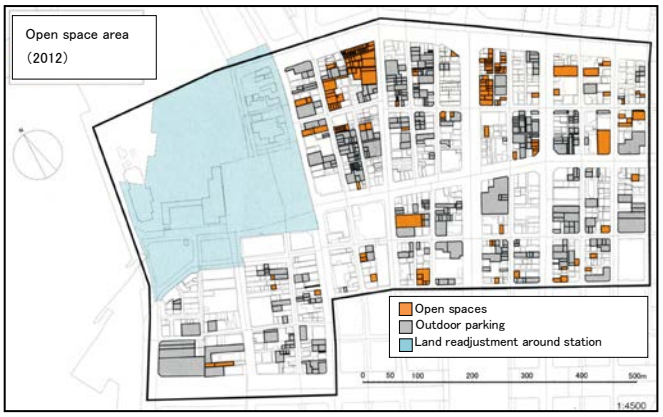
■ Most of the parking lots are mandatory attached parking facilities.

| Division | Spaces | Rate |
|---|---|---|
| City planning parking lots | 118,477 | 2.5% |
| Registered parking lots | 1,661,432 | 34.8% |
| Mandatory attached parking facilities | 2,997,363 | 62.7% |
| On-street parking lots | 775 | 0.02% |
| Total | 4,778,047 | 100.0% |
| Number of car ownership | 76,696,825 | |
| Number of parking spaces per ten thousand car | 623 | |

Source: Created by the author using fiscal 2013 data from the 2014 Annual Report on Automobile Parking Lots (City Bureau, Ministry of Land, Infrastructure and Transport, 2014).

Figure 3. Increase in the number of parking lots in urban areas

■ Parking lots converted from vacant lots have continued to increase. In this area, the number increased by 1.9-fold between 1993 and 2012.




Source: 2013 White Paper on Land (Ministry of Land, Infrastructure and Transport, 2013)

Table 2. Availability of motorcycle parking lots

■ When motorcycle-only and motorcycle and car parking lots are combined, 1,200 parking lots (49,061 spaces) have been developed.

| | City planning parking lots | | Registered parking lots | | Mandatory attached parking facilities | | On-street parking lots | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parking lots | Capacity | Parking lots | Capacity | Parking lots | Capacity | Parking lots | Capacity | Parking lots | Capacity |
| motorcycles and cars | 55 | 10,387 | 109 | 23,243 | 5 | 37 | 1 | 26 | 170 | 33,693 |
| motorcycle-only | 73 | 4,469 | 181 | 5,965 | 750 | 3,933 | 26 | 1,001 | 1,030 | 15,368 |
| Total | 128 | 14,856 | 290 | 29,208 | 755 | 3,970 | 27 | 1,027 | 1,200 | 49,061 |

Source: Created by the author using fiscal 2014 data from the 2014 Annual Report on Car Parking Lots (City Bureau, Ministry of Land, Infrastructure and Transport, 2014)

Table 3. Number of motorcycles accepted at bicycle parking lots

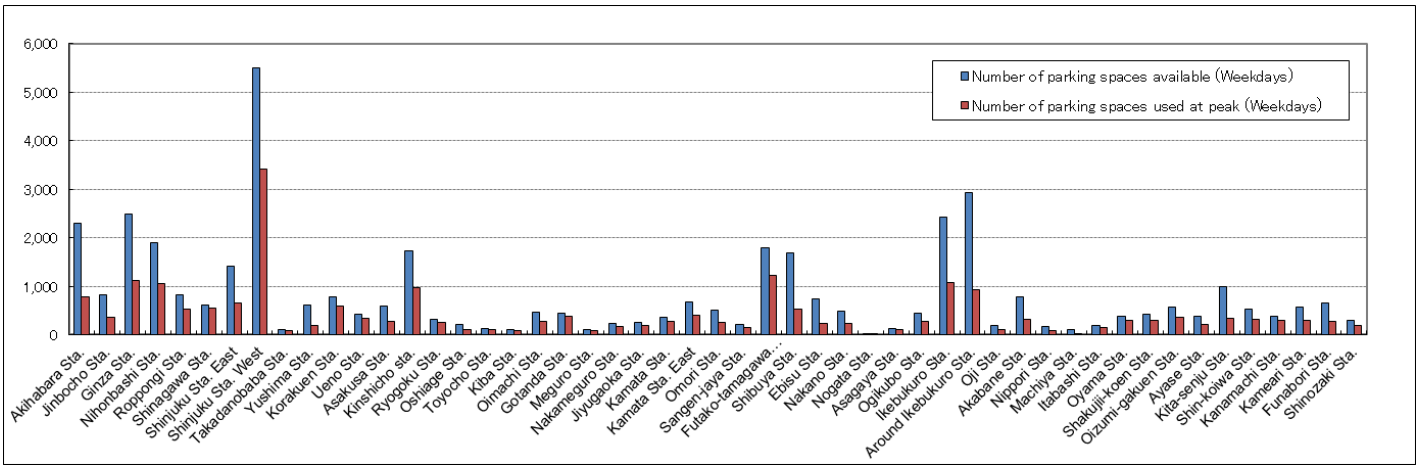
■ To respond to an increase in motorcycles and their illegal parking, some parts of bicycle parking lots have been converted to spaces for motorcycles.

| Cities | | Parking lots | Capacity | Total |
|---|---|---|---|---|
| 264 | bicycles and motorcycles | 864 | 164,758 | 165,622 |
| | bicycle-only | 697 | 91,181 | 91,878 |

Source: Created by the author using fiscal 2014 data from the 2014 Annual Report on Parking Lots (City Bureau, Ministry of Land, Infrastructure and Transport, 2014).

Figure 4. Number of parking spaces available (supply) and parking spaces used at peak times (demand) on weekdays in the 23 wards of Tokyo in fall 2014

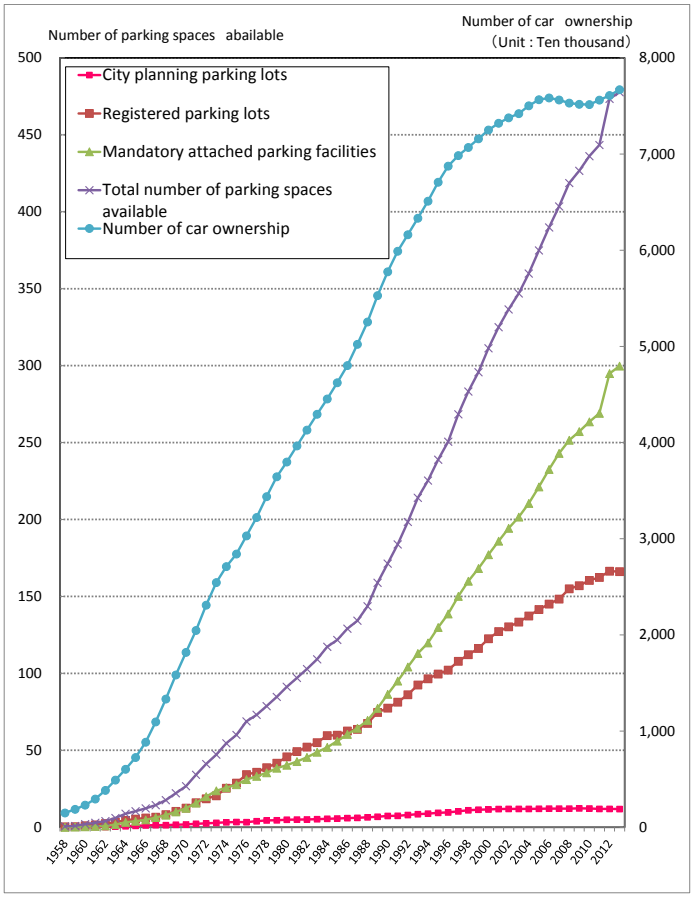
■ Parking demand is being met by supply. On weekends and public holidays, demand is also being met by supply, but demand is higher than on weekdays.




Source: Created by author using the data of the 2014 survey on on-street parking (Metropolitan Public Corporation for Road Improvement 2015)

Fig. 5 Changes in the number of car ownership and the number of parking spaces available

■ The number of car ownership has been on the decline after peaking in 2006, whereas the number of parking spaces available has continued to increase.

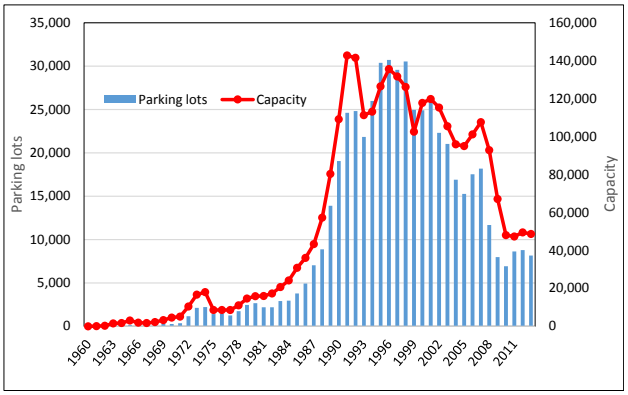



Note: The total number of parking spaces available = Total of parking spaces available at city planning parking lots, registered parking lots, and on-street parking lots.

Source: Created by the author using fiscal 2013 data from the 2014 Annual Report on Parking Lots (City Bureau, Ministry of Land, Infrastructure and Transport, 2014).

Figure 6. Changes in the number of mechanical parking facilities

■ To secure sufficient parking spaces in limited land area, mechanical parking facilities have been developed. Overseas development has recently begun; in 2014, it was announced that technologies related to mechanical parking facilities would be transferred to Singapore.




Source: Created by the author using fiscal 2014 data from the 2014 Annual Report on Parking Lots (City Bureau, Ministry of Land, Infrastructure and Transport, 2014).

Figure 7. Accidents at mechanical parking facilities

■ Although the number of accidents at mechanical parking l facilities is on the decline, accidents resulting in death or injury at mechanical parking facilities have occurred frequently. In 2014, a guideline was created for the establishers and managers of mechanical parking facilities to promote awareness about accidents.


Source: Created by the author based on “Recent Development of Parking Measures” (Urban Transport Facilities Division, City Bureau, Ministry of Land, Infrastructure, Transport and Tourism, 2015).

# 2-7 Trends and Activities in ITS

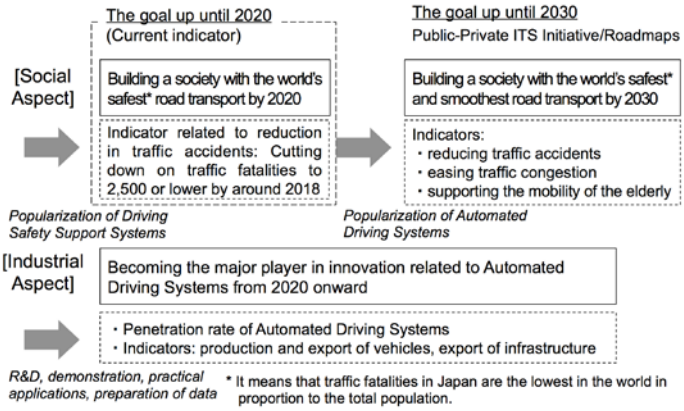
Research Associate, Institute of Industrial Science, the University of Tokyo
**Kentaro Wada**

Professor, Institute of Industrial Science, the University of Tokyo
**Takashi Oguchi**

In 2014, the medium- and long-term goals and directions of ITS developments, which private companies and relevant ministries and agencies should address together, was decided by the IT Strategic Headquarters. Their main targets are (1) safety driving support systems and automated driving systems and (2) the utilization of road transport data; these are expected to be implemented and promoted by strategically exploit opportunities offered by the 2020 Tokyo Olympic and Paralympic Games. The automated driving was also selected as one of the topics in the Strategic Innovation Promotion (SIP) Program since 2014, and its R&D has been activated.

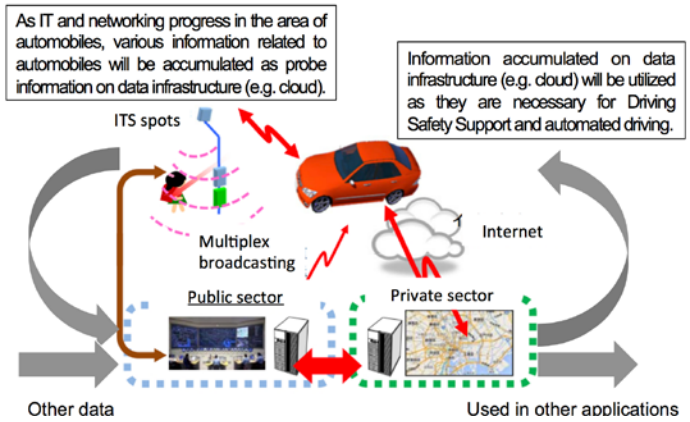
☐ In "Declaration to be the World's Most Advanced IT Nation" approved by the Cabinet on the basis of the study of IT Strategy Headquarters in June 2013, ITS is regarded as a key tool to build "a society with world's safest, environmentally-friendly, and economical road transportation". Then, "Public-Private ITS Initiative/Roadmaps - Strategies on Automated Driving Systems and the Utilization of Road Transport Data to Build a Society with the World's Safest and Smoothest Road Traffic -" was decided in June 2014 (revised to June 2015).

Fig.1 Setting goals and indicators (ITS Initiative/Roadmaps)




Source: Public-Private ITS Initiative/Roadmaps 2015

Fig.2 Relationship between automobiles and the structure for the utilization of road transport data




Source: Public-Private ITS Initiative/Roadmaps 2015

☐ Methods of driving support are classified by the degree of involvement in the operation of the vehicle. In terms of information collection, the methods are grouped into autonomous type and cooperative Type. The former mainly has been developed by private companies and the road infrastructures have been developed for the latter. Experiments of self-driving cars on public roads have been conducted all over the world, and we are entering competitve age for practical application and popularization of automated driving systems on a global scale.

Fig.3 Definitions of safety driving support and automated driving systems

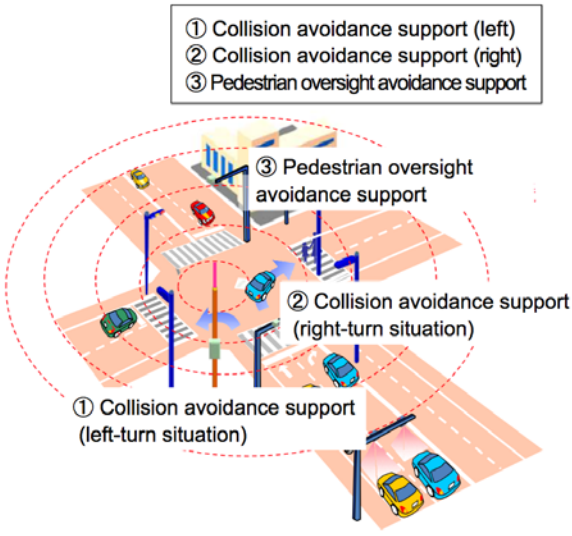
■ SIP-adus (Automated Driving for Universal Services) presents a target of developing the market of Level 3 by around the first half of the 2020s, and develop that of Level 4 in the late 2020s (trial period).

| Categories | | Outline | Systems | |
|---|---|---|---|---|
| Informational | | Alerting drivers | Driving Safety Support Systems | |
| Automated | Stand-alone (Level 1) | Any of the acceleration, steering, or control operations is done by the system. | | |
| | Compounding of systems (Level 2) | More than one of the acceleration, steering, and control operations is done by the system at the same time. | Semi-Automated Driving Systems | Automated Driving Systems |
| | Advancement of systems (Level 3) | All of the acceleration, steering, and control operations are done by the system. Drivers only act on the request of the system. | | |
| | Fully automated driving (Level 4) | All of the acceleration, steering, and control operations are done by everything other than drivers. Drivers have no involvement at all. | Fully Automated Driving Systems | |

Source: Public-Private ITS Initiative/Roadmaps 2015

Fig.4 Driving Safety Support Systems (DSSS)

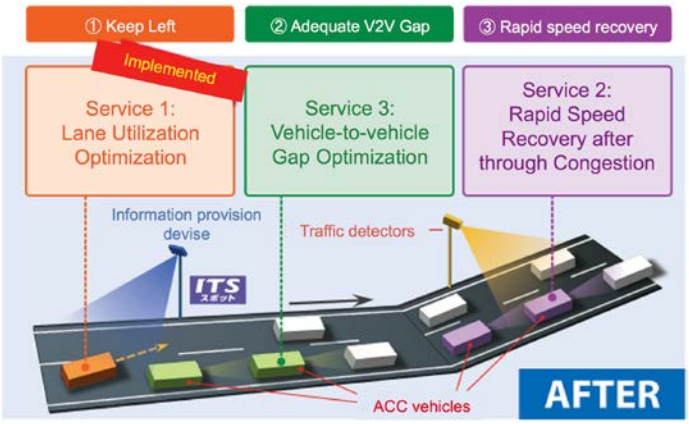
■ DSSS with infrared beacons is being implemented.




Source: National Police Agency website

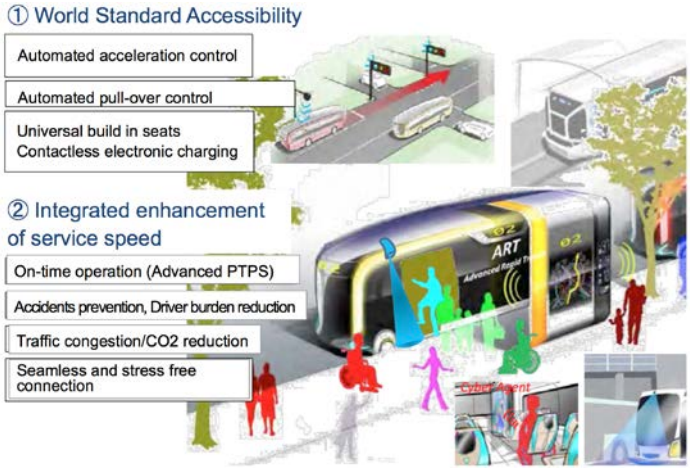
Fig.5 Traffic smoothing at sag section by I2V cooperation

■ Services utilizing Adaptive Cruise Control (ACC) and I2V (Infrastructure-to-Vehicle)communication are studied.




Source: NILIM website

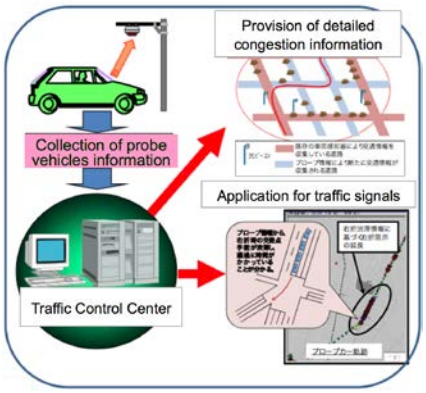
Fig.6 Advanced Rapid Transit (ART): A next-generation urban transportation system by automated vehicle technologies




Source: SIP website

☐ The government began to promote the utilization of probe data, which is now mainly collected and utilized by private companies, because the data contributes to an information provision in a disaster and to congestion measures. The public and private sectors are also studying on data standards and ways to open data in order to share or link traffic-related information (horizontal division of labor), while the data currently is prepared and built separately.

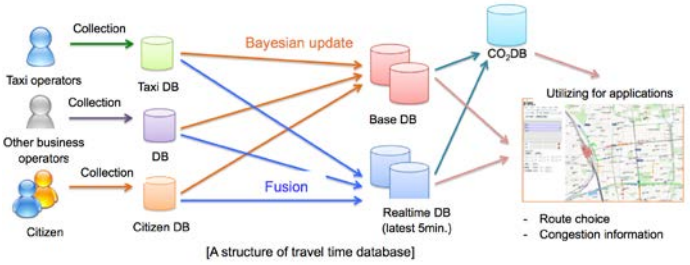
Fig.7 Advanced traffic control system utilizing probe data




Source: National Police Agency website

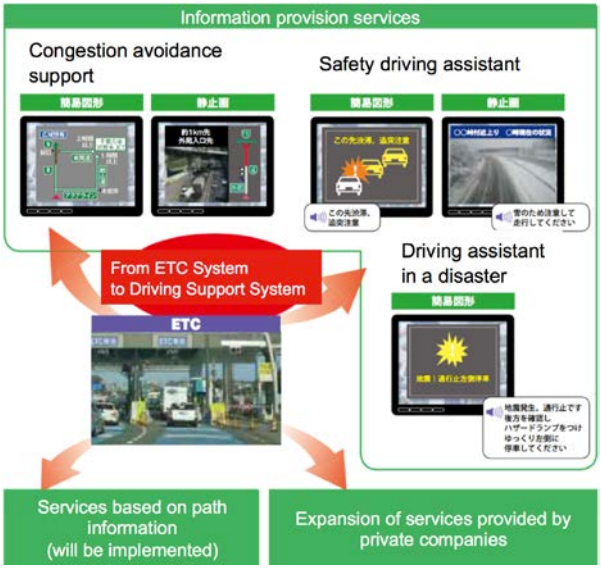
Fig.8 A study on the structure of probe database

■ Integration methods of a wide variety of probe data are being studied for improving the amount and precision of information.




Source: METI webpage

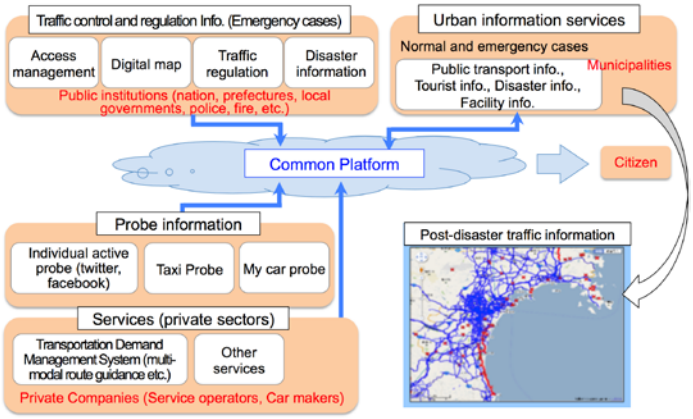
Fig.9 Various driving support services utilizing ETC2.0




Source: MLIT webpage

Fig.10 Regional ITS information center initiative

■ The center integrates traffic information owned by both public and private sectors and utilizes it for immediate response to accidents and disasters and regional government services.




Source: Reproduced by the authors based on ITS Japan website

# 2-8 Mobility Management Measures

Associate Professor,
Graduate School of Engineering,
Kyoto University
Yusuke Kanda

In recent years, MM is being implemented. along with various TDM measures worldwide. MM emphasizes creating a responsible awareness among each person. Late 2000s, MM has begun to be applied in practice to relax traffic congestion, promote public transportation use. Recently, MM has widely applied on transportation, town management. And MM tries innovates a concept of design, information technology. Essentiality of MM is “Tenacious communication and cooperation among stakeholders to overcome the problems associated with transportation and town management”.

Fig. 1 Share of types of MM in Japan – Project reported in JCOMM (Japanese Conference on Mobility Management-

■ In the spread phase of MM (MM was begun to be positioned as a transportation policy of national/local government), MM was mainly applied on promotion of transportation use. Recently, MM is increased to be applied on “Town Management”, “in School”, “Shopping Behavior”.

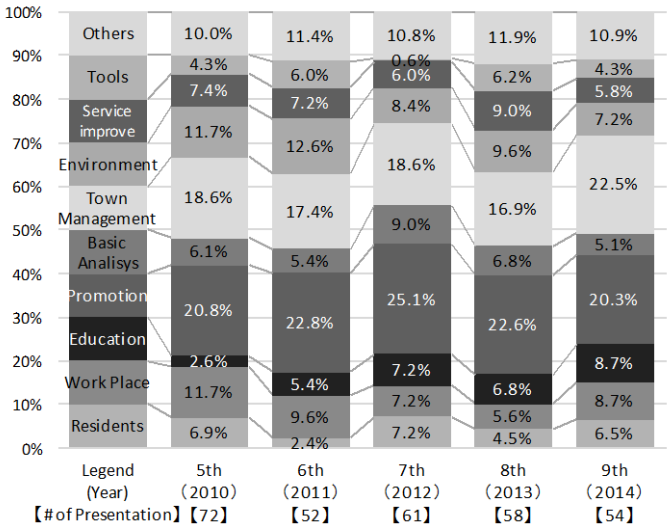



Table 1 Theme of Special Session in JCOMM

■ New possibility of MM is discussed in JCOMM every year. Recently, innovation of MM with “Information Technology”, “Design”, “Public Health” is focused.

| year | Theme of Special Session in JCOMM |
|---|---|
| 2011 | Mobility considering mega-earthquake<br>MM for commuting / MM for city center vitalization<br>MM for aging society in rural area |
| 2012 | Mega-earthquake and MM<br>MM in local cities/towns<br>MM in school education / MM collaborating with Mass Media |
| 2013 | Mega-earthquake and MM<br>MM for Sightseeing, leisure, shopping activity<br>Strategic deployment of MM<br>MM with various participants /MM and information technology |
| 2014 | MM and public health<br>MM and government’s policy / Strategic deployment of MM<br>Emotional MM projects<br>Possibility of MM for safer society |
| 2015 | MM and Design / MM by transportation firm<br>MM and information technology |

Table 2 Topics in ECOMM

■ In Europe, ECOMM (European Conference on Mobility Management) is held every year. Recently in ECOMM, installation strategy of new mobility such as EV, information technology have been discussed.

| year | Theme and topic |
|---|---|
| 2010 | moving people – bridging spaces<br>MM in historical centers / MM for new districts<br>Cross linking of districts and regions<br>MM for all generations / New forms of mobility |
| 2011 | Economic Recession: A New Dawn for Mobility Management<br>Financing and sponsoring / Marketing and partnerships<br>Resource-constrained world / Shared space, responsibilities<br>Travel networks and Life Cycle analysis |
| 2012 | Mobility Management- Key Factor for European Development<br>e-Mobility / Regeneration of cities / Immigrants and MM<br>Climate change / Demographic Focus in MM |
| 2013 | Smart Choices require easy access<br>IT, Gamification, Fun<br>MM and the economy / Sustainable MM plans |
| 2014 | Creating the bridge to a green, fair and prosperous mobility future<br>Walking - beyond the city centers / Citizens participation<br>How to ensure free access to multimodal travel information<br>e-mobility / City logistics |

Fig. 2 MM and Design – Toward Attractive Transportation

■ “Design” have been focused to increase attractiveness of public transportation. For example, “Hitachi BRT”, in Ibaraki, has introduce total design concept, well-designed bus body (left photo), bus stop (right), route map and timetable (below). Residents of wayside highly evaluated for the design, and number of passengers of Hitachi BRT has been increasing.


Source: Hitachi City

□ While advancement of information technology, development, installation and operation of information tools introducing the concept of Mobility Management have been progressed. For example, Misawa City, Aomori, introduces simplified bus-location system display (Fig. 3) and monitor (Fig. 4) that consider users' usability, easiness-to-understand. It contributes to increase convenience of public transportation and led to increase number of passengers.

Fig. 3 Information Display of Bus Location System Considering Users' Needs


Yellow and Black icon indicates "bus has already left".
Source: Misawa City, ITS ALLIANCE Co., Ltd.

Fig 4. Simplified Bus Location System

Bus position information by simplified display.
Source: Misawa City, ITS ALLIANCE Co., Ltd.

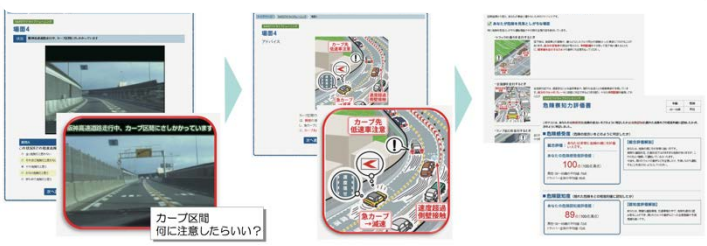
Fig. 5 MM Application on Traffic Safety

■ Incorporating process of attitude and behavior change by Mobility Management, with "perception", "awareness", and "considering", traffic safety measures that promote drivers' safety driving behavior. Hanshin Expressway Co., Ltd. that operates inner-city expressway road service has developed interned-based driving education and training program for free. The program makes a diagnosis on each driver's driving characteristics based on huge objective data, such as traffic accident records, and give concrete advice to drivers based on each driver's characteristics. Many companies and industry groups introduce this program into traffic-safety training course.

Give questions under real situation

Give advices based on objective data

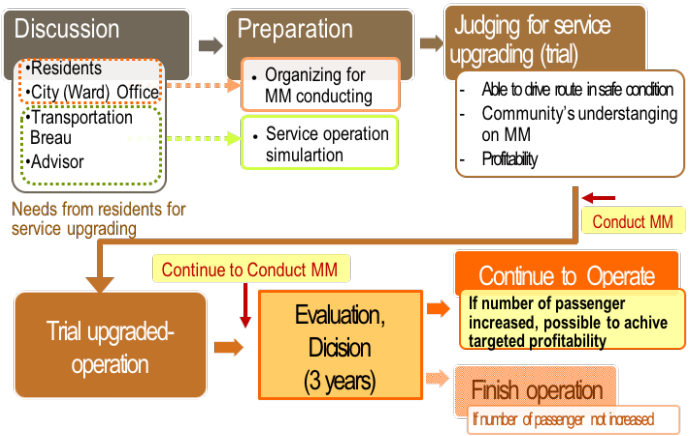
Evaluation, feedback and reconfirmation




Source: Hanshin Expressway Co., Ltd.

Fig. 6 MM with local residents' active participation

■ In order to improve local transportation service and pursue better town management, local residents' active participation is essential. Kyoto Municipal Transportation Bureau has introduced collaboration program with local residents, that discuss local transportation service such as service route, frequency, and promotion measures to increase number of passengers, with support of city government and advisors since 2014. Currently, four community groups join this program.




Source: Kyoto Municipal Transportation Bureau

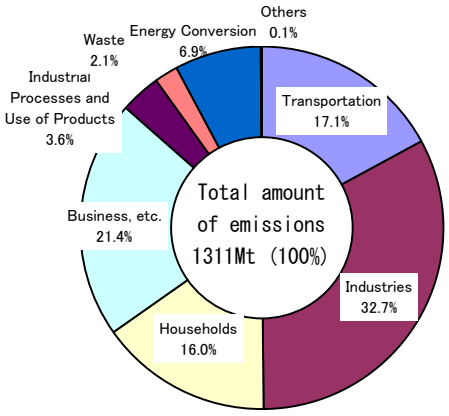
# 3-1 Mitigation / Adaptation of Climate Change

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

Total GHG emissions for FY 2013 in Japan were 148 Mt, which increased by 1.2% from FY 2012 and by 10.8% from FY 1990. The share of $CO_2$ emissions from transportation sector is 17.1% on a downward trend. Japanese government submitted Japan's Intended Nationally Determined Contribution to Reduction in GHG emissions after 2020. The target of the total emissions is -26.0%, and that of transportation sector (from fuel combustion) is -27.6% from the base year of FY 2013.

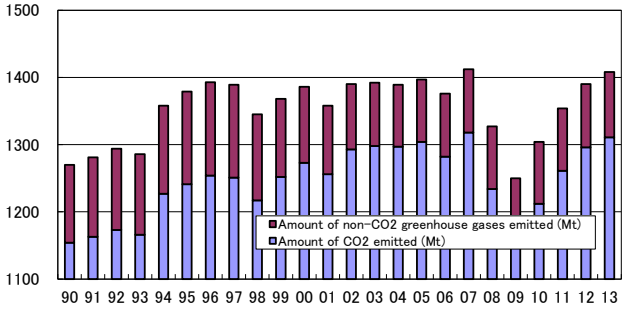
## Fig. 1 Breakdown of $CO_2$ emissions by sectors (FY 2013)

■About 17.1% of the total emissions derived from the transportation sector.



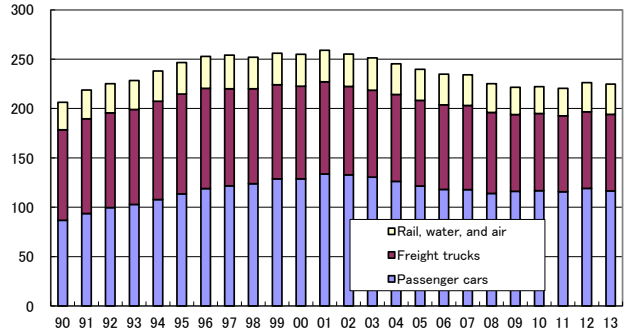

Source: Ministry of the Environment, https://www.env.go.jp/press/files/jp/26800.pdf, 2015

## Fig. 2 Changes in the amounts of greenhouse gas and $CO_2$ emissions in Japan (Mt)




Source: Ministry of the Environment, https://www.env.go.jp/press/files/jp/26800.pdf, 2015

## Fig. 3 Changes in the amount of $CO_2$ emitted from transportation sector (Mt)




Source: National Institute for Environmental Studies, http://www-gio.nies.go.jp/index-j.html, 2015

## Table 1 Japan's 2020 target for GHG emission reduction, and sink by sector and category

| (Mt-CO2) | Base Year (FY 2005) A | Target for Each Sector in FY 2020 B | Difference from Base Year Emission B-A | Ratio to Base Year Emission (B-A)/A |
|---|---|---|---|---|
| CO2 from fossil fuel combustion | 1203 | 1208 | 5 | 0.4% |
| (Industries) | 459 | 484 | | 5.4% |
| (Business, etc.) | 236 | 263 | | 11.4% |
| (Households) | 174 | 176 | | 1.1% |
| (Transportation) | 254 | 190 | | -25.2% |
| (Energy Conversion) | 79 | 95 | | 20.3% |
| CO2 from non-fossil fuel combustion | 80 | 70 | -10 | -12.5% |
| Methane | 23 | 18 | -5 | -21.7% |
| N2O | 24 | 22 | -2 | -8.3% |
| HFC, PFC, SF6, NF3 | 22 | 46 | 24 | 109.1% |
| Greenhouse gas sink | | | -38 | |
| Bilateral Offset Crediting Mechanism | - | - | - | - |
| Total | 1351 | 1300 | -51 | -3.8% |

*1)The reduction of greenhouse gas emissions by nuclear power generation is not counted.
*2)The amount of reduction by Bilateral Offset Crediting Mechanism is not indicated.

Source: Ministry of the Environment, Measures against global warming for implementing Cancun Agreement, 2013

## Table 2 GHG reduction targets in 2020 and 2050 by countries (as of 2009 except Japan's 2020 as of 2014)

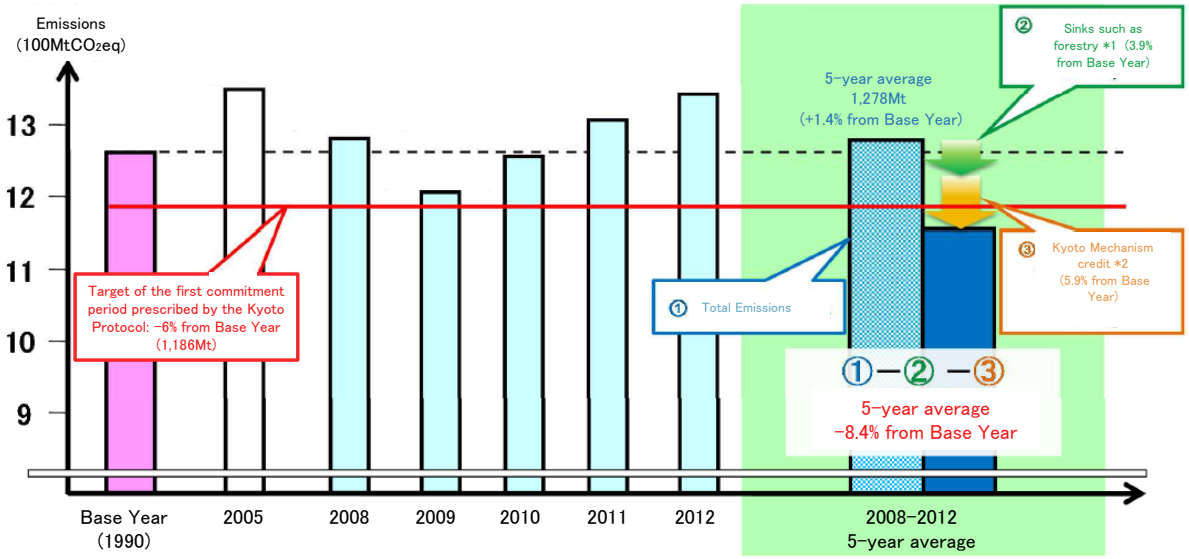
| | 2020 | | 2050 | |
|---|---|---|---|---|
| | Base Year | % of reduction | Base Year | % of reduction |
| Japan | 2005 | 3.8% | Current | 60 to 80% |
| EU (27) | 1990 | 20%(*1, 2) | - | -(*3) |
| UK | 1990 | 26% or more (*4) | 1990 | 80% or more |
| Germany | 1990 | 40% | - | - |
| France | 1990 | 20% | 1990 | 75% |
| US | 2005 | 14%(*2) | 2005 | 83% |
| Canada | 2006 | 20% | 2006 | 60 to 70% |
| Australia | 2000 | 5%(*5) | 2000 | 60% |
| Norway | 1990 | 30%(*6) | - | -(*7) |

*1) 30% provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries adequately contribute according to their responsibilities and respective capabilities
*2) The reduction ratio to 2005 is 14% for both EU and US.
*3) The EU environmental council agreed on the 60 to 80% reduction from its 1990 level by developed countries as a whole.
*4) The Committee on Climate Change proposed 34 to 42% reduction on December 2008
*5) Maximum 15% provided that all the major economic countries reduce emissions considerably and developed countries agree on comparable emission reduction by international negotiations
*6) 10% reduction by 2012
*7) The carbon neutral will be accomplished by 2050.

Source: Ministry of the Environment, https://www.env.go.jp/earth/ondanka/mid-target/exam_prog/countries.pdf, 2014

## Fig. 4 The Status of the Achievement of the Target for the First Commitment Period of Kyoto Protocol (FY 2008 to 2012)

- Total GHG emissions in FY 2012 of Japan is 1,343Mt (+6.5% from Base Year, +2.8% from FY 2011)
- The average emissions from 2008 to 2012 including sinks such as forestry and Kyoto Mechanism credit in addition to the total emissions decreased by 8.4% from base year, which met the target of Kyoto Protocol (−6% from base year).




*1) Sinks such as forestry: The sink such as forestry (measures for forestry sink and urban tree-planting) which can be counted for meeting the target. In relation to the sink by the measure for forestry sink, since the amount of the five-year forestry sink exceeded the maximum allowable amount, the amount is set to the annual average of the maximum allowable amount.

*2) Kyoto Mechanism credit: Governmental Obtainment: Total credit obtained by Kyoto Mechanism credit project at the end of FY 2013 (97.493Mt)
Private Obtainment: The credit by the Federation of Electric Power Companies Japan (Source: Environmental Action Plan by the Japanese Electric Utility Industry (FY 2013))

*3) The amount of emissions and sinks will be established after the inspection under the UNFCCC and the Kyoto Protocol in 2014. Kyoto Mechanism credit will also be established after the adjustment period of the first commitment period in prospect of the latter half of 2015.

Source: Global Warming Prevention Headquarters,
https://www.kantei.go.jp/jp/singi/ondanka/kaisai/dai28/siryou.pdf, 2015

## Fig. 5 Japan's Intended Nationally Determined Contribution to Reduction in GHG after 2020

Base Year
-While the Base Year is set to be FY 2013 mainly, FY 2005 is also registered as the Base Year.
Target Year: FY 2030
Commitment Period: 1 April 2021 to 31 March 2031
Target Sectors, Target Gases
-Target Sectors: All sectors (Energy (Fuel Combustion (Energy Industry, Manufacturer, Construction, Transportation, Business, Households, Agriculture, Forestry and Fisheries, Others), Leakage from Fuel, CO2 Transportation and Storage), Industrial Processes and Use of Product, Agriculture, Land Use, Land Use Change and Forestry, and Waste)
-Target Gases: $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$, and $NF_3$
$CO_2$ from Fuel Combustion

| (Mt-$CO_2$) | Target Emissions for each Sector in FY 2030 | FY 2013 (FY 2005) |
|---|---|---|
| $CO_2$ from Fuel Combustion | 927 | 1235 (1219) |
| Industries | 401 | 429 (457) |
| Business etc. | 168 | 279 (239) |
| Households | 122 | 201 (180) |
| Transportation | 163 | 225 (240) |
| Energy Conversion | 73 | 101 (104) |

Basic measures for accumulatively meeting the GHG emission reduction target: Transportation Sector

- Improvement of fuel efficiency
- Promotion of the next generation automobile
- Other measures for transportation sector (Promotion of the measures for traffic flow, Promotion of public transportation use, Modal shift to freight rail, Comprehensive measures for greening maritime, Reduction of land freight transportation distance by optimal port choice, Comprehensive de-carbonization of ports, Increase in efficiency of truck transportation, Improvement of energy efficiency of rail, Improvement of energy efficiency of air, Promotion of the ships contributing to energy-saving, Greening transportation business by the promotion of the use of environmentally friendly automobiles, Promotion of cooperative delivery system, Promotion of Intelligent Transport System (ITS) (centralization of the control of traffic signals), Construction and maintenance of traffic safety facilities (upgrading of traffic signals, promotion of LED traffic signals), Promotion of automated driving, Promotion of eco-driving and car-sharing)
- Utilization of Structural Reform Special Zone for the measures against global warming
- Planning of promotion of coordinated actions among the Ministries by the roadmap for the measures against global warming

Source: Global Warming Prevention Headquarters,
https://www.kantei.go.jp/jp/singi/ondanka/kaisai/dai30/yakusoku_souan.pdf, 2015

# 3-2 Current Status and Challenges of road traffic noise and air pollution

Professor, Tokyo Metropolitan University
Hiroyuki Oneyama

With the implementation of automobile exhaust emissions regulations and Automobiles NOx and PM Control Law, the achievement rate of environmental quality for nitrogen dioxide (NO2) and suspended particulate matter (SPM) has been greatly improved. On the other hand, the achievement rate of environmental standards for fine particulate matter (PM2.5) is still low. Since road traffic is one of the main causes of PM2.5,, it is necessary to conduct various measures to tackle this issue.

Regarding noise, although the achievement rate has been on a moderately improving trend for the past few years; however, the achievement rate still stays flat on the roads with special road conditions such as multiple cross-section roads. To solve the road traffic noise problem, it is necessary to implement comprehensive measures such as source measures, traffic flow measures, road structure measures and roadside measures.

Figure 1 Environmental Quality Standard Compliance of Nitrogen Oxides (NOx)

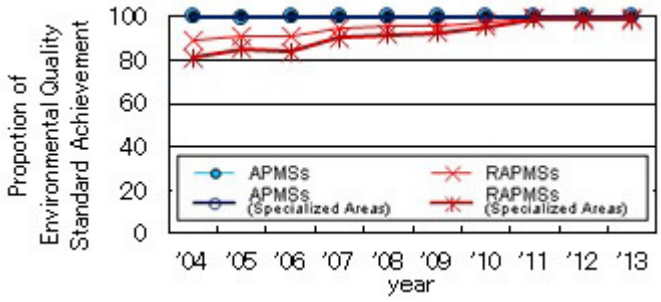
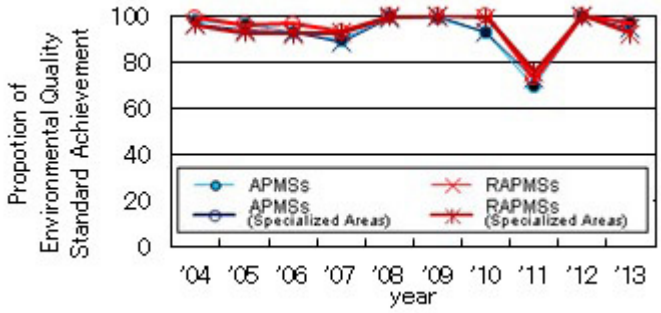


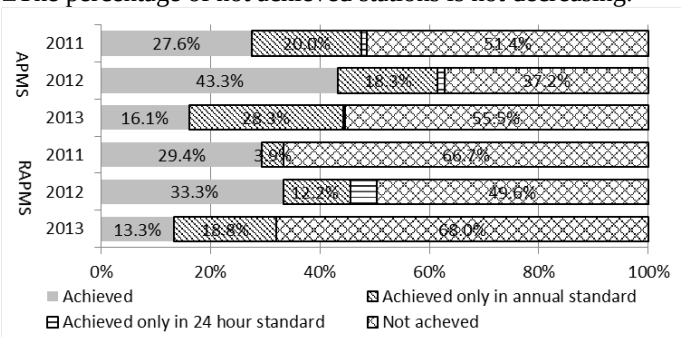

Figure 2 Environmental Quality Standard Compliance of Suspended Particulate Matter (SPM)




Note: APMS: Air Pollution Monitoring Station. RAPMS: Roadside Air Pollution Monitoring Station. Specialized Area is designated for NOx and PM measures in "Automobile NOx and PM Act", namely, a part of Tokyo, Kanagawa, Saitama, Chiba, Aichi, Mie, Osaka, Hyogo Pref.

Figure 3 Environmental Quality Standard Compliance of fine particulate matter (PM2.5)

□The percentage of not achieved stations is not decreasing.



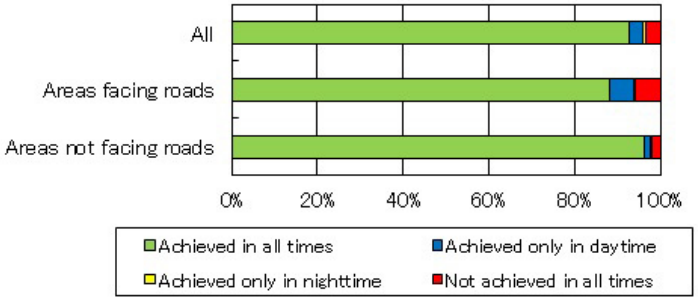

Note: The annual standard for $PM_{2.5}$ is less than or equal to 15.0 μg/m$^3$. The 24 hour standard, which means the annual 98th percentile values at designated monitoring sites in an area, is less than or equal to 35μg/m$^3$.

Source of Figure 1, 2 and 3 : "Status of Air Pollution", Ministry of Environment

Figure 4 Environmental Quality Standard Compliance of Traffic Noise (2013)

□The achievement rate of environmental quality standards on mixed road sections is much lower than in total road section.

(Total)




(Mixed Road Section)

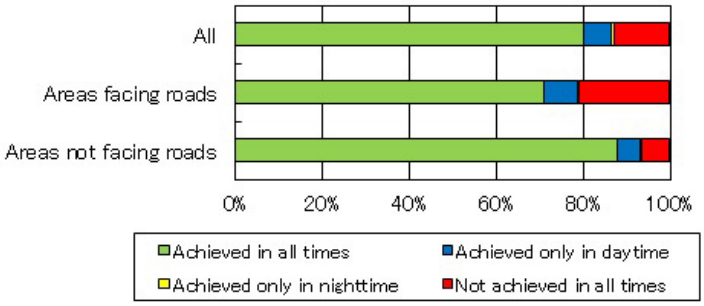
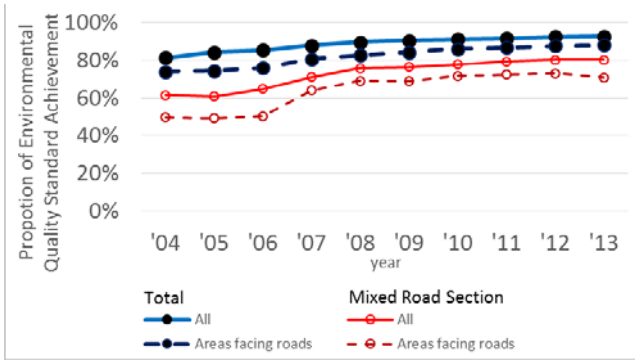



Figure 5 Trend in Proportion of Environmental Quality Standard Achievement

□Achievement is improving gradually, but the improvement on mixed road sections is stagnating.




Source of Figure 4 and 5 : "Status of Motor Vehicle Traffic Noise", Ministry of Environment

Table 1 Roadside Traffic Noise Measures

| Classification of measures | Measures | Overview |
|---|---|---|
| Source measures | Vehicle exhaust noise measures | Reduction of vehicle exhaust noise by Improvement of vehicle structures |
| Traffic flow measures | Traffic control | Sophistication of the traffic signal control, Effective traffic regulation, Traffic guidance crackdown |
| | Development of the bypass | Reduction of inner city heavy vehicles and dispertion of traffic by development of circular roads or bypass etc. |
| | Development logistics Centers | Reduction of inner city heavy vehicles by proper placement of logistics facilities, rationalization of logistics such as joint transport and delivery. |
| Road structure measures | Installation of low-noise pavement | Installtion of low-noise pavement with a lot of voids. |
| | Installation of noise barriers | Installation of high noise barrier with high sound insulation effect. This is effective in motorways with limited access. |
| | Installation of environmental buffer zone | Securing of the buffer space for noise reduction of 10 or 20m between the roadside and roadway. |
| Roadside measures | Development of roadside district plan | A roadside district plan is established in urban planning to promote the prevention of disorder caused by road traffic noise and the proper and reasonable land use. It promotes urban development worthy of the roadside of the main road. |
| Impact prevention measures | Implementation of the grant of residential soundproofing | A reduction of the impact of road traffic noise by the soundproofing subsidies of housing such as emergency measures |
| Development of promotion organization | Creating organization for road traffic pollution measures promotion | In order to solve road traffic noise problem, a close cooperation among relevant organizations should be made. |

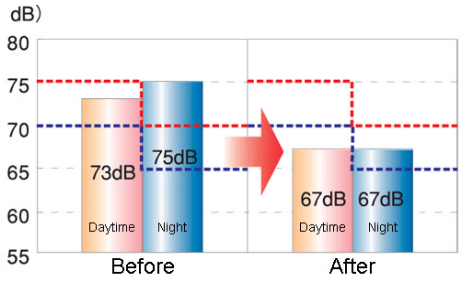
Source: White paper 2015, Ministry of Environment (Modified)

Table 2 Roadside Air Pollution Measures

| Classifications | Measures |
|---|---|
| Low-pollution of automobiles | - Support of introduction of the DPF and oxidation catalyst.<br>- Low-sulfur diesel fuel - Crackdown on illegal diesel<br>- Limitation of high emission vehicle<br>- Development of low emission vehicles<br>- Support of installation of low emission vehicles |
| Reduction of automobile traffic demand | - Road pricing - Traffic regulation<br>- Park & Ride - Installation of walkway and bikeway - Development of station squire<br>- Off-peak and flextime commuting - Development of public transport such as LRT and tram<br>- Promotion of effective imformation provision to drivers using VICS and ETC2.0<br>- Development of effective logistics - Promotion of multi-modal logistics using trains and ships<br>- Idling stop - Eco-drive - Promotion of re-routing |
| Road Network and Capacity Measures | - Development of road network such as circular road and bypass<br>- Bottleneck measures such as grade separation and elimination of rail crossing<br>- Appropriate management or roadworks - Crackdown on illegal parking<br>- Sophistication of the traffic signal control - Development ITS and UTMS |
| Roadside environmental Measures | - Air purification technology such as low concentration denitration and soil denitration<br>- Road greening such as planting strips - Environmental buffer zone |

Figure 6 Traffic Noise Measures utilizing the framework in the Roadside Act (Route 23)

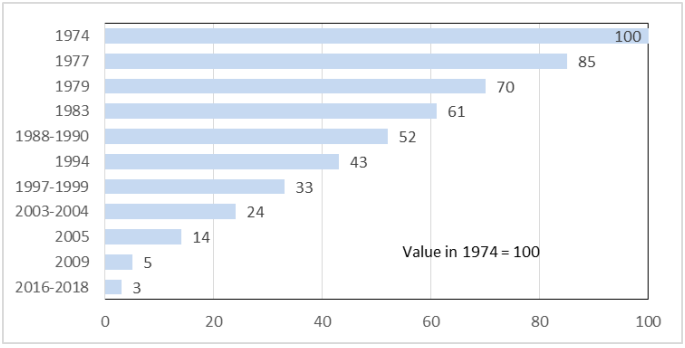
□Along the Route 23 at Yokkaichi, Mie pref., the roadside area development plan based on the Roadside Act has been established including various noise reduction measures. As a result, the roadside environment has been greatly improved.

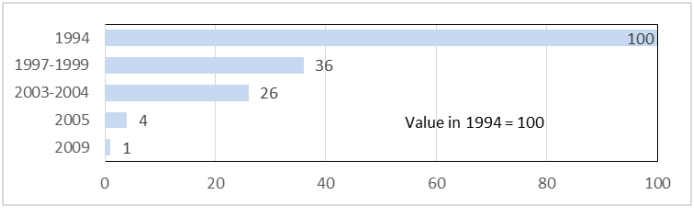

Source : HP, Chubu Regional Development Bureau, MLIT (http://www.cbr.mlit.go.jp/road/doro_sozo/detail01.htm)

Figure 7 Trend in Regulation of Exhaust Gas of Heavy Duty Vehicles (GVW is over 3.5 ton)

□Nitrogen Oxides (NOx)




□Particulate Matter (PM)




Source : White paper 2015, Ministry of Environment

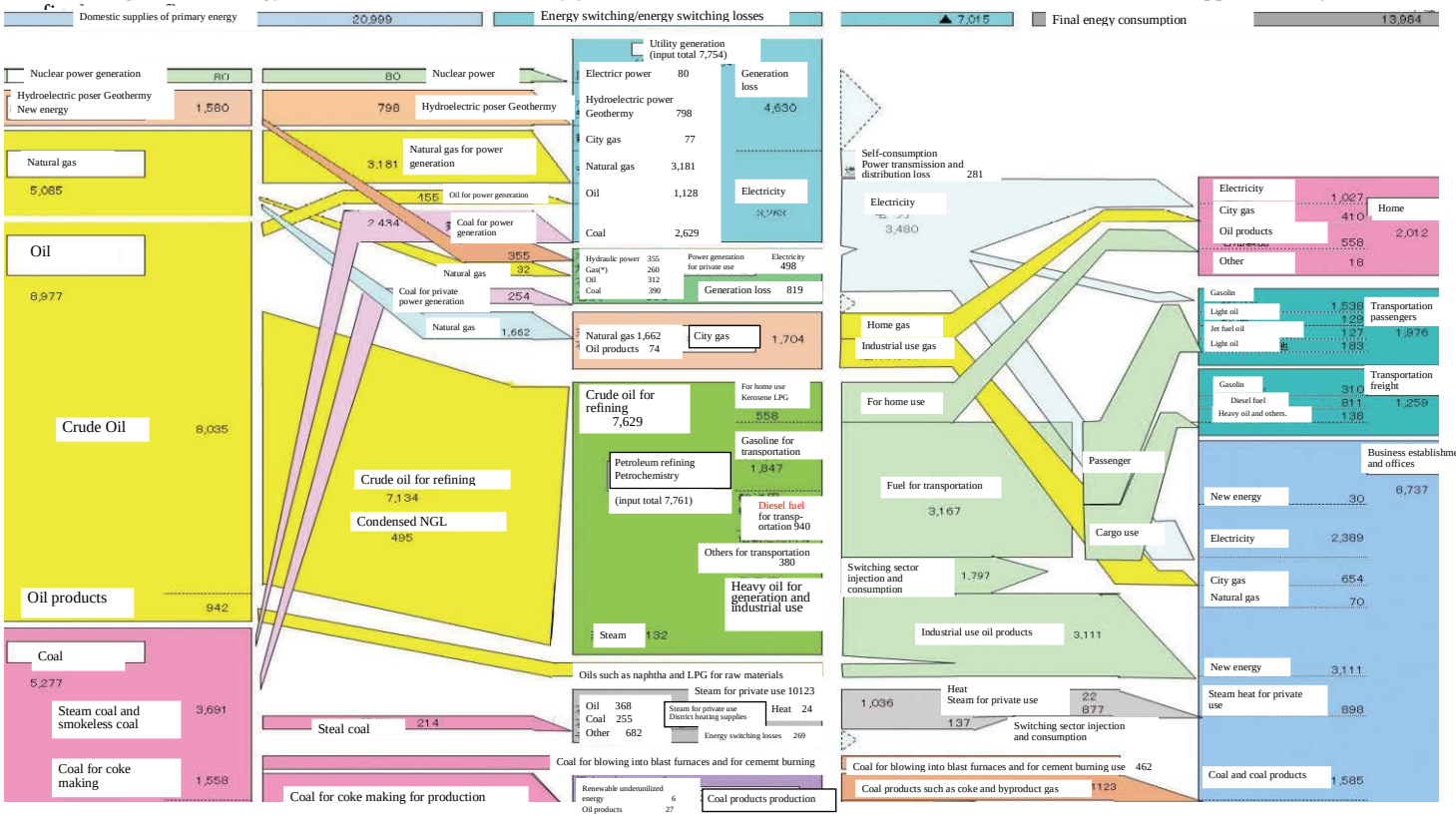
# 3-3 Improving Energy Efficiency

Japan Automobile Manufacturers Association,
Director General, Environment Department
**Tadashi Kotake**

Consumers can eventually use approximately 67% of the primary energy. Gasoline and Diesel fuel account for 86.1% of the energy consumed by the transport sector.
In formulating greenhouse gas reduction target for 2030, the government's trial calculations showed potential energy savings of around 50.3 million KL (crude oil equivalent) based on thoroughgoing energy-saving policies in each sector. Measures in the transportation sector, including improvements in fuel efficiency and traffic flows, as well as the promotion of next-generation vehicles, will achieve a reduction of 16 million KL.

**Figure 1: Outline of Japan's Energy Balance Flows**（FY 2013, Unit: $10^{15}$J）

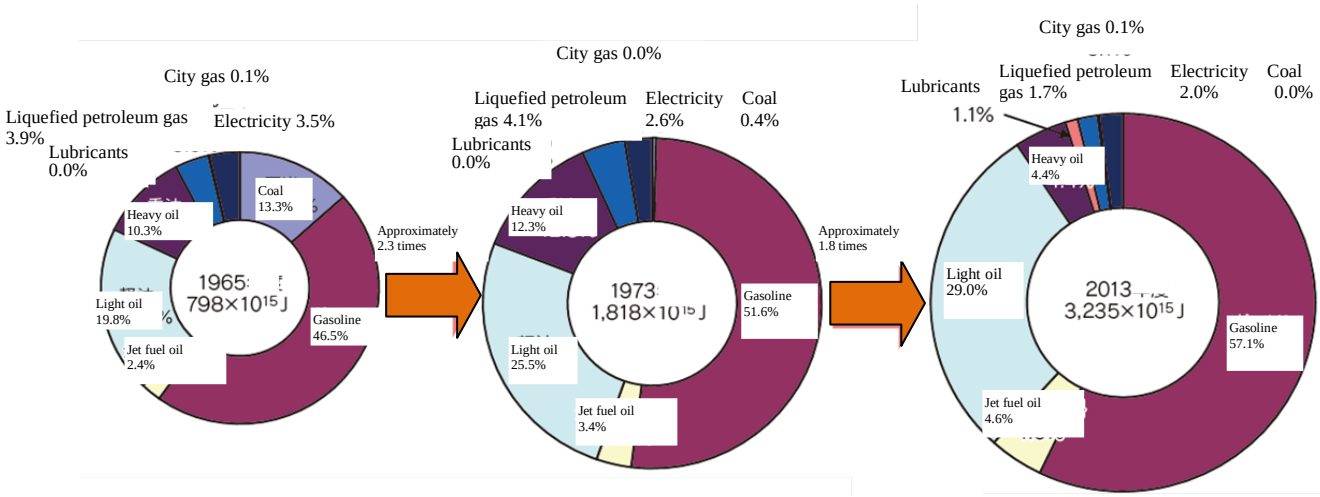
■ Before energy is supplied to end-consumers, there are losses due to generation and transportation as well as self-consumption in generation and switching. So, the energy that can be used decreases by just that amount of losses. In FY 2013, such losses amounted to approximately 27% of




Source: Agency for Natural Resources and Energy "Annual Report on FY 2014 Energy" (Energy White Paper 2015)

**Figure 2: Transportation Sector Energy Consumption by Energy Source**

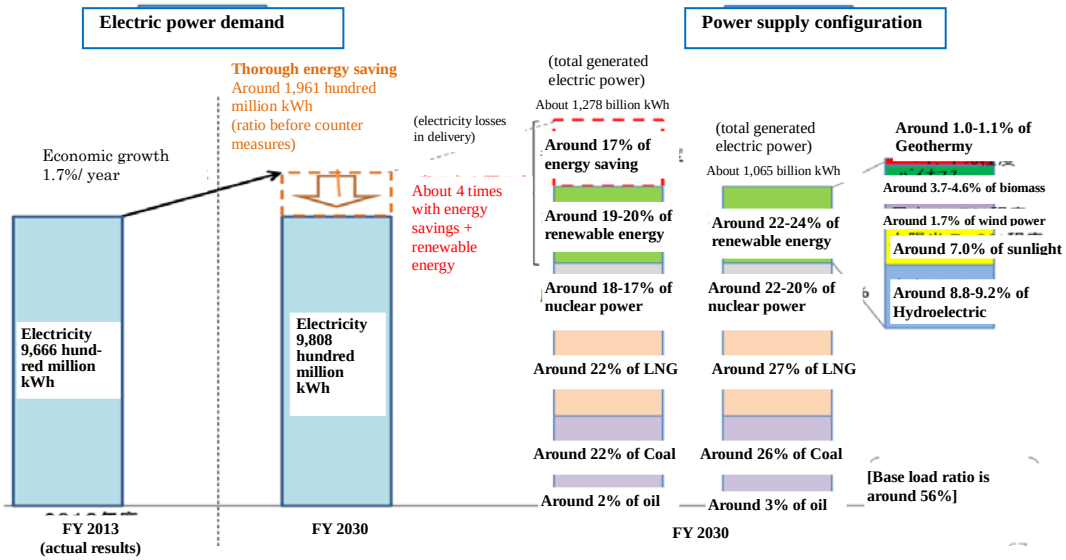
■ The transport sector consumed 4.1 times as much energy in FY 2013 compared to 1965. The oil-based energy such as gasoline, light oil, LP gas, and lubricants accounted for 97.9% of this consumption.




Source: Agency for Natural Resources and Energy "Annual Report on FY 2014 Energy" (Energy White Paper 2015)

**Figure 3: Long-term Energy Supply and Demand Outlook**

■ Moving ahead with the introduction of thoroughgoing energy saving policies and renewable energy (22-24%), while at the same time achieving specific policy goals related to S (Safety) +3E (stable supplies of Energy, Economy, and Environmental protection).




Source: Advisory Committee for Natural Resources and Energy, Basic Policy Subcommittee, Materials (10th session) of Working Party on Long-term Energy Supply and Demand Outlook

**Figure 4: Energy-saving Policies**

■ By 2030, the government plans to achieve energy savings of 50.3 million KL by combining energy-saving measures in each sector, including industry, the home, work, and transport.

■ In the transport sector, trial calculations show a reduction of 16.07 million KL due to simple measures such as fuel efficiency improvements and the spread of next-generation vehicles as well as other measures such as improving traffic flows and promoting eco-driving.

**Industrial sector: about -10,420,000 KL**

**Work sector: about -12,260,000 KL**

**Home sector: about -11,600,000 KL**

**Transportation sector: about -16.07 million KL**

- The spread of next-generation vehicles, fuel efficiency improvements
  => One of two vehicles is next-generation; fuel cell-powered vehicles: annual sales of more than 100,000 units
- Traffic flow measures
  => ITS, automated driving (trucks running in convoys), eco-driving promotion

| Users | Names of energy-saving measures | Actual results of introduction 2012FY | Forecasts for introduction and spread 2030FY | Amount of energy-savings in KL10,000 2030FY | Breakdown: Within electric power | Breakdown: Within fuels | Outline |
|---|---|---|---|---|---|---|---|
| Single measures | Fuel efficiency improvements The spread of next-generation | HEV 3% | 29% | 938.9 | -100.1 | 1039.0 | Support for the introduction and spread of next-generation vehicles that have outstanding energy efficiency (hybrid electric vehicles (HEV)), electric vehicles (EV), plug-in hybrid electric vehicles (PHEV), and clean diesel vehicles (CDV), etc.)<br>In addition, continuing the goal of enhancing vehicle performance by focus on fuel economy (top runner standards) standards, etc. |
| | | EV 0% PHEV 0% | 16% | | | | |
| | | FCV 0% | 1% | | | | |
| | | CDV 0% | 4% | | | | |
| Other | Other transportation sector measures | – | | 668.2 | 62.4 | 605.8 | ・Measures to improve traffic flows<br>・Promotion of public transport<br>・Modal shift to rail freight transportation<br>・Upgrade trucking efficiency<br>・Comprehensive measures for eco-friendly marine transportation<br>・Reduction of the land transportation freight distance by choosing the nearest port<br>・Comprehensive low carbon emissions in ports<br>・Improvement of railway energy efficiency<br>・Improvement of aviation energy efficiency<br>・Promotion of energy-saving ships<br>・Eco-friendly trucking by promoting eco-friendly vehicles<br>・Promotion of collective shipments<br>・Promotion of Intelligent Transport Systems ITS (centralized control of traffic signals)<br>・Development of traffic safety facilities (improvement of traffic signals, and promotion of the use of LED traffic lights)<br>・Promotion of automated driving<br>・Promotion of eco-driving<br>・Car sharing |
| | **Transportation sector total** | | | 1,607.1 | -37.7 | 1,644.8 | |

Source: The figure reproduced by the author based on Materials (10th session) of Working Party on Long-term Energy Supply and Demand Outlook, Advisory Committee for Natural Resources and Energy, Basic Policy Subcommittee

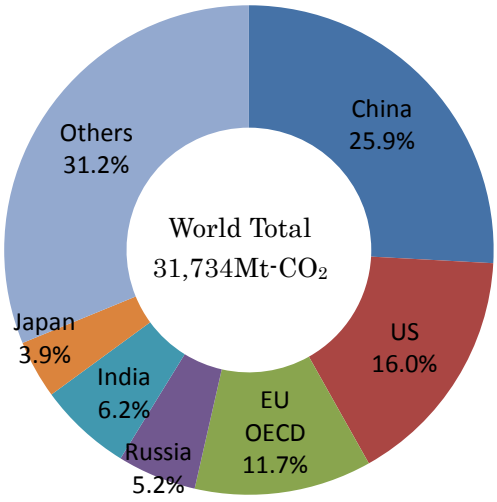
# 3-4 Actions for Sustainable Transport

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

Worldwide $CO_2$ emissions amount to 31.7 billion tons, and while the share of US decreases that of China and India increases. The GHG emissions from transportation sector in some developed countries have been stabilized since the late 2000s, which leads discussions on the cause and effect of the phenomena. In Japan, guidelines for carbon-offset programs are introduced, which is supposed to promote carbon initiatives.

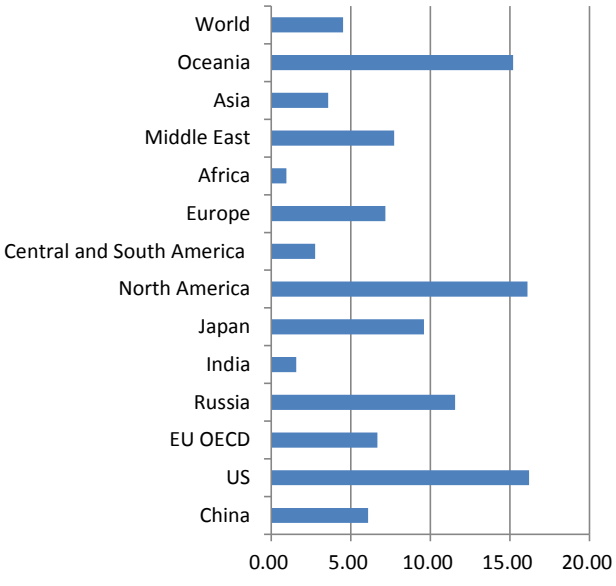
**Fig. 1 The share of $CO_2$ emissions from fuel combustion in major countries and regions (2012)**

■While the share of $CO_2$ emissions from US decreases, that from China and India increases.



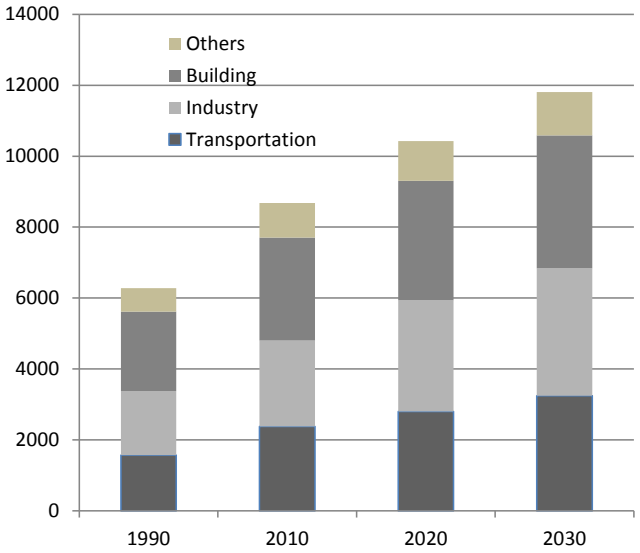

Source: Ministry of the Environment, Environmental Statistics 2015, 2015

**Fig. 2 $CO_2$ emissions per capita in major countries and regions (2012, t-$CO_2$)**



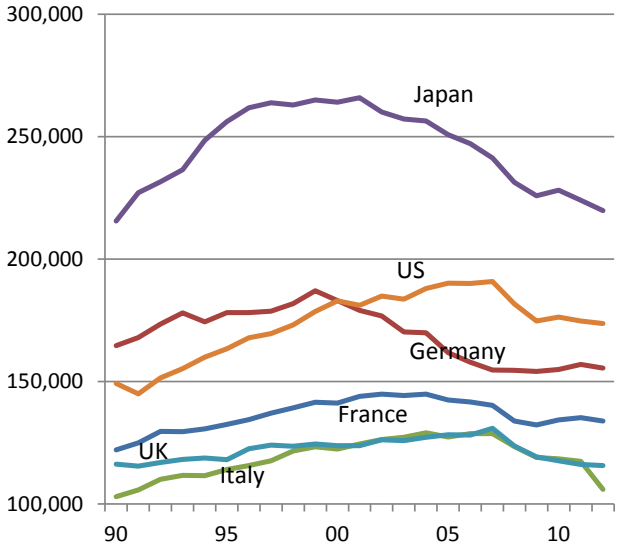

Source: Ministry of the Environment, Environmental Statistics 2015, 2015

**Fig. 3 Trend and forecast of world final energy consumption by sector (reference case, Mtoe)**




Source: IEA, World Energy Outlook 2012, 2012

**Fig. 4 Trend of GHG emissions from transportation sector in major countries (1,000t-$CO_2$, except for US, 10,000t-$CO_2$)**




Source: UNFCCC, http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php, 2015

## Fig.5　Introduction of Carbon Offset Guideline

The objective of this guideline is mainly to explain the practice and procedure of carbon offset program particularly for practitioners who take initiative in the program. The guideline explains the voluntary carbon offset or carbon neutral program not necessarily prescribed by law and regulation which is indicated in 'The State of Carbon Offset in Japan (Guideline) Ver.2.'

Method for estimating emissions from travel

Since it is difficult to collect information on general travelers, the data on true travel distance for each traveler might not be obtainable. The method for estimating travel distance is illustratively introduced for a case.

An example of a meeting event with 1,000 participants in the city center of Tokyo
(Assuming that all the participants come from Tokyo or neighboring prefectures)
The method assumes that one-way travel time by rail is about one hour and the participants can freely choose the nearest station to the event and major rail stations.

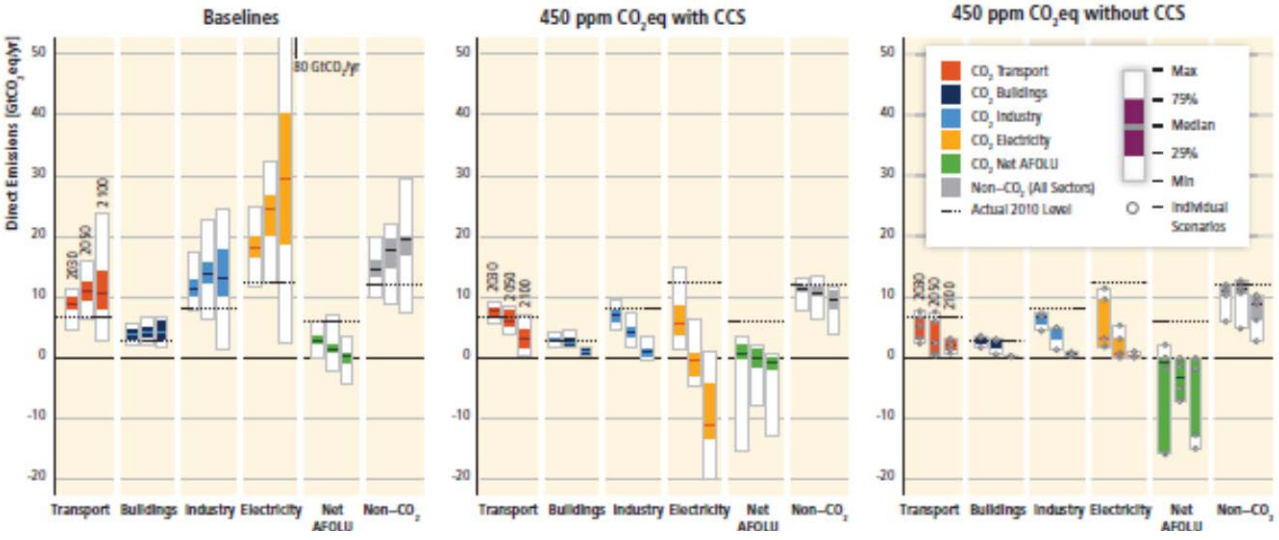
Greenhouse gas emissions from the travel by the participants
= Origin (Hachioji: suburban area) <-> destination (the city center)
* Fuel efficiency * emission factor * 1,000
(About 1 hour from the origin to the destination, one-way is 48.2km)

If the origin of the travel by each participant can be identified as Tokyo or a neighboring prefecture according to the characteristics of the meeting event, the origin can be easily assumed. For the above example, while many participants are assumed to come from the origin in Tokyo, the method estimates emissions conservatively in order to avoid underestimation by assuming a longer travel distance. (In case of rail travel, the true amount of emissions can be estimated with the margin of error less than 1 ton even when the travel distance is half actually.)

Source: Ministry of the Environment, Carbon Offset Guideline Ver.1.0, 2015

## Fig. 6　Direct emissions of $CO_2$ by sector and total non-$CO_2$ GHGs (Kyoto gases) across sectors in baseline (the left panel), and mitigation scenarios that reach around 450 (430 - 480) ppm $CO_2$eq with CCS (Carbon dioxide Capture and Storage) (the middle panel), and without CCS (the right panel)

■The numbers at the bottom of the graphs refer to the number of scenarios included in the range which differs across sectors and time due to different sectoral resolution and time horizon of models. Note that many models cannot reach 450 ppm $CO_2$eq concentration by 2100 in the absence of CCS, resulting in a low number of scenarios for the right panel.




Source: IPCC, Summary for Policymakers, In: Climate Change 2014, Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the IPCC, 2014

# 3-5 Environmentally Friendly Institutional Measures

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

Since 2010, the Clean Development Mechanism has been applied for real in transportation sector; however, from 2013 onward, only one project has been registered. The Joint Crediting Mechanism has also been promoted to contribute to the development of low carbon society in developing countries. In Japan, Location Adjustment Plan has been introduced to promote the formulation of compact cities. Local Governments have been developing their plans.

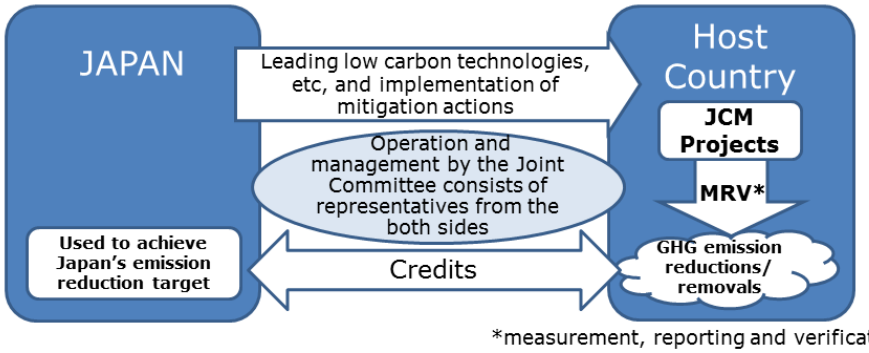
**Table 1 The current status of Clean Development Mechanism in transportation sector**

| Registered | Title | Host Parties | Other Parties | Reductions (t/yr) | Registered | Title | Host Parties | Other Parties | Reductions (t/yr) |
|---|---|---|---|---|---|---|---|---|---|
| 7-Dec-06 | BRT Bogotá, Colombia: TransMilenio Phase II to IV | Colombia | Switzerland<br>Netherlands | 246563 | 12-Mar-12 | MIO Cali, Colombia | Colombia | Netherlands | 242187 |
| | | | | | 13-Mar-12 | BRT Metroplus Medellin, Columbia | Colombia | Switzerland | 123479 |
| 29-Dec-07 | Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system | India | Japan | 41160 | 3-Jul-12 | Bus Rapid Transit (BRT) in Guatemala City | Guatemala | | 536148 |
| 26-Apr-10 | Cable Cars Metro Medellín, Colombia | Colombia | Switzerland | 17290 | 23-Jul-12 | Lanzhou Bus Rapid Transit (BRT) Project | China | Sweden | 12621 |
| 19-Oct-10 | BRT Chongqing Lines 1-4, China | China | Switzerland<br>Germany | 218067 | 10-Aug-12 | MEGABUS, Pereira, Colombia | Colombia | Netherlands | 33956 |
| | | | | | 12-Sep-12 | Metro Line 12, Mexico City | Mexico | Switzerland | 136983 |
| 17-Dec-10 | Plant-Oil Production for Usage in Vehicles, Paraguay | Paraguay | Switzerland | 17188 | 24-Sep-12 | BRT Metrobus 2-13, Mexico | Mexico | Switzerland | 134601 |
| 4-Feb-11 | Modal Shift from Road to Train for transportation of cars | India | | 23001 | 27-Sep-12 | EKO electric vehicles, India | India | Switzerland | 24563 |
| 30-May-11 | BRT Lines 1-5 EDOMEX, Mexico | Mexico | Switzerland<br>Portugal | 145863 | 27-Sep-12 | Hero Electric Vehicles, India | India | Switzerland | 37647 |
| | | | | | 28-Sep-12 | Nittsu Fuel Efficiency Improvement with Digital Tachograph Systems on Road Freight Transportation CDM Project in Malaysia | Malaysia | Japan | 239 |
| 7-Jun-11 | BRT Zhengzhou, China | China | Switzerland<br>Portugal | 204715 | 2-Nov-12 | Electrotherm Electric Vehicles, India | India | Switzerland | 36175 |
| | | | | | 2-Nov-12 | Lohia Auto Industries Electric Vehicles, India | India | Switzerland | 25518 |
| 30-Jun-11 | Metro Delhi, India | India | Switzerland | 529043 | 22-Nov-12 | Mode-shift of passengers from private vehicles to MRTS for Gurgaon metro | India | Switzerland | 105863 |
| 10-Aug-11 | BRT Metrobus Insurgentes, Mexico | Mexico | Spain | 46544 | 19-Dec-12 | LRT System in Tunis | Tunisia | | 29193 |
| 4-Oct-11 | Mumbai Metro One, India | India | Switzerland | 195547 | 31-Jan-13 | Demonstration project for annual production 4, 000, 000 m3 biogas from organic waste in Anyang City | China | United Kingdom of Great Britain and Northern Ireland | 50739 |
| 16-Dec-11 | BRT Transmetro Barranquilla, Colombia | Colombia | Spain | 55828 | 25-Feb-13 | Guiyang MRTS Line I Project | China | | 335188 |
| 10-Feb-12 | BRT Macrobus Guadalajara, Mexico | Mexico | Spain | 54365 | 6-Nov-14 | Landfill Closure and Gas capture CDM project by GAIL at Ghazipur, India | India | | 9337 |

Source: UNFCCC, http://cdm.unfccc.int/Projects/projsearch.html, 2015

**Fig. 1 Development of the Joint Crediting Mechanism (JCM)**

■The Joint Crediting Mechanism (JCM) facilitates the diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as the implementation of mitigation actions, and contributes to the sustainable development of developing countries.



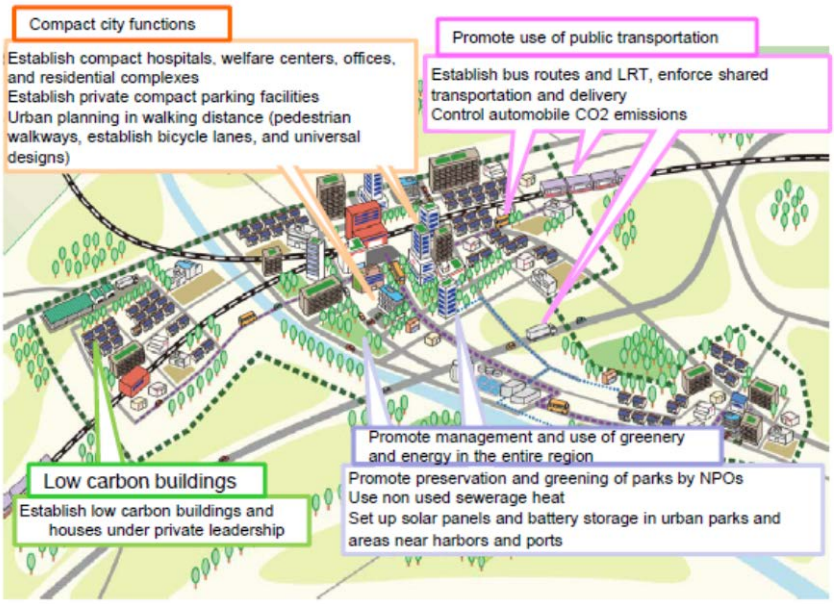

Host Countries: Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, and Chile as of May, 2015

Transportation Project Example:
Eco-Driving by Utilizing Digital Tachograph System in Vietnam

Source: The Joint Crediting Mechanism (JCM), https://www.jcm.go.jp/, 2015

## Fig.2 The Act on the Promotion of Low Carbon in Cities

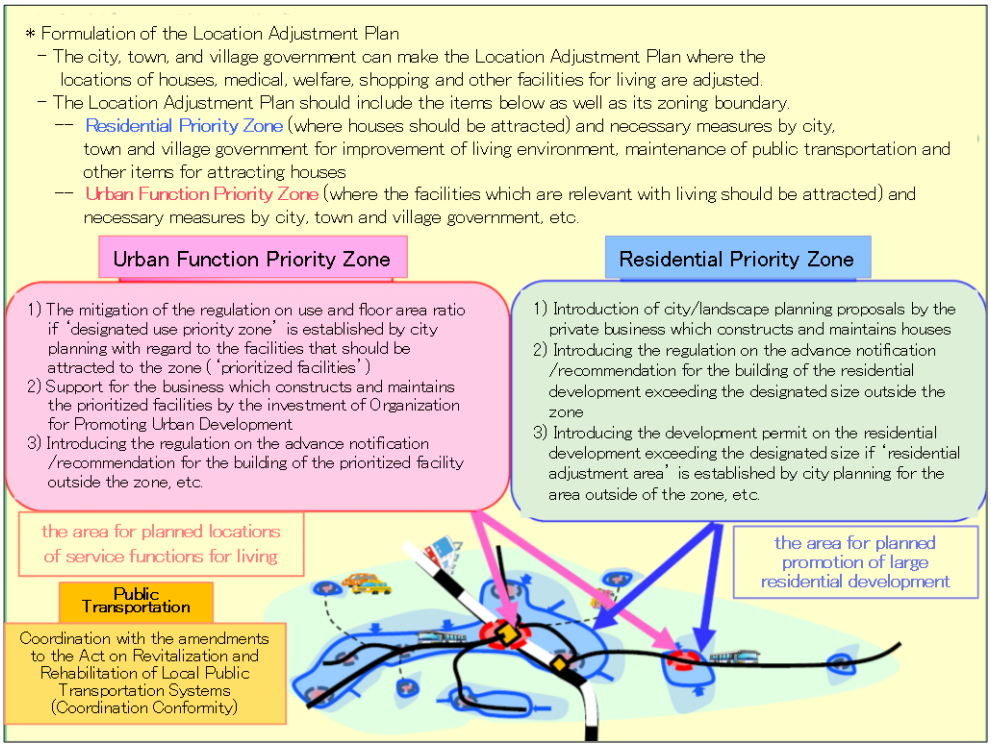
■With the change in energy demand due to the Great East Japan Earthquake and based on the uplift of consciousness among the people on energy and global warming, it is necessary to promote private investments in city areas, to create success stories on the rationalization of low carbon cities and transportation and energy use to spread these concepts to activate housing markets and regional economy.




Source: Ministry of Land, infrastructure, Transport and Tourism, http://www.mlit.go.jp/common/000996976.pdf, 2013

## Fig.3 Introduction of Location Adjustment Plan

■In order to adjust the locations of houses, medical, welfare, shopping and other facilities for living, the amendments to the Act on Special Measures concerning Urban Reconstruction has required the development of Location Adjustment Plans of Local Governments(city, town and village) to attract the facilities to designated zones. The Location Adjustment has established floor area ratios and the relaxation of restrictions for the residential facilities.




Source: Ministry of Land, infrastructure, Transport and Tourism, http://www.mlit.go.jp/report/press/toshi07_hh_000079.html, 2014

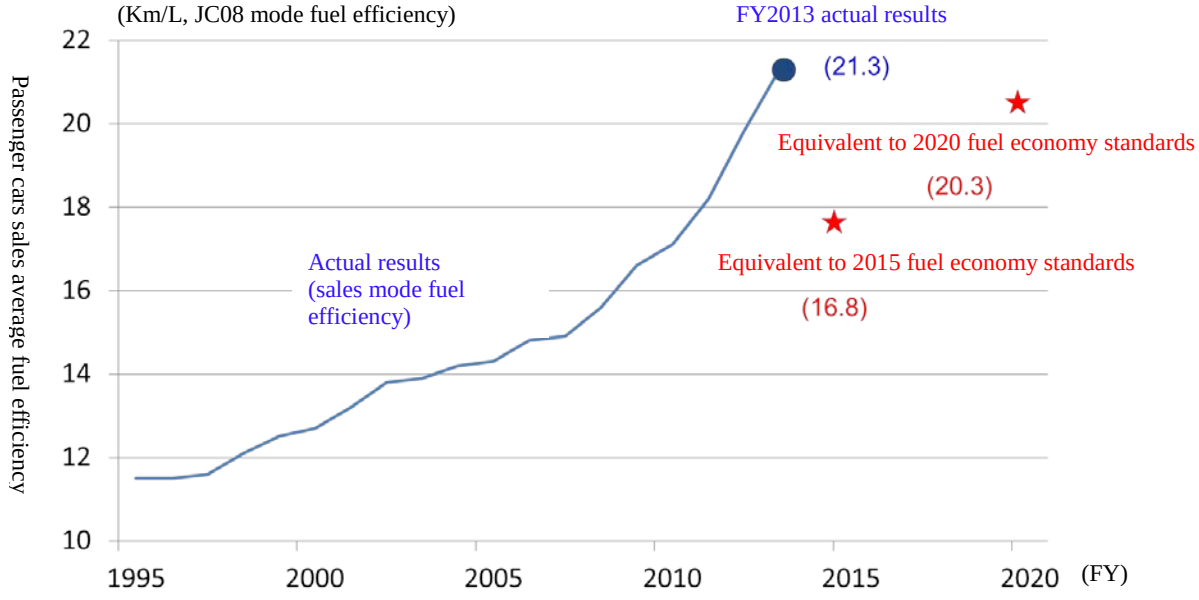
# 3-6 Development and Popularization of Eco-Vehicles

Japan Automobile Manufacturers Association,
Director General, Environment Department
**Tadashi Kotake**

To combat global warming, automakers continue efforts to improve fuel efficiency by introducing a wide range of fuel efficiency enhancing technologies while promoting the development and popularization of next-generation vehicles. They also are working on the recycling of vehicles to construct a recycle-based society.

**Figure 1 Average fuel efficiency of passenger cars sold**

■ The fuel efficiency of passenger cars is improving quickly. The fuel efficiency of new passenger cars is expected to improve continuously through implementing fuel efficiency improvement technologies and the development and commercialization of next-generation vehicles.



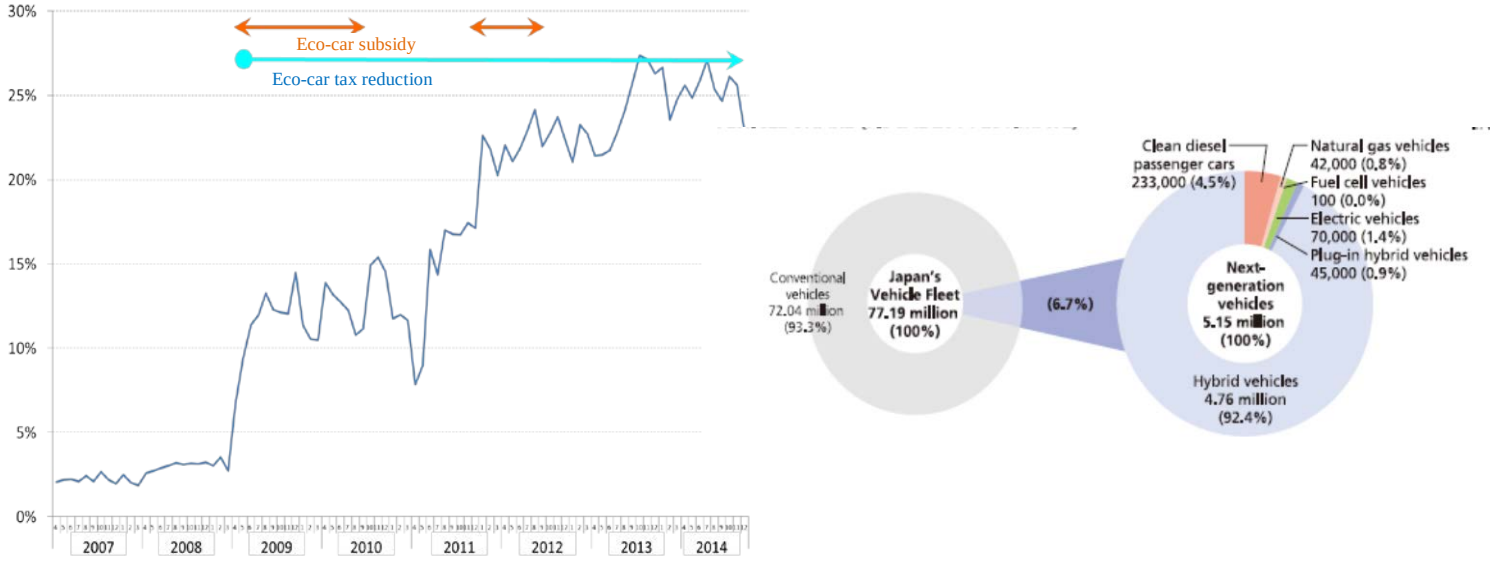

Note: Values of past results are converted into JC08 mode to display fuel efficiency results. Applies only to domestic vehicles.

Source: Japan Automobile Manufacturers Association

**Figure 2 Next-generation Vehicles: Unit sales ratio and the number of vehicles owned**

■ The sales of next-generation passenger cars have grown to account for about 25% of total sales. This growth is the result of measures such as the creation of initial demand and the introduction of eco-car subsidies as well as the reduction of taxes on eco-cars.

■ As of 2014, the number of next-generation vehicles owned was estimated at about 5,150,000. Though, the number is only approximately 6.7% of the total number of currently owned cars, but it has grown rapidly in recent years. Such next-generation vehicles are expected to contribute greatly to the reduction of $CO_2$ emissions in the future.




Source: Japan Automobile Manufacturers Association

**Table 1 The dissemination goal and strategy for next-generation vehicles in "Next Generation Vehicle Strategy 2010" (Ministry of Economy, Trade and Industry)**

- To accelerate the spread of next-generation vehicles, the government has set the following desirable targets in terms of car model percentage in the unit sales of new cars. To achieve these targets will require government-led pro-active incentive measures (aid for development, assistance with purchases, benefits in the taxation system, construction of infrastructure, and so on).
- The "Next Generation Vehicle Strategy 2010" includes action plans for each of six strategies to encourage the spread of next-generation vehicles.
- In addition, the global strategy of "Automobile Industrial Strategy 2014 " specifies the areas to be addressed to achieve the targets for the spread of next-generation vehicles.

Targets for next-generation vehicles

| | 2020 | 2030 |
|---|---|---|
| Conventional vehicles | 50~80% | 30~50% |
| Next-generation vehicles | 20~50% | 50~70% |
| Hybrid vehicles | 20~30% | 30~40% |
| Electric vehicles Plug-in hybrid vehicles | 15~20% | 20~30% |
| Fuel cell-powered vehicles | ~1% | ~3% |
| Clean diesel-powered vehicles | ~5% | 5~10% |

Six strategies

① Overall strategy
Japan to develop and produce next-generation vehicles in its production facilities
Targets for the spread of next-generation vehicles
Up to 50% by 2020
・Advanced environmental vehicles (next-generation vehicles + conventional vehicles with superior environmental performance)
Up to 80% by 2020
・Fuel diversification

② Battery strategy
Ensuring the world's most advanced battery R&D and technology

③ Resources strategy
Securing supplies of rare metals + building of resource recycling system

④ Infrastructure construction strategy
Two million standard battery chargers
Five thousand units of quick chargers

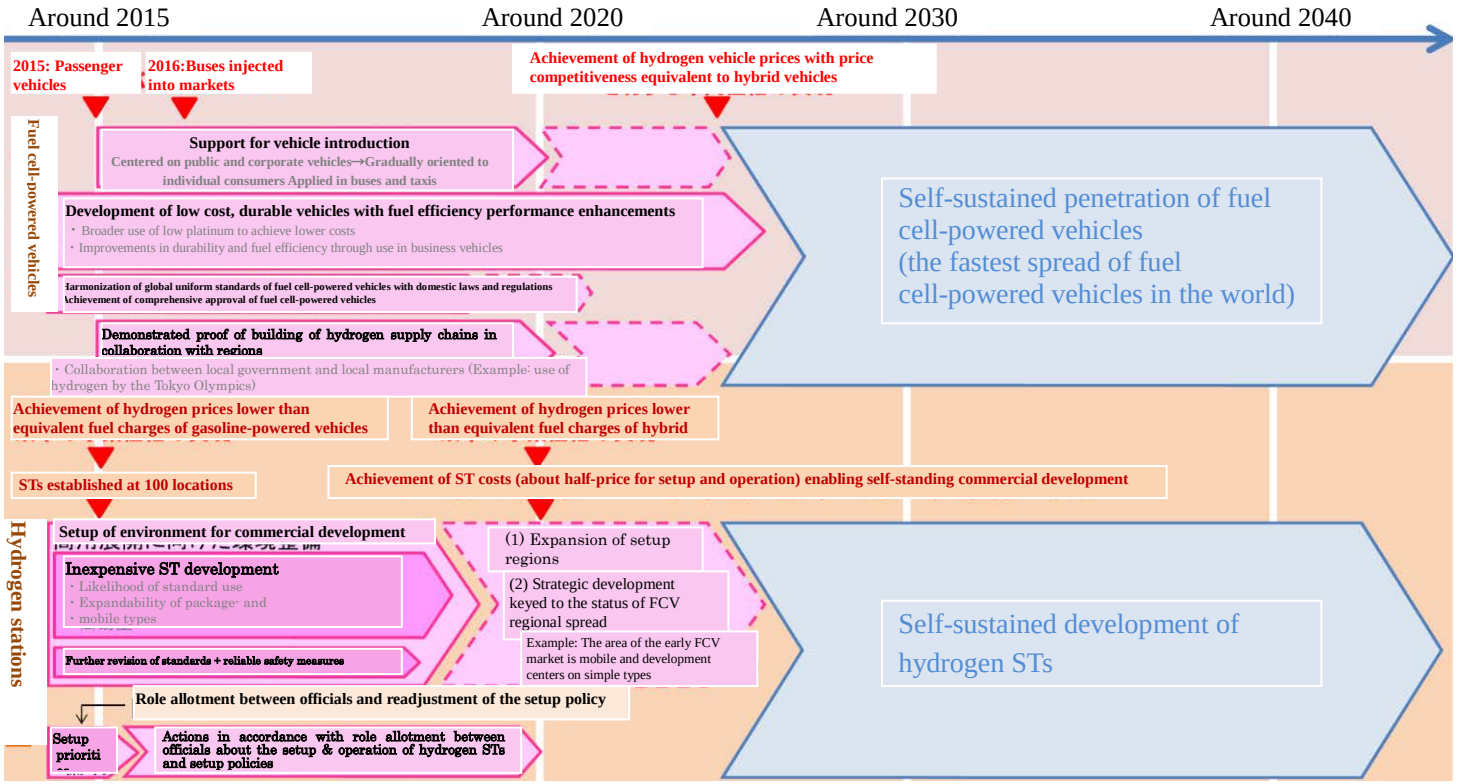
⑤ System strategy
Systemized vehicle exports (smart grids)

⑥International standardization strategy
Strategic international standardization led by Japan

Source: Next Generation Vehicle Strategy 2010

**Figure 3 Road Map for Hydrogen and Fuel Cell Strategy**

- In December 2013, the Ministry of Economy, Trade and Industry established the "Hydrogen/Fuel Cell Strategy Council." In collaboration with the government, industry, and academia, the Council reviewed the most useful applications of hydrogen energy in the future. On June 23, 2014, it released the "Hydrogen/fuel Cell Strategy Roadmap." This Roadmap highlighted official initiatives leading to the achievement of a future society based in part on hydrogen power.
- Besides including applications of hydrogen, the Roadmap specified desirable targets for each stage of production, transportation, and storage as well as initiatives for collaborating between government, industry, and academia leading to implementation. It also clearly stated a time-base (schedule). The major new contents are as follows.
  (1) Target prices of fuel cell-powered cars（equivalent to hybrid vehicles of the same vehicle rank around 2025）
  (2) Hydrogen price targets ((lower than fuel charges of the equivalent gasoline-powered vehicles in the year 2015 and lower than fuel charges of the equivalent hybrid vehicles around 2020).
  (3) Global uniform standards of fuel cell-powered vehicles and harmonization of Japanese domestic laws and mutual recognition of approvals.




Source: Ministry of Economy, Trade and Industry

**Figure 4　Establishment of charging and supply infrastructures in Japan**

■ The establishment of charging and supply infrastructures has become indispensable in order to popularize electric car and fuel cell-powered vehicles.

Automakers:

**Electric vehicles**: Production vehicles were introduced into the domestic market in the year 2009 and unit sales have greatly increased in recent years.

**Fuel cell-powered vehicles**: Production vehicles were introduced into the domestic market in 2014 and sales were begun to general users.

Businesses providing charging and supplies:

**Electric vehicles** : As of July 2015, approximately 5,400 quick-chargers had been installed in Japan.

**Fuel cell-powered vehicles**: To create markets for the beginning of sales of such vehicles, the goal is to install preparatory hydrogen supply infrastructure in four metropolitan areas (Tokyo, Nagoya, Kyoto, Osaka and Fukuoka).

Automakers and businesses providing charging and supplies:

・Introduction and expansion of vehicles nationwide and joint initiatives to establish the charging and supply infrastructure networks.

・Requests to the government to devise a joint public-private strategy for the spread of such vehicles.

An electric vehicle during quick charging

A hydrogen station for fuel cell-powered vehicles

Sources: **Electric vehicles:** CHAdeMO Association and other materials
**Fuel cell-powered vehicles:** Japan Automobile Manufacturers Association

**Table 2 The number of vehicles in use and trend of the average age of vehicles**

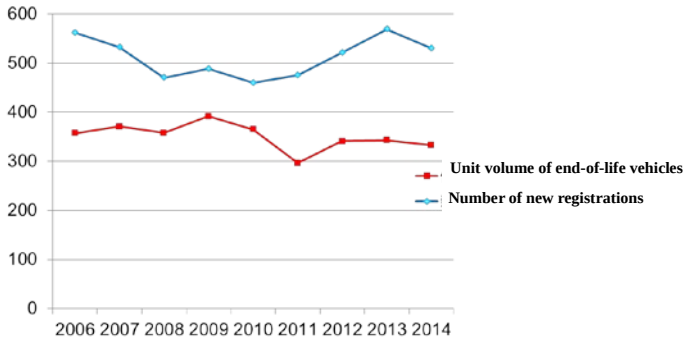
■ The average years of use tends to lengthen in step with the growth of the number of vehicles owned.

| FY | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| Japan's vehicle fleet | 7551 | 7568 | 7547 | 7514 | 7502 | 7499 | 7544 | 7654 |
| Average years of use | 12.4 | 12.9 | 13.0 | 13.5 | 13.4 | 13.7 | 14.1 | 14.3 |

Source: Automobile Inspection & Registration Information Association and Japan Automobile Recycling Promotion Center

**Figure 5 The trend of number of End of Life Vehicles recovered**

■ The number of ELVs in FY 2011 was less than 3 million for the first time since the End-of-Life Vehicle Recycling Law went into force, but it increased to 3.4 million after 2012.




Source: Japan Automobile Dealers Association and Japan Automobile Recycling Promotion Center

**Table 3 Automakers' recycling rates**

■ Targets for shredder dust and air bags have already been achieved.

| | Recycling rate (%) | |
|---|---|---|
| | Shredder dust | Air bags |
| Targets | 30 (2005~)<br>50 (2010~)<br>70 (2015~) | 85 |
| FY 2011 | 92～94 | 93～100 |
| FY 2012 | 93～96.8 | 93～95 |
| FY 2013 | 96～97.7 | 93～100 |

Source: Materials from METI Industrial Structure Council and Central Environment Council

# 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 |
| FY 1960 | 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 |
| 1995 | 61 271 653 (72.8) | 7 619 016 | 43 054 973 | 2 758 386 | 35 018 454 | 5 278 133 |
| 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 | 53 826 529 | 2 024 813 | 36 024 555 | 15 777 161 |
| 2009 | 66 599 647 (74.4) | 5 733 474 | 54 171 896 | 1 948 325 | 35 724 780 | 16 498 791 |
| 2010 | 65 705 843 (74.2) | - | - | 6 241 395 | 59 464 448 | - |
| 2011 | 64 991 077 (74.0) | - | - | 6 073 486 | 58 917 591 | - |
| 2012 | 68 667 586 (74.7) | - | - | 6 076 806 | 62 590 780 | - |
| 2013 | 70 179 556 (72.4) | - | - | 6 152 916 | 64 026 640 | - |

| | Passenger-kilometers transported x 1 million passenger-kilometers ( % in parentheses) | | | | | |
|---|---|---|---|---|---|---|
| | Motor Vehicles | | | | | |
| | | Buses | Passenger cars total | | | |
| | | | | Commercial use | Private Use | |
| | | | | | Registered cars | Light cars |
| FY 1960 | 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 |
| 1995 | 917 419 (66.1) | 97 288 | 664 625 | 13 796 | 594 712 | 56 117 |
| 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 |
| 2009 | 898 721 (65.6) | 87 402 | 588 248 | 10 155 | 533 499 | 44 594 |
| 2010 | 876 878 (65.1) | - | - | 77 677 | 799 201 | - |
| 2011 | 866 347 (64.9) | - | - | 73 916 | 792 431 | - |
| 2012 | 914 609 (65.3) | - | - | 75 668 | 838 941 | - |
| 2013 | 926 751 (64.9) | - | - | 74 571 | 852 180 | - |

Source: Transportation-related Statistics Data Collection; Annual Statistical Report on Motor Vehicle Transport (Ministry of Land, Infrastructure, Transport and Tourism)

Note: 1. Starting from FY 1987, motor vehicles include light motor vehicles and trucks in Private Use

Note: 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

Note: 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).

Note: 4. For passenger cars total, the figures after the FY2010 are given only in the forms of commercial use and private use.

| Trucks in private use | | Railways | Passenger ships | Aircraft | Total | |
|---|---|---|---|---|---|---|
| Registerd 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 |
| 3 133 874 | 7 463 790 | 22 630 439 (26.9) | 148 828 (0.2) | 78 101 (0.09) | 84 129 021 (100.0) | 1995 |
| 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 |
| 1 769 573 | 4 924 704 | 22 774 444 (25.4) | 92 173 (0.1) | 83 872 (0.1) | 89 500 155 (100.0) | 2009 |
| - | - | 22 669 011 (25.6) | 85 047 (0.3) | 82 211 (0.3) | 88 542 112 (100.0) | 2010 |
| - | - | 22 632 357 (25.8) | 84 066 (0.1) | 79 052 (0.1) | 87 786 552 (100.0) | 2011 |
| - | - | 23 041 825 (25.1) | 87 134 (0.1) | 85 996 (0.1) | 91 882 541 (100.0) | 2012 |
| - | - | 26 606 410 (27.4) | 88 018 (0.1) | 92 643 (0.1) | 96 966 627 (100.0) | 2013 |

| Trucks in private use | | Railways | Passenger ships | Aircraft | Total | |
|---|---|---|---|---|---|---|
| Registerd 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 |
| 73 887 | 81 620 | 400 056 (28.8) | 5 527 (0.4) | 65 012 (4.7) | 1 388 014 (100.0) | 1995 |
| 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 |
| 168 016 | 55 054 | 393 765 (28.7) | 3 073 (0.2) | 75 203 (5.5) | 1 370 900 (100.0) | 2009 |
| - | - | 393 466 (29.2) | 3 004 (0.5) | 73 750 (13.5) | 1 347 098 (100.0) | 2010 |
| - | - | 395 067 (29.6) | 3 047 (0.2) | 71 165 (5.3) | 1 335 626 (100.0) | 2011 |
| - | - | 404 394 (28.9) | 3 092 (0.2) | 77 917 (5.6) | 1 400 012 (100.0) | 2012 |
| - | - | 414 387 (29.0) | 3 265 (0.2) | 84 144 (5.9) | 1 428 547 (100.0) | 2013 |

## 1-2 Freight transport in Japan

| | Tonnage transported x 1000 tons (% in parentheses) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Motor Vehicle | | | | | | |
| | | Commercial use | | | Private Use | | |
| | | | Registerd vehicles | Light vehicles | | Registerd 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 |
| 1995 | 6 016 571 (90.6) | 2 647 067 | 2 633 277 | 13 790 | 3 369 504 | 3 230 135 | 139 369 |
| 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 |
| 2009 | 4 454 028 (92.2) | 2 686 556 | 2 666 521 | 20 035 | 1 767 472 | 1 652 982 | 114 490 |
| 2010 | 4 600 624 (91.8) | 3 069 416 | 3 050 476 | 18 940 | 1 531 208 | 1 410 779 | 120 429 |
| 2011 | 4 619 486 (92.0) | 3 153 051 | 3 133 872 | 19 179 | 1 466 435 | 1 343 904 | 122 531 |
| 2012 | 4 495 208 (91.7) | 3 011 839 | 2 988 696 | 23 143 | 1 483 369 | 1 354 088 | 129 281 |
| 2013 | 4 481 702 (91.4) | 2 989 496 | 2 967 945 | 21 551 | 1 492 206 | 1 356 256 | 135 950 |

| | Ton-kilometers transported x 1 million ton-kilometers (% in parentheses) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Motor Vehicle | | | | | | |
| | | Commercial use | | | Private Use | | |
| | | | Registerd vehicles | Light vehicles | | Registerd 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 |
| 1995 | 294 648 (52.7) | 223 090 | 222 655 | 435 | 71 558 | 69 911 | 1 647 |
| 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 |
| 2009 | 334 667 (63.9) | 293 227 | 292 520 | 707 | 41 440 | 39 954 | 1 486 |
| 2010 | 244 750 (54.9) | 213 288 | 212 832 | 456 | 31 462 | 29 862 | 1 600 |
| 2011 | 232 693 (54.3) | 202 441 | 201 984 | 457 | 30 252 | 28 620 | 1 632 |
| 2012 | 211 669 (51.5) | 180 336 | 179 865 | 471 | 31 333 | 29 620 | 1 713 |
| 2013 | 215 885 (51.1) | 184 840 | 184 360 | 480 | 31 045 | 29 252 | 1 793 |

Source: Transportation-related Statistics Data Collection; Annual Statistical Report on Motor Vehicle Transport (Ministry of Land, Infrastructure, Transport and Tourism)
Note: 1. Starting from FY 1987, motor vehicles include light motor vehicles and trucks in Private Use
Note: 2. In FY 2010, data collection research and aggregation methods have been changed. Therefore, the number of the before and after of 2010 is not continuous

| 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 |
| 76 932 (1.2) | 548 542 (8.3) | 960 (0.01) | 6 643 005 (100.0) | 1995 |
| 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) | 1 074 (0.02) | 5 144 322 (100.0) | 2008 |
| 43 251 (0.9) | 332 175 (6.9) | 1 024 (0.02) | 4 830 478 (100.0) | 2009 |
| 43 647 (0.9) | 366 734 (7.3) | 1 004 (0.02) | 5 012 009 (100.0) | 2010 |
| 39 886 (0.8) | 360 983 (7.2) | 960 (0.02) | 5 021 315 (100.0) | 2011 |
| 42 340 (0.9) | 365 992 (7.5) | 977 (0.02) | 4 904 517 (100.0) | 2012 |
| 44 101 (0.9) | 378 334 (7.7) | 1 016 (0.02) | 4 905 153 (100.0) | 2013 |

| 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 |
| 25 101 (4.5) | 238 330 (42.6) | 924 (0.17) | 559 002 (100.0) | 1995 |
| 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 |
| 20 562 (3.9) | 167 315 (32.0) | 1 043 (0.20) | 523 587 (100.0) | 2009 |
| 20 398 (4.6) | 179 898 (40.3) | 1 032 (0.23) | 446 078 (100.0) | 2010 |
| 19 998 (4.7) | 174 900 (40.8) | 992 (0.23) | 428 583 (100.0) | 2011 |
| 20 471 (5.0) | 177 791 (43.3) | 1 017 (0.25) | 410 948 (100.0) | 2012 |
| 21 071 (5.0) | 184 860 (43.7) | 1 049 (0.25) | 422 865 (100.0) | 2013 |

## 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 | 2010 | 779.2 (58.7) | 77.7 (5.9) | 393.5 (29.6) | 3.0 (0.2) | 73.8 (5.6) | 1 327.2 (100) |
| U.S.A | 2010 | 6 359.9 (82.1) | 470.4 (6.1) | 10.3 (0.1) | — | 908.9 (11.7) | 7 749.5 (100) |
| U.K. | 2009 | 680.2 (86.2) | 38.5 (4.9) | 62.5 (7.9) | — | 8.3 (1.1) | 789.5 (100) |
| France | 2009 | 723.9 (82.1) | 48.9 (5.5) | 99.2 (11.3) | — | 9.7 (1.1) | 881.7 (100) |
| Germany | 2009 | 886.8 (84.1) | 62.4 (5.9) | 98.9 (9.4) | — | 6.5 (0.6) | 1 054.6 (100) |

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)
Note: 1. Since the values of Japan are excluded the private car, it has deviated greatly from the actual situation
Note: 2. Figures for passenger cars for the U.S.A. include motorcycles
Note: 3. Figures for buses for U.K. are those for public transport vehicles
Note: 4. Figures for buses for Germany are the total of all public transport modes including taxis and streetcars

### 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 | Pipeline | Total |
|---|---|---|---|---|---|---|---|
| Japan | 2010 | 24.5 (10.9) | 20.4 (9.0) | 179.9 (79.7) | 1.0 (0.4) | — | 225.8 (100) |
| U.S.A | 2009 | — (32.0) | 2 237.0 (39.0) | 696.6 (12.0) | 17.6 (0.0) | — (16.0) | — (100) |
| U.K. | 2009 | 131.6 (80.3) | 21.2 (12.9) | 0.2 (0.1) | 0.7 (0.4) | 10.2 (6.2) | 163.9 (100) |
| France | 2009 | 156.0 (72.3) | 32.1 (14.9) | 8.7 (4.0) | 0.9 (0.4) | 18.2 (8.4) | 215.9 (100) |
| Germany | 2009 | 245.6 (59.4) | 95.8 (23.2) | 55.7 (13.5) | 0.6 (0.1) | 16.0 (3.9) | 413.7 (100) |

Source: Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism)
Note: 1. Figures for passenger cars and buses for Japan is corrected by "Motor Vehicle Transport Statistical Yearbook"

## 3. Road Traffic in Japan and Other Countries

### 3-1 Vehicle kilometers traveled in Japan

(unit: 1 million kilometers)

| | Passenger cars | | | Trucks | | | Total |
|---|---|---|---|---|---|---|---|
| | Passenger cars (excl. light vehicles) | Buses | Sub total | Commercial use (excl. light trucks) | Private use (excl. light trucks) | Sub 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 |
| 1990 | 350 317 | 7 112 | 357 429 | 48 459 | 122 077 | 170 536 | 527 964 |
| 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 |
| 2009 | 382 740 | 6 549 | 389 289 | 69 488 | 86 265 | 155 753 | 545 042 |

| | Gasoline | | Light oil | | LPG | CNG | Total |
|---|---|---|---|---|---|---|---|
| | Commercial | Private | Commercial | Private | | | |
| 2010 | 7 668 | 564 084 | 66 309 | 55 963 | 12 161 | 429 | 706 614 |
| 2011 | 7 482 | 572 516 | 64 535 | 53 632 | 11 245 | 424 | 709 834 |
| 2012 | 7 809 | 602 209 | 58 021 | 52 814 | 10 689 | 401 | 731 943 |
| 2013 | 7 874 | 621 693 | 55 922 | 49 984 | 10 335 | 369 | 746 177 |

Source: Transportation-related Statistics Data Collection; Annual Report of Automobile Fuel Consumption Statistics (Ministry of Land, Infrastructure, Transport and Tourism)

Note: The survey method and aggregation method has been changed from FY 2010. Because the numbers are aggregated by fuel, also the number of the light cars is added, so the numbers are not continuous from 2010.

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

(unit: 1 million vehicle-kilometers)

| | Survey year | Passenger cars | Buses | Trucks | Total |
|---|---|---|---|---|---|
| Asia | | | | | |
| Japan | 2012 | — | | — | 731 943 |
| Korea | 2012 | 193 371 | 23 100 | 63 172 | 279 643 |
| China | 2000 | 418 330 | — | 422 630 | — |
| Hong-Kong | 2012 | 7 345 | 1 297 | 3 515 | 12 157 |
| Singapore | 2012 | 11 149 | 568 | 5 203 | 16 920 |
| India | 2002 | 208 581 | 63 500 | 297 374 | 569 455 |
| Turkey | 2012 | 64 926 | 4 110 | 24 953 | 93 989 |
| Europe | | | | | |
| U.K. | 2012 | 386 678 | 4 381 | 91 441 | 482 500 |
| Germany | 2011 | 608 800 | 3 255 | 80 000 | 692 055 |
| France | 2012 | 426 280 | 3 511 | 119 988 | 549 779 |
| Netherlands | 2012 | 102 697 | 627 | 23 886 | 127 210 |
| Bergium | 2012 | 79 147 | 796 | 18 316 | 98 259 |
| Spain | 2012 | — | — | — | 115 010 |
| Portugal | 2012 | — | 389 | — | — |
| Greece | 2010 | 54 848 | 1 277 | 15 542 | 71 667 |
| Switzerland | 2012 | 52 582 | 124 | 6 185 | 58 891 |
| Austria | 2011 | 63 900 | 510 | 11 900 | 76 310 |
| Norway | 2012 | 33 115 | 366 | 9 415 | 42 896 |
| Sweden | 2012 | 62 806 | 949 | 12 195 | 75 950 |
| Finland | 2012 | 46 620 | 580 | 7 035 | 54 235 |
| Denmark | 2012 | 35 325 | 563 | 9 643 | 45 531 |
| Poland | 2012 | 166 095 | 2 062 | 34 742 | 202 899 |
| Hungary | 2012 | 24 314 | 637 | 9 714 | 34 665 |
| Ukraine | 2012 | 4 874 | 2 736 | 6 872 | 14 482 |
| America | | | | | |
| U.S.A. | 2012 | 3 320 643 | 23 745 | 1 399 170 | 4 743 558 |
| Canada | 2009 | 213 734 | — | 119 147 | 332 881 |
| Mexico | 2012 | 111 536 | 5 997 | 32 707 | 150 240 |
| Africa | | | | | |
| Morocco | 2006 | 23 037 | — | — | — |
| South Africa | 2007 | 75 573 | 9 007 | 47 278 | 131 858 |
| Oceania | | | | | |
| Australia | 2012 | 169 585 | 2 352 | 61 385 | 233 322 |
| New Zealand | 2012 | 36 852 | 241 | 2 522 | 39 615 |

Source: World Road Statistics (IRF)

# 4. Road Traffic in Japan

## 4-1 Traffic volume by road type/ 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 | Small trucks | Buses | Ordinary trucks | | Passenger cars | Trucks | |
| | | | | Small vehicles(2010～) | | Ordinary vehicles(2010～) | | | Small vehicles | Ordinary Vehicles | |
| National expressways | 1980 | 2 698.8 | 38 933 | 15 424 | 9 590 | 1 130 | 12 789 | 55 512 | 21 352 | 34 160 | 82.95 |
| | 1985 | 3 555.4 | 51 762 | 22 699 | 10 953 | 1 465 | 16 646 | 76 438 | 35 066 | 41 372 | 82.81 |
| | 1990 | 4 675.3 | 80 526 | 34 973 | 16 838 | 2 256 | 26 460 | 121 629 | 55 180 | 66 449 | 84.99 |
| | 1994 | 5 567.7 | 105 461 | 49 661 | 21 051 | 2 620 | 32 128 | 153 673 | 75 083 | 78 590 | 78.34 |
| | 1999 | 7 094.9 | 128 829 | 69 668 | 22 972 | 2 692 | 33 498 | 187 687 | 94 167 | 93 521 | 79.11 |
| | 2005 | 8 513.1 | 140 500 | 82 193 | 20 092 | 2 660 | 35 406 | 202 400 | 108 180 | 94 220 | 78.20 |
| | 2010 | 7 807.6 | 149 665 | 110 153 | | 39 512 | | 214 564 | 138 596 | 75 968 | 71.10 |
| Urban expressways | 1980 | 250.8 | 12 316 | 5 638 | 3 943 | 102 | 2 632 | 17 118 | 8 638 | 8 480 | 42.27 |
| | 1985 | 322.5 | 16 013 | 7 299 | 5 139 | 194 | 3 381 | 23 592 | 10 997 | 12 595 | 40.05 |
| | 1990 | 421.0 | 20 820 | 9 750 | 5 766 | 235 | 5 068 | 32 172 | 15 322 | 16 850 | 51.28 |
| | 1994 | 490.7 | 23 738 | 11 497 | 5 915 | 236 | 6 090 | 35 634 | 17 436 | 18 198 | 24.58 |
| | 1999 | 604.1 | 28 032 | 16 578 | 5 107 | 335 | 6 012 | 41 262 | 25 283 | 15 979 | 44.31 |
| | 2005 | 675.4 | 29 786 | 16 919 | 5 570 | 447 | 6 881 | 42 931 | 25 302 | 17 629 | 40.40 |
| | 2010 | 738.7 | 31 239 | 25 126 | | 6 113 | | 44 142 | 34 635 | 9 507 | 41.70 |
| Expressways total | 1980 | 2 949.6 | 51 249 | 21 062 | 13 533 | 1 232 | 15 422 | 72 630 | 29 990 | 42 640 | 79.42 |
| | 1985 | 3 877.9 | 67 775 | 29 998 | 16 092 | 1 659 | 20 027 | 100 030 | 46 063 | 53 967 | 76.06 |
| | 1990 | 5 096.3 | 101 346 | 44 724 | 22 604 | 2 490 | 31 528 | 153 802 | 70 502 | 83 300 | 80.62 |
| | 1994 | 6 058.4 | 129 198 | 61 158 | 26 967 | 2 855 | 38 218 | 189 307 | 92 518 | 96 789 | 66.55 |
| | 1999 | 7 699.0 | 156 861 | 86 246 | 28 079 | 3 026 | 39 510 | 228 949 | 119 450 | 109 500 | 74.50 |
| | 2005 | 9 188.5 | 170 290 | 99 109 | 25 714 | 3 065 | 42 402 | 245 331 | 133 482 | 111 849 | 73.10 |
| | 2010 | 10 083.7 | 197 788 | 148 403 | | 49 385 | | 281 170 | 189 733 | 91 436 | 67.50 |
| National roads (government management) | 1980 | 19 025.0 | 191 007 | 91 783 | 59 238 | 3 457 | 36 530 | 254 878 | 130 363 | 124 515 | 40.86 |
| | 1985 | 19 710.0 | 208 403 | 101 545 | 64 800 | 3 269 | 38 789 | 284 962 | 142 869 | 142 093 | 37.08 |
| | 1990 | 20 052.3 | 242 582 | 119 468 | 72 413 | 3 365 | 47 336 | 336 002 | 169 790 | 166 212 | 36.92 |
| | 1994 | 20 622.1 | 263 293 | 142 268 | 66 134 | 3 053 | 51 838 | 362 013 | 199 372 | 162 642 | 34.92 |
| | 1999 | 20 837.4 | 279 297 | 164 875 | 58 869 | 2 867 | 52 685 | 389 786 | 234 203 | 155 583 | 34.62 |
| | 2005 | 21 280.9 | 281 099 | 174 282 | 53 409 | 2 530 | 50 598 | 390 137 | 243 649 | 146 488 | 34.70 |
| | 2010 | 21 874.0 | 266 801 | 220 098 | | 46 702 | | 364 001 | 291 259 | 72 743 | 36.50 |
| National roads (other) | 1980 | 20 920.9 | 93 836 | 46 721 | 31 900 | 2 048 | 13 167 | 119 232 | 65 154 | 54 078 | 38.01 |
| | 1985 | 26 395.7 | 123 550 | 61 379 | 43 637 | 2 258 | 16 275 | 159 835 | 82 397 | 77 438 | 36.74 |
| | 1990 | 26 672.3 | 148 720 | 74 334 | 50 639 | 2 366 | 21 381 | 194 672 | 100 544 | 94 128 | 37.63 |
| | 1994 | 32 428.6 | 185 088 | 101 366 | 54 502 | 2 444 | 26 777 | 239 627 | 134 577 | 105 051 | 36.66 |
| | 1999 | 32 558.2 | 202 744 | 123 706 | 47 695 | 2 433 | 28 911 | 266 163 | 170 278 | 95 885 | 38.21 |
| | 2005 | 32 954.6 | 204 714 | 132 859 | 42 581 | 2 457 | 27 022 | 267 896 | 180 855 | 87 041 | 38.20 |
| | 2010 | 32 450.1 | 203 166 | 176 179 | | 26 987 | | 263 489 | 226 923 | 36 566 | 38.10 |
| National roads total | 1980 | 39 945.9 | 284 843 | 138 504 | 91 137 | 5 505 | 49 697 | 374 110 | 195 517 | 178 593 | 39.37 |
| | 1985 | 46 105.7 | 331 952 | 162 925 | 108 436 | 5 528 | 55 064 | 444 797 | 225 266 | 219 531 | 36.88 |
| | 1990 | 46 724.6 | 391 302 | 193 802 | 123 052 | 5 732 | 68 717 | 530 674 | 270 334 | 260 340 | 37.32 |
| | 1994 | 53 050.7 | 448 381 | 243 634 | 120 636 | 5 497 | 78 614 | 601 641 | 333 948 | 267 692 | 35.96 |
| | 1999 | 53 395.6 | 482 041 | 288 581 | 106 565 | 5 299 | 81 596 | 655 949 | 404 481 | 251 468 | 36.72 |
| | 2005 | 54 235.5 | 485 787 | 307 018 | 95 700 | 4 858 | 77 726 | 658 032 | 424 503 | 233 529 | 36.70 |
| | 2010 | 54 324.1 | 469 967 | 396 277 | | 73 690 | | 627 490 | 518 181 | 109 309 | 37.40 |
| Principal local roads | 1980 | 43 582.3 | 156 748 | 79 204 | 54 995 | 3 079 | 19 470 | 201 848 | 114 493 | 87 355 | 36.22 |
| | 1985 | 49 159.7 | 184 220 | 92 800 | 66 155 | 3 134 | 22 131 | 240 932 | 125 619 | 115 313 | 33.73 |
| | 1990 | 49 710.0 | 216 726 | 110 233 | 75 183 | 3 191 | 28 119 | 287 033 | 150 468 | 136 565 | 35.63 |
| | 1994 | 56 178.6 | 269 128 | 145 938 | 76 502 | 3 223 | 33 465 | 339 056 | 195 382 | 143 674 | 32.91 |
| | 1999 | 56 377.4 | 284 268 | 177 061 | 67 562 | 3 137 | 36 508 | 377 036 | 250 254 | 126 782 | 33.83 |
| | 2005 | 57 718.3 | 289 169 | 190 851 | 60 725 | 3 181 | 34 411 | 383 419 | 265 774 | 117 646 | 34.20 |
| | 2010 | 56 512.7 | 279 402 | 246 035 | | 33 367 | | 365 228 | 320 821 | 44 407 | 33.60 |
| General prefectural roads | 1980 | 86 583.6 | 165 874 | 85 537 | 60 391 | 3 132 | 16 814 | 210 507 | 121 844 | 88 663 | — |
| | 1985 | 74 198.8 | 162 282 | 82 354 | 61 202 | 2 678 | 16 047 | 210 693 | 110 677 | 100 016 | 34.24 |
| | 1990 | 75 730.9 | 195 980 | 99 843 | 72 168 | 2 743 | 21 226 | 253 172 | 133 017 | 120 155 | 33.60 |
| | 1994 | 64 341.2 | 173 097 | 97 566 | 54 768 | 2 100 | 18 663 | 221 357 | 127 801 | 93 556 | 32.11 |
| | 1999 | 67 971.2 | 198 329 | 124 321 | 50 310 | 2 195 | 21 502 | 237 908 | 172 310 | 85 598 | 33.01 |
| | 2005 | 70 599.9 | 199 374 | 133 182 | 44 062 | 2 193 | 19 937 | 259 499 | 182 940 | 76 558 | 33.10 |
| | 2010 | 68 176.5 | 193 546 | 173 974 | | 19 573 | | 250 817 | 224 373 | 26 444 | 32.70 |
| Local roads total | 1980 | 130 165.9 | 322 622 | 164 741 | 115 387 | 6 211 | 36 284 | 412 355 | 236 337 | 176 018 | 36.22 |
| | 1985 | 123 358.5 | 346 503 | 175 155 | 127 357 | 5 813 | 38 178 | 451 625 | 236 296 | 215 329 | 33.74 |
| | 1990 | 125 440.9 | 412 706 | 210 077 | 147 351 | 5 934 | 49 345 | 540 205 | 283 485 | 256 720 | 34.19 |
| | 1994 | 120 519.8 | 432 225 | 243 504 | 131 270 | 5 323 | 52 128 | 560 413 | 323 183 | 237 230 | 32.48 |
| | 1999 | 124 730.0 | 482 597 | 301 383 | 117 872 | 5 332 | 58 010 | 634 944 | 422 564 | 212 380 | 33.38 |
| | 2005 | 128 318.2 | 488 507 | 323 880 | 104 541 | 5 374 | 54 713 | 642 918 | 448 714 | 194 204 | 33.60 |
| | 2010 | 124 689.2 | 472 948 | 420 008 | | 52 940 | | 616 045 | 545 194 | 70 851 | 33.10 |
| National roads and local roads ,total | 1980 | 170 111.8 | 607 466 | 303 245 | 206 524 | 11 716 | 85 981 | 786 466 | 431 854 | 354 612 | 37.74 |
| | 1985 | 169 464.2 | 678 455 | 338 080 | 235 794 | 11 340 | 93 242 | 896 422 | 461 562 | 434 860 | 35.19 |
| | 1990 | 172 165.5 | 804 008 | 403 879 | 270 403 | 11 665 | 118 061 | 1 070 879 | 533 819 | 517 060 | 34.41 |
| | 1994 | 173 570.5 | 880 607 | 487 138 | 251 906 | 10 820 | 130 743 | 1 162 054 | 657 132 | 504 922 | 33.48 |
| | 1999 | 178 125.6 | 964 638 | 589 964 | 224 437 | 10 631 | 139 606 | 1 290 893 | 827 045 | 463 848 | 34.32 |
| | 2005 | 182 553.7 | 974 289 | 631 339 | 200 704 | 10 717 | 132 503 | 1 300 950 | 873 217 | 427 733 | 34.50 |
| | 2010 | 179 013.3 | 942 915 | 816 285 | | 126 629 | | 1 243 535 | 1 063 376 | 180 160 | 34.30 |
| Overall total | 1980 | 173 061.4 | 658 715 | 324 307 | 220 057 | 12 948 | 101 402 | 859 115 | 461 863 | 397 252 | 39.15 |
| | 1985 | 173 342.1 | 746 230 | 368 077 | 251 885 | 12 999 | 113 269 | 996 452 | 507 625 | 488 827 | 35.95 |
| | 1990 | 177 261.8 | 905 351 | 448 602 | 293 007 | 14 156 | 149 586 | 1 224 681 | 624 321 | 600 360 | 34.41 |
| | 1994 | 179 628.9 | 1 009 805 | 548 296 | 278 872 | 13 675 | 168 961 | 1 351 361 | 749 650 | 601 711 | 34.06 |
| | 1999 | 185 186.7 | 1 115 622 | 672 885 | 251 516 | 13 504 | 177 718 | 1 511 810 | 942 060 | 569 750 | 35.04 |
| | 2005 | 190 607.6 | 1 134 687 | 725 065 | 224 668 | 13 616 | 172 472 | 1 532 720 | 998 947 | 533 773 | 35.30 |
| | 2010 | 187 559.6 | 1 123 819 | 951 564 | | 172 255 | | 1 502 241 | 1 236 607 | 265 635 | 35.10 |

Source: Road Traffic Census (Japan Society of Traffic Engineering)
Note: In FY 2010, aggregation methods for segmenting of vehicle model have been changed from 4 classes to 2 classes.

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

| | Lengs of road surveyed(km) 2010 | Vehicle-kilometers traveled in 12 hours(x 1000 vehicle-kilometers) 1980 | 1985 | 1990 | 1994 | 1999 | 2005 | 2010 | Average travel speed at peak hours (km/h) 1980 | 1985 | 1990 | 1994 | 1999 | 2005 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sapporo City, Hokkaido | 152.3 | 2 572 | 2 688 | 3 099 | 3 463 | 3 574 | 3 167 | 3 080 | 29.4 | 29.0 | 30.3 | 27.5 | 24.6 | 23.2 | 25.9 |
| Sendai City, Miyagi Pref. | 145.3 | — | — | 2 373 | 2 627 | 2 845 | 2 951 | 3 080 | — | — | 19.6 | 24.1 | 22.2 | 22.6 | 30.0 |
| Special Wards of Tokyo | 189.1 | 5 491 | 5 584 | 5 663 | 5 917 | 6 156 | 5 269 | 5 241 | 21.4 | 14.8 | 19.1 | 11.6 | 18.0 | 18.2 | 16.2 |
| Yokohama City, Kanagawa Pref. | 157.2 | 3 428 | 4 597 | 4 968 | 5 998 | 6 152 | 5 589 | 5 579 | 31.4 | 23.3 | 27.0 | 18.2 | 23.0 | 23.4 | 23.0 |
| Kawasaki City, Kanagawa Pref. | 54.6 | 444 | 527 | 861 | 1 349 | 1 219 | 792 | 1 231 | 24.6 | 17.4 | 19.3 | 19.7 | 20.0 | 22.7 | 21.1 |
| Nagoya City, Aichi Pref. | 125.9 | 3 181 | 3 408 | 3 629 | 3 785 | 3 671 | 3 616 | 3 953 | 25.6 | 19.7 | 19.3 | 13.1 | 19.6 | 20.6 | 17.6 |
| Kyoto City, Kyoto Pref. | 168.4 | 1 923 | 2 070 | 2 292 | 2 339 | 2 276 | 2 238 | 2 192 | 29.7 | 23.8 | 20.2 | 20.9 | 21.6 | 25.4 | 26.4 |
| Osaka City, Osaka Pref. | 114.1 | 2 177 | 2 893 | 2 945 | 3 434 | 3 216 | 2 779 | 2 986 | 21.5 | 19.5 | 18.3 | 20.1 | 17.0 | 15.9 | 16.5 |
| Kobe City, Hyogo Pref. | 134.3 | 2 463 | 2 786 | 3 340 | 3 469 | 3 458 | 2 854 | 3 184 | 38.6 | 32.9 | 30.4 | 28.2 | 33.6 | 32.0 | 27.5 |
| Hiroshima City, Hiroshima Pref. | 160.5 | 1 909 | 2 144 | 2 503 | 2 783 | 2 888 | 2 859 | 3 013 | 30.9 | 24.3 | 25.7 | 21.7 | 20.2 | 23.6 | 28.6 |
| Kitakyushu City, Fukuoka Pref. | 162.8 | 3 251 | 3 413 | 3 688 | 3 209 | 3 257 | 3 210 | 3 151 | 33.6 | 26.9 | 26.6 | 23.5 | 25.7 | 22.7 | 23.1 |
| Fukuoka City, Fukuoka Pref. | 107.0 | 1 673 | 1 868 | 2 223 | 2 144 | 1 954 | 2 006 | 2 208 | 24.5 | 18.7 | 22.2 | 17.1 | 18.4 | 18.7 | 17.7 |

Source: Road Traffic Census (Japan Society of Traffic Engineering)
Note: The figures are measured on national highways.

## 5. Roads in Japan and Other Countries

### 5-1 Length of roads in Japan

(km, at the end of beginning of each fiscal year)

| | National expressway | 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 |
| 1990 | 4 661 | 46 935 | 128 782 | 50 354 | 78 428 | 934 319 | 1 110 037 | 1 114 698 |
| 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 | 57 890 | 71 502 | 1 012 088 | 1 196 217 | 1 203 777 |
| 2009 | 7 642 | 54 790 | 129 377 | 57 877 | 71 500 | 1 016 058 | 1 200 225 | 1 207 867 |
| 2010 | 7 803 | 54 981 | 129 366 | 57 868 | 71 499 | 1 018 101 | 1 202 449 | 1 210 252 |
| 2011 | 7 920 | 55 114 | 129 343 | 57 901 | 71 442 | 1 020 286 | 1 204 744 | 1 212 664 |
| 2012 | 8 050 | 55 222 | 129 397 | 57 924 | 71 473 | 1 022 248 | 1 206 867 | 1 214 917 |
| 2013 | 8 358 | 55 432 | 129 397 | 57 931 | 71 444 | 1 023 962 | 1 208 769 | 1 217 127 |

Source: Annual Report on Road Statistics ((～2009)Japan Highway Users Conference, (2010～)Ministry of Land, Infrastructure, Transport and Tourism)

5-2 Length of roads in Japan and other countries (km)

| | Survey year | Expressways | Principal roads | Second-class roads | Other roads | Total | Road density (expressway & principal roads) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | by area (m/km2) | by vehicle owned (m/vehicle) |
| Asia | | | | | | | | |
| Japan | 2012 | 8 050 | 51 237 | 91 440 | 190 782 | 341 509 | 156.9 | 0.8 |
| Korea | 2012 | 4 044 | 13 766 | 18 162 | 69 731 | 105 703 | 180.4 | 0.9 |
| Taiwan | 2012 | 989 | 5 154 | 3 551 | 32 209 | 41 903 | 170.6 | 0.8 |
| China | 2012 | 96 200 | 74 271 | 331 455 | 3 735 582 | 4 237 508 | 18.3 | 1.4 |
| Hong-Kong | 2012 | 2 090 | — | — | — | 2 090 | 1 893.1 | 3.3 |
| Thailand | 2006 | 450 | 51 405 | 44 000 | 84 198 | 180 053 | 101.5 | 3.7 |
| Malaysia | 2012 | — | — | — | — | 180 882 | — | — |
| Indonesia | 2012 | — | 38 570 | 53 642 | 409 757 | 501 969 | 21.3 | 2.0 |
| Singapore | 2012 | 161 | 652 | 561 | 2 051 | 3 425 | 1 355.0 | 1.0 |
| India | 2012 | — | 76 818 | 1 186 647 | 3 601 929 | 4 865 394 | 25.8 | 2.4 |
| Turkey | 2012 | 2 127 | 31 375 | 31 880 | 329 366 | 394 748 | 42.8 | 2.5 |
| Europe | | | | | | | | |
| U.K. | 2012 | 3 733 | 49 076 | 122 743 | 244 795 | 420 347 | 218.3 | 1.5 |
| Germany | 2012 | 12 879 | 39 604 | 178 034 | 413 000 | 643 517 | 150.4 | 1.1 |
| France | 2012 | 11 491 | 8 894 | 377 965 | 664 343 | 1 062 693 | 37.1 | 0.5 |
| Netherlands | 2011 | 2 651 | 2 470 | 7 863 | 124 707 | 137 691 | 151.2 | 0.6 |
| Bergium | 2011 | 1 763 | 12 900 | 1 349 | 138 000 | 154 012 | 473.0 | 2.3 |
| Italy | 2005 | 6 700 | 21 500 | 147 400 | 312 100 | 487 700 | 95.9 | 0.7 |
| Spain | 2012 | 3 025 | 23 500 | 139 070 | 501 053 | 666 648 | 52.4 | 1.0 |
| Portugal | 2011 | 2 737 | 6 254 | 4 420 | 8 750 | 22 161 | 97.5 | 1.6 |
| Greece | 2012 | 1 197 | 9 299 | 30 864 | 75 600 | 116 960 | 73.3 | 1.6 |
| Switzerland | 2012 | 1 809 | 18 013 | 51 691 | — | 71 513 | 495.6 | 4.2 |
| Austria | 2012 | 1 719 | 10 477 | 23 642 | 88 750 | 124 588 | 147.9 | 2.4 |
| Norway | 2012 | 392 | 10 189 | 44 317 | 38 970 | 93 868 | 32.7 | 3.5 |
| Sweden | 2011 | 1 920 | 13 465 | 83 079 | 481 676 | 580 140 | 37.5 | 3.0 |
| Finland | 2012 | 779 | 13 329 | 13 550 | 51 236 | 78 894 | 41.7 | 3.9 |
| Denmark | 2012 | 1 186 | 2 646 | 0 | 70 276 | 74 108 | 90.3 | 1.4 |
| Poland | 2012 | 1 365 | 17 817 | 28 423 | 364 430 | 412 035 | 59.4 | 0.8 |
| Hungary | 2012 | 1 515 | 6 836 | 23 341 | 170 249 | 201 941 | 89.8 | 2.4 |
| Ukraine | 2012 | 15 | 21 249 | 78 986 | 69 459 | 169 709 | 35.2 | 2.1 |
| America | | | | | | | | |
| U.S.A. | 2012 | 76 335 | 25 531 | 1 932 222 | 4 552 535 | 6 586 623 | 11.1 | 0.4 |
| Canada | 2009 | 17 000 | 86 000 | 115 000 | 1 191 000 | 1 409 000 | 11.3 | 4.6 |
| Mexico | 2012 | 8 900 | 40 752 | 83 982 | 244 026 | 377 660 | 26.0 | 1.4 |
| Brasil | 2012 | — | 100 183 | 222 176 | 1 261 745 | 1 584 104 | 11.8 | 2.5 |
| Argentina | 2012 | — | 39 620 | 188 892 | — | 228 512 | 14.3 | 3.2 |
| Africa | | | | | | | | |
| Egypt | 2010 | 836 | 23 143 | 113 451 | — | 137 430 | 24.1 | 5.3 |
| South Africa | 2001 | 239 | 2 887 | 60 027 | 300 978 | 364 131 | 2.6 | 0.3 |
| Oceania | | | | | | | | |
| Australia | 2012 | 51 847 | 181 314 | — | 666 922 | 900 083 | 30.4 | 14.2 |
| New Zealand | 2012 | — | 10 916 | 83 244 | — | 94 160 | 40.7 | 3.4 |

Source: World Road Statistics (IRF), World Road Statistics (Japan Road Association)
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 government | | 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 |
| 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 | 19 386 | △7.3 | 76 580 | △6.0 |
| 2009 | 47 910 | 0.1 | 10 776 | △0.2 | 18 027 | △0.1 | 76 713 | 0.0 |
| 2010 | 39 851 | △0.2 | 9 081 | △0.2 | 17 941 | 0.0 | 66 873 | △0.1 |
| 2011 | 39 077 | 0.0 | 9 198 | 0.0 | 18 040 | 0.0 | 66 315 | 0.0 |
| 2012 | 38 094 | 0.0 | 10 727 | 0.2 | 18 211 | 0.0 | 67 032 | 0.0 |

Source: Road Handbook (Japan Highway Users Conference)

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

### 6-1 The 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 | | Trucks | | Buses | Vehicles for special use | Total |
|---|---|---|---|---|---|---|---|
| | | Light four-wheeled passenger cars | | Light four-wheeled trucks | | | |
| 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 |
| 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 |
| 2009 | 57 902 835 | 17 483 915 | 15 533 270 | 9 170 836 | 228 295 | 1 188 275 | 74 852 675 |
| 2010 | 58 139 471 | 18 004 339 | 15 137 641 | 8 922 794 | 226 839 | 1 175 676 | 74 679 627 |
| 2011 | 58 729 343 | 18 585 902 | 15 008 821 | 8 872 908 | 226 270 | 1 171 571 | 75 136 005 |
| 2012 | 59 357 223 | 19 347 873 | 14 851 666 | 8 783 528 | 226 047 | 1 654 739 | 76 089 675 |
| 2013 | 60 051 338 | 20 230 295 | 14 749 266 | 8 708 181 | 226 542 | 1 669 679 | 76 696 825 |

Source: (～1999) survey by Ministry of Transport; (2000～2011) Transportation-related Statistics Data Collection (Ministry of Land, Infrastructure, Transport and Tourism); (2012～)Automobile Inspection & Registration Information Association, Light Motor Vehicle Inspection Organization

Note: 1. For statistics of 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 before 1999.

Note: 2. Since source of data are different, the number of vehicles for special use are not continuous.

6-2 The number of motor vehicles owned in Japan and other countries (2013) (vehicle)

| | 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 | 60 035 | 472.2 | 16 584 | 130.4 | 76 619 | 602.6 |
| Korea | 15 078 | 306.1 | 4 323 | 87.8 | 19 401 | 393.8 |
| Taiwan | 6 237 | 268.4 | 1 070 | 46.0 | 7 307 | 314.5 |
| China | 55 930 | 40.4 | 63 580 | 45.9 | 119 510 | 86.3 |
| Hong-Kong | 476 | 66.1 | 157 | 21.8 | 633 | 87.9 |
| Thailand | 7 109 | 106.1 | 6 813 | 101.7 | 13 922 | 207.8 |
| Malaysia | 11 154 | 375.3 | 1 142 | 38.4 | 12 296 | 413.8 |
| Indonesia | 11 485 | 46.0 | 7 901 | 31.6 | 19 386 | 77.6 |
| Singapore | 607 | 112.2 | 206 | 38.1 | 813 | 150.2 |
| India | 21 551 | 17.2 | 10 948 | 8.7 | 32 499 | 26.0 |
| Turkey | 9 284 | 123.9 | 4 331 | 57.8 | 13 615 | 181.7 |
| Europe | | | | | | |
| U.K. | 31 918 | 505.5 | 4 365 | 69.1 | 36 283 | 574.7 |
| Germany | 43 851 | 530.1 | 3 163 | 38.2 | 47 014 | 568.3 |
| France | 31 650 | 492.3 | 6 550 | 101.9 | 38 200 | 594.2 |
| Netherlands | 8 154 | 486.5 | 1 053 | 62.8 | 9 207 | 549.4 |
| Bergium | 5 439 | 489.8 | 859 | 77.4 | 6 298 | 567.2 |
| Italy | 36 963 | 606.1 | 4 867 | 79.8 | 41 830 | 685.9 |
| Spain | 22 025 | 469.3 | 5 130 | 109.3 | 27 155 | 578.7 |
| Portugal | 4 480 | 422.3 | 1 273 | 120.0 | 5 753 | 542.3 |
| Greece | 5 124 | 460.5 | 1 343 | 120.7 | 6 467 | 581.1 |
| Switzerland | 4 321 | 534.9 | 431 | 53.4 | 4 752 | 588.3 |
| Austria | 4 641 | 546.3 | 435 | 51.2 | 5 076 | 597.5 |
| Norway | 2 487 | 493.2 | 579 | 114.8 | 3 066 | 608.0 |
| Sweden | 4 502 | 470.4 | 580 | 60.6 | 5 082 | 531.0 |
| Finland | 3 106 | 572.4 | 536 | 98.8 | 3 642 | 671.2 |
| Denmark | 2 278 | 405.4 | 458 | 81.5 | 2 736 | 486.9 |
| Poland | 19 389 | 507.3 | 3 345 | 87.5 | 22 734 | 594.9 |
| Hungary | 3 041 | 305.5 | 436 | 43.8 | 3 477 | 349.3 |
| Ukraine | 8 541 | 188.8 | 1 672 | 37.0 | 10 213 | 225.8 |
| America | | | | | | |
| U.S.A. | 120 214 | 375.6 | 132 501 | 414.0 | 252 715 | 789.6 |
| Canada | 21 262 | 604.3 | 1 072 | 30.5 | 22 334 | 634.8 |
| Mexico | 24 286 | 198.5 | 10 094 | 82.5 | 34 380 | 281.0 |
| Brasil | 31 339 | 156.4 | 8 356 | 41.7 | 39 695 | 198.1 |
| Argentina | 9 452 | 228.1 | 3 041 | 73.4 | 12 493 | 301.4 |
| Africa | | | | | | |
| Egypt | 3 380 | 41.2 | 1 164 | 14.2 | 4 544 | 55.4 |
| South Africa | 6 377 | 120.8 | 2 922 | 55.4 | 9 299 | 176.2 |
| Oceania | | | | | | |
| Australia | 13 000 | 556.9 | 3 382 | 144.9 | 16 382 | 701.8 |
| New Zealand | 2 700 | 599.2 | 534 | 118.5 | 3 234 | 717.7 |

Source: World motor vehicle statistics (Japan Automobile Manufacturers Association)

7. The Number of People Who Hold a Driver's License in Japan (end of 2014) (persons, %)

| | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | | % of license holders | | % of license holders | | % of license holders |
| Age 15～19* | 589 821 | 19.2 | 398 995 | 13.7 | 988 816 | 16.5 |
| Age 20～24 | 2 592 702 | 81.0 | 2 203 596 | 73.0 | 4 796 298 | 77.2 |
| Age 25～29 | 3 176 756 | 93.4 | 2 811 533 | 86.5 | 5 988 289 | 90.0 |
| Age 30～34 | 3 671 376 | 97.4 | 3 340 050 | 91.0 | 7 011 426 | 94.2 |
| Age 35～39 | 4 258 200 | 97.4 | 3 911 443 | 92.0 | 8 169 643 | 94.8 |
| Age 40～44 | 4 848 704 | 97.6 | 4 466 368 | 92.1 | 9 315 072 | 94.9 |
| Age 45～49 | 4 229 297 | 97.4 | 3 880 065 | 90.4 | 8 109 362 | 94.0 |
| Age 50～54 | 3 791 510 | 97.0 | 3 419 943 | 87.7 | 7 211 453 | 92.2 |
| Age 55～59 | 3 615 288 | 95.4 | 3 157 328 | 82.2 | 6 772 616 | 88.8 |
| Age 60～64 | 4 035 760 | 92.8 | 3 288 108 | 72.7 | 7 323 868 | 82.6 |
| Age 65～69 | 4 076 811 | 91.4 | 2 992 346 | 62.5 | 7 069 157 | 76.4 |
| Age 70～74 | 3 098 451 | 84.0 | 1 747 309 | 41.2 | 4 845 760 | 61.1 |
| Age 75～79 | 1 945 498 | 70.0 | 724 050 | 20.6 | 2 669 548 | 42.4 |
| Age 80～84 | 1 071 203 | 54.9 | 254 744 | 8.7 | 1 325 947 | 27.2 |
| Age 85 and over | 428 868 | 30.0 | 50 100 | 1.5 | 478 968 | 9.9 |
| Total | 45 430 245 | 73.5 | 36 645 978 | 56.1 | 82 076 223 | 64.6 |

Source: Driver's License Statistics (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. Though shown as "Age 15-19".

## 8. Traffic Accidents in Japan

### 8-1 The number of traffic accidents, fatalities, and injuries (person)

| | Number of traffic accidents | | Number of fatalities | Number of injuries | Note:The number of all traffic accidents, that occurred on expressways (National & designated | | |
|---|---|---|---|---|---|---|---|
| | | 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 |
| 1990 | 643 097 | 10 651 | 11 227 | 790 295 | 9 060 | 401 | 459 |
| 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 | 737 474 | 4 773 | 4 914 | 911 108 | 11 113 | 161 | 178 |
| 2010 | 725 773 | 4 726 | 4 863 | 896 208 | 12 200 | 166 | 188 |
| 2011 | 691 937 | 4 481 | 4 612 | 854 493 | 11 708 | 188 | 214 |
| 2012 | 665 138 | 4 280 | 4 411 | 825 396 | 11 299 | 196 | 225 |
| 2013 | 629 021 | 4 278 | 4 373 | 781 494 | 11 520 | 208 | 227 |
| 2014 | 573 842 | 4 013 | 4 113 | 711 374 | 10 202 | 189 | 205 |

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

## 8-2 The number of fatalities by age group and by circumstances of accident (2014)

(person)

| Age group | Situation | In a vehicle | | | On a motorcycle | | | | Total | On a bicycle | While walking | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Motorcycles | | | Mopends | | | | | |
| | | Driver | Passenger | Subtotal | Driver | Passenger | Subtotal | | | | | | |
| 15 and under | Fatalities | 0 | 21 | 21 | 0 | 1 | 1 | 0 | 1 | 19 | 43 | 0 | 84 |
| | increased/decreased by* | -1 | -2 | -3 | 0 | 0 | 0 | 0 | 0 | -3 | -4 | 0 | -10 |
| Age 16～19 | Fatalities | 26 | 41 | 67 | 39 | 9 | 48 | 24 | 72 | 14 | 11 | 0 | 164 |
| | increased/decreased by* | -11 | 10 | -1 | -3 | 1 | -2 | -13 | -15 | 0 | 4 | 0 | -12 |
| Age 20～24 | Fatalities | 61 | 22 | 83 | 48 | 1 | 49 | 14 | 63 | 8 | 20 | 0 | 174 |
| | increased/decreased by* | -16 | -7 | -23 | 1 | -1 | 0 | 1 | 1 | -1 | 0 | -1 | -24 |
| Age 16～24 | Fatalities | 87 | 63 | 150 | 87 | 10 | 97 | 38 | 135 | 22 | 31 | 0 | 338 |
| | increased/decreased by* | -27 | 3 | -24 | -2 | 0 | -2 | -12 | -14 | -1 | 4 | -1 | -36 |
| Age 25～29 | Fatalities | 55 | 11 | 66 | 34 | 0 | 34 | 8 | 42 | 9 | 27 | 0 | 144 |
| | increased/decreased by* | -10 | 2 | -8 | -13 | 0 | -13 | -1 | -14 | 0 | 9 | 0 | -13 |
| Age 30～39 | Fatalities | 94 | 18 | 112 | 67 | 0 | 67 | 13 | 80 | 16 | 53 | 2 | 263 |
| | increased/decreased by* | -1 | 2 | 1 | -7 | -3 | -10 | -3 | -13 | 0 | -15 | 1 | -26 |
| Age 40～49 | Fatalities | 125 | 21 | 146 | 109 | 0 | 109 | 23 | 132 | 28 | 75 | 0 | 381 |
| | increased/decreased by* | -4 | 10 | 6 | 8 | -2 | 6 | -4 | 2 | -11 | -11 | 0 | -14 |
| Age 50～59 | Fatalities | 141 | 21 | 162 | 68 | 0 | 68 | 29 | 97 | 48 | 104 | 0 | 411 |
| | increased/decreased by* | 8 | 1 | 9 | 1 | 0 | 1 | 5 | 6 | -12 | -12 | 0 | -9 |
| Age 60～64 | Fatalities | 94 | 19 | 113 | 19 | 0 | 19 | 12 | 31 | 53 | 102 | 0 | 299 |
| | increased/decreased by* | -13 | 0 | -13 | -5 | -1 | -6 | -19 | -25 | 0 | -3 | -1 | -42 |
| Age 65～69 | Fatalities | 103 | 24 | 127 | 15 | 0 | 15 | 30 | 45 | 66 | 152 | 1 | 391 |
| | increased/decreased by* | 9 | 3 | 12 | 1 | 0 | 1 | 6 | 7 | 8 | -10 | 0 | 17 |
| Age 60～69 | Fatalities | 197 | 43 | 240 | 34 | 0 | 34 | 42 | 76 | 119 | 254 | 1 | 690 |
| | increased/decreased by* | -4 | 3 | -1 | -4 | -1 | -5 | -13 | -18 | 8 | -13 | -1 | -25 |
| Age 70～74 | Fatalities | 93 | 28 | 121 | 11 | 0 | 11 | 33 | 44 | 64 | 177 | 1 | 407 |
| | increased/decreased by* | -6 | -4 | -10 | -1 | 0 | -1 | -3 | -4 | -18 | -39 | 0 | -71 |
| Age 75 and over | Fatalities | 232 | 120 | 352 | 21 | 0 | 21 | 69 | 90 | 215 | 734 | 4 | 1395 |
| | increased/decreased by* | -6 | -9 | -15 | 1 | 0 | 1 | -9 | -8 | -23 | -5 | -5 | -56 |
| Age 70 and over | Fatalities | 325 | 148 | 473 | 32 | 0 | 32 | 102 | 134 | 279 | 911 | 5 | 1802 |
| | increased/decreased by* | -12 | -13 | -25 | 0 | 0 | 0 | -12 | -12 | -41 | -44 | -5 | -127 |
| Total | Fatalities | 1024 | 346 | 1370 | 431 | 11 | 442 | 255 | 697 | 540 | 1498 | 8 | 4113 |
| | increased/decreased by* | -51 | 6 | -45 | -17 | -6 | -23 | -40 | -63 | -60 | -86 | -6 | -260 |

Source: Traffic Statistics (Institute for Traffic Accident Research and Data Analysis)
Note: "increased/decreased by * "shows the changes from the previous year.

## 9. The 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 |
|---|---|---|---|---|---|---|
| Asia | | | | | | |
| Japan | 2012 | 127 144 | 5 237 | 4.1 | 0.68 | 0.7 |
| Korea | 2012 | 49 263 | 5 392 | 10.9 | 2.78 | 1.9 |
| Taiwan | 2012 | 23 236 | 2 040 | 8.8 | 2.79 | |
| China | 2011 | 1 385 567 | 62 387 | 4.5 | 5.22 | |
| Hong-Kong | 2012 | 7 204 | 120 | 1.7 | 1.90 | 1.0 |
| Thailand | 2012 | 67 011 | 7 127 | 10.6 | 5.12 | |
| Malaysia | 2011 | 29 717 | 6 877 | 23.1 | 5.59 | |
| Indonesia | 2010 | 249 866 | 19 873 | 8.0 | 10.25 | |
| Singapore | 2012 | 5 412 | 168 | 3.1 | 2.07 | 1.0 |
| India | 2012 | 1 252 140 | 138 238 | 11.0 | 42.54 | 24.3 |
| Turkey | 2012 | 74 933 | 3 750 | 5.0 | 2.75 | 4.0 |
| Europe | | | | | | |
| U.K. | 2012 | 63 136 | 1 754 | 2.8 | 0.48 | 0.4 |
| Germany | 2012 | 82 727 | 3 600 | 4.4 | 0.77 | 0.5 |
| France | 2012 | 64 291 | 3 653 | 5.7 | 0.96 | 0.7 |
| Netherlands | 2012 | 16 759 | 650 | 3.9 | 0.71 | 0.5 |
| Bergium | 2012 | 11 104 | 767 | 6.9 | 1.22 | 0.8 |
| Italy | 2010 | 60 990 | 4 090 | 6.7 | 0.98 | |
| Spain | 2012 | 46 927 | 1 903 | 4.1 | 0.70 | 1.7 |
| Portugal | 2012 | 10 608 | 718 | 6.8 | 1.25 | |
| Greece | 2011 | 11 128 | 1 141 | 10.3 | 1.76 | 1.6 |
| Switzerland | 2012 | 8 078 | 339 | 4.2 | 0.71 | 0.6 |
| Austria | 2012 | 8 495 | 531 | 6.3 | 1.05 | 0.7 |
| Norway | 2012 | 5 043 | 145 | 2.9 | 0.47 | 0.3 |
| Sweden | 2012 | 9 571 | 285 | 3.0 | 0.56 | 0.4 |
| Finland | 2012 | 5 426 | 255 | 4.7 | 0.70 | 0.5 |
| Denmark | 2012 | 5 619 | 167 | 3.0 | 0.61 | 0.4 |
| Poland | 2012 | 38 217 | 3 577 | 9.4 | 1.57 | 1.8 |
| Hungary | 2012 | 9 955 | 605 | 6.1 | 1.74 | 1.7 |
| Ukraine | 2012 | 45 239 | 5 131 | 11.3 | 5.02 | 35.4 |
| America | | | | | | |
| U.S.A. | 2012 | 320 051 | 33 561 | 10.5 | 1.33 | 0.7 |
| Canada | 2012 | 35 182 | 2 104 | 6.0 | 0.94 | 0.6 |
| Mexico | 2012 | 122 332 | 4 539 | 3.7 | 1.32 | 3.0 |
| Brasil | 2009 | 200 362 | 7 376 | 3.7 | 1.86 | |
| Argentina | 2010 | 41 446 | 5 094 | 12.3 | 4.08 | |
| Africa | | | | | | |
| Egypt | 2012 | 82 056 | 6 431 | 7.8 | 14.15 | |
| South Africa | 2010 | 52 776 | 13 967 | 26.5 | 15.02 | 10.6 |
| Oceania | | | | | | |
| Australia | 2012 | 23 343 | 1 299 | 5.6 | 0.79 | 0.6 |
| New Zealand | 2012 | 4 506 | 308 | 6.8 | 0.95 | 0.8 |

Source: World Road Statistics (IRF); World Population Prospects (United Nations)
Note: 1. The number refers to those who died within 30 days.
Note: 2. The population is estimated in 2013 by UN.

## 10. Implementation of Traffic Safety Facilities in Japan

(at the end of each fiscal year)

| | | | | FY 1985 | FY 1990 | FY 1995 | FY 2000 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY2010 | FY 2011 | FY 2012 | FY 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | - | - | - | - | - | - | - | - | - | - |
| Trafic Signals | Centralized control units | | | 32 585 | 43 019 | 50 556 | 57 908 | 66 037 | 67 231 | 68 785 | 70 371 | 71 375 | 72 211 | 72 211 | 72 900 | 73 218 |
| | Synchronized control system | Automatic traffic-actuated units | | 5 576 | 4 682 | 4 585 | 4 023 | 2 293 | 2 225 | 1 957 | 1 141 | 754 | 481 | 481 | 211 | 123 |
| | | Programmed multi-stage units | | 12 814 | 14 355 | 17 340 | 20 218 | 22 653 | 23 233 | 23 700 | 23 676 | 23 965 | 23 382 | 23 382 | 23 710 | 24 941 |
| | | Push-button units | | 1 164 | 801 | 1 213 | 963 | 1 106 | 1 131 | 1 187 | 1 193 | 1 181 | 1 168 | 1 168 | 1 170 | 977 |
| | Independent control system | Traffic-actuated control | Full traffic-actuated units | 1 120 | 984 | 959 | 867 | 802 | 771 | 749 | 745 | 737 | 739 | 739 | 774 | 759 |
| | | | Semi traffic-actuated units | 6 640 | 7 788 | 10 110 | 11 535 | 13 032 | 13 149 | 13 321 | 13 996 | 14 087 | 14 533 | 14 533 | 14 592 | 14 502 |
| | | | Bus-actuated units | 238 | 101 | 165 | 154 | 127 | 123 | 121 | 121 | 121 | 116 | 116 | 28 | 28 |
| | | | Train-actuated units | 228 | 162 | 180 | 177 | 183 | 179 | 180 | 185 | 180 | 184 | 184 | 179 | 142 |
| | | Fixed-cycle units (including programmed multi-stage units) | | 35 577 | 41 200 | 45 282 | 48 802 | 51 087 | 50 921 | 50 769 | 50 984 | 51 707 | 52 059 | 52 059 | 52 838 | 51 849 |
| | | Push-button units | | 23 113 | 20 713 | 23 083 | 25 696 | 28 200 | 28 599 | 28 774 | 29 135 | 29 565 | 30 599 | 30 599 | 30 678 | 31 776 |
| | | Single flashing units | | 465 | 1 829 | 4 319 | 5 670 | 6 250 | 6 295 | 6 354 | 6 409 | 6 412 | 6 406 | 6 406 | 6 409 | 6 398 |
| | Total units | | | 119 520 | 135 634 | 157 792 | 176 013 | 191 770 | 193 857 | 195 897 | 197 956 | 200 084 | 201 878 | 201 878 | 203 489 | 204 713 |
| Lights | For vehicles | | | - | 720 725 | 885 383 | 1 001 623 | 1 125 659 | 1 146 167 | 1 169 963 | 1 189 368 | 1 208 241 | 1 222 359 | 1 222 359 | 1 241 059 | 1 251 216 |
| | | (LED lights) | | | | | | 144 013 | 180 265 | 217 764 | 275 265 | 338 422 | 390 561 | 390 561 | 458 447 | 514 320 |
| | For pedestrians | | | - | 524 122 | 634 959 | 764 976 | 869 188 | 884 349 | 899 928 | 912 899 | 928 546 | 942 451 | 942 451 | 954 542 | 976 463 |
| | | (LED lights) | | | | | | 46 461 | 64 445 | 88 129 | 126 541 | 177 129 | 214 243 | 214 243 | 279 166 | 329 854 |
| Traffic signs | Variable signs | | | 23 089 | 24 109 | 23 259 | 30 186 | 27 526 | 23 353 | 22 667 | 21 912 | 20 490 | 19 816 | 19 816 | 17 039 | 16 265 |
| | Fixed signs | Large signs | | 420 640 | 500 347 | 582 255 | 617 279 | 642 270 | 628 255 | 623 709 | 624 671 | 624 276 | 614 753 | 614 753 | 617 593 | 614 053 |
| | | Roadside signs | | 9 705 165 | 10 020 616 | 10 379 062 | 10 183 538 | 9 422 368 | 9 297 292 | 9 346 943 | 9 420 018 | 9 366 820 | 9 416 920 | 9 416 920 | 9 282 355 | 9 309 494 |
| Road markings | Crosswalks | | (number of) | 719 548 | 801 464 | 890 723 | 967 355 | 1 054 219 | 1 064 369 | 1 080 358 | 1 092 226 | 1 100 886 | 10 031 673 | 10 031 673 | 1 118 335 | 1 125 688 |
| | Solid lines | | (km) | 110 465 | 116 248 | 115 898 | 125 838 | 131 141 | 127 660 | 128 169 | 128 375 | 123 411 | 124 129 | 124 129 | 124 284 | 121 936 |
| | Graphic markings | | (number of) | 3 238 374 | 3 913 961 | 3 995 149 | 3 945 511 | 4 506 671 | 4 531 593 | 4 571 460 | 4 609 045 | 4 607 652 | 4 637 370 | 4 637 370 | 4 486 284 | 4 570 829 |

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 |
| 1990 | 73 092 | 774 504 | 863 955 | 1 417 | 1 712 968 | 296.6 |
| 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 | 556.0 |
| 2009 | 122 574 | 1 570 013 | 2 571 884 | 1 361 | 4 265 832 | 567.4 |
| 2010 | 121 651 | 1 604 463 | 2 634 973 | 1 032 | 4 362 119 | 580.5 |
| 2011 | 119 317 | 1 623 951 | 2 689 925 | 785 | 4 433 978 | 586.4 |
| 2012 | 119 214 | 1 664 443 | 2 949 036 | 775 | 4 733 468 | 622.1 |
| 2013 | 118 477 | 1 661 432 | 2 997 363 | 775 | 4 778 047 | 623.0 |

Source: Annual Report of Motor Vehicle Parking (Ministry of Land, Infrastructure, Transport and Tourism)
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.
Note: 2. The number of vehicles owned includes light vehicles.

11-2 The 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 |
| 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 |
| 2010 | 21 533 | 1 290 | 9 123 | 22 823 | 30 656 |
| 2011 | 21 040 | 1 339 | 9 349 | 22 379 | 30 389 |
| 2012 | 20 772 | 1 431 | 9 459 | 22 203 | 30 231 |

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

11-3 Parking Facilities in Major Cities

| 2013 | 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 | 2 | 601 | 183 | 32 439 | 3 187 | 185 105 | - | - | 3 372 | 218 145 |
| Sendai City, Miyagi Pref. | 2 | 392 | 174 | 29 336 | 971 | 78 237 | - | - | 1 147 | 107 965 |
| Saitama City, Saitama Pref. | 2 | 601 | 86 | 14 095 | 136 | 18 426 | - | - | 224 | 33 122 |
| Special Wards of Tokyo | 48 | 17 306 | 551 | 92 638 | 20 749 | 595 544 | - | - | 21 348 | 705 488 |
| Yokohama City, Kanagawa Pref. | 7 | 3 363 | 219 | 39 297 | 6 704 | 295 631 | - | - | 6 930 | 338 291 |
| Kawasaki City, Kanagawa Pref. | 1 | 366 | 83 | 12 407 | 1 156 | 59 396 | - | - | 1 240 | 72 169 |
| Nagoya City, Aichi Pref. | 14 | 4 838 | 306 | 74 808 | 3 009 | 162 797 | - | - | 3 329 | 242 443 |
| Kyoto City, Kyoto Pref. | 5 | 1 532 | 178 | 30 573 | 726 | 32 917 | - | - | 909 | 65 022 |
| Osaka City, Osaka Pref. | 10 | 4 055 | 798 | 64 561 | 7 084 | 265 988 | - | - | 7 892 | 334 604 |
| Kobe City, Hyogo Pref. | 13 | 3 830 | 217 | 47 884 | 1 034 | 60 802 | - | - | 1 264 | 112 516 |
| Hiroshima City, Hiroshima Pref. | 6 | 2 334 | 171 | 23 545 | 1 517 | 46 747 | 14 | 640 | 1 708 | 73 266 |
| Fukuoka City, Fukuoka Pref. | 8 | 3 082 | 286 | 51 460 | 2 904 | 112 213 | - | - | 3 198 | 166 755 |

Source: Annual Report of Motor Vehicle Parking (Ministry of Land, Infrastructure, Transport and Tourism)

## 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 | Personal care | Eat | Going to work or school | Work | Study | Housework | Medical treatment / recuperation | Childcare | Shopping | Other travel | Mass media contact | Rest | Learning, self-development and training | Leisure | Sports | Volunteer and social interactions | Dating, socializing | Consultation, medical treatment | Other / unknown |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | Weekday | Male | 7:48 | 0:56 | 1:33 | 1:23 | 8:51 | 6:59 | 1:44 | - | 1:22 | 1:04 | 1:29 | 2:41 | 1:45 | 2:19 | 2:26 | 1:54 | 2:26 | 2:43 | 3:11 | 1:47 |
| | | Famale | 7:33 | 1:15 | 1:40 | 1:14 | 6:59 | 6:55 | 3:54 | - | 3:01 | 1:04 | 1:15 | 2:42 | 1:52 | 2:03 | 2:13 | 1:46 | 2:22 | 2:13 | 2:32 | 1:44 |
| | Saturdays | Male | 7:51 | 0:58 | 1:35 | 1:19 | 8:10 | 5:29 | 1:50 | - | 1:52 | 1:19 | 1:44 | 3:05 | 1:57 | 2:29 | 3:06 | 2:36 | 2:44 | 3:16 | 3:11 | 2:07 |
| | | Famale | 7:36 | 1:15 | 1:42 | 1:11 | 6:32 | 5:22 | 3:59 | - | 3:00 | 1:14 | 1:24 | 2:47 | 2:00 | 2:12 | 2:25 | 2:09 | 2:21 | 2:40 | 2:35 | 2:00 |
| | Sundays | Male | 8:37 | 1:05 | 1:40 | 1:12 | 7:17 | 5:20 | 2:04 | - | 2:40 | 1:35 | 1:54 | 3:54 | 2:29 | 2:48 | 3:50 | 3:22 | 2:51 | 3:49 | 5:16 | 2:38 |
| | | Famale | 8:13 | 1:21 | 1:46 | 1:05 | 6:10 | 4:43 | 3:53 | - | 3:09 | 1:31 | 1:35 | 3:00 | 2:14 | 2:24 | 3:07 | 3:05 | 2:27 | 3:24 | 5:00 | 2:27 |
| 1991 | Weekday | Male | 7:41 | 1:00 | 1:33 | 1:24 | 8:53 | 6:43 | 1:43 | 2:23 | 1:21 | 1:05 | 1:32 | 2:51 | 1:47 | 2:18 | 2:33 | 2:02 | 2:34 | 2:48 | 3:02 | 1:40 |
| | | Famale | 7:27 | 1:19 | 1:40 | 1:15 | 7:01 | 6:53 | 3:51 | 2:47 | 3:14 | 1:05 | 1:13 | 2:48 | 1:53 | 2:11 | 2:15 | 1:47 | 2:34 | 2:17 | 2:28 | 1:33 |
| | Saturdays | Male | 7:52 | 1:02 | 1:36 | 1:17 | 8:08 | 5:11 | 2:09 | 2:30 | 1:52 | 1:24 | 1:46 | 3:24 | 2:08 | 2:39 | 3:18 | 2:41 | 3:04 | 3:33 | 3:04 | 2:10 |
| | | Famale | 7:35 | 1:20 | 1:43 | 1:08 | 6:29 | 5:11 | 3:54 | 2:44 | 3:17 | 1:18 | 1:25 | 3:03 | 2:06 | 2:17 | 2:37 | 2:09 | 2:43 | 2:56 | 2:36 | 1:49 |
| | Sundays | Male | 8:36 | 1:08 | 1:41 | 1:09 | 7:22 | 5:05 | 2:16 | 2:25 | 2:38 | 1:36 | 1:49 | 4:11 | 2:35 | 2:55 | 3:53 | 3:18 | 3:29 | 3:58 | 5:11 | 2:25 |
| | | Famale | 8:10 | 1:24 | 1:46 | 1:05 | 6:15 | 4:49 | 3:47 | 2:51 | 3:19 | 1:33 | 1:34 | 3:15 | 2:19 | 2:36 | 3:03 | 2:58 | 3:03 | 3:28 | 5:07 | 2:09 |
| 1996 | Weekday | Male | 7:45 | 1:03 | 1:35 | 1:18 | 8:56 | 6:34 | 1:39 | 2:35 | 1:20 | 1:09 | 1:30 | 2:59 | 1:48 | 2:04 | 2:32 | 1:57 | 2:27 | 2:46 | 2:33 | 1:21 |
| | | Famale | 7:31 | 1:24 | 1:42 | 1:06 | 6:58 | 6:35 | 3:45 | 2:47 | 3:06 | 1:05 | 1:14 | 2:55 | 1:52 | 2:02 | 2:12 | 1:40 | 2:26 | 2:16 | 2:08 | 1:21 |
| | Saturdays | Male | 8:03 | 1:06 | 1:38 | 1:09 | 8:13 | 4:47 | 1:49 | 2:23 | 2:06 | 1:28 | 1:47 | 3:40 | 2:13 | 2:27 | 3:36 | 2:55 | 3:07 | 3:43 | 2:20 | 1:59 |
| | | Famale | 7:48 | 1:24 | 1:44 | 1:00 | 6:25 | 4:44 | 3:47 | 2:33 | 3:08 | 1:24 | 1:33 | 3:15 | 2:07 | 2:16 | 2:40 | 2:16 | 2:43 | 3:07 | 2:10 | 1:47 |
| | Sundays | Male | 8:40 | 1:11 | 1:42 | 1:05 | 7:16 | 4:32 | 1:53 | 2:16 | 2:25 | 1:38 | 1:51 | 4:20 | 2:31 | 2:35 | 3:55 | 3:31 | 3:30 | 3:59 | 3:42 | 2:09 |
| | | Famale | 8:18 | 1:28 | 1:47 | 1:00 | 6:06 | 4:32 | 3:40 | 2:37 | 3:05 | 1:36 | 1:39 | 3:28 | 2:18 | 2:24 | 2:56 | 3:02 | 3:00 | 3:28 | 3:33 | 1:59 |
| 2001 | Weekday | Male | 7:42 | 1:07 | 1:35 | 1:17 | 8:56 | 6:14 | 1:29 | 2:01 | 1:23 | 1:02 | 1:29 | 3:03 | 1:49 | 2:14 | 2:42 | 1:47 | 2:31 | 2:36 | 2:28 | 1:27 |
| | | Famale | 7:29 | 1:27 | 1:40 | 1:05 | 6:52 | 6:17 | 3:35 | 2:18 | 3:11 | 1:03 | 1:15 | 2:55 | 1:52 | 2:09 | 2:10 | 1:32 | 2:28 | 2:12 | 2:08 | 1:21 |
| | Saturdays | Male | 8:05 | 1:10 | 1:38 | 1:08 | 8:04 | 4:32 | 1:42 | 2:12 | 2:05 | 1:25 | 1:46 | 3:42 | 2:10 | 2:42 | 3:29 | 2:35 | 3:17 | 3:25 | 2:19 | 1:53 |
| | | Famale | 7:50 | 1:28 | 1:44 | 0:57 | 6:13 | 4:24 | 3:36 | 2:08 | 3:10 | 1:21 | 1:34 | 3:08 | 2:03 | 2:26 | 2:36 | 1:55 | 2:50 | 2:52 | 2:10 | 1:41 |
| | Sundays | Male | 8:36 | 1:14 | 1:41 | 1:05 | 7:16 | 4:02 | 1:43 | 1:59 | 2:13 | 1:30 | 1:52 | 4:21 | 2:26 | 2:49 | 3:44 | 3:04 | 3:51 | 3:44 | 3:27 | 2:01 |
| | | Famale | 8:16 | 1:31 | 1:47 | 0:58 | 6:01 | 3:49 | 3:25 | 2:14 | 2:57 | 1:30 | 1:41 | 3:22 | 2:11 | 2:43 | 2:49 | 2:22 | 3:07 | 3:05 | 3:32 | 1:49 |
| 2006 | Weekday | Male | 7:38 | 1:11 | 1:35 | 1:19 | 9:08 | 6:46 | 1:38 | 2:14 | 1:32 | 1:04 | 1:28 | 3:05 | 1:56 | 2:13 | 2:42 | 1:56 | 2:30 | 2:39 | 2:37 | 1:40 |
| | | Famale | 7:26 | 1:30 | 1:41 | 1:06 | 7:06 | 6:46 | 3:37 | 2:11 | 3:14 | 1:04 | 1:15 | 2:58 | 1:59 | 2:06 | 2:17 | 1:32 | 2:31 | 2:15 | 2:17 | 1:29 |
| | Saturdays | Male | 8:05 | 1:16 | 1:31 | 1:11 | 8:12 | 4:43 | 1:50 | 2:06 | 2:22 | 1:26 | 1:51 | 3:52 | 2:27 | 2:48 | 3:38 | 3:03 | 3:22 | 3:38 | 2:23 | 2:09 |
| | | Famale | 7:50 | 1:32 | 1:46 | 0:59 | 6:28 | 4:40 | 3:31 | 2:22 | 3:25 | 1:24 | 1:40 | 3:16 | 2:17 | 2:30 | 2:50 | 2:13 | 3:10 | 3:03 | 2:20 | 1:55 |
| | Sundays | Male | 8:33 | 1:19 | 1:44 | 1:05 | 7:24 | 4:16 | 1:50 | 2:08 | 2:34 | 1:37 | 1:53 | 4:22 | 2:43 | 2:54 | 3:55 | 3:10 | 3:52 | 3:40 | 3:37 | 2:16 |
| | | Famale | 8:11 | 1:35 | 1:49 | 0:57 | 6:19 | 4:08 | 3:29 | 2:19 | 3:09 | 1:34 | 1:42 | 3:26 | 2:23 | 2:41 | 2:59 | 2:20 | 3:10 | 3:11 | 2:46 | 1:58 |
| 2011 | Weekday | Male | 7:37 | 1:14 | 1:35 | 1:19 | 9:10 | 7:05 | 1:40 | 2:00 | 1:31 | 1:08 | 1:32 | 3:20 | 2:07 | 2:19 | 2:54 | 1:55 | 2:25 | 2:42 | 2:28 | 1:45 |
| | | Famale | 7:26 | 1:34 | 1:41 | 1:07 | 7:04 | 7:25 | 3:36 | 2:03 | 3:15 | 1:08 | 1:16 | 3:06 | 2:05 | 2:04 | 2:20 | 1:33 | 2:25 | 2:18 | 2:07 | 1:28 |
| | Saturdays | Male | 8:10 | 1:18 | 1:40 | 1:11 | 8:14 | 4:28 | 1:41 | 2:05 | 2:37 | 1:32 | 1:45 | 4:13 | 2:46 | 2:57 | 3:48 | 2:46 | 3:25 | 3:41 | 2:16 | 2:03 |
| | | Famale | 7:55 | 1:36 | 1:45 | 1:00 | 6:36 | 4:23 | 3:25 | 2:04 | 3:25 | 1:28 | 1:34 | 3:33 | 2:29 | 2:34 | 2:53 | 2:02 | 3:03 | 3:03 | 2:09 | 1:53 |
| | Sundays | Male | 8:27 | 1:23 | 1:44 | 1:08 | 7:36 | 4:04 | 1:47 | 2:14 | 2:51 | 1:37 | 1:53 | 4:35 | 2:55 | 2:59 | 4:02 | 3:03 | 3:52 | 3:43 | 3:39 | 2:13 |
| | | Famale | 8:06 | 1:38 | 1:48 | 1:00 | 6:20 | 3:48 | 3:28 | 2:10 | 3:21 | 1:37 | 1:43 | 3:38 | 2:31 | 2:39 | 3:01 | 2:16 | 3:10 | 3:12 | 3:07 | 1:56 |

Source: Social Life Basic Survey (Ministry of Internal Affairs and Communications Statistics Bureau)
Note: 1. Total hours of all activities don't add up to 24 hours because they don't include the people who didn't make the activity.
Note: 2. Item "Medical treatment / recuperation" was applied from 1991 survey.

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

(hours : minutes)

| | | 1990 | | | 1995 | | 2000 | | | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 | Going to work | Going to school | Other |
| Whole nation | | 1:07 | 1:06 | :58 | 1:15 | 1:11 | 1:16 | 1:05 | 1:26 | 1:16 | 1:05 | 1:26 | 1:16 | 1:12 | 1:24 |
| By gender | Male | 1:13 | 1:05 | 1:00 | 1:23 | 1:10 | 1:21 | 1:06 | 1:23 | 1:21 | 1:06 | 1:23 | 1:23 | 1:13 | 1:17 |
| | Female | :57 | 1:08 | :56 | 1:02 | 1:12 | 1:09 | 1:04 | 1:28 | 1:09 | 1:04 | 1:28 | 1:06 | 1:12 | 1:29 |
| Male: by age group | 10～15 | :35 | :50 | :41 | :51 | :54 | :15 | :52 | 1:25 | :15 | :52 | 1:25 | - | - | - |
| | 16～19 | :56 | 1:22 | :53 | 1:02 | 1:31 | :43 | 1:31 | 1:13 | :43 | 1:31 | 1:13 | - | - | - |
| | 10s | - | - | - | - | - | - | - | - | - | - | - | 0:53 | 1:09 | 1:12 |
| | 20s | 1:09 | 1:38 | 1:01 | 1:18 | 1:45 | 1:16 | 1:46 | 1:04 | 1:16 | 1:46 | 1:04 | 1:16 | 2:00 | 1:02 |
| | 30s | 1:10 | :46 | :53 | 1:20 | :44 | 1:18 | 1:17 | :57 | 1:18 | 1:17 | :57 | 1:17 | 1:15 | 1:07 |
| | 40s | 1:16 | :46 | 1:06 | 1:22 | 1:22 | 1:20 | :40 | 1:15 | 1:20 | :40 | 1:15 | 1:33 | :33 | 1:09 |
| | 50s | 1:17 | :42 | 1:05 | 1:30 | :31 | 1:26 | :51 | 1:29 | 1:26 | :51 | 1:29 | 1:27 | :39 | 1:05 |
| | 60s | 1:16 | 1:48 | 1:18 | 1:25 | :32 | 1:28 | :49 | 1:31 | 1:28 | :49 | 1:31 | 1:22 | - | 1:23 |
| | 70s and over | 1:00 | 1:50 | 1:05 | 1:20 | 1:15 | 1:10 | :15 | 1:52 | 1:10 | :15 | 1:52 | 1:39 | - | 1:45 |
| Female: by age group | 10～15 | :34 | :52 | :37 | :39 | :55 | - | :50 | 1:14 | - | :50 | 1:14 | - | - | - |
| | 16～19 | 1:02 | 1:29 | :52 | :59 | 1:34 | :57 | 1:26 | 1:21 | :57 | 1:26 | 1:21 | - | - | - |
| | 10s | - | - | - | - | - | - | - | - | - | - | - | 1:16 | 1:11 | 1:37 |
| | 20s | 1:13 | 1:40 | :58 | 1:14 | 1:42 | 1:20 | 1:05 | 1:20 | 1:20 | 1:05 | 1:20 | 1:17 | 1:54 | 1:16 |
| | 30s | :50 | :31 | :50 | 1:00 | :53 | 1:14 | 1:02 | 1:10 | 1:14 | 1:02 | 1:10 | 1:09 | :49 | 1:09 |
| | 40s | :48 | :35 | 1:00 | :55 | :48 | 1:01 | :40 | 1:26 | 1:01 | :40 | 1:26 | 1:02 | :39 | 1:30 |
| | 50s | :55 | :51 | 1:02 | :59 | :55 | 1:03 | :39 | 1:19 | 1:03 | :39 | 1:19 | :56 | :20 | 1:25 |
| | 60s | :56 | :31 | 1:07 | 1:05 | :47 | 1:12 | :35 | 1:37 | 1:12 | :35 | 1:37 | 1:13 | :49 | 1:28 |
| | 70s and over | :55 | 1:00 | 1:04 | :55 | 1:10 | :58 | - | 1:57 | :58 | - | 1:57 | 1:14 | :45 | 1:46 |
| By occupation | Farmer / fisher / forest worker | :46 | :29 | :57 | 1:12 | :35 | 1:04 | - | 1:42 | 1:04 | - | 1:42 | :48 | - | 1:33 |
| | Self-employed | :53 | 1:05 | 1:05 | 1:09 | :42 | 1:18 | 1:00 | 1:27 | 1:18 | 1:00 | 1:27 | 1:09 | :50 | 1:26 |
| | Sales or service person | 1:02 | :51 | 1:00 | 1:09 | 1:11 | 1:17 | :37 | 1:30 | 1:17 | :37 | 1:30 | 1:12 | :42 | 1:15 |
| | Blue-collar worker (skilled / unskilled) | 1:02 | :48 | :48 | 1:10 | :45 | 1:12 | :36 | 1:21 | 1:12 | :36 | 1:21 | 1:17 | :31 | 1:14 |
| | Office worker / technical expert | 1:15 | :46 | :52 | 1:21 | :49 | 1:20 | :53 | 1:02 | 1:20 | :53 | 1:02 | 1:19 | :59 | 1:04 |
| | Management & administration | 1:28 | 1:27 | 1:16 | 1:37 | 1:17 | 1:23 | 1:15 | :56 | 1:23 | 1:15 | :56 | 1:23 | :55 | 1:13 |
| | Professional or free-lance worker, or other | 1:12 | :58 | 1:06 | 1:13 | :48 | 1:18 | 1:00 | 1:16 | 1:18 | 1:00 | 1:16 | 1:19 | :36 | 1:09 |
| | Housewife | :51 | :48 | 1:06 | :58 | :50 | 1:03 | :25 | 1:30 | 1:03 | :25 | 1:30 | 1:19 | :35 | 1:44 |
| | Unemployed | 1:11 | :58 | 1:14 | 1:12 | 1:10 | 1:27 | 1:15 | 1:53 | 1:27 | 1:15 | 1:53 | 1:44 | :39 | 1:38 |
| By size of city | Tokyo area | 1:32 | 1:17 | 1:08 | - | - | 1:39 | 1:13 | 1:32 | 1:42 | 1:19 | 1:32 | 1:37 | 1:25 | 1:18 |
| | Osaka area | 1:20 | 1:09 | :57 | - | - | 1:28 | 1:11 | 1:34 | 1:25 | 1:24 | 1:34 | 1:28 | 1:05 | 1:32 |
| | City of a half million or more | 1:03 | 1:04 | :57 | - | - | 1:11 | :55 | 1:21 | 1:12 | 1:07 | 1:21 | 1:09 | 1:00 | 1:22 |
| | City of 100,000 or more and less than 500,000 | :59 | :59 | :54 | - | - | 1:05 | 1:02 | 1:10 | 1:05 | 0:58 | 1:10 | 1:05 | 1:10 | 1:20 |
| | City of less than 100,000 | :55 | 1:03 | :56 | - | - | :55 | :54 | 1:26 | 1:03 | 0:58 | 1:26 | 1:10 | 1:04 | 1:28 |
| | Town / village | :56 | 1:06 | :56 | - | - | 1:05 | 1:13 | 1:27 | 1:06 | 1:06 | 1:27 | 1:03 | 1:27 | 1:28 |

Source: National Time Use Survey (NHK Broadcasting Culture Research Institute)
Note: 1. 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.
Note: 2. Size of city in 2010 are "City of 300,000 or more", "City of 100,000 or more", "Cities, towns and villages of 50,000 or more", "Cities, towns and villages less than 50,000".

## 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 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consumption expenditures | 331 595 | 349 663 | 341 896 | 296 790 | 285 057 | 289 821 | 291 498 | 283 685 | 283 401 | 275 999 | 276 830 | 280 642 | 280 809 | 100.0% |
| Food | 79 993 | 78 947 | 75 174 | 64 282 | 62 502 | 63 541 | 64 548 | 62 868 | 63 031 | 61 087 | 62 494 | 63 089 | 63 874 | 22.7% |
| Housing | 16 475 | 23 412 | 21 716 | 23 713 | 22 461 | 22 171 | 22 510 | 21 797 | 22 479 | 23 824 | 22 136 | 22 312 | 23 085 | 8.2% |
| Utilities | 16 797 | 19 551 | 21 282 | 18 004 | 18 538 | 18 233 | 19 239 | 18 124 | 18 400 | 18 445 | 19 059 | 19 508 | 19 651 | 7.0% |
| Funiture / housework supplies | 13 103 | 13 040 | 11 268 | 8 634 | 8 154 | 8 395 | 8 718 | 8 732 | 8 725 | 8 790 | 8 725 | 8 591 | 8 878 | 3.2% |
| Clothing & shoes | 23 902 | 21 085 | 17 195 | 13 374 | 13 105 | 13 444 | 13 068 | 12 607 | 12 343 | 11 760 | 11 928 | 11 883 | 12 198 | 4.3% |
| Health maintenance / medical expenditures | 8 670 | 9 334 | 10 901 | 10 240 | 9 614 | 9 949 | 9 896 | 9 970 | 9 655 | 9 354 | 10 036 | 9 835 | 9 745 | 3.5% |
| Transport / communicatuons | 33 499 | 38 524 | 43 632 | 43 296 | 41 464 | 42 358 | 43 531 | 42 567 | 42 916 | 41 024 | 43 906 | 45 699 | 46 126 | 16.4% |
| Transport & motor vehicle related expenditures | 27 072 | 31 419 | 33 118 | 31 372 | 29 494 | 29 965 | 31 070 | 29 909 | 30 173 | 28 031 | 30 794 | 32 501 | 32 905 | 11.7% |
| Transport | 7 543 | 8 064 | 7 873 | 8 090 | 7 322 | 7 701 | 7 526 | 6 896 | 6 747 | 6 942 | 6 720 | 7 261 | 6 865 | 2.4% |
| Railway fares | 2 730 | 2 654 | 2 453 | 2 533 | 2 231 | 2 402 | 2 284 | 2 172 | 2 164 | 2 318 | 2 121 | 2 373 | 2 244 | 0.8% |
| Railway passes | 1 877 | 2 269 | 2 198 | 2 311 | 2 121 | 2 297 | 2 311 | 2 037 | 2 041 | 2 036 | 2 073 | 2 250 | 1 867 | 0.7% |
| Bus fares | 423 | 356 | 326 | 342 | 309 | 321 | 333 | 335 | 373 | 373 | 356 | 397 | 371 | 0.1% |
| Bus passes | 463 | 474 | 395 | 400 | 391 | 348 | 369 | 329 | 250 | 205 | 169 | 194 | 228 | 0.1% |
| Taxi fares | 671 | 545 | 460 | 406 | 384 | 372 | 363 | 472 | 445 | 480 | 457 | 444 | 446 | 0.2% |
| Airplane fares and other | 1 379 | 1 766 | 2 041 | 2 099 | 1 887 | 1 961 | 1 866 | 1 550 | 1 473 | 1 531 | 1 543 | 1 603 | 1 709 | 0.6% |
| Vehicle related expenditures | 19 529 | 23 355 | 25 245 | 23 282 | 22 172 | 22 264 | 23 544 | 23 013 | 23 426 | 21 089 | 24 074 | 25 240 | 26 040 | 9.3% |
| Purchace of motor vehicle, etc. | 6 842 | 7 734 | 8 847 | 6 187 | 5 680 | 5 532 | 6 004 | 6 489 | 6 462 | 4 286 | 6 506 | 7 373 | 8 125 | 2.9% |
| Purchace of bicycle | 369 | 337 | 342 | 199 | 199 | 264 | 317 | 271 | 272 | 283 | 278 | 284 | 314 | 0.1% |
| Maintenance of motor vehicle | 12 319 | 15 284 | 16 055 | 16 896 | 16 293 | 16 469 | 17 222 | 16 253 | 16 692 | 16 520 | 17 290 | 17 583 | 17 601 | 6.3% |
| Communication | 6 426 | 7 104 | 10 514 | 11 924 | 11 970 | 12 392 | 12 461 | 12 658 | 12 744 | 12 993 | 13 112 | 13 198 | 13 221 | 4.7% |
| Education | 16 827 | 18 467 | 18 261 | 13 934 | 13 868 | 14 213 | 13 956 | 14 351 | 13 707 | 13 774 | 13 347 | 13 916 | 13 156 | 4.7% |
| Cultural matters / entertainment | 31 761 | 33 221 | 33 796 | 31 332 | 30 024 | 31 444 | 31 018 | 31 288 | 31 575 | 29 117 | 28 033 | 28 409 | 28 044 | 10.0% |
| Other expenditures | 90 569 | 94 082 | 88 670 | 69 979 | 65 328 | 66 073 | 65 015 | 61 382 | 60 569 | 58 104 | 57 167 | 57 399 | 56 051 | 20.0% |

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 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall consumer prices | 93.5 | 100.0 | 101.5 | 99.3 | 99.6 | 99.6 | 101.0 | 99.6 | 98.9 | 98.6 | 98.6 | 98.9 | 101.7 |
| Transport / communication | 99.0 | 100.0 | 97.8 | 96.6 | 96.9 | 97.0 | 98.9 | 94.1 | 95.1 | 96.2 | 96.5 | 97.9 | 100.4 |
| Transport | 93.5 | 100.0 | 105.6 | 106.1 | 105.8 | 105.9 | 106.9 | 106.1 | 105.4 | 106.2 | 106.5 | 106.5 | 111.9 |
| Railway fees (excl. Japan Railway) | 86.8 | 100.0 | 110.7 | 111.2 | 111.4 | 111.6 | 111.8 | 111.8 | 111.8 | 111.8 | 111.7 | 111.7 | 113.7 |
| Railway fees (Japan Railway) | 100.0 | 100.0 | 103.2 | 102.8 | 102.8 | 102.8 | 102.8 | 102.8 | 102.8 | 102.7 | 102.7 | 102.7 | 104.9 |
| General route bus fares | 88.8 | 100.0 | 105.5 | 105.3 | 104.9 | 104.9 | 105.1 | 105.7 | 106.1 | 106.0 | 105.9 | 105.9 | 108.5 |
| Taxi fares | 82.2 | 100.0 | 106.3 | 106.2 | 106.2 | 106.9 | 112.5 | 113.1 | 113.1 | 113.1 | 113.1 | 113.3 | 116.2 |
| Air fares | 100.3 | 100.0 | 102.4 | 108.3 | 105.4 | 105.8 | 113.2 | 114.6 | 109.4 | 118.3 | 115.2 | 113.2 | 113.8 |
| Toll road fares | 95.2 | 100.0 | 103.7 | 104.4 | 104.4 | 104.4 | 103.4 | 95.7 | 92.5 | 92.8 | 96.0 | 97.3 | 122.7 |
| Motor vehicle related expenditures | 100.1 | 100.0 | 95.2 | 98.5 | 100.9 | 101.8 | 105.2 | 96.7 | 99.1 | 101.3 | 102.2 | 104.9 | 107.7 |
| Motor vehicles | 100.4 | 100.0 | 101.0 | 99.7 | 99.6 | 99.8 | 99.8 | 99.0 | 98.4 | 98.3 | 98.5 | 98.1 | 99.9 |
| Maintenance of motor vehicles | 100.0 | 100.0 | 93.1 | 98.1 | 101.2 | 102.4 | 106.7 | 95.8 | 99.1 | 101.9 | 103.1 | 106.7 | 109.7 |
| Gasoline | 110.4 | 100.0 | 91.0 | 107.4 | 117.0 | 120.6 | 134.8 | 104.2 | 115.2 | 126.3 | 127.6 | 135.2 | 141.9 |
| Rent for parking spaces | 82.0 | 100.0 | 101.6 | 100.3 | 100.1 | 100.1 | 99.5 | 99.0 | 98.5 | 97.4 | 97.0 | 96.9 | 97.0 |
| Parking fees | 87.7 | 100.0 | 99.1 | 95.4 | 94.1 | 93.5 | 92.8 | 92.6 | 92.1 | 91.7 | 91.8 | 91.7 | 92.1 |
| Communications | 105.8 | 100.0 | 93.4 | 79.5 | 76.6 | 75.0 | 75.0 | 74.7 | 74.2 | 73.7 | 72.9 | 72.6 | 73.5 |
| 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 | 103.0 |
| Fixed telephone charge** | 110.0 | 100.0 | 93.7 | 75.0 | 75.0 | 75.2 | 75.1 | 75.2 | 75.2 | 75.2 | 75.1 | 75.0 | 76.6 |
| Shipping fees | 89.8 | 100.0 | 101.8 | 101.8 | 101.4 | 101.8 | 101.8 | 96.9 | 95.3 | 95.3 | 95.3 | 95.3 | 97.2 |

Source: Annual Report on Consumer Price Index (Ministry of Internal Affairs and Communications)
* The "General route Bus fares" for 1990 and 2010 means the "bus fares".
** 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, 2014)

| | 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) | Kitakyusyu & Fukuoka |
| Consumer expenditures | 251 481 | 252 351 | 247 755 | 257 930 | 251 541 | 246 102 | 268 196 | 262 902 | 249 527 | 229 689 |
| Food | 60 272 | 60 896 | 62 327 | 61 269 | 58 440 | 56 362 | 66 054 | 62 749 | 63 561 | 55 108 |
| Housing | 19 069 | 19 619 | 21 736 | 19 387 | 17 028 | 15 561 | 23 905 | 16 352 | 18 639 | 16 572 |
| Utilities | 20 129 | 19 774 | 18 277 | 20 417 | 21 016 | 22 385 | 19 486 | 20 490 | 19 329 | 17 584 |
| Funiture / housework utensils | 8 823 | 8 841 | 8 283 | 9 072 | 9 323 | 8 708 | 9 496 | 9 357 | 8 387 | 8 315 |
| Clothing & shoes | 10 269 | 10 494 | 11 304 | 10 325 | 9 595 | 8 854 | 11 886 | 10 982 | 11 295 | 9 795 |
| Health maintenance / medical treatment | 11 031 | 11 051 | 11 131 | 10 740 | 11 351 | 10 916 | 12 732 | 10 807 | 10 586 | 10 617 |
| Transport / communication | 35 080 | 34 275 | 29 932 | 36 648 | 37 161 | 33 873 | 41 083 | 31 040 | 28 888 | 32 702 |
| (Ratio to the total consumption expenditure) | 13.9% | 13.6% | 12.1% | 14.2% | 14.8% | 13.8% | 15.3% | 11.8% | 11.6% | 14.2% |
| Transport | 5 235 | 5 543 | 6 889 | 5 214 | 4 102 | 3 293 | 7 512 | 4 851 | 5 905 | 5 621 |
| (Ratio to the total consumption expenditure) | 2.1% | 2.2% | 2.8% | 2.0% | 1.6% | 1.3% | 2.8% | 1.8% | 2.4% | 2.4% |
| Vehicle related expenditures | 19 423 | 13 573 | 20 853 | 22 318 | 25 075 | 26 450 | 16 333 | 25 608 | 14 819 | 13 615 |
| (Ratio to the total consumption expenditure) | 7.7% | 5.4% | 8.4% | 8.7% | 10.0% | 10.7% | 6.1% | 9.7% | 5.9% | 5.9% |
| Purchase of motor vehicles, etc. | 5 516 | 5 122 | 3 329 | 6 240 | 6 125 | 7 974 | 4 479 | 7 976 | 3 774 | 1 482 |
| Purchace of bicycle | 215 | 228 | 294 | 189 | 186 | 137 | 249 | 216 | 279 | 143 |
| Maintenance of motor vehicle | 13 691 | 13 173 | 9 950 | 14 424 | 16 007 | 16 964 | 11 605 | 17 415 | 10 766 | 11 990 |
| Communication | 10 422 | 10 209 | 9 471 | 10 582 | 10 742 | 11 783 | 10 028 | 10 624 | 10 317 | 9 653 |
| (Ratio to the total consumption expenditure) | 4.1% | 4.1% | 3.8% | 4.2% | 4.3% | 4.7% | 4.0% | 4.2% | 4.1% | 3.8% |
| Education | 7 576 | 7 750 | 8 195 | 7 993 | 6 822 | 6 483 | 9 154 | 9 769 | 9 213 | 7 565 |
| Cultural matters / entertainment | 25 928 | 26 674 | 27 456 | 26 742 | 25 516 | 21 246 | 29 584 | 29 460 | 26 616 | 23 137 |
| Other expenditures | 53 305 | 52 980 | 49 113 | 55 337 | 55 288 | 55 437 | 52 025 | 51 852 | 50 861 | 52 107 |

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

(10 billion kcal)

| | FY 1975 | FY 1980 | FY 1985 | FY 1990 | FY 1995 | FY 2000 | FY 2005 | FY 2010 | FY 2011 | FY 2012 | FY 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Passenger transport | 23 805 | 29 728 | 34 016 | 44 922 | 54 192 | 58 100 | 59 041 | 54 873 | 53 106 | 52 191 | 50 740 |
| Railways | 1 456 | 1 513 | 1 520 | 1 847 | 1 947 | 1 941 | 2 007 | 1 987 | 1 884 | 1 886 | 1 978 |
| Buses | 1 414 | 1 339 | 1 297 | 1 530 | 1 505 | 1 378 | 1 503 | 1 623 | 1 551 | 1 599 | 1 703 |
| Passenger cars | 19 129 | 24 385 | 28 764 | 38 537 | 46 903 | 51 104 | 51 419 | 47 110 | 46 339 | 45 573 | 43 046 |
| Commercial passenger cars | 2 089 | 1 870 | 2 113 | 2 384 | 1 735 | 1 532 | 1 494 | 1 284 | 1 206 | 1 189 | 1 153 |
| Private passenger cars | 17 040 | 22 515 | 26 651 | 36 153 | 45 168 | 49 572 | 49 925 | 45 826 | 45 133 | 44 384 | 41 893 |
| Passenger ships | 140 | 130 | 99 | 167 | 140 | 208 | 173 | 144 | 148 | 146 | 153 |
| Aircraft | 1 665 | 2 360 | 2 336 | 2 840 | 3 697 | 3 469 | 3 940 | 4 007 | 3 183 | 2 986 | 3 860 |
| Freight transport | 22 491 | 25 274 | 24 864 | 29 464 | 32 448 | 32 639 | 31 459 | 28 251 | 28 265 | 28 252 | 28 361 |
| Railways | 407 | 320 | 198 | 160 | 154 | 134 | 140 | 124 | 120 | 122 | 128 |
| Motor Vehicles | 15 690 | 18 901 | 19 574 | 25 278 | 27 977 | 26 657 | 25 970 | 24 371 | 24 367 | 24 351 | 25 002 |
| Coastal shipping | 6 268 | 5 833 | 4 769 | 3 613 | 3 794 | 5 279 | 4 792 | 3 245 | 3 280 | 3 282 | 2 706 |
| Aircraft | 126 | 221 | 323 | 414 | 523 | 570 | 557 | 511 | 498 | 498 | 526 |
| Total (Passenger & Freight) | 46 296 | 55 002 | 58 880 | 74 386 | 86 640 | 90 739 | 90 500 | 83 124 | 81 371 | 80 443 | 79 101 |

Source: EDMC Handbook of Japan's & World Energy & Economic Statistics (The Institute of Energy Economics)

### 14-2 Energy consumption in Japan and other countries (2012)

| | Japan | U.S.A. | Germany | U.K. | France | China | Russia |
|---|---|---|---|---|---|---|---|
| Energy consumption per person (oil-equivalent; tons / person) | 3.55 | 6.82 | 3.89 | 3.02 | 3.84 | 2.14 | 5.28 |
| Oil consumption per person (oil-equivalent; tons / person) | 1.65 | 2.46 | 1.26 | 0.92 | 1.12 | 0.34 | 1.18 |
| Total energy consumption (oil-equivalent; x 1 million tons) | | | | | | | |
| As primary energy | 452 | 2 141 | 313 | 192 | 252 | 2 894 | 757 |
| As final consumption | 309 | 1 433 | 221 | 128 | 155 | 1 702 | 461 |
| Breakdown of final energy consumption (oil-equivalent; x 1 million tons) | | | | | | | |
| Industrial sector | 82 | 248 | 56 | 24 | 28 | 810 | 144 |
| (%) | (26.5) | (17.3) | (25.2) | (18.8) | (18.0) | (47.6) | (31.2) |
| Transport sector | 75 | 597 | 53 | 39 | 44 | 238 | 94 |
| (%) | (24.1) | (41.7) | (24.1) | (30.4) | (28.6) | (14.0) | (20.3) |
| Commercial & residential sector | 115 | 483 | 90 | 58 | 71 | 518 | 157 |
| (%) | (37.2) | (33.7) | (40.9) | (45.2) | (45.7) | (30.4) | (34.1) |

Source: EDMC Handbook of Japan's & World Energy & Economic Statistics (The Institute of Energy Economics)

## 15. Travel in Japan

### 15-1 The number of trips made per person by trip purpose

(unit: the number of trips per person per day / weekdays)

| City area \ Purpose | Going to work / school | Going home | Business | Other | Total |
|---|---|---|---|---|---|
| Tokyo metropolitan area | 0.56 | 1.00 | 0.23 | 0.61 | 2.41 |
| Keihanshin (Kyoto-Osaka-Kobe) metropolitan area | 0.46 | 0.90 | 0.20 | 0.64 | 2.18 |
| Chukyo (Nagoya) metropolitan area | 0.64 | 1.19 | 0.24 | 0.78 | 2.85 |

Note: Data for Tokyo are from the hifth survey (2008); for Keihanshin (weekdays & holidays), from the fifth survey (2010); and for Chukyo, from the fifth survey (2011).

### 15-2 The number of trips made per person by trip purpose and by automobile ownership

(unit: the number of trips per person per day)

| | Three major metropolitan area | | | Local city area | | |
|---|---|---|---|---|---|---|
| | Owning a car | Family shared a car | Not owning a car | Owning a car | Family shared a car | Not owning a car |
| 1992 | 2.85 | 2.61 | 2.24 | 3.12 | 2.70 | 2.16 |
| 1999 | 2.59 | 2.58 | 2.17 | 2.63 | 2.50 | 1.99 |
| 2005 | 2.52 | 2.49 | 2.11 | 2.65 | 2.44 | 1.93 |
| 2010 | 2.73 | 2.56 | 2.20 | 2.78 | 2.58 | 2.07 |

Source: Movement of people in the City (Ministry of Land, Infrastructure and Transport)

### 15-3 Comparison of trip purposes by city type

(%)

| | | | 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 |
| | | 2010 | 15.4 | 6.3 | 8.4 | 40.6 | 29.3 |
| | Three major metropolitan area | 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 |
| | | 2010 | 15.8 | 6.3 | 7.9 | 41.1 | 28.9 |
| | 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 |
| | | 2010 | 15.0 | 6.3 | 9.0 | 40.2 | 29.6 |
| 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 |
| | | 2010 | 3.9 | 0.8 | 2.7 | 40.3 | 52.3 |
| | Three major metropolitan area | 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 |
| | | 2010 | 3.7 | 0.6 | 2.4 | 40.7 | 52.6 |
| | 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 |
| | | 2010 | 4.1 | 1.1 | 2.9 | 39.9 | 52.0 |

Source: Movement of People in the City (Ministry of Land, Infrastructure and Transport)

15-4 Comparison of transport mode by city type (Unit: %)

| | | | Railways | Buses | Motor vehicles | Motorcycle/Bicycle | Walking & other |
|---|---|---|---|---|---|---|---|
| Weekdays | Nationwide | 1987 | 11.6 | 3.9 | 34.0 | 23.2 | 27.4 |
| | | 1992 | 13.6 | 3.9 | 39.0 | 19.4 | 24.0 |
| | | 1999 | 13.4 | 3.3 | 42.5 | 19.4 | 21.4 |
| | | 2005 | 13.2 | 2.8 | 45.2 | 18.5 | 20.3 |
| | | 2010 | 14.9 | 2.9 | 45.7 | 16.8 | 19.7 |
| | Three major metropolitan area | 1987 | 22.3 | 3.3 | 26.4 | 19.8 | 28.2 |
| | | 1992 | 25.5 | 3.2 | 29.1 | 16.9 | 25.2 |
| | | 1999 | 23.8 | 2.8 | 33.6 | 18.2 | 21.7 |
| | | 2005 | 23.1 | 2.5 | 33.9 | 18.5 | 22.0 |
| | | 2010 | 26.0 | 2.7 | 33.0 | 16.8 | 21.5 |
| | Local city areas | 1987 | 2.5 | 4.5 | 40.4 | 26.0 | 26.7 |
| | | 1992 | 2.9 | 4.6 | 48.0 | 21.6 | 22.9 |
| | | 1999 | 3.3 | 3.8 | 51.2 | 20.5 | 21.1 |
| | | 2005 | 3.5 | 3.0 | 56.3 | 18.6 | 18.5 |
| | | 2010 | 3.9 | 3.1 | 58.2 | 16.8 | 18.0 |
| Holidays | Nationwide | 1987 | 7.3 | 3.2 | 45.9 | 21.9 | 21.7 |
| | | 1992 | 7.6 | 2.6 | 53.8 | 17.6 | 18.4 |
| | | 1999 | 7.5 | 2.1 | 60.0 | 15.8 | 14.6 |
| | | 2005 | 7.1 | 1.7 | 63.5 | 13.1 | 14.5 |
| | | 2010 | 8.6 | 1.9 | 61.3 | 12.9 | 15.3 |
| | Three major metropolitan area | 1987 | 14.4 | 3.0 | 37.7 | 20.7 | 24.2 |
| | | 1992 | 15.0 | 2.4 | 44.5 | 16.8 | 21.4 |
| | | 1999 | 13.2 | 2.1 | 52.3 | 16.0 | 16.3 |
| | | 2005 | 12.5 | 1.6 | 54.1 | 14.2 | 17.6 |
| | | 2010 | 15.1 | 1.9 | 50.1 | 14.4 | 18.4 |
| | Local city areas | 1987 | 1.9 | 3.3 | 52.3 | 22.8 | 19.7 |
| | | 1992 | 1.9 | 2.8 | 61.0 | 18.2 | 16.2 |
| | | 1999 | 2.2 | 2.1 | 67.0 | 15.6 | 13.1 |
| | | 2005 | 2.0 | 1.7 | 72.5 | 12.0 | 11.7 |
| | | 2010 | 2.3 | 1.8 | 72.0 | 11.6 | 12.4 |

Source: Movement of People in the City (Ministry of Land, Infrastructure and Transport)

15-5 The number of trips per person by city type (Unit: %)

| | | Weekdays | | | Holidays | | |
|---|---|---|---|---|---|---|---|
| | | Nationwide | Three major metropolitan area | Local city areas | Nationwide | Three major metropolitan area | 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 |
| | 2010 | 2.44 | 2.42 | 2.46 | 2.08 | 2.02 | 2.13 |
| 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 |
| | 2010 | 2.84 | 2.80 | 2.88 | 2.91 | 2.84 | 2.98 |
| 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 |
| | 2010 | 85.8 | 86.5 | 85.2 | 71.3 | 71.2 | 71.4 |

Source: Movement of People in the City (Ministry of Land, Infrastructure and Transport)
Note: 1. Gross: Trips per person (persons = both those who went out and those who did not)
Note: 2. Net: Trips per person (of persons who went out)
Note: 3. 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) (Unit: %)

| | | | Railways | Buses | Motor vehicles | Motorcycle/Bicycle | Walking & othes |
|---|---|---|---|---|---|---|---|
| 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 |
| | | 2010 | 27.4 | 3.4 | 44.9 | 17.2 | 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 |
| | | 2010 | 16.5 | 2.6 | 8.8 | 18.5 | 53.7 |
| | 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 |
| | | 2010 | 11.2 | 1.0 | 71.6 | 8.6 | 7.7 |
| | 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 |
| | | 2010 | 15.3 | 3.1 | 42.9 | 18.2 | 20.6 |
| | 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 |
| | | 2010 | 7.7 | 2.9 | 51.2 | 16.5 | 21.6 |
| | All purpose | 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 |
| | | 2010 | 14.9 | 2.9 | 45.7 | 16.8 | 19.7 |
| 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 |
| | | 2010 | 17.5 | 2.9 | 51.8 | 18.9 | 8.9 |
| | 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 |
| | | 2010 | 14.3 | 2.7 | 11.3 | 36.3 | 35.4 |
| | 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 |
| | | 2010 | 8.1 | 1.3 | 67.7 | 11.6 | 11.2 |
| | 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 |
| | | 2010 | 8.5 | 1.9 | 59.7 | 14.3 | 15.7 |
| | 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 |
| | | 2010 | 7.6 | 1.7 | 64.3 | 11.0 | 15.5 |
| | All purpose | 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 |
| | | 2010 | 8.6 | 1.9 | 61.3 | 12.9 | 15.3 |

Source: Movement of People in the City (Ministry of Land, Infrastructure and Transport)

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

| City area | Purpose \ Transport | Railways | Buses | Motor vehicles | Motorcycle/Bicycle | Walking & other | Total |
|---|---|---|---|---|---|---|---|
| Tokyo metropolitan area (weekdays) | Going to work | 53 | 2 | 24 | 13 | 7 | 100 |
| | Going to school | 31 | 2 | 7 | 11 | 49 | 100 |
| | Going home | 31 | 3 | 27 | 17 | 22 | 100 |
| | Home to place of business | 32 | 2 | 39 | 16 | 11 | 100 |
| | Between workplace and place of business | 26 | 1 | 58 | 7 | 8 | 100 |
| | Home to private destination | 12 | 4 | 34 | 23 | 27 | 100 |
| | Other private matters | 21 | 3 | 32 | 15 | 29 | 100 |
| | All purposes | 30 | 3 | 29 | 16 | 22 | 100 |
| Keihanshin metropolitan area (weekdays) | Going to work | 38 | 2 | 30 | 23 | 7 | 100 |
| | Going to school | 26 | 3 | 4 | 15 | 52 | 100 |
| | Going home | 21 | 3 | 29 | 23 | 24 | 100 |
| | Business | 16 | 2 | 51 | 18 | 13 | 100 |
| | Personal | 10 | 3 | 35 | 24 | 28 | 100 |
| | All purposes | 20 | 3 | 31 | 22 | 24 | 100 |
| Chukyo metropolitan area (weekdays) | Going to work | 22 | 2 | 59 | 12 | 5 | 100 |
| | Going to school | 19 | 1 | 8 | 15 | 57 | 100 |
| | Going home | 13 | 1 | 56 | 13 | 17 | 100 |
| | Business | 5 | 0 | 87 | 4 | 4 | 100 |
| | Personal | 5 | 1 | 69 | 11 | 14 | 100 |
| | All purposes | 12 | 1 | 59 | 12 | 16 | 100 |
| Chukyo metropolitan area (holidays) | Going to work | 16 | 1 | 63 | 14 | 6 | 100 |
| | Going to school | 21 | 1 | 13 | 32 | 33 | 100 |
| | Going home | 7 | 1 | 75 | 8 | 9 | 100 |
| | Business | 4 | 0 | 84 | 7 | 5 | 100 |
| | Personal | 5 | 1 | 80 | 6 | 8 | 100 |
| | All purposes | 6 | 1 | 77 | 7 | 9 | 100 |

Source: Data for Tokyo are from the fifth survey (2008); for Keihanshin (weekdays & holidays), from the fifth survey (2010); and for Chukyo, from the fifth survey (2011).

## 16 Basic Transport Data for Major World Cities (2000, 52 cities plus 3Japanese cities)

| Cities | Popusation | 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 | | |
| | (x1000perrsons) | (euro/person/ /Year) | (vehicles/1000 persons) | (vehicles/1000 persons | (km/vehicle/year) | (Megajoules/person /year) | (%) | (%) | (%) | (trips/person/day | (min.) |
| Amsterdam | 850 | 3410 | 336 | 16.9 | 8750 | 11100 | 14.7 | 51.4 | 33. | 2.9 | 23 |
| Athens | 3900 | 11600 | 385 | 64.1 | 7500 | 13100 | 27.9 | 8.15 | 63. | 1.61 | 30 |
| Barcelona | 4390 | 17100 | 424 | 65.5 | 6710 | 11000 | 18.8 | 34.3 | 46. | 1.85 | 24.6 |
| Berlin | 3390 | 20300 | 328 | 23.5 | 7760 | 10700 | 24.6 | 36.2 | 39. | 3.05 | 21 |
| Bern | 293 | 35500 | 425 | 66.2 | 8370 | 15700 | 21.2 | 38.5 | 40. | 3.27 | 24 |
| Bilbao | 1120 | 20500 | 392 | 19.2 | 7040 | 9910 | 16 | 48.6 | 35. | 1.95 | 26 |
| Bologna | 434 | 31200 | 634 | 102 | 5090 | 10100 | 14.4 | 29.1 | 56. | 3.18 | 25 |
| Brussels | 964 | 23900 | 497 | 17.9 | 8980 | 18800 | 13.6 | 27.5 | 58. | 2.82 | 22 |
| Budapest | 1760 | 9840 | 329 | 7 | 7200 | 10000 | 43.5 | 23.4 | 33. | 2.85 | 27 |
| Chicago | 8180 | 40000 | 513 | 20.5 | 19800 | 43600 | 6.3 | 6.2 | 87. | 2.91 | 27 |
| Clermont-Ferran | 264 | 24200 | 519 | 30.3 | 8000 | 14700 | 6.3 | 3 | 60. | 3.6 | 14 |
| Copenhagen | 1810 | 34100 | 315 | 18.9 | 14800 | 15800 | 12.1 | 39 | 48. | 3 | 20 |
| Dubai | 910 | 22000 | 243 | 3.73 | 18100 | 18100 | 6.7 | 16 | 77. | 2.56 | 15 |
| Dublin | 1120 | 35600 | 377 | 12.2 | | | | | | | |
| Geneva | 420 | 37900 | 508 | 85.9 | 8070 | 19200 | 15.3 | 33.5 | 51. | 3.68 | 21 |
| Gent | 226 | 26700 | 421 | 28 | 10700 | 16700 | 4.78 | 29.9 | 65. | 2.51 | |
| Glasgow | 2100 | 20600 | 345 | 5.42 | 12800 | 17000 | 10.6 | 23.5 | 65. | 2.96 | 17 |
| Graz | 226 | 29600 | 468 | 48.6 | 9040 | 14900 | 18.4 | 35.2 | 46. | 3.7 | 18 |
| Hamburg | 2370 | 38800 | 510 | 25.9 | 7550 | 14400 | 15.7 | 36.9 | 47. | 3.19 | 25 |
| Helsinki | 969 | 36500 | 361 | 15.5 | 9000 | 12800 | 27 | 29 | 4 | 3.1 | 15 |
| Hong Kong | 6720 | 27600 | 50.6 | 4.03 | 8960 | 4850 | 46 | 37.8 | 16. | 2.57 | 24 |
| Krakow | 759 | 7010 | 225 | 11.2 | 6030 | 6140 | 39.6 | 32.7 | 27. | 1.97 | |
| Lille | 1100 | 21800 | 413 | 23.6 | 7500 | 11100 | 6.1 | 30.7 | 63. | 3.59 | 16 |
| Lisbon | 2680 | 17100 | 432 | 25.5 | 5000 | 9220 | 27.5 | 24.5 | 4 | 1.61 | 25 |
| London | 7170 | 36400 | 343 | 14.3 | 9140 | 14700 | 18.8 | 31.1 | 50. | 2.65 | 24 |
| Lyons | 1180 | 27100 | 489 | 25.5 | 6770 | 12500 | 13 | 32.7 | 54. | 3.37 | 19 |
| Madrid | 5420 | 20000 | 478 | 29.5 | 8530 | 15100 | 22.4 | 26.1 | 51. | 2.71 | 22 |
| Manchester | 2510 | 22400 | 434 | 10.1 | 9320 | 14600 | 9.35 | 22.6 | 68. | 2.84 | 15 |
| Marseilles | 800 | 22700 | 406 | 19.4 | 8910 | 13300 | 11.4 | 34.5 | 54. | 3.02 | 20 |
| Melbourne | 3370 | 22800 | 578 | 20.4 | 13900 | | 6 | 18 | 7 | 3.72 | |
| Milan | 2420 | 30200 | 594 | 50.1 | | | | | | | |
| Moscow | 11400 | 6060 | 189 | 4.04 | 9510 | 8530 | 49.3 | 24.4 | 26. | 2.67 | 27 |
| Munich | 1250 | 45800 | 542 | 42.1 | 9560 | 19700 | 21.9 | 37.5 | 40. | 3.2 | 30 |
| Nantes | 555 | 25200 | 546 | 28.9 | 7260 | 14200 | 12.8 | 23.3 | 63. | 3.12 | 16 |
| Newcastle | 1080 | 18400 | 320 | 8.52 | 12700 | 15100 | 16.1 | 26.8 | 57. | 2.52 | 16 |
| Oslo | 981 | 42900 | 418 | 40.7 | 10700 | 16500 | 15.4 | 25.5 | 59. | 3.18 | 15 |
| Paris | 11100 | 37200 | 439 | 58.6 | 8220 | 14600 | 18 | 35.6 | 46. | 2.81 | 22 |
| Prague | 1160 | 15100 | 536 | 45.2 | 4950 | 11800 | 43.3 | 21.1 | 35. | 3.71 | 19 |
| Rome | 2810 | 26600 | 689 | 81 | 5530 | 15400 | 20.2 | 23.6 | 56. | 2.19 | 32 |
| Rotterdam | 1180 | 28000 | 356 | 18.3 | 9290 | 11800 | 9.71 | 41.9 | 48. | 2.74 | 22 |
| Sao Paulo | 18300 | 6420 | 238 | 21.8 | 4780 | 7560 | 29 | 37.4 | 33. | 1.78 | 30 |
| Sevilla | 1120 | 11000 | 406 | 35.1 | 5000 | 7450 | 10.4 | 41.6 | 4 | 1.85 | 23 |
| Singapore | 3320 | 28900 | 123 | 39.7 | 19500 | 14200 | 40.9 | 14 | 45. | 2.87 | 23 |
| Stockholm | 1840 | 32700 | 397 | 13 | 8700 | 17800 | 21.6 | 31.4 | 47. | 2.77 | 21 |
| Stuttgart | 2380 | 32300 | 566 | 43.8 | 10200 | 20700 | 11 | 30.1 | 58. | 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 | 5 | 1.82 | 26 |
| Valencia | 1570 | 14300 | 466 | 42.2 | 5460 | 9250 | 12.4 | 46.2 | 41. | 2.09 | |
| Vienna | 1550 | 34300 | 414 | 42.2 | 5230 | 9040 | 4 | 30 | 3 | 2.7 | 21 |
| Warsaw | 1690 | 13200 | 380 | 18.9 | 5730 | 9090 | 51.6 | 19.8 | 28. | 2.26 | 24 |
| Zürich | 809 | 41600 | 495 | 58.5 | 8650 | 18400 | 23 | 30.5 | 46. | 3.18 | 22 |
| Tokyo | 13159 | 49050 | 237 | 37.4 | 6760 | 7319 | 50. | 30.3 | 19. | 2.54 | 36 |
| Nagoya | 7411 | 46534 | 524 | 25.6 | 7073 | 14936 | 23. | 27.8 | 49. | 2.57 | 26 |
| Osaka | 8865 | 55861 | 303 | 26.5 | 6592 | 9257 | 33. | 39.8 | 26. | 2.48 | 30 |

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.
4. Data for 3 Japanese metropolises(2010) are added. Tokyo, Nagoya and Osaka refer to the respective prefectures( i.e. Tokyo-to, Aichi-ken and Osaka-fu). Then CBDs are their central districts or ku areas(i.e. Chiyoda, Chuo and Minato-ku areas for Tokyo; Naka, Nakamura, Nishi-ku areas for Nagoya; Kita, Nishi and Chuo-kuareas for Osaka)

Source : data from MOBILITY IN CITES. UITP database Japanese cities data were added with the help of MLIT.

| Public transportation indexes | | Motor vehicle indexes | | Average travel speed | | | Annual use | | Population density in city | | Central Business District employment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual supply | Fare balance rate | Length of roads | Central BuDistrict parking areassiness | Private cars | Railways | Buses | Private cars | Public t ransportation | 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 | |
| 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 |
| 11710 | 120.9 | 0.6 | 21 | 25.1 | 32.7 | 13.2 | 2904 | 4418 | 60.2 | 27.5 | 3.12 |
| 9674 | 113.4 | 1.5 | 194 | 31.1 | 33.2 | 13.6 | 6477 | 2465 | 14.3 | 7.1 | 4.79 |
| 8485 | 127.1 | 0.4 | 91 | 29.8 | 31.9 | 13.0 | 3743 | 2201 | 46.7 | 20.1 | 3.25 |

# TRANSPORT POLICY IN PERSPECTIVE 2015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