TRANSPORT POLICY IN PERSPECTIVE : 2005

Preface

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

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

Under these circumstances, we are reaching a major turning point in the movement toward a mature motorized society for the 21st Century. Fortunately, advanced road traffic systems and next generation motor vehicles that will be safer as well as more environmentally friendly are beginning to emerge. These include technological innovations for motor vehicle themselves, such as less polluting and more efficient hybrid motor vehicles, and the development of intelligent motor vehicles and roads that use ITS (Intelligent Transportation Systems) technology. In addition to the globalization of our economy, we must reassess the significance of roads and motor vehicle traffic systems in the overall transportation system in Japan, where the society has become more urbanized while the total population is declining and the population is aging rapidly. We must also solve a variety of existing problems and move toward a road and motor vehicle transport system for a vibrant and sustainable society.

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

Every year since the year 2000, with the full support of the Japan Automobile Manufacturers Association, the Japan Research Center for Transport Policy has published "Research on Automobiles and Transport - Environment and Policy" annually, a booklet giving a general view of the trends in policy and research concerning motor vehicles and road traffic in Japan. From last year, the Center has published the majority of the contents of the booklet in English.

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

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

December 2005

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Japan Research Center for Transport Policy

Recent Trends in Japanese Transportation

Masahiro Sugiyama

1. Countermeasures for Natural Disasters

2004 was a year with an unusually high occurrence of natural disasters. There were 10 typhoons from June and the country was visited by heavy rains in the Niigata/Fukushima region and Fukui region in July. The disasters led to more than 230 dead or missing and almost 170,000 homes immersed in water. In October, the Chuetsu Earthquake with an intensity of 7 rocked the country, resulting in 40 deaths and the evacuation of over 100,000 people. In December, furthermore, the Sumatra-Andaman Earthquake and ensuing tsunami, led to approximately 100,000 dead or missing in 10 countries around the Indian Ocean. Many Japanese were among the victims. Faced with such a serious situation, the annual White Paper on Land, Infrastructure and Transport in Japan 2005 published in fiscal 2004 mentions the disaster recovery countermeasures and rebuilding support offered by the national government and the Ministry of Land, Infrastructure and Transport under the title of "Aiming to Build a Country Resilient to Disasters." This attempt was made to actively respond to social needs, and discussion includes actions taken against heavy rains and typhoons, earthquakes and tsunamis.

Chuetsu Earthquake
(Collapsed lane on Kan-etsu Expressway)
(Photograph: Japan Highway Public Corporation Hokuriku Branch)

It is essential to quickly restore damaged lifelines such as transportation in affected areas as stated in the White Paper. Confirmation made through

Traffic in Japan this year

			FY2003	FY2004	Change (%)
Traffic volume	Passengers (100 million passenger kilometers)	Total	14,255	14,265	0.1
		Passenger cars, etc.	7,566	7,551	-0.2
		Buses	862	864	0.2
		Railways	3,822	3,850	0.7
		Maritime	39	40	2.6
		Aviation	839	833	-0.7
	Freight (100 million ton kilometers)	Total	5,707	5,639	-1.2
		Motor vehicles	3,120	3,219	3.2
		Railways	221	228	3.2
		Coastal shipping	2,356	2,182	-7.4
		Aviation	10	10	0.0
Number of automobiles owned* (Thousands, annual)[1]		Total	75,640	76,020	0.5
		Passenger cars	54,571	55,288	1.3
		Trucks	17,342	17,014	-1.9
		Buses	233	232	-0.4
		Other	3,494	3,486	-0.2
Driving license holders** (Thousands)[1]		Total	77,468	78,247	1.0
		Male	44,786	45,020	0.5
		Female	32,682	33,227	1.7
High-standard arterial highways*** (km)[2]			8,344	8,344	0.0
Improved national and prefectural roads (km, start of year)[1]			131,327	132,412	0.8
Traffic accidents		Accidents (Thousands)	948	952	0.4
		Fatalities within 30 days	8,877	8,492	-4.3

* Figures for end of March (Registered vehicles + light motor vehicles)
** Figures for end of preceding December
*** Figures for end of fiscal year
Note: The following sources were referred to for data.
1) Annual Report on Road Statistics
2) Road Handbook
3) Traffic Statistics

horrible incidents of disasters is not necessarily appropriate, but it creates a keen awareness of the functions and roles of transportation in an open economic society. Many people came to realize that today's social and economic lifestyle cannot be maintained without transportation services. This led to a reemergence of discussion on redundancy, but putting ideals aside, discussion on transportation infrastructure cannot be realistically carried out independently from the issue of cost burden. It is necessary to conduct investigations backed by the ability to procure financial resources for infrastructure.

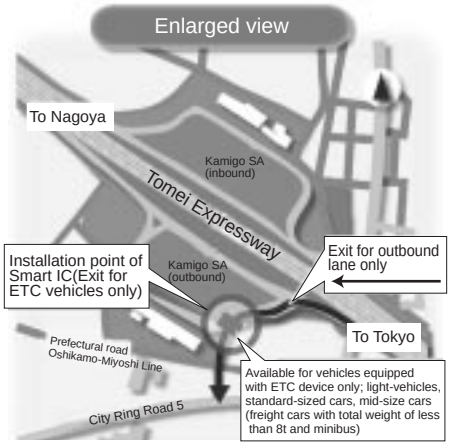
Whereas restoration of railways physically requires time, roads make up a relatively dense network including local streets, and partly due to the fact there is a high likelihood of rapid restoration, trucking services played a significant role in logistics after disasters. This was one lesson that came out of the Kobe Earthquake that occurred ten years ago. There is a detailed description on countermeasures made through road transportation during this period in a special feature in the May 2005 edition of a journal "Kosoku Doro to Jidosha *[Expressways and Automobiles]"*. As natural disasters are likely to occur in the future, it is necessary to learn from the past, and make a clear manual for people towards the future.

2. Supply of New Services

Many new services were provided in 2004. Looking at roads, attention should be paid to the expansion of the expressway network and the implementation of a variety of social experiments. In December, the implementation of four lanes was completed on the Kyushu Expressway (Hitoyoshi Interchange - Ebino Interchange), making the expressway from Aomori to Kagoshima and Miyazaki have four-lanes for its entire length. This is significant with respect to securing capacity for the artery. The Ise Coastal Expressway (Toyota Junction - Toyota-minami Interchange) was also opened in December, linking the Tomei Expressway and the Higashi-Meihan Expressway. Social experiments include nighttime long distance discounts for ETC-fitted vehicles on national expressways in April, lowering of the toll for the bridge to Kansai International Airport in July and the use of smart ICs in the Kamigo Service Area on the Tomei Expressway in October. There is great interest in how the results of these experiments will affect the tollway business in the near future. In the pricing system, approval was given for national expressway toll discounts in September and the elimination of coupon tickets for high traffic volume in the Metropolitan Expressway and the Hanshin Expressway in October. With the privatization based on the four laws related to the Four Highway-related Public Corporations issued in June, a significant amount of attention has been paid to the pricing systems and pricing levels of expressway services offered by private companies.

Railway services included the opening of the Minato Mirai 21 Line (Yokohama - Motomachi/Chinatown) in February, the Kyushu Shinkansen (Shin-Yatsushiro - Kagoshima Chuo) and the Hisatsu Orange Railway (Yatsushiro - Sendai) in March, Joetsu Shinkansen Honjo Waseda Station also in March, the Line No.4 (Nagoya Daigaku - Aratamabashi) of the Nagoya

Kamigo Smart Interchange Experiment
Photographed by Motohiro Yamazaki,TTRI



Kamigo Smart Interchange
(Materials: Toyota City Transportation Policy Section)

Central Japan International Airport (Centrair) Access

Opening of Central Japan International Airport (Centrair)
Photographed by Motohiro Yamazaki,TTRI

Subway in October, the Kyoto Tozai Line (Rokujizo - Daigo) in November and the Tokyo Monorail Haneda Line (Haneda Airport Terminal 1 - Haneda Airport Terminal 2) in December. Looking at freight transportation, service of Super Rail Cargo began in March and high-speed freight trains were allowed to operate on the Tokaido Line. Expansion of the IC card usage including the interchangeable use of JR East's SUICA and JR West's ICOCA in August, and the implementation of the common PiTaPa card for use with railway companies such as Keihan and Hankyu.

Regarding airports, paving work on runways, taxi ways and aprons was completed at Chubu International Airport in March, and after the passenger terminal was completed in October, the airport was opened in February 2005. Before this, the Central Japan International Airport Railway (Rinku-Tokoname - Central Japan International Airport) started its service under separation system of operation and infrastructure. The Narita International Airport Corporation was established in April 2004, and the name of the airport was changed from Shin-Tokyo International Airport to Narita International Airport. The total cumulative number of passengers that have used the airport recorded over 500 million in September. In December, Passenger Terminal 2 became available at Tokyo International (Haneda) Airport. At the end of December, it was decided to extend the runway at the New Ishigaki Airport. With regard to airlines, it was decided to provide assistance to Skynet Asia Airlines from the Industrial Revitalization Corporation of Japan, which came into question for the management of new airline companies.

Although there were essentially no new services in ports, in July, Keihin Port, Ise Bay and Hanshin Port were designated as Super Core Ports with the aim of lowering port costs by 30 percent and reducing lead time to around one day. In the same month Super Liner Ogasawara became the first Techno Super Liner to be put into use when it was named and a launching ceremony was conducted. The ship was scheduled to operate on the Ogasawara route in 2005, but this is feared to be postponed to April 2006 or later due to the national government's assistance policy.

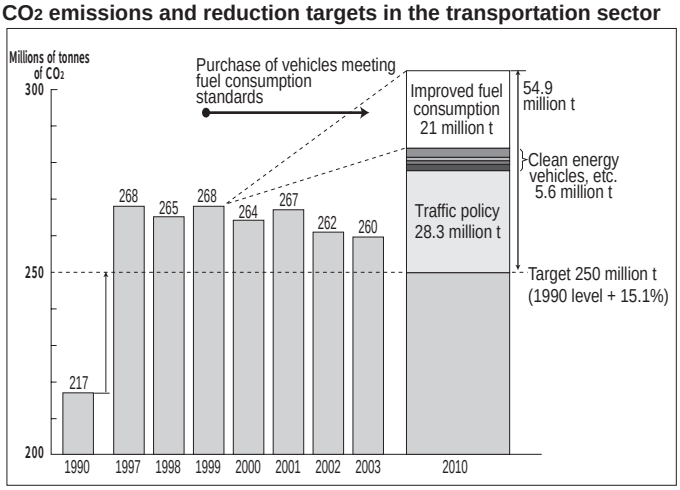
3. Efforts for Preventing Global Warming

As is commonly known, the Kyoto Protocol obligates Japan to reduce greenhouse-effect gas emissions to six percent less than 1990 levels during the first stage from 2008 to 2012. The most recent data available shows the 2003 figure to be 1.339 billion tonnes (CO_2 conversion, same applies below), exceeds the base level of 1.237 billion tonnes and significantly exceeds the target of 1.163 billion tonnes. Assuming a BAU(Business as Usual) case of only the current policies being implemented, this is expected to be 1.311 billion tonnes in 2010, but based on the current volume of emissions, there are difficulties in achieving the target. Ratification by Russia in November 2004 provided the impetus for the Kyoto Protocol being brought into force in February 2005, over 7 years after it was adopted. Japan responded with the Kyoto Protocol Target Achievement Plan, following on from the Guideline for Measures to Prevent Global Warming, Action Program to Arrest Global

Warming, Basic Policy on Measures against Global Warming, further accelerating concrete steps toward the reduction of greenhouse-effect gases.

Looking at the transportation sector, it has been confirmed that the CO_2 emissions that make up a large part of greenhouse-effect gases have decreased since 1997. Decreases in 2002 and 2003 are notable, and tax breaks for low emission vehicles and the demand shift from commercial to private trucks have been proven beneficial. These deserve considerable praise. Even though the figure for 2003 is 10 million tonnes over the 250 million tonnes target for 2010, additional policies are required. In May 2004, the Environmental Subcommittee of the Council of Transport Policy made an interim report on reduction target figures based on fiscal 2001 data, and this was recalculated when the data for fiscal 2002 became available. According to this, the necessary reduction for the transportation sector is 24.5 million tonnes, of which 16.1 million tonnes can be achieved by using existing policies, with 8.4 million tonnes requiring new policies. The former is made up of more environmentally friendly automobiles and driving (4.5 million tonnes), traffic policies (5.1 million tonnes), more efficient logistics (4.5 million tonnes), promotion of the use of public transportation (1.8 million tonnes) and improved energy consumption efficiency by trains and aircraft (200,000 tonnes), while the latter is made up of the demand shift from commercial to private trucks used in logistics and improved load efficiency (3.9 million tonnes), commuter traffic management (900,000 tonnes) and the use of sulfur-free and bio fuels (3.6 million tonnes). The feasibility of such steps is being considered. In the open economic society of today, it is important to find ways of securing mobility while reducing CO_2. In this respect, wide-ranging collaboration between logistics businesses and shippers, such as seen in the Green Logistics Partnership Council (formed in December 2004), is expected to be essentianl of effectively reducing CO_2.

CO_2 emissions and reduction targets in the transportation sector



(Source: Ministry of Land, Infrastructure and Transport)

Meanwhile, there has been discussion on the introduction of an environmental tax in Japan. The proposal put forward by the Ministry of the Environment is to set the tax at 2,400 yen per carbon tonne (approximately 1.5 yen per liter of gasoline), and the expected revenues of 490 billion yenis planned to be used for global warming policies and allocation to maintaining and improving corporate activities as part of general financial resources, with the effect of implementation being a 52 million tonnes reduction in greenhouse-effect gases, and a 0.01% reduction in GDP. It was planned to be introduced in January 2006, but was postponed due to debate about the basis and reliability of the figures showing the effect of the policy s introduction.

Environmental policies for emissions were stated in the Central Environment Council s so-called Post New Long-term Regulations Report submitted in February 2005, with the PM and NOx regulation targets being lowered by 75-85% and 41-50%, respectively, from the current levels in the New Long-term Regulations that are the strictest in the world. Examination is required from the perspective of EST (Environmentally Sustainable Transport).

4. New Developments in Automobile Transportation

ITS World Conference
(source: ITS Japan)

Cover of "Transport Policy in Perspective 2004"

Two events that gained a lot of attentions throughout society regarding the development of automobile technology were the ITS World Conference Aichi/Nagoya 2004 held in October 2004 and the Tokyo Motor Show held the following month. Reports were made on Advanced Safety Vehicles (ASV) in the executive session and special session of the former, with exhibitions and test drives also offered. The Japan Research Center for Transport Policy distributed "TRANSPORT POLICY IN PERSPECTIVE: 2004" at the venue and it was well received. At the Tokyo Motor Show, a prototype developed in a next-generation low-pollution vehicle research project was presented, and the symposium became a great success. There are strong expectations that these new technologies will spread throughout society in order to create a safe and environmentally-friendly automobile society.

There were also new systems and laws linked to new developments in automobile transportation that were introduced in the first half of 2004. A system for evaluating and publishing the fuel efficiency of vehicles began in January, and tax breaks for low emission vehicles began in fiscal 2004. The Law on One-Stop Service for Automobile-Related Procedures was established in May in an attempt to improve convenience for automobile users. The Nagoya ITS Taxi Verification Test of a system directly linking taxi drivers to calls in Nagoya began at the end of May, This is a test aimed at allowing taxi drivers to use ITS technology before the ITS World Conference.

In January 2005, the Automobile Recycling Law came into force, offering another layer of environmental policies. The law was announced in July 2002 with the objective of recycling and properly disposing of the 4 million automobiles that are discarded every year, and the framework was ready after a preparation period of two and a half years. The law makes it mandatory for automobile manufacturers and importers to recycle or dispose of shredder dust, airbags and CFCs, with automobile owners bearing the cost in the form of a recycling fee. Despite the increased burden on automobile owners, the smooth enforcement of the Automobile Recycling Law is desirable in respect to social cost burden because of the beneficial effect it is expected to have on the environment.

With regard to toll roads, the four laws related to the highway-related public corporations (Law Concerning Expressway Companies, Law Concerning the Japan Expressway Holding and Debt Repayment Agency, Law Concerning the Establishment of Road-related Laws Accompanying the Privatization of the Japan Highway Public Corporation, Law for Enforcement of Laws Concerning the Privatization of the Japan Highway Public Corporation) was passed in June 2004 as actual steps were taken in preparation for privatization in October 2005. Executive managers from the private sector have been chosen to head the highway service companies that will become corporations and the Japan Expressway Holding and Debt Repayment Agency that will become an independent corporation, and this is expected to result in tollway services being provided smoothly and in an appropriate fashion.

Despite such new developments, one remaining issue is that the number of

vehicle recall incidents recorded in 2004 was the highest ever. It is hoped that automobile transportation become more sound through the serious actions taken to prevent the recurrence of unethical activity related top recalls.

5. Traffic Accidents and Safety Policies

The number of traffic accidents reported in 2004 were 952,192 (up 0.4% from the previous year), fatalities numbered 7,358 (down 4.5%) and injuries 1,183,120 (up 0.1%).The number of fatalities fell further from the previous year's figure, when this fell below 8,000 for the first time in 46 years. Although it is a positive sign that this figure fell into the low 7,000s, the slight increase in accidents and injured compared to the previous year is a problem. The fact that the number of accidents exceeded 900,000 for five consecutive years and the number of injured exceeded 1 million for six consecutive years is a serious social issue. We tend to focus on the decrease in the number of fatalities but there is a strong need to reduce the number of accidents and also the number of injured.

One characteristic of fatal accidents is the involvement of elderly people. The ratio of elderly victims in the total fatality count is quite high at 41.4% and the number of fatal accidents involving the elderly, especially those aged 70 or more, is increasing (up 0.2% and 6.0% respectively). Overall, the number of fatal accidents resulting from speed violations or driving under the influence of alcohol has decreased significantly (down 19.5% and 9.0% respectively) but accidents resulting from not checking for safety is rising (up 1.9%) and the increase of elderly drivers (up 11.9%) is also seen to be a problem here. It could be said that there is an extremely high need for effective actions targeting elderly drivers. Within the Cabinet Office, the Central Traffic Safety Measures Council was launched to establish the 8th Basic Plan for Traffic Safety. Discussion was started in a special council in February 2005 and the plan is to be decided upon in the Central Traffic Safety Measures Council at the end of fiscal 2005.

Attention should be given to the numerous tragic railway accidents that have occurred since the start of 2005. In March, a derailment occurred in Sukumo station on the Sukumo Line of the Tosa-Kuroishio Railway, killing the driver and injuring 10 others. In April, a derailment occurred between Amagasaki and Tsukaguchi on the JR West s Fukuchiyama Line, resulting in tragedy with 107 fatalities and 460 injured. Improving safety to prevent such tragic accidents is an important issue that needs to be addressed. Investigation of the cause and implementation of safety policies are much needed. As the former accident was in a local railway and the latter a urban railway, the actions implemented cannot be identical, but ensuring safety in both cases is important. The number of level crossing accidents has been decreasing in the long term, but the fatal accident that occurred in the manual level crossing inside Takenotsuka Station on Tobu Group s Isesaki Line, Tokyo in March 2005 was horrific. There is a need to carry out further debate on safety versus economy.

JR West,railroad accident(9:43am, 25 April, 2005) (Amagasaki-shi, Hyogo)
Provided by Asahi Shimbun
(Source: 25 April, 2005 Evening Edition)

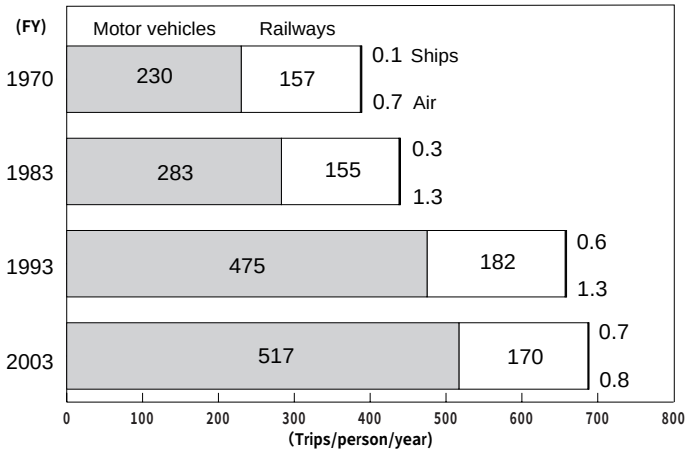
1-1 Quantitative and Qualitative Changes in Mobility

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

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

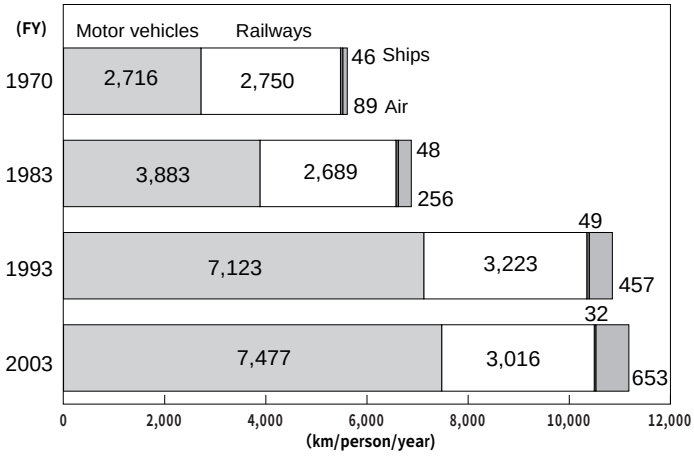
■ Annual number of trips by air and motor vehicle is on an upward trend, while annual trips by rail and passenger ship has been on a slight downward trend for 10 years. Trends for annual kilometers traveled are similar. Increased number of trip of air travel and kilometers traveled by air leads to the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

Fig.1 Annual number of trips (per person)



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

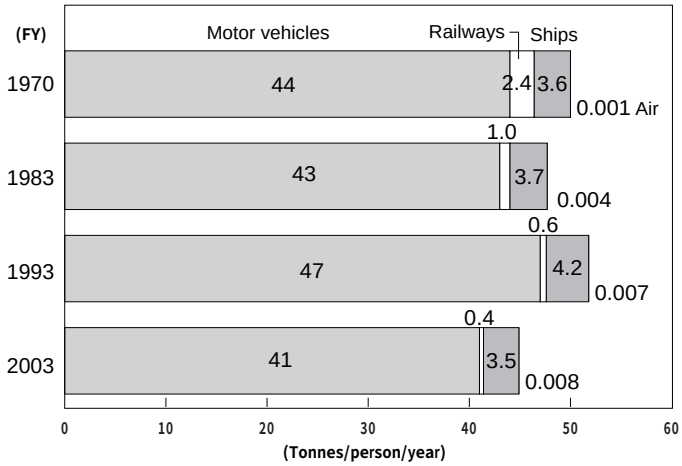
Fig.2 Annual kilometers traveled (per person)



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

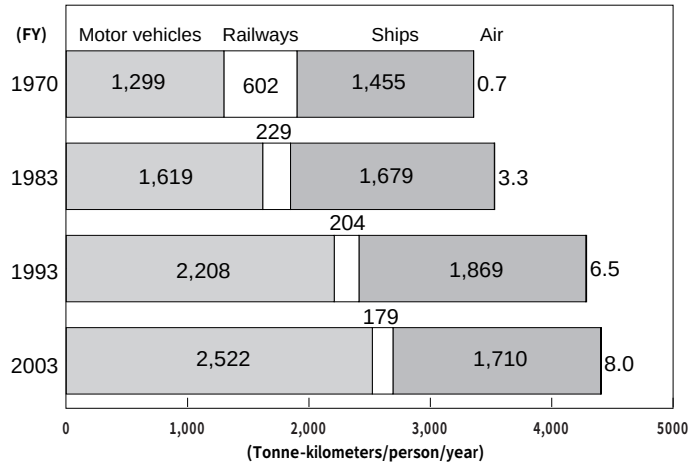
■ As for flow of goods, over the past 10 years, tonnes transported have decreased, but transport tonne-kilometers have increased slightly. Tonnes transported by motor vehicle were flat, while tones transported by rail and coastal shipping continued on a downward trend. The rate of decrease in coastal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

Fig.3 Annual freight transport tonnage (per person)



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

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



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

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

Fig.5 Modal share by male age/district group

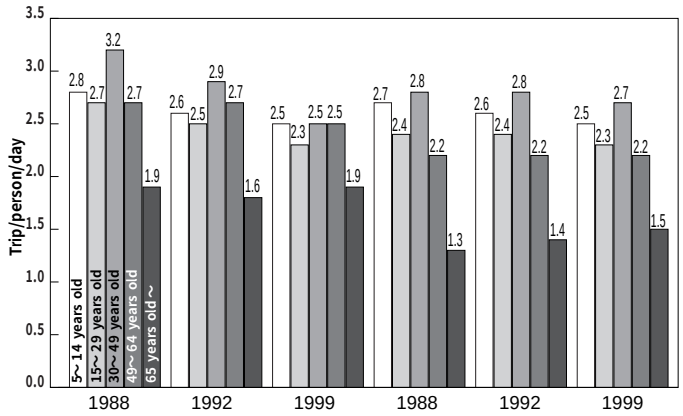
Source: Ministry of Land, Infrastructure and Transport "Fiscal 1999 Survey of Personal Travel in Japanese Cities"

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

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

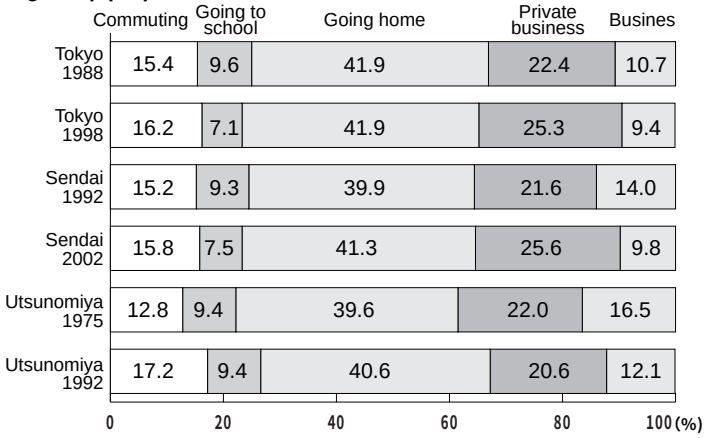
■ Trips per person per day showed a slight declining trend for those under 65, with a slight increasing trend for those 65 and older. By purpose, the rate of increase and number of trips was higher for commuter trips to Utsunomiya than for other major local cities.

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



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

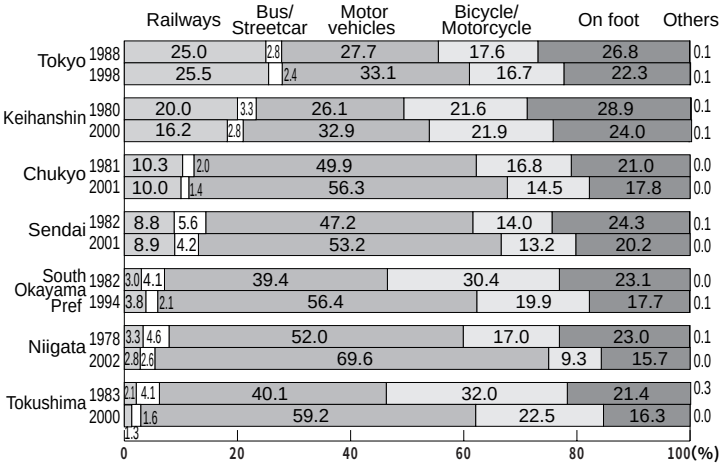
Fig.8 Trip purpose in various cities



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

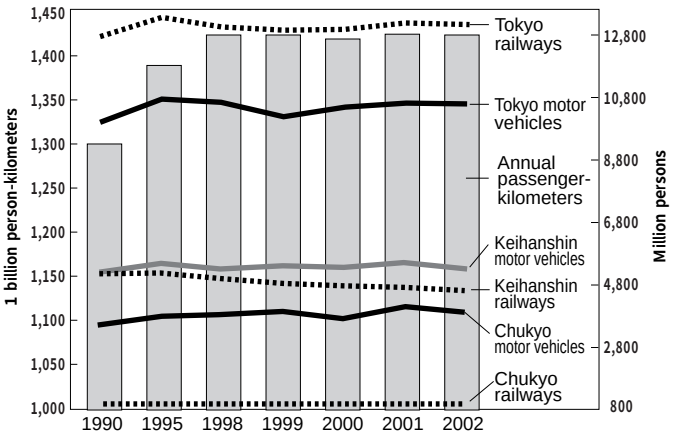
■ Looking at usage rates by city, the usage rate for motor vehicles increased for each city, most notably in the areas around local cities. Among the three metropolitan areas, the number of bus passengers in the Chukyo(Nagoya) and Keihanshin(Kyoto/Osaka/Kobe) areas decreased slightly from 2001 to 2002.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

Fig.9 Modal share of various cities



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

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



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

1-2 Transport Network Today

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

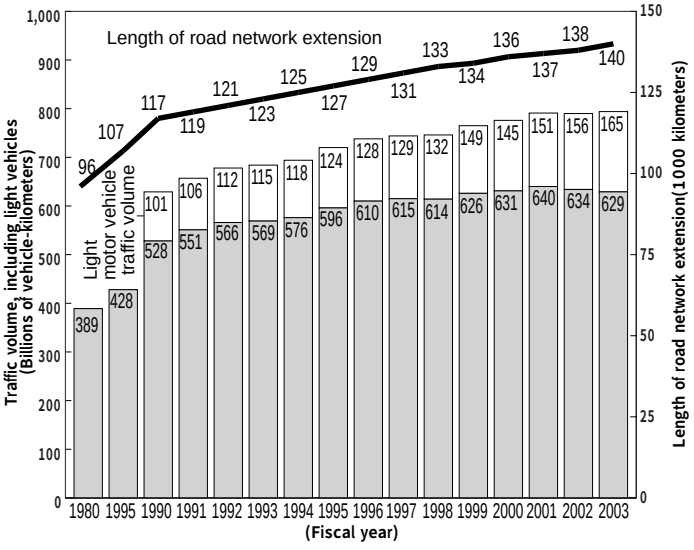
Fumihiko Nakamura

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

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

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

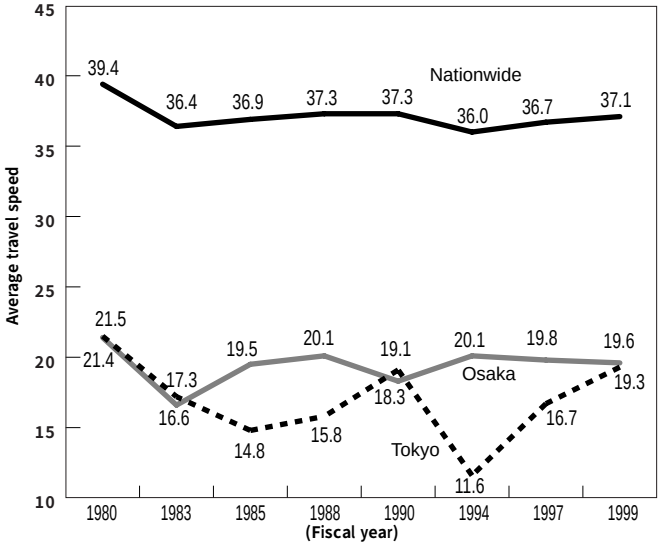
Road network extension and road traffic volume have been on an increasing trend since 1990, although road traffic volume has been up and down subsequent to 1990.



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

Fig.2 Average travel speed on national roads

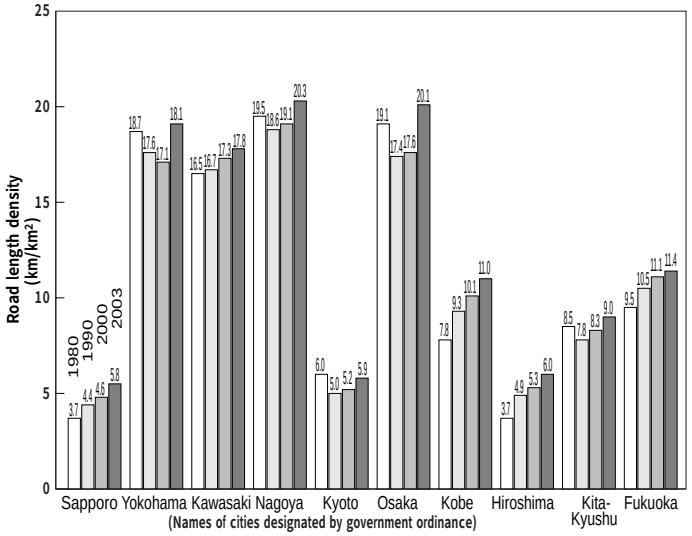
Although annual changes are not large, at 10-20 km/h, average travel speed in the Tokyo and Osaka areas is about half the national average of 35-40 km/h.



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

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

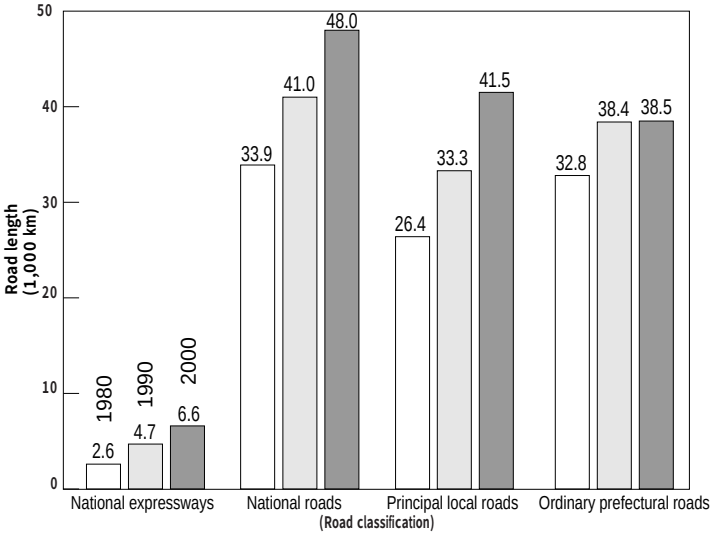
Yokohama, Nagoya, Osaka, and Kyoto were on a downward trend from 1980 to 2000. Yokohama rapidly increased in 2003.



Source: Annual Report on Road Statistics (each year)

Fig.4 Improvements and new construction by road type

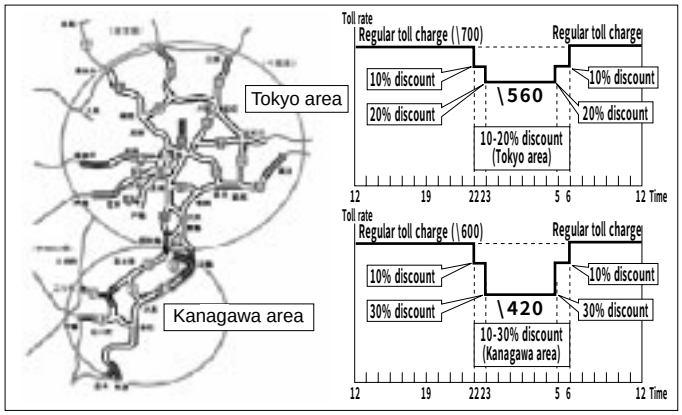
An upward trend since 1980 is apparent for national expressways, national roads, and principal local roads. Ordinary prefectural roads show no change since 1990.



Source: Annual Report on Road Statistics (each year)

Fig.5 Metropolitan Expressway night discount experiment (FY2004)

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



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

Source: Metropolitan Expressway Public Corporation

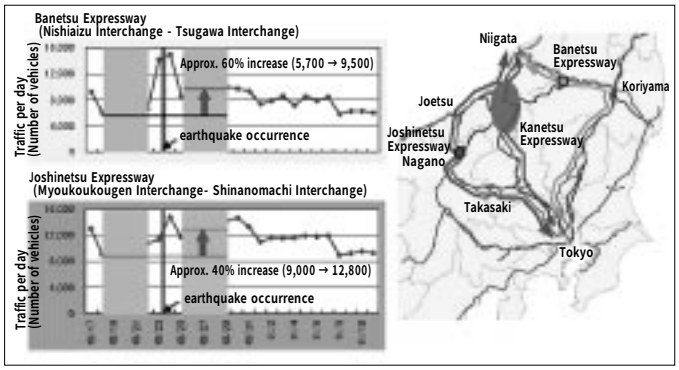
Tokyo area (Standard-sized car)
\700 ⇒ \630 (10% discount): 20:00-23:00, 5:00-6:00
\560 (20% discount): 23:00-5:00

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

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

Fig.6 Redundancy of wide-area expressway networks

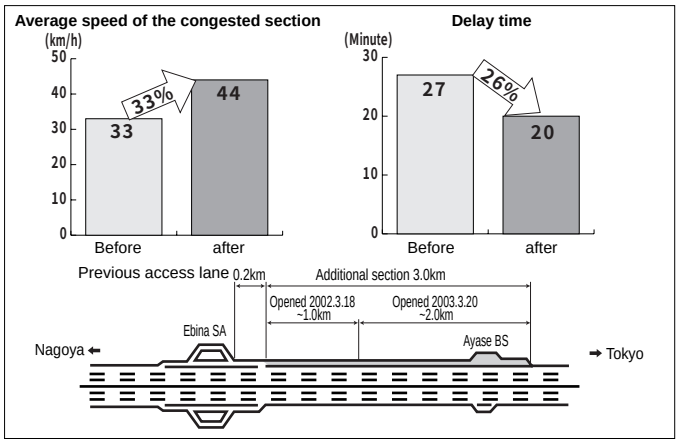
The Niigata-Chuetsu Earthquake closed part of the Kanetsu Highway. This led to traffic volume increases of 40 percent on the Banetsu Expressway and 60 percent on the Joshinetsu Expressway compared with the average. Because a wide-area expressway network between the Tokyo area and Niigata Prefecture was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



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

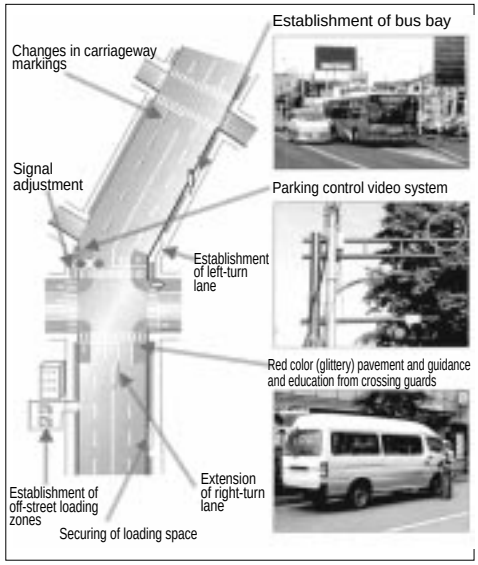
Fig.7 Area traffic congestion mitigate project at Tomei Expressway (Up line) Ayase

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



Source: Japan Highway Public Corporation

Fig.8 "Smooth Tokyo 21" initiative



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

Source: Metropolitan Police Department Website

Table.1 Area traffic congestion mitigate project

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

Source: Japan Highway Public Corporation

1-3 Public Transport Today

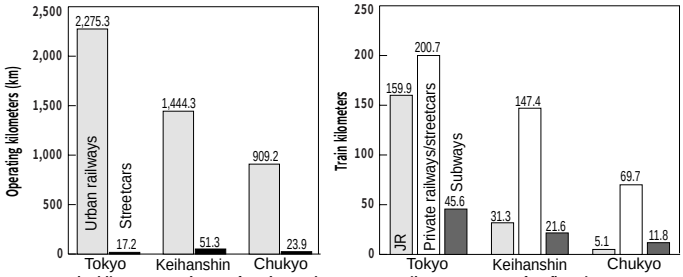
Professor, Graduate School of Environment and Information Sciences, Yokohama National University

Fumihiko Nakamura

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

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

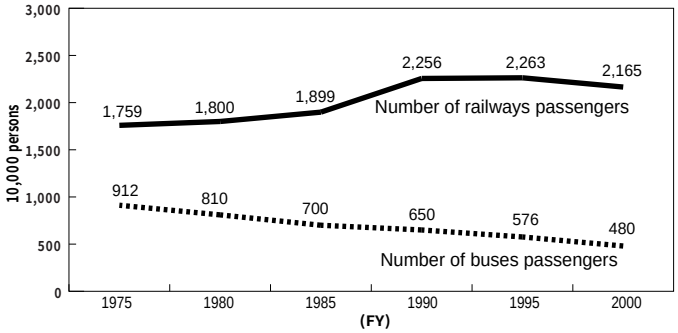
Fig.1 Operating kilometers and train-kilometers for conventional lines in three metropolitan areas



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

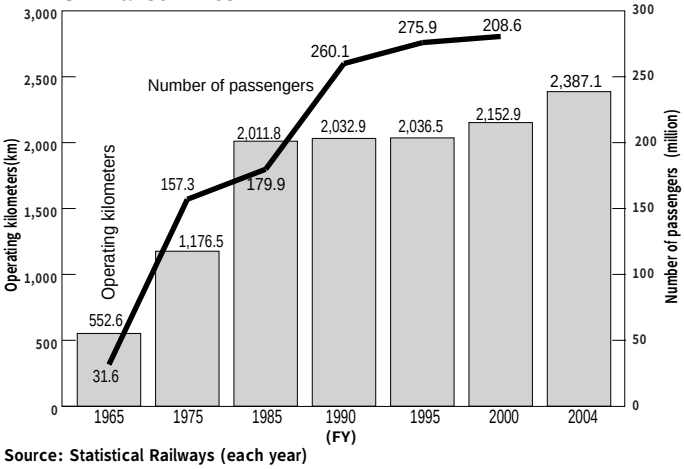
Source: Annual Urban Transportation Reports (each year)

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



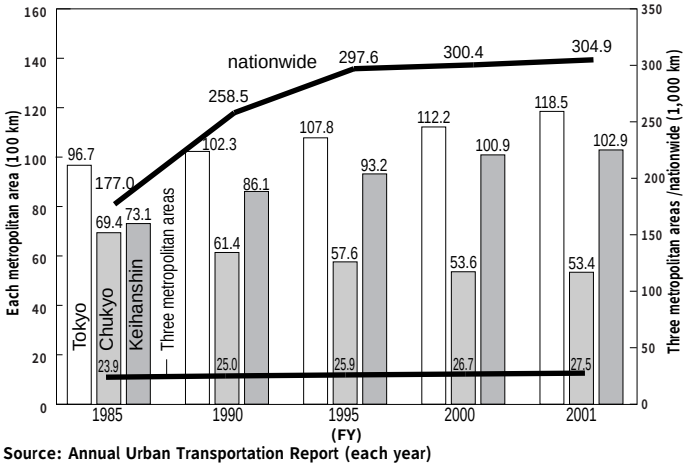
Source: Annual Land Transport Statistics 2002

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



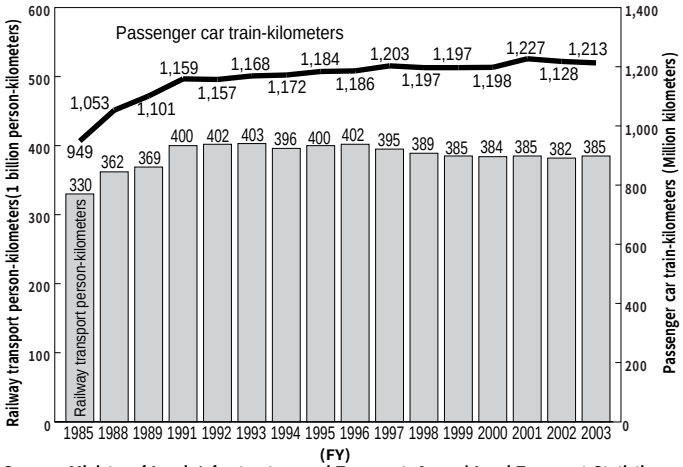
Source: Statistical Railways (each year)

Fig. 4 Extensions to bus routes



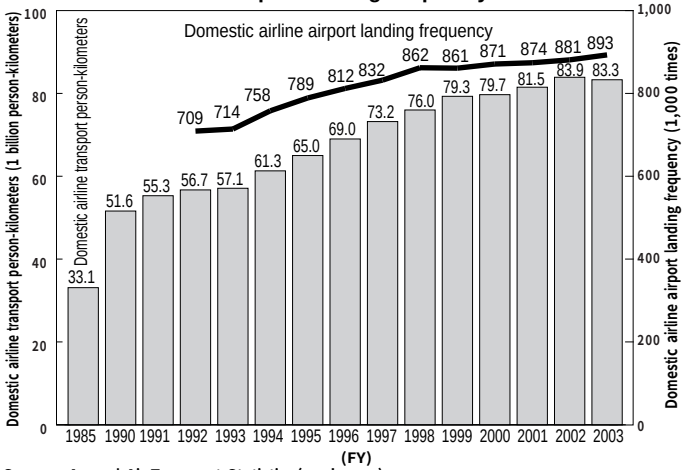
Source: Annual Urban Transportation Report (each year)

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



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

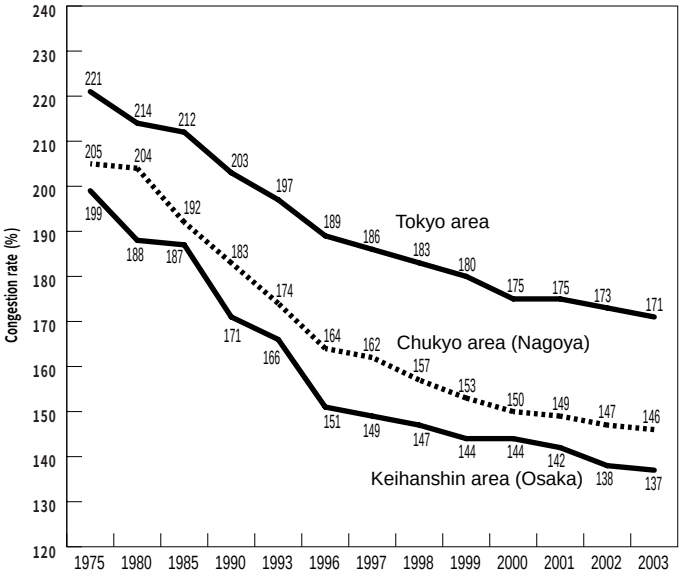
Fig.6 Domestic air transportation passenger-kilometers and domestic airline airport landing frequency



Source: Annual Air Transport Statistics(each year)

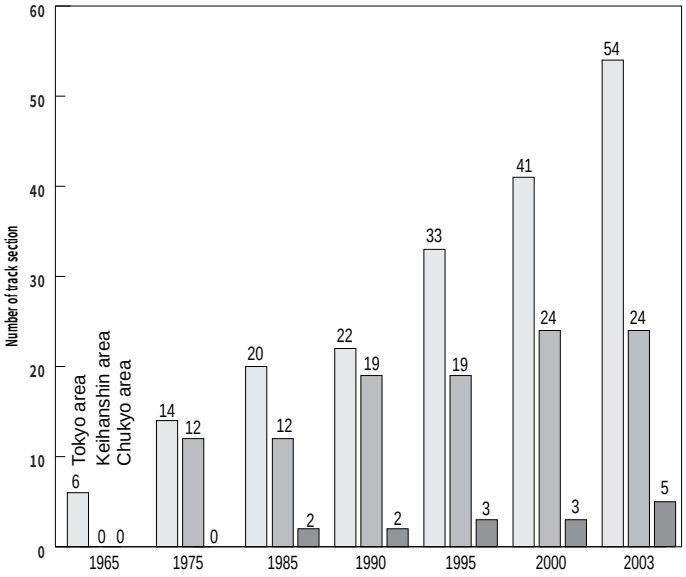
As for major urban areas, the railway congestion rate is easing in each of the three major metropolitan areas. In the Tokyo area, the number of track sections with through-operation between multiple railway companies is increasing, as are through-operation services. In the Keihanshin and Chukyo areas,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

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



Source: Statistical Railways (each year)

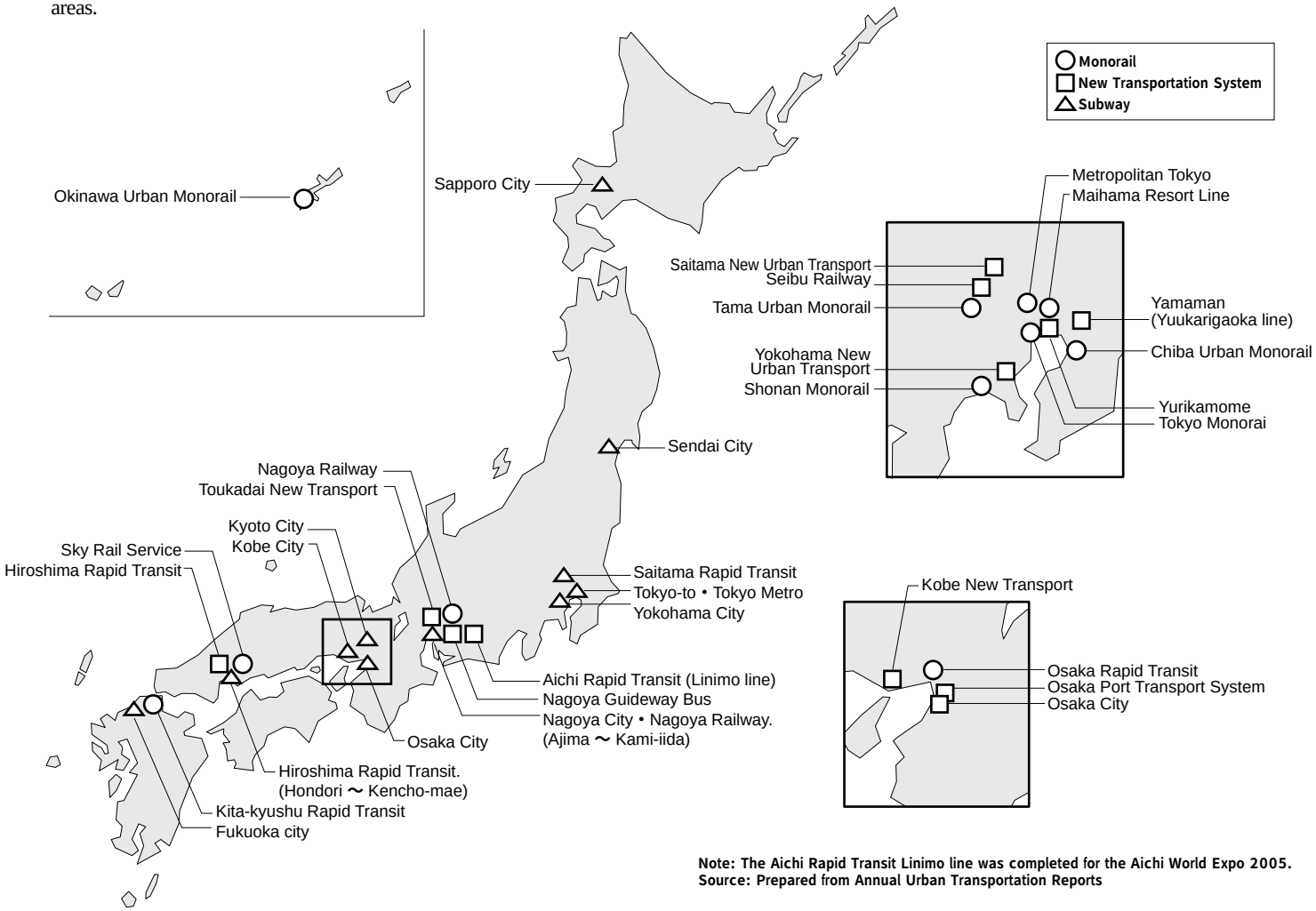
Fig.8 Change in the number of track sections with through-operation



Source: Statistical Railways (each year)

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

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



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

1-4 Developments in New Urban Transport Systems

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

Fumihiko Nakamura

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

Table 1 New urban transport system trends

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

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

Table 2 Innovative measures of public transport

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

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

Fig.1 Slope transportation system in Saruhashi

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

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

Fig.2 Low-floor LRV in Okayama City

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

Photographed by Tsutomu Yabe

Fig.3 Community bus in Yokohama City

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

Source: Yokohama City website

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

Fig.4 LINIMO

Fig.5 IMTS

Fig.6 Global Tram

Fig.7 Velo Taxi

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

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

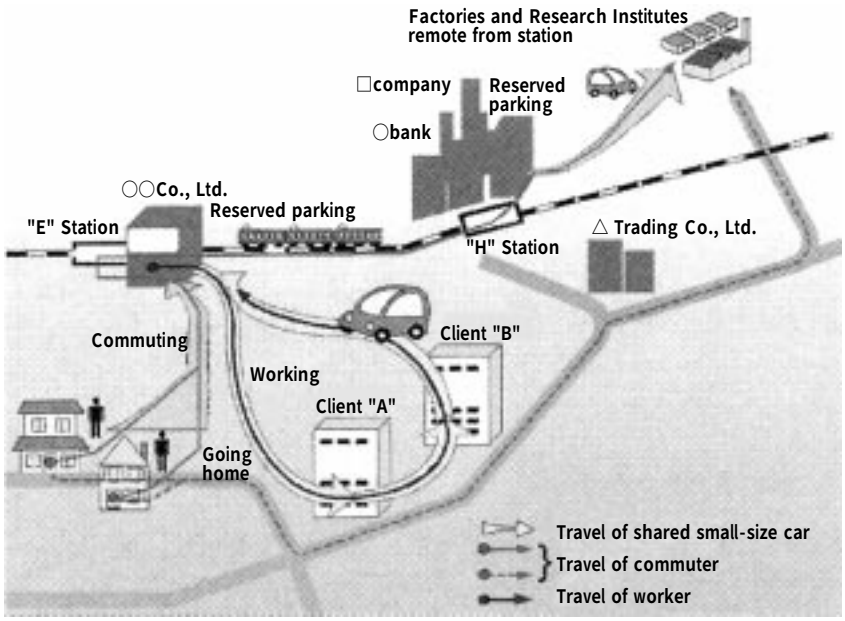


Table 3 Summary of deregulation of buses

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

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

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

Diversified fare system was introduced just before deregulation started.

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

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

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

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

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

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

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

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

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

Source: Curitiba City materials

Fig.15 Development axis in Curitiba City

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

Photographed by Katsutoshi Ohta

1-5 Transportation Accesibility Improvement for People with Disabilities

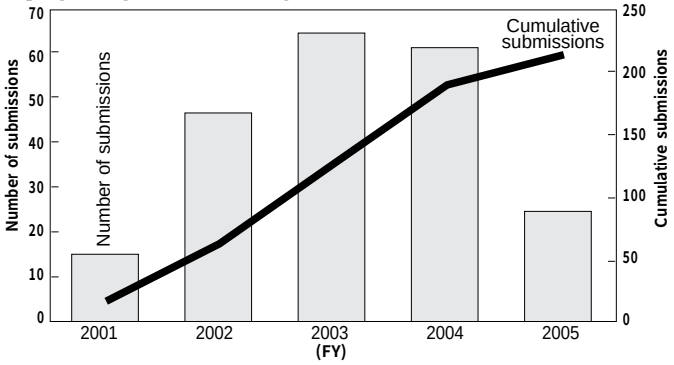
Hyogo Assistive Technology Research and Design Institute Research Unit 1

Hiroshi Kitagawa

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

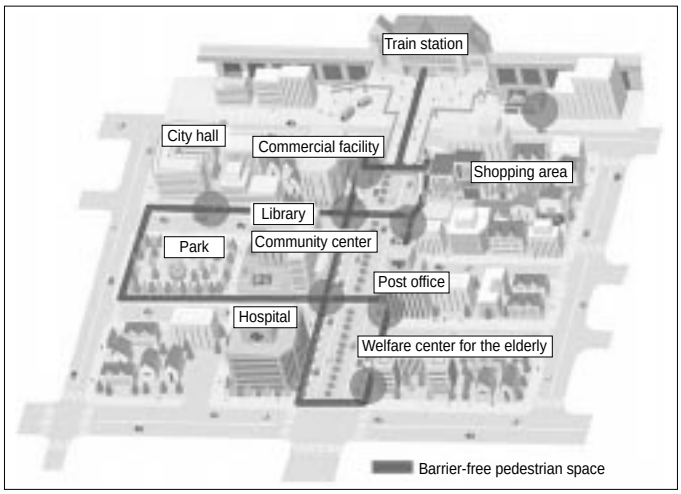
Fig.1 Basic concepts for Transportation Accessibility Improvement submitted

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



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

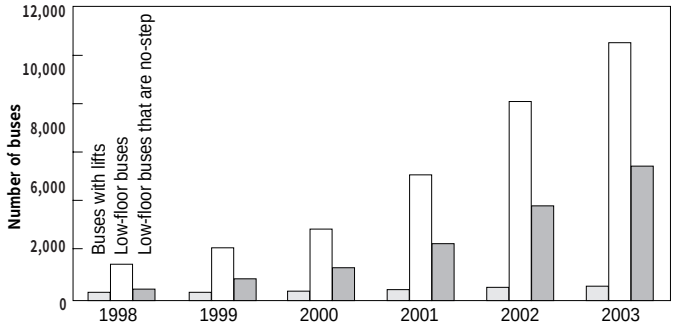
Fig.2 Pedestrian environment considering a pedestrian network



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

Fig.3 Number of non-step buses in use

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



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

Fig.4 Call for train station volunteers

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

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

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

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

Source: Transport Ecomo Foundation website

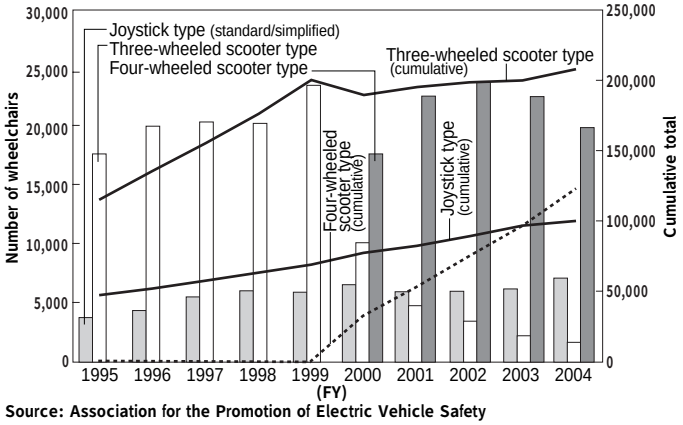
Table 1 Outline of universal design policy concepts

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

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

Fig.6 Dissemination of scooter-type power wheelchairs

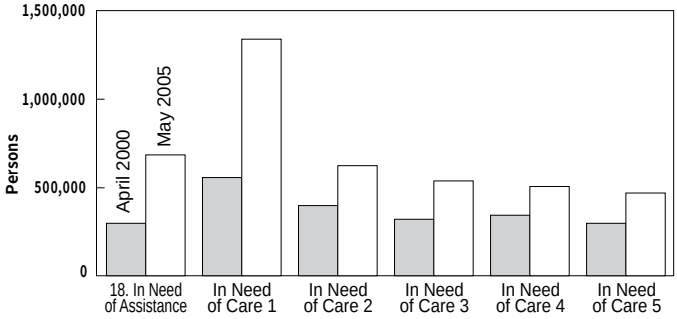
The number of scooter-type power wheelchairs is rapidly increasing mainly among the elderly.



Source: Association for the Promotion of Electric Vehicle Safety

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

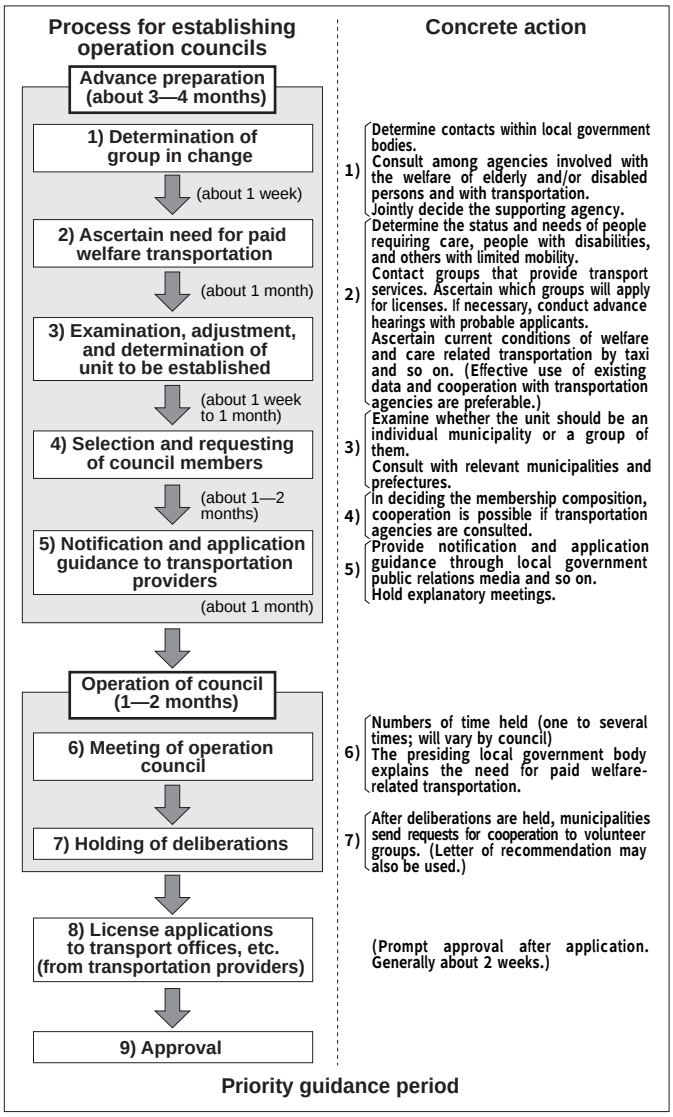
The number of elderly persons requiring care is climbing, so improved transportation services and transportation for those needing care is necessary.



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

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

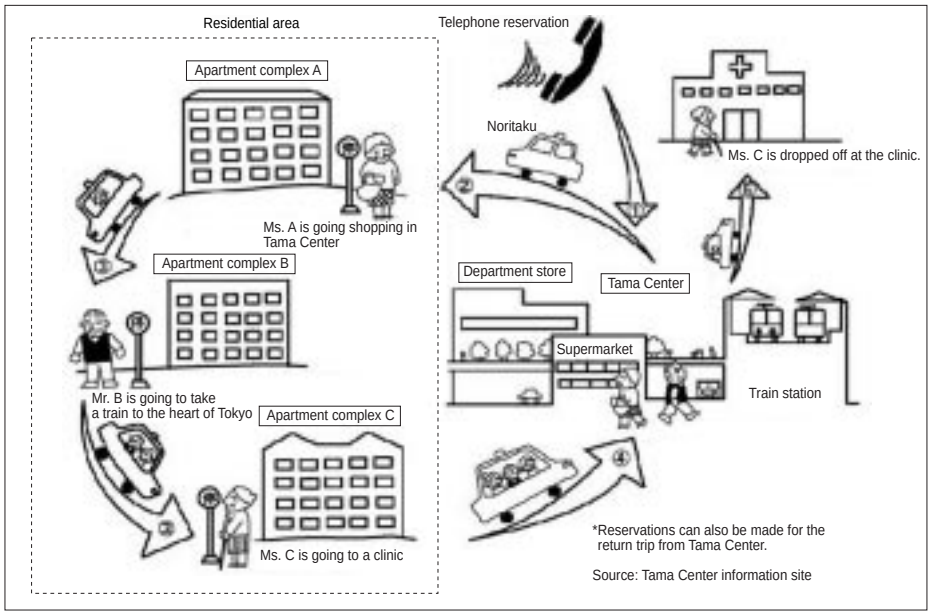
Guideline for the creation of operation councils: From determining a contact to establishment (model case)



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

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

A new community bus transportation initiative is making progress.



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

1-6 Future Transport Infrastructure Development

Associate Professor, Graduate School of Engineering, Yokohama National University
Toshiyuki Okamura
Research Associate, Yokohama National University GraduateSchool of Environment and Information Sciences
Tsutomu Yabe

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

Table 1 Outlines of the Comprehensive National Development plans

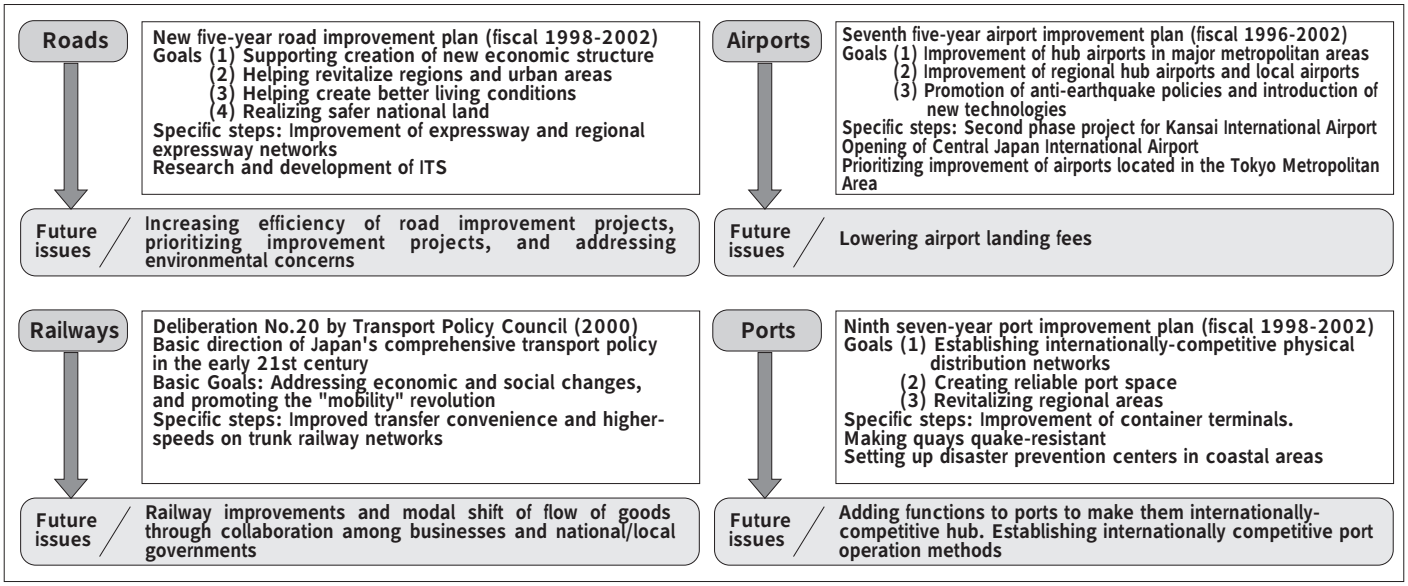
Under Comprehensive National Development Plans, Japan's transportation infrastructure was improved to form the backbone of national land development.

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

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

Fig.1 Outline of previous and future infrastructure improvement plans

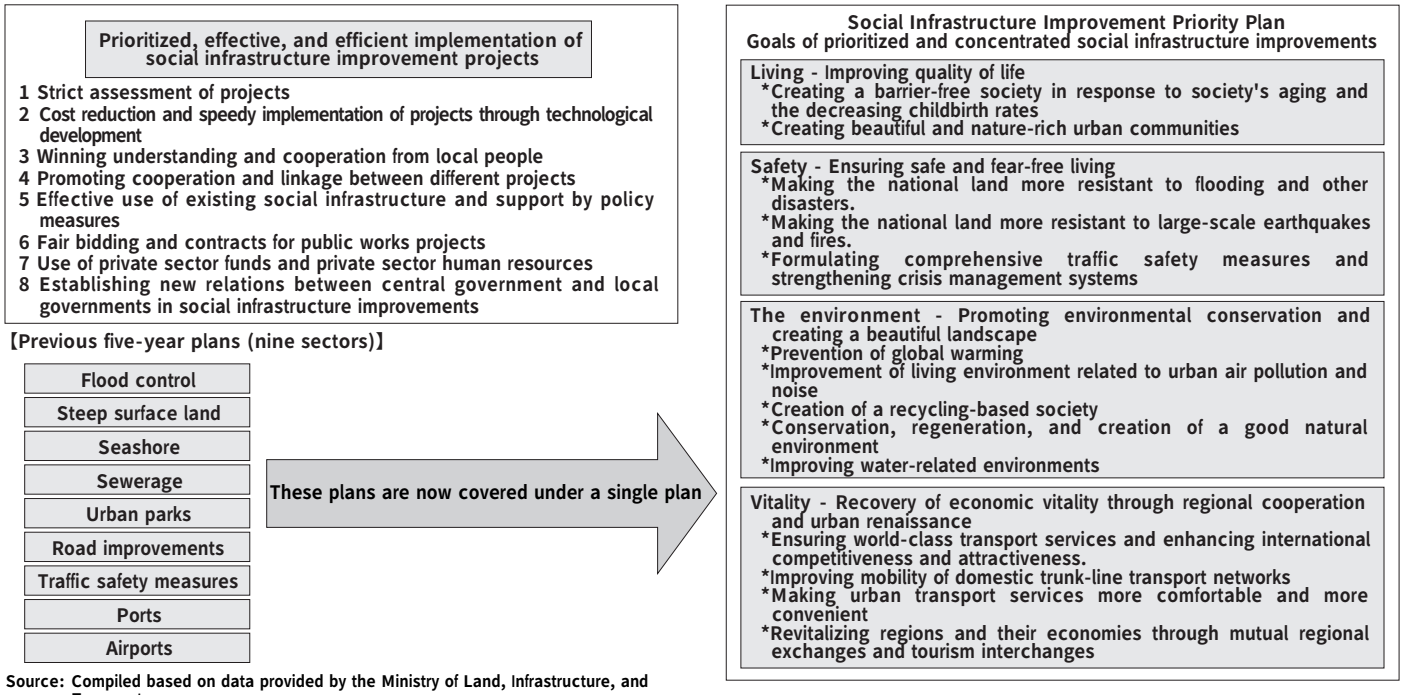
Under infrastructure improvement plans, improvements have been implemented by taking into account not only quantitative aspects of the plans but the qualitative aspects. How to secure financial sources should be considered when formulating these plans.



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

Fig.2 Outline of Social Infrastructure Improvement Priority Plan

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



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

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

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

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

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

1-7 Revenue Sources and the Use for Road Facilities

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

Fumihiko Nakamura

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

Table 1 Vehicle taxes and revenues earmarked for road construction

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

Revenues earmarked for road construction

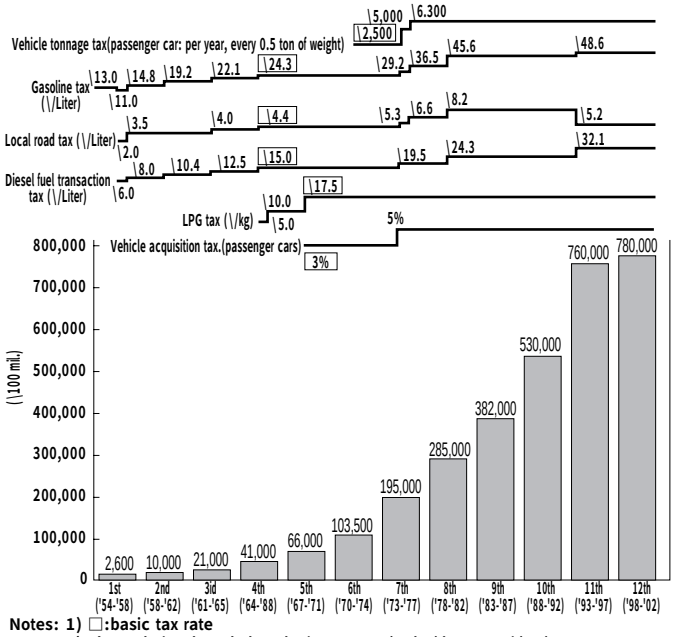
Note 1: Three-quarters of vehicle tonnage tax revenues are earmarked for road construction by the national government and one-quarter is earmarked for road construction by local governments.
Note 2: The 1% portion of the 5% tax rate is local consumption tax (local tax).
Source: Japan Automobile Manufacturers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

Table 2 Revenue sources for road construction in major countries

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

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

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



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

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

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

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

Table 4 Road-related budget

(Unit: ¥100 mil.)

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

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

Table 5 Composition of road investment by implementing body

(Unit: ¥100 mil.)

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

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

Table 6 Breakdown of general road project funds

(Unit: ¥100 mil.)

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

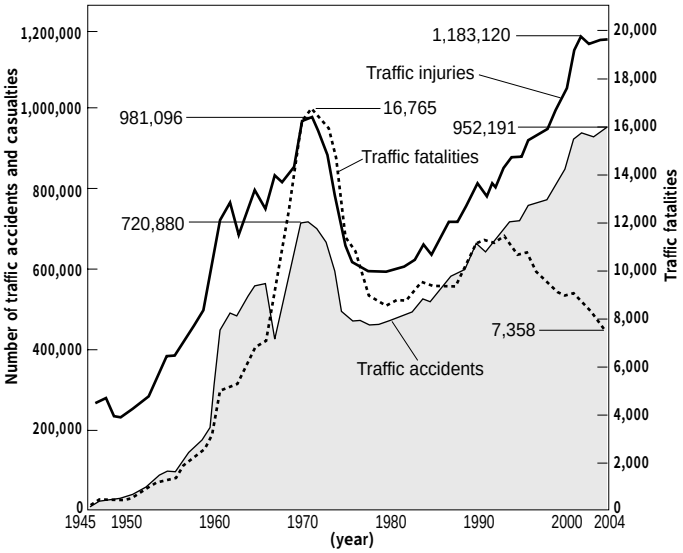
Source: Compiled based on data provided by the Ministry of Land, Infrastructure, and Transport

2-1 Trends and Present Situation of Road Traffic Accidents

Senior Researcher, Toyota Transportation Research Institute
Seiji Hashimoto

The number of traffic fatalities fell below 8,000 and totaled 7,358 in 2004 in a continuation of the downward trend seen in the past several years. The decrease resulted from all-out efforts by society to reduce traffic accidents, including the June 2002 revision to the Road Traffic Law and the strong resolve shown by the Prime Minister (who heads the Central Transport Safety Council) in a statement issued in January 2003 to halve the number of traffic deaths. Improved vehicle safety systems also led to the decrease in traffic fatalities. However, the number of overall traffic accidents and the number of accidents resulting in injury continue to rise, requiring the promotion of further countermeasures. In addition, the number of traffic fatalities involving senior citizens and pedestrians is relatively higher than for similar accidents in other countries, which indicates the need for further efforts to prevent accidents.

Fig.1 Changes in traffic fatalities, injuries, and number of accidents
The number of traffic fatalities decreased but the number of accidents and the number of accidents resulting in injury are still high.



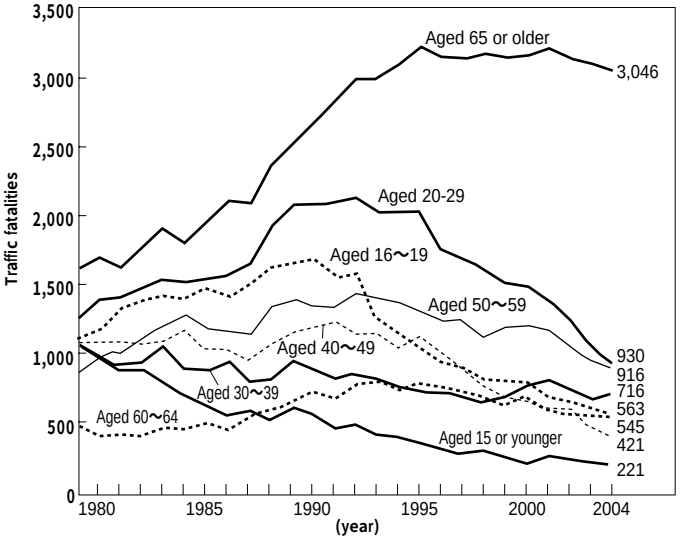
Source: Institute for Traffic Accident Research and Data Analysis, "Traffic Statistics" (2004 edition)

Table 1 Traffic injuries per 100,000 people and per 10,000 vehicles for the worst 10 prefectures (2004)

Per 100,000 people		Per 10,000 vehicles	
Kagawa Prefecture	1,655.9	Kagawa Prefecture	189.6
Saga Prefecture	1,550.1	Saga Prefecture	185.3
Saitama Prefecture	1,521.1	Ibaraki Prefecture	177.3
Fukui Prefecture	1,417.2	Fukuoka Prefecture	176.6
Okayama Prefecture	1,389.4	Osaka Prefecture	174.8
Fukuoka Prefecture	1,236.0	Fukui Prefecture	170.6
Miyazaki Prefecture	1,153.9	Saitama Prefecture	163.1
Toyama Prefecture	1,120.6	Kanagawa Prefecture	162.5
Aichi Prefecture	1,064.2	Okayama Prefecture	157.9
Tokushima Prefecture	1,049.8	Hyogo Prefecture	153.1
Nationwide	932.4	Nationwide	131.6

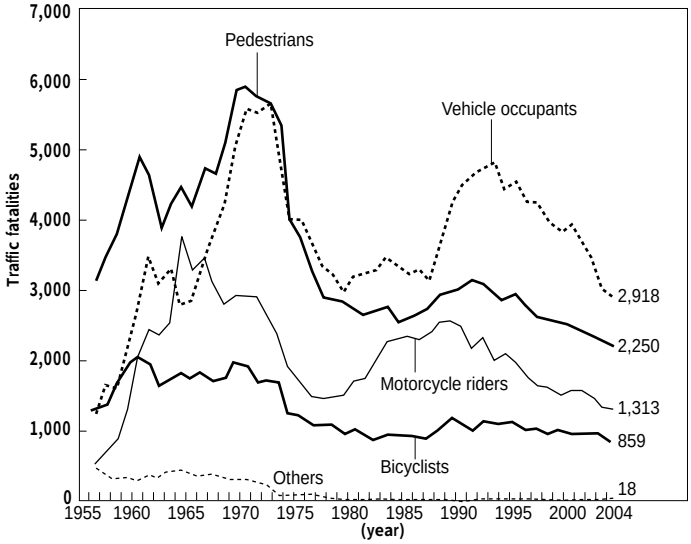
Source: Institute for Traffic Accident Research and Data Analysis,"Traffic Statistics" (2004 edition)

Fig. 2 Changes in traffic fatalities by age bracket
Deaths among senior citizens (aged 65 or older) remain at high levels. But the number declines sharply for the 20-29 age group.



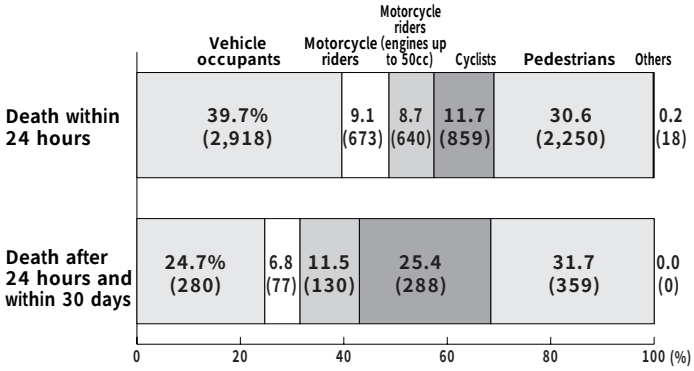
Source: Traffic Statistics (2004 edition)

Fig.3 Changes in traffic fatalities by travel mode
Vehicle occupant fatalities are falling. Measures need to be adopted to curb fatalities for pedestrians and cyclists.



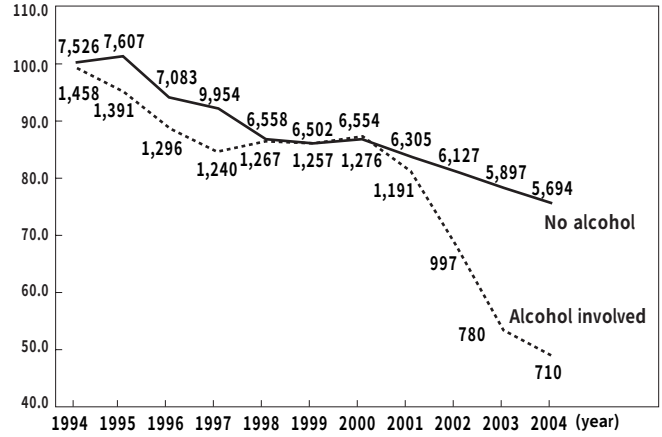
Source: Traffic Statistics (2004 edition)

Fig.4 Breakdown of ratios of accidents for deaths occurring within 24 hours and deaths occurring within 30 days



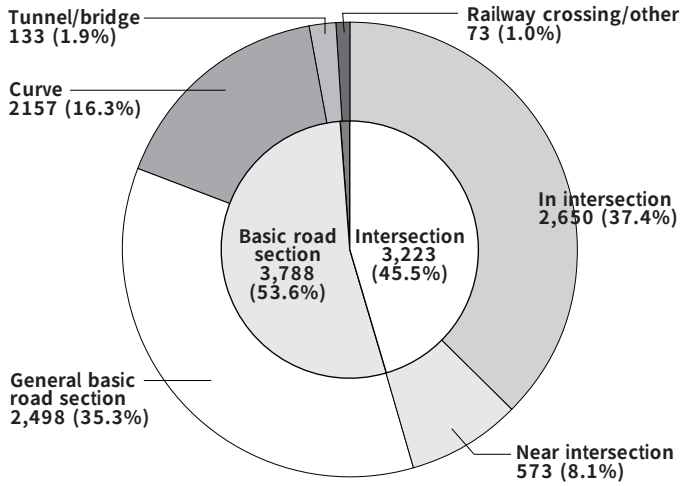
Notes: Death within 24 hours: death resulting from the accident and occurring within 24 hours of the accident
Death within 30 days: death resulting from the accident and occurring within 30 days of the accident, excluding the first 24 hours
Source: Cabinet Office "Traffic Safety White Paper" (2005 edition)

Fig.5 Change in number of fatalities after penalties against driving under the influence of alcohol were strengthened



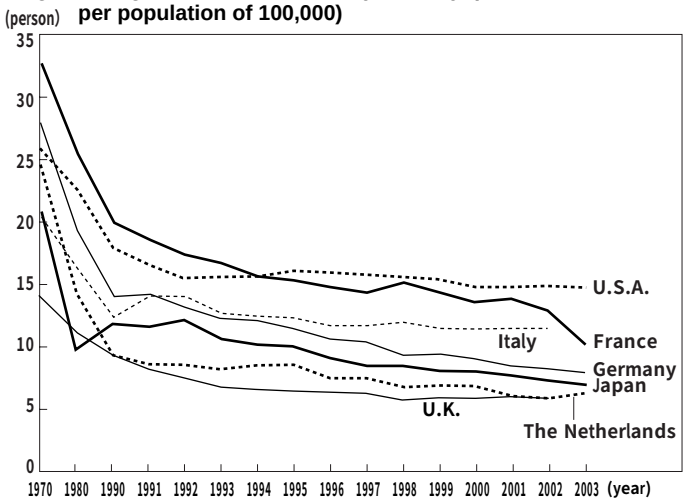
Note: The contribution of driving under the influence of alcohol to fatal accidents in 1994 is set as 100. Penalties for driving under the influence of alcohol were strengthened in the June 2002 revision of the Road Traffic Law.
Source: Cabinet Office Traffic Safety White Paper (2005 edition)

Fig.6 Number of fatal accidents by road configuration



Source: Cabinet Office "Traffic Safety White Paper" (2005 edition)

Fig.7 Changes in traffic deaths by country (Number of fatalities per population of 100,000)



Source: Traffic Safety White Paper (2004 edition)

Table 2 Traffic deaths in each country by situation (2003)

	Fatalities	Vehicle. occupants	Motorcycle riders	Motorcycle riders (engines up to 50cc)	Cyclists	Pedes trians	Others
Germany	6,613 100.0	3,774 57.1	946 14.3	134 2.0	616 9.3	812 12.3	331 5.0
France	6,058 100.0	3,709 61.2	859 14.2	393 6.5	201 3.3	626 10.3	270 4.5
Italy (2000)	6,736 100.0	3,555 52.8	859 12.8	409 6.1	315 4.7	1,188 17.6	410 6.1
The Netherlands	1,028 100.0	483 47.0	95 9.2	94 9.1	188 18.3	97 9.4	71 6.9
U.K.	3,658 100.0	1,861 50.9	690 18.9	25 0.7	116 3.2	802 21.9	164 4.5
U.S.A.	42,643 100.0	19,460 45.6	3,633 8.5	28 0.1	622 1.5	4,749 11.1	14,151 33.2
South Korea	7,212 100.0	1,717 23.8	906 12.6	232 3.2	256 3.5	2,896 40.2	1,205 16.7
Japan	8,877 100.0	2,230 25.1	803 9.0	766 8.6	1,243 14.0	2,739 30.9	1,096 12.3

Figures shown in upper half of cell are the number of fatalities and those in lower half represent percentage shares.
Source: Institute for Traffic Accident Research and Data Analysis, "Traffic Statistics" (2004 edition)

Table 3 Traffic deaths in each country by age bracket (2003)

	Fatalities	5or younger	6-9	10-14	15-17	18-20	21-24	25-64	65 or older	Unknown
Germany	6,613 100.0	47 0.7	61 0.9	100 1.5	316 4.8	720 10.9	672 10.2	3,367 50.9	1,329 20.1	1 0.0
France	6,058 100.0	69 1.1	48 0.8	106 1.7	273 4.5	565 9.3	722 11.9	3,090 51.0	1,099 18.1	87 1.4
Italy (2000)	6,736 100.0	50 0.7	36 0.5	102 1.5	186 2.8	399 5.9	672 10.0	3,554 52.8	1,404 20.8	333 4.9
The Netherlands	1,028 100.0	16 1.6	17 1.7	31 3.0	54 5.3	85 8.3	94 9.1	510 49.6	221 21.5	0 0.0
U.K.	3,658 100.0	39 1.1	29 0.8	77 2.1	201 5.5	411 11.2	361 9.9	1,865 51.0	658 18.0	17 0.5
U.S.A.	42,643 100.0	741 1.7	457 1.1	938 2.2	2,448 5.7	3,988 9.4	4,360 10.2	22,964 53.9	6,630 15.5	117 0.3
South Korea	7,212 100.0	170 2.4	144 2.0	80 1.1	158 2.2	254 3.5	396 5.5	4,267 59.2	1,707 23.7	36 0.5
Japan	8,877 100.0	83 0.9	84 0.9	67 0.8	256 2.9	493 5.6	472 5.3	3,769 42.5	3,653 41.2	0 0.0

Figures shown in upper half of cell are the number of fatalities and those in lower half represent percentage shares.
Source: Institute for Traffic Accident Research and Data Analysis, "Traffic Statistics" (2004 edition)

2-2 Traffic Safety Measures

Associate Professor, Faculty of Urban Environmental Sciences, Tokyo Metropolitan University

Takashi Oguchi

Japan's so-called social losses from traffic accidents are estimated to total \4.2 trillion a year. Of this sum, losses deriving from death or injury of a person are calculated by estimating incomes and other economic benefits that the person would accrue over the rest of his/her life if he/she were not dead or had not become handicapped. But given the worldwide tendency to estimate human losses by using the Willingness-to-Pay method (WTP), total losses in Japan from traffic accidents would swell further and reach huge levels. The central government and local governments have taken measures to ensure traffic safety based on the Traffic Safety Measures Basic Law. Their efforts have produced the desired outcomes, since they are concentrating their financial and human resources for traffic safety on areas where accidents have occurred frequently in the past. The central and local governments are making efforts to improve the safety of vehicle-driving conditions, by introducing advanced safety facilities, advanced traffic-control systems, and improving road conditions and road facilities. But their safety efforts go beyond these conventional approaches to the launching of public relations campaign, for example, so that dangerous road conditions and traffic risks in certain areas are widely disseminated to the general public.

Fig.1 Government efforts for traffic safety

The central government has implemented comprehensive and meticulously-planned safety measures based on the Traffic Safety Measures Basic Law and improved traffic-related facilities and systems based on the Social Infrastructure Improvement Priority Plan.

Traffic Safety Plan based on the Traffic Safety Measures Basic Law

The law is intended to implement safety measures in ground, marine, and aviation traffic in a comprehensive and meticulously-planned manner.

Basic Plan for Traffic Safety

- Devised by the Central Traffic Safety Measures Council (headed by Prime Minister Junichiro Koizumi).
- Stipulates policy guidelines and policy measures for traffic safety

Seventh basic plan for traffic safety (approved by the Central Traffic Safety Measures Council on March 16, 2002) for fiscal 2001-2005

Outline

a. Safety measures addressing the actual conditions of traffic accidents and the changes in social and economic situations are necessary in order to create a safer traffic society in the 21st century.
b. The government will formulate adequate and effective traffic safety measures in a comprehensive manner by addressing issues associated with three elements constituting our traffic society - people, modes of transport, and traffic environments. The government will firmly implement these measures while winning understanding and cooperation from the citizens.
c. The government will promote comprehensive research and analysis on causes of traffic accidents as a basis for introducing measures on the three elements.
d. The government will implement measures to reduce the damage deriving from traffic accidents and measures to relieve the victims of traffic accidents.
e. The government will implement adequate measures in a concentrated and effective manner in accordance with the changes in society, such as the rapid aging of the population and advancements in information technology.
f. The government will promote traffic safety campaigns with general citizens participating in the move.

Traffic Safety Plans by prefectural governments → **Traffic Safety Plans by municipal governments**

Traffic safety facilities improvement projects (after revision)

A five-year comprehensive plan to improve traffic safety facilities was abolished in March 2003, and was integrated into the Social Infrastructure Improvement Priority Plan along with other infrastructure improvement projects.

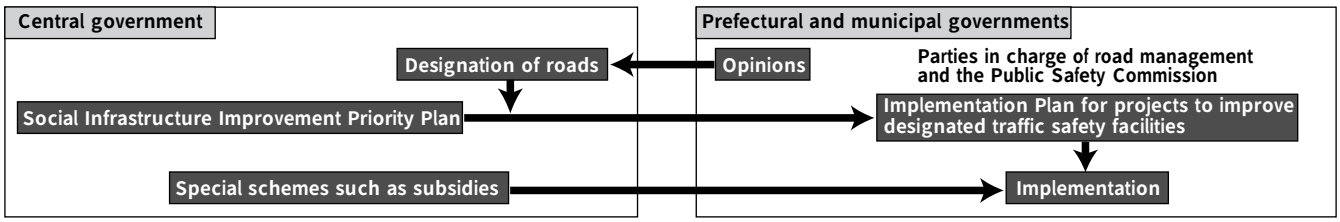


Table 1 Social losses caused by traffic accidents (FY 1999)

In Japan, human losses (calculated by projecting economic costs that victims of accidents would accrue over the rest of their lives if they were not dead or had not become handicapped) and physical losses together account for the bulk of total social losses from traffic accidents.

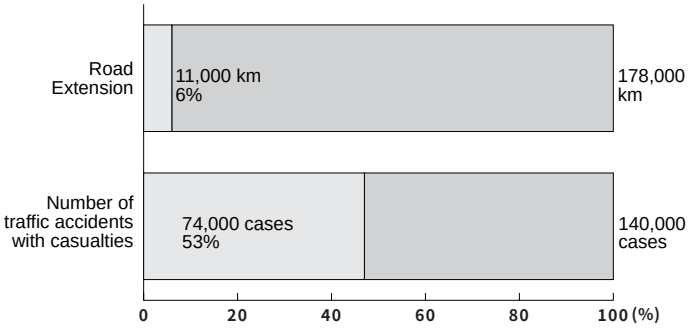
	Losses (\1 million)	% shares	Notes
Human losses	1,726,855	40.5	Medical fees, business compensation, consolation money, econonic loss of victims, etc.
Physical losses	1,804,100	42.3	Repair of vehicles and damaged structures, and payments of damages.
Losses of business operators	77,183	1.8	Decline in business value of persons involved in accidents stemming from their death, physical injury, and suspension from work.
Losses of public organizations	676,883	15.5	Ambulance fees, paperwork fees charged by police, insurance management fees, financial assistance to victims of accidents
Total	4,285,021	100.0	

Source: Economic Losses of Traffic Accidents, compiled by the Director-General in charge of comprehensive planning and research at the Cabinet Office in June 2002

■ Emergency safety measures began in 1996 to focus on accident black spots, where traffic accident had occurred frequently. As the measures produced the intended results, 4,000 other black spots were designated as "dangerous" areas in July 2003.

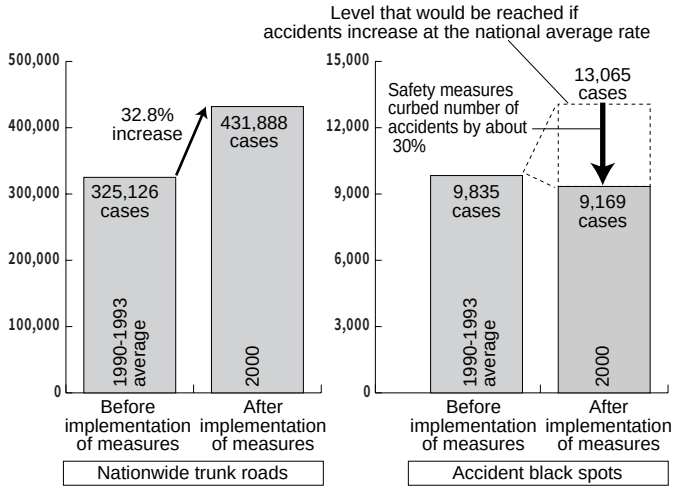
Fig.2 Correlation between road extensions on single-lane areas of trunk roads and the number of traffic accidents with casualties

Traffic accidents on trunk roads concentrate on certain sections.



Note: Traffic accident figures are averages for 1996-1998
Source: Website of the Ministry of Land, Infrastructure and Transport
http://www.mlit.go.jp/road/road/traffic/sesaku/03.html

Fig.3 Effects of emergency safety measures at accident

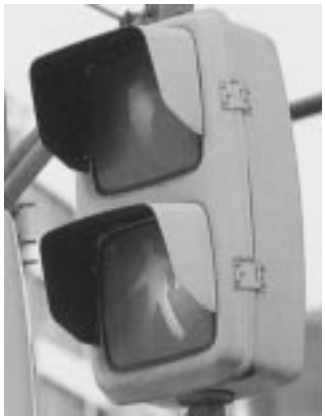


Source: Website of the Ministry of Land, Infrastructure and Transport
http://www.mlit.go.jp/road/road/traffic/taisaku/

Fig.4 Enhanced visibility after introduction of LED-type traffic signal lamps

An LED-type traffic signal lamp gives an instantly recognizable signal. In addition, it consumes less electricity and has a longer life.

<Light bulb-type traffic signal lamp>

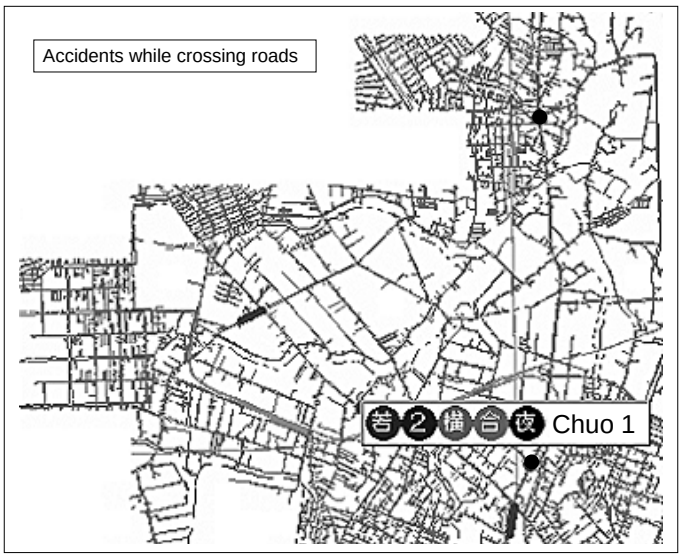


<LED-type traffic signal lamp>

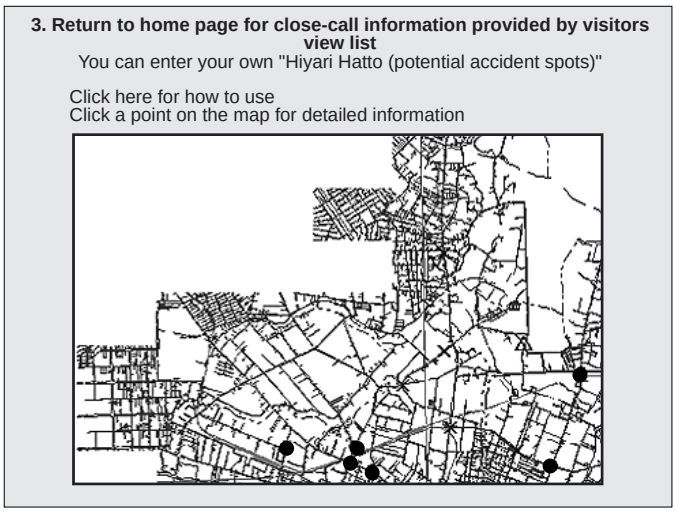
Fig.5 Pavement with better drainage, which is designed to maintain traction and prevent water splashing up from the road's surface

Fig 6 Project to halve traffic accidents in Kamagaya City, Chiba Prefecture

The local government makes available data on locations with frequent accidents.



People's written accounts of close calls can be examined.



Source: Website of the Administration Section, Civil Engineering Department, operated by Kamagaya City(English Translation from the Source)
http://www.utef.co.jpkamagaya/top.html

2-3 The Second Stage of ITS (Intelligent Transport Systems)

Assistant Manager in Charge,
ITS Japan Planning Group
Masahiro Sakakibara

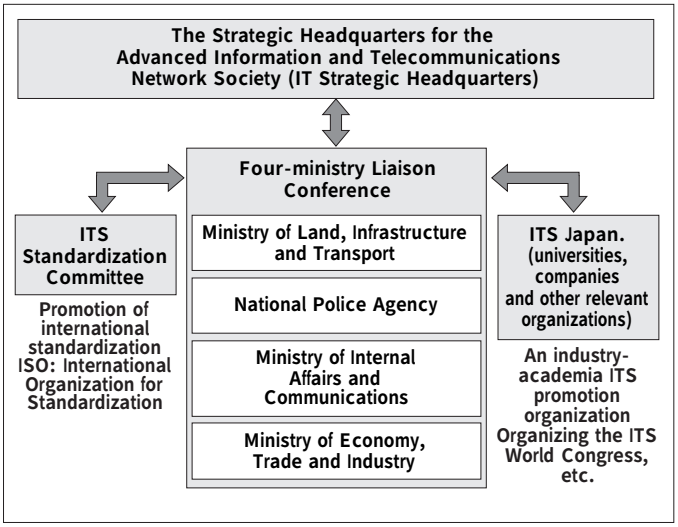
Intelligent Transport Systems (ITS) are designed to increase safety, transportation efficiency, and comfort, as well as promote environmental conservation by organically communication between people, vehicles, and roads using the most advanced information and telecommunications technologies. In Japan, four government agencies (five before reorganization, i.e., the National Police Agency and the former Ministries of International Trade and Industry; Transport, Posts and Telecommunications; and Construction) released an overall scheme for ITS in July 1996. Practical use of ITS has been implemented in the Vehicle Information and Communication System (VICS), Electronic Toll Collection (ETC), and the HELP emergency reporting system, with effective results. This was the first stage of ITS. In September 2004, industry, government, and academic users formed the ITS Info-communications Forum, which announced its second-stage Policy on ITS Promotion. In addition, the e-Japan Strategy II, in its final year, decided on the IT Policy Package 2005 as a priority initiative, with ITS included to "improve the convenience and safety of movement and transportation." In particular, strengthened industry-government-academia collaboration is moving forward on the government's goal of reducing annual traffic fatalities to less than 5,000 by 2012.

Table 1 ITS Info-communications Forum's Policy on ITS Promotion

Field	Overall theme	Individual themes
Safety and Security	(1) Improving the safety of road traffic	*The intelligent automobile *Enhancement of infrastructure *Vehicle-to-vehicle and road-to-vehicle cooperation *Supporting the safety of pedestrians, bicyclists, and motorcyclists *Enhancement of first-aid rescue of traffic-accident victims
Efficiency and Environment	(2) Ensuring smoother traffic and reducing environmental impact	*Optimization of traffic demand *Advanced road traffic management systems *Advanced parking systems The increase in efficiency of freight distribution
Comfort and Convenience	(3) Improving convenience to individualsl	*Raising the quality of road traffic information provided and promoting its active use *Advanced application of ITS content *Improving convenience to the elderly disabled
	(4) Stimulating regional economic activity	*Improving access between regions and expressways *Raising the convenience of intermodal transportation using public transport
Multiple fields	(5) Preparation of a common platform and promotion of international standards and global technical regulations	*Construction of an ITS platform *Promoting the international standards and global technical regulations

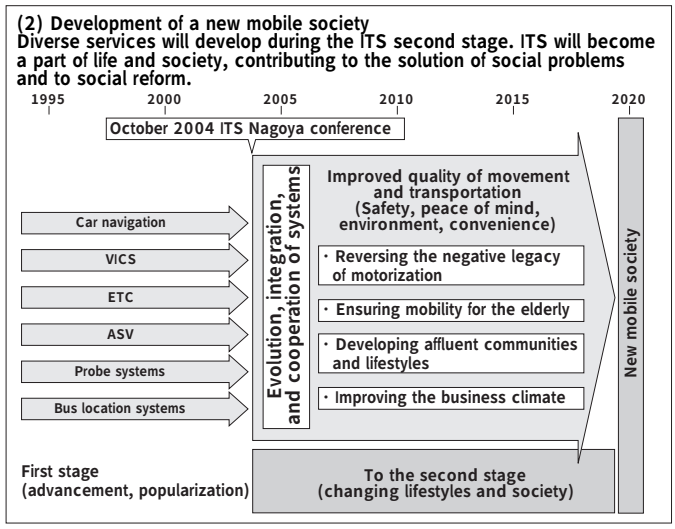
Source: ITS Info-communications Forum (Website of the ITS Japan)
(http://www.its-jp.org/topics/topics017.html)

Fig.2 Government efforts to promote ITS



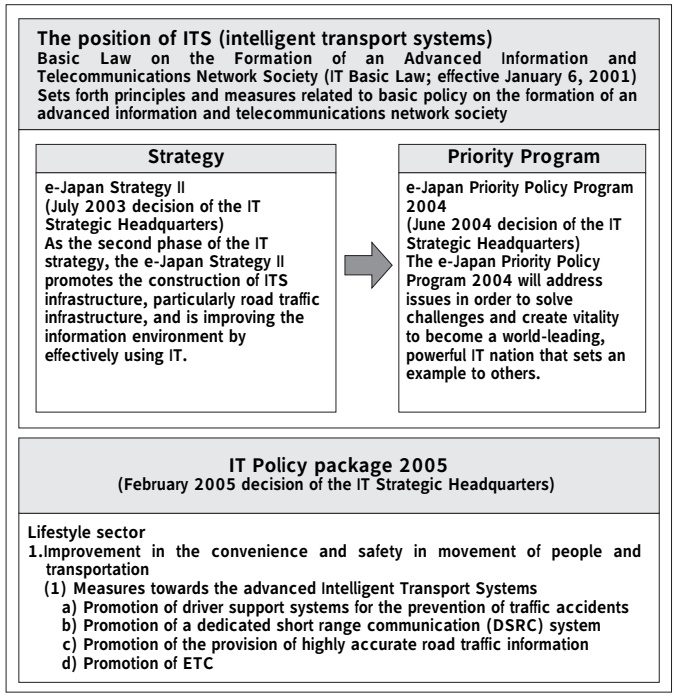
Source: ITS information shown on the website of the Road Bureau of the Ministry of Land, Infrastructure and Transport
(http://www.mlit.go.jp/road/ITS/j-html/index.html)

Fig.1 Direction of the ITS second stage



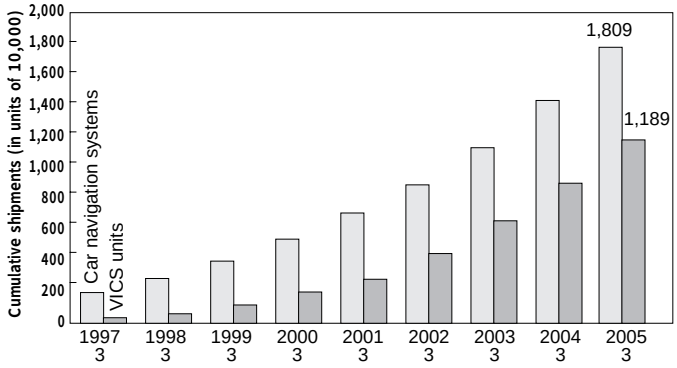
Source: Smartway Project Advisory Council, Road Bureau, Ministry of Land, Infrastructure and Transport
(http://www.its.go.jp/ITS/j-html/Smartway/20040609/)

Fig.3 The position of ITS as a national strategy



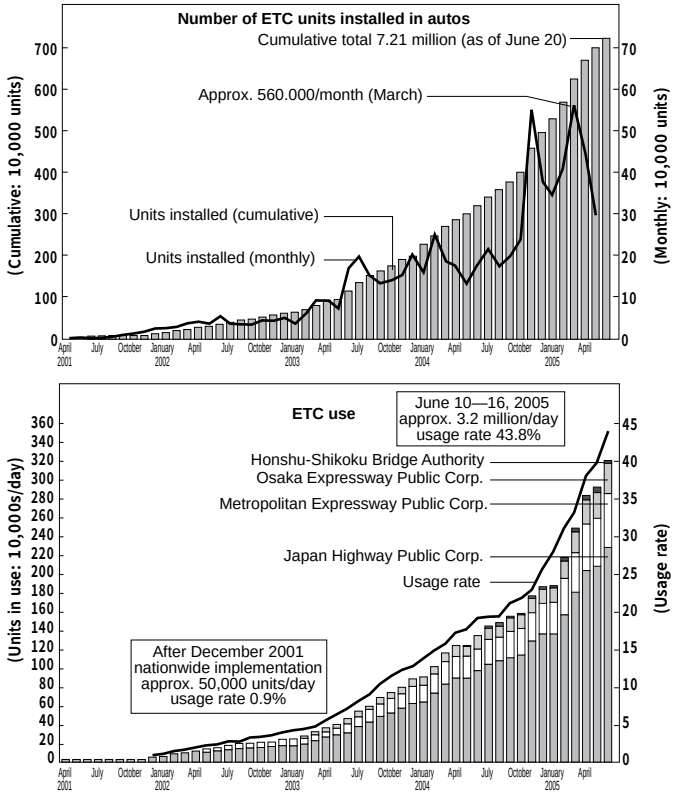
Source: Website of the Strategic Headquarters for Advanced Information and Telecommunications, the Prime Minister of Japan and his Cabinet
(http://www.kantei.go.jp/jp/singi/it2/)

Fig.4 Spread of car navigation systems and VICS



Source: Taken from the Vehicle Information and Communication System Center (http://www.its.go.jp/ITS/j-html/ITSinJapan/navi.html)

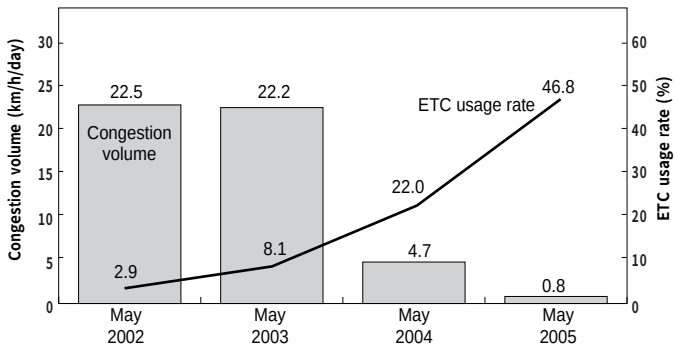
Fig.5 Number of ETC units installed in autos and status of use



Source: Website of the Ministry of Land, Infrastructure and Transport (http://www.mlit.go.jp/road/yuryo/riyou.pdf)

Fig.8 Lessening of congestion at toll gates due to the spread of ETC systems

Traffic congestion almost vanished after pioneering use at toll gates on the main Metropolitan Expressway beginning in May 2005.



Source: Created from website of the Metropolitan Expressway Public Corp (http://www.mex.go.jp/press/2005/050615/index.html)

Table 2 Expanding ITS market : approximately ¥12 trillion already

Current ITS market
Information: About ¥6 trillion
Car navigation systems, etc.
VICS and ETC
Message signs
Infrastructure: About ¥5 trillion
Roadside sensors and cameras
Networks
Services: About ¥1 trillion
Map software
Content
Total: About ¥12 trillion

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

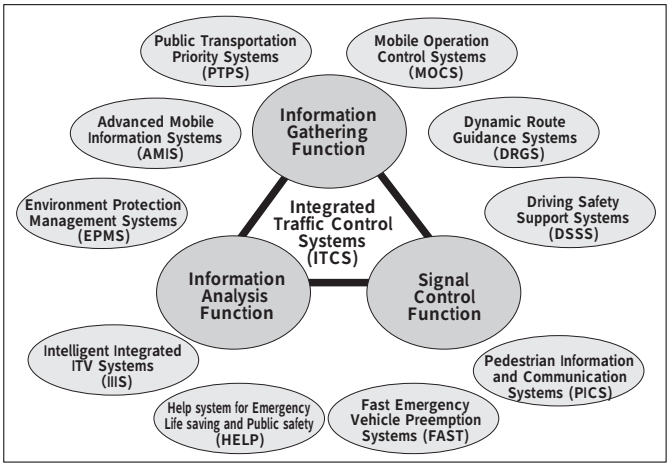
Fig.6 Third-Phase Advanced Safety Vehicle (ASV3)

Research and development is planned between 2001 and 2005 on 32 systems in six fields to develop practical applications and eventual diffusion.

I	Preventive safety technology (information display, warning, and reduction of burden)
II	Accident-avoiding technology (enhancing vehicle functions to maximum levels, automated maneuvering)
III	Automated driving technology (use of existing and new infrastructure)
IV	Collision safety technology (protection of drivers and passengers, reducing damage to pedestrians)
V	Technology to prevent spread of damage from traffic disasters
VI	Basic vehicle technology

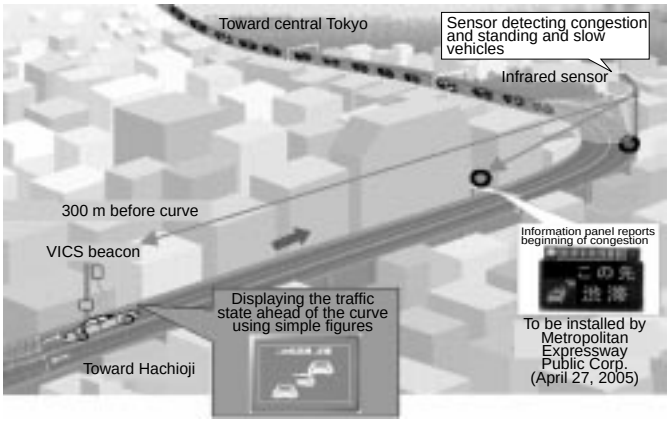
Source: ITS Handbook 2002-2003, compiled by the Highway Industry Development Organization

Fig.7 Subsystems of the Universal Traffic Management Systems (UTMS)



Source: Taken from home page of the Universal Traffic Management Society of Japan (UTMS) (http://www.utms.or.jp/japanese)

Fig.9 Overview of the Sangubashi pilot program for an advanced cruise-assist highway system (AHS)



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

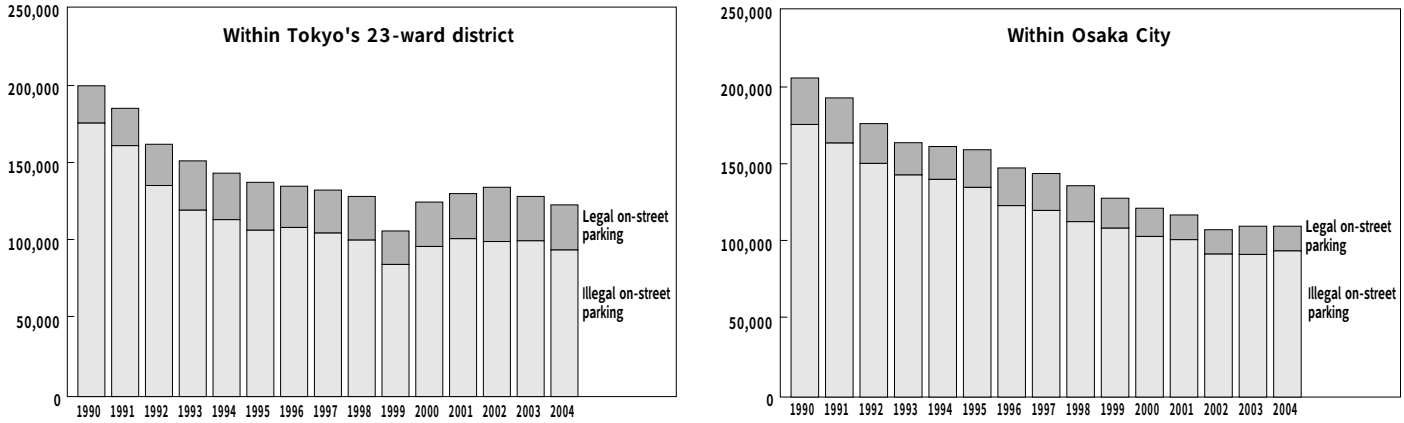
2-4 Efforts to Solve Parking Problems

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

Yasunori Muromachi

With the revision of Standard Parking Requirements, flexible rules were introduced based on performance rather than uniform numerical standards and the conventional principle of locating them within a building or on the same sites. Parking lot development can consider local conditions, enabling the passage of creative and innovative local rules and integration with town planning.

Fig.1 Changes in the number of vehicles that were temporarily parked on city streets in two metropolitan areas



Source: Toshi Kotsumondai Chosakai, URBAN TRAFFIC 2005

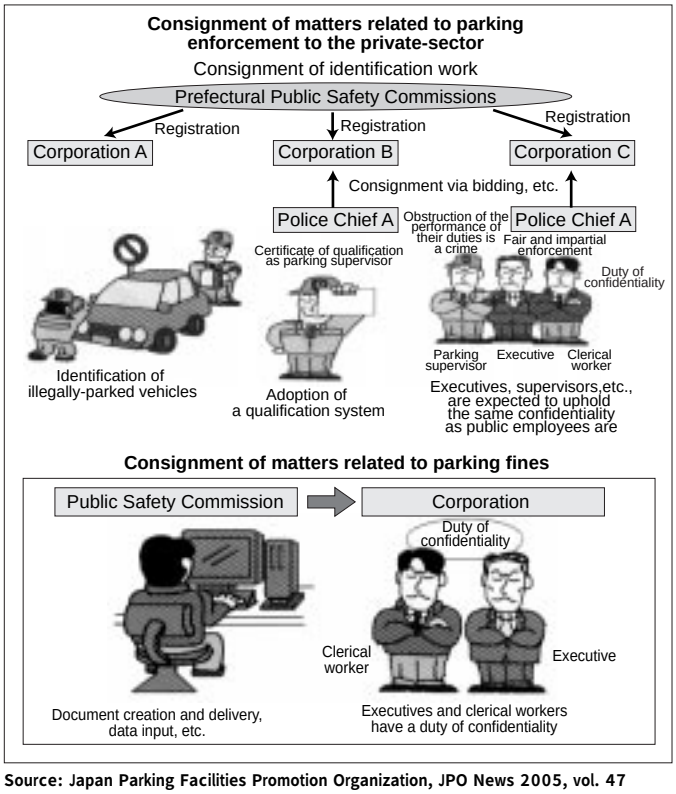
Table 1 A list of who is liable in the event of illegal parking by country

	Driver is liable	Owner of the vehicle is liable
U.S.A. (Washington D.C.)	△	○
(New York City)	△	○
Canada (Ontario)	△	○
U.K. (non-criminal act)	×	○
(criminal act)	△	○
Belgium	△	○
Denmark	△	○
Germany	△	○
Greece	△	○
Spain	△	○
France	△	○
Ireland	△	○
Italy	△	○
Luxembourg	△	○
The Netherlands (The Hague)	△	○
Austria	△	○
Portugal	△	○
Finland	×	○(user of the vehicle)
Sweden	×	○
Australia	△	○
New Zealand (Wellington)	△	○
South Korea	△	○
Singapore	△	○
Japan	○	○

In countries with △ for "driver is liable" and ○ for "owner is liable," authorities initially pursue liability on the part of the driver for illegal parking, but the vehicle's owner is held liable if the driver cannot be identified.

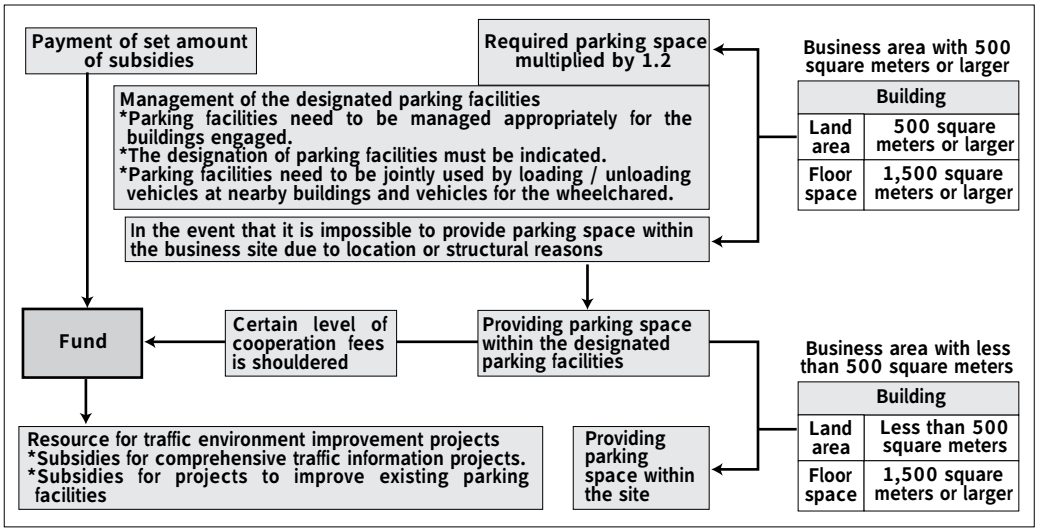
Source: Japan Parking Facilities Promotion Organization Vol. 41, 2004 of JPO NEWS

Fig.2 Consignment of matters related to parking enforcement to the private-sector



Source: Japan Parking Facilities Promotion Organization, JPO News 2005, vol. 47

Fig.3 Outline of guidelines (Ginza Rule) introduced in Chuo-ku (Tokyo) for parking requirement.



Scope of areas subject to the Ginza Rule from Ginza 1 to Ginza 8
Content:
*Buildings which are subject to parking requirement under an ordinance of the Tokyo Metropolitan Government.
*A business area of 500 square meters or larger is required to provide within the business area 1.2 times the number of space under the Tokyo Metropolitan Government. parking requirement.
*A business area of less than 500 square meters is required to provide within the business area or the designated parking facilities the number of space under the Tokyo Metropolitan Government parking requirement.
Effective Date: December 2003 (April 2004 for part of the designated district)

Source:http://www.city.chuo.tokyo.jp/koho/150915/02-01.html

Table 2 Revised enforcement regulations for the Parking Law

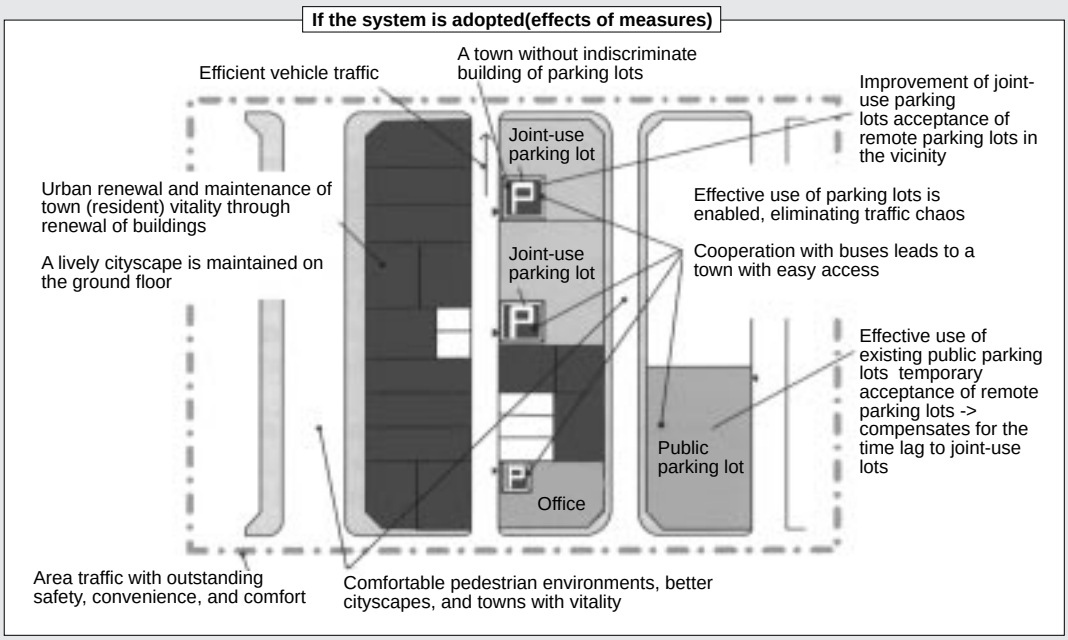
Revision of regulations on entrances and exits to off-street parking in intersections.
Before revision
(Article 7 Section 1) Automobile entrances and exits may not be in roads as listed in Article 44 of the Road Traffic Law.
After revision
Regulations concerning the prohibition on entrances and exits do not apply for off-street parking located alongside an intersection and within five meters of the intersection if the Minister of Land, Infrastructure, and Transport determines through consultation with the relevant road administrator and prefectural Public Safety Commission that said entrances and exits do not impede traffic flow and safety (revision of Article 7 Sections 2 and 3).

Revision of the regulation requiring off-street parking lot entrances and exits to be at least 10 meters apart.
Before revision
(Article 7 Section 5) Off-street parking lots with a motor vehicle parking area of 6,000 m2 or more must have separate entrances and exits for vehicles and they must be at least 10 meters apart as measured along the road.
After revision
When traffic traveling in opposite directions on the facing road is separated by dividers, etc., the rule requiring 10 meters distance does not apply.

Source: Japan Parking Facilities Promotion Organization, JPO News 2004, vol. 44, 2004

Fig.4 Conception of remote parking requirement

*Formation of a consensus among local landowners, government, road administrators, police, and other stakeholders
*Setting forth of a plan to implement joint use of a remote parking facility (improvement of joint-use parking lot, projected structures)
*Reflection of policy in the setting and revision of a parking lot improvement plan



Source: Japan Parking Facilities Promotion Organization, JPO News 2004, vol. 44, 2004

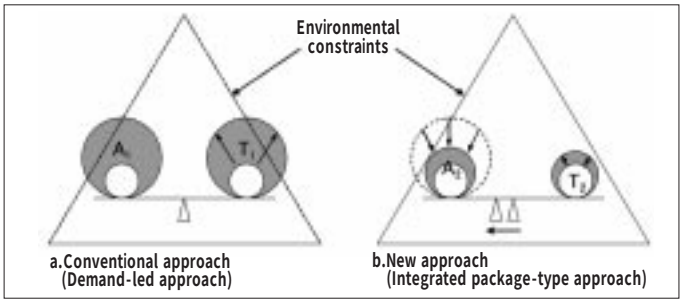
2-5 Developments of Transportation Demand Management (TDM) Measures

Research Associate, Faculty of Engineering, Saitama University
Kunihiro Sakamoto

Transportation Demand Management (TDM) is an idea that came to be rapidly gaining acceptance in recent years as a means of helping smooth traffic flows. Its main concept is to control the "traffic load" in urban cities in accordance with the traffic "capacity." TDM places an emphasis on taking demand-side measures based on conventional supply-side measures such as new road construction and improvement of intersection systems. Given physical and environmental limitations that weigh heavily on the formulation of supply-side measures, TDM, which is essential element of an "integrated package-type" management system, is expected to play an increased role globally in transport policy in the future. Specifically, the concept may prompt governments to review existing frameworks on their transport policies, including regulatory rules, planning, and how to allocate investment burdens among relevant parties, thus affecting the overall demand-supply balance of transport services. In Japan, TDM has become a major pillar of the government's transportation policy from the viewpoint of curbing global warming. Many social experiments on traffic control are now under way in Japan based on the TDM concept.

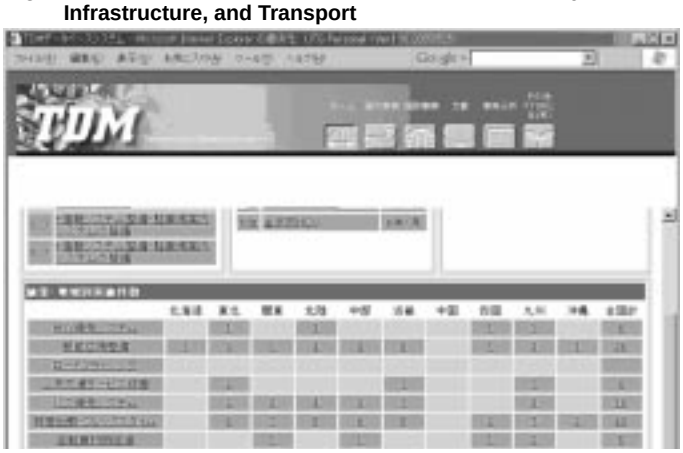
Fig.1 Changing the paradigm of urban transport management policy, and the TDM concept

TDM is a new concept that calls for limiting transport demand to certain levels in line with environmental constraints and limitations on transport policy.



Source: Katsutoshi Ohta Development of Traffic System Plan and Community

Fig.2 TDM database of the Road Bureau of the Ministry of Land, Infrastructure, and Transport



Source:http://218.224.224.229/tdm/servlet/TDM

Fig.3 "Connection Map" to promote use of public transportation

Intergovernmental cooperation on a TDM initiative extending beyond the borders of Osaka and Nara Prefectures

Table 1 Number of pilot programs solicited by the Road Bureau of the Ministry of Land, Infrastructure, and Transport

Direct TDM support such as promotion of public transportation use is declining.

Theme \ Fiscal year	1999	2000	2001	2002	2003	2004
	Number of implemented	Number of implemented	Number of implemented	Number of implemented	Number of implemented	Number of implemented
Pedestrian/bicycle prioritization measures ("Kurashi no Michi" zones, transit malls)	0	0	0	1	11	9
Locally-oriented road use (sidewalk cafes, etc.)	1	1	2	1	4	19
Promotion of use of public transportation	4	3	3	1	1	0
Improved traffic flow in tourist areas	1	1	3	3	0	0
Improved environments for bicycles	0	3	1	3	0	0
Measures on flow of good and parking	0	1	3	0	2	0
Other measures	0	0	2	5	2	1
Total	6	9	14	14	20	29

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

Fig.4 Changing routes from general roads to expressways with smart IC

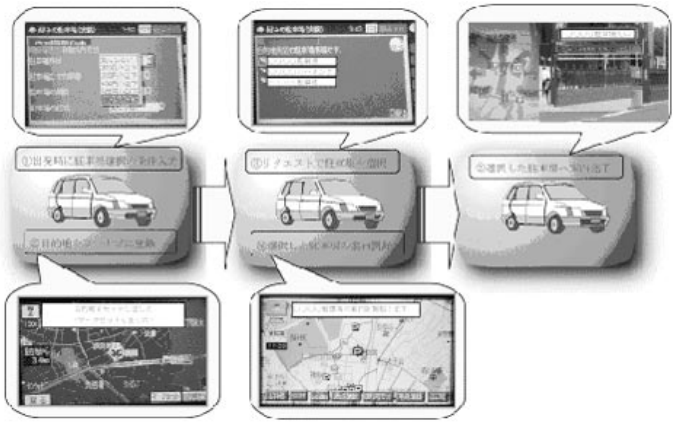
Fourteen percent of survey respondents said they would not use expressways without smart IC, confirming its strong effect on route guidance and decentralization.

Source: Website of the Miyagi Prefecture

Fig.5 Application of a parking guidance system that takes preferences into account

Tokyo Prefecture and the Metropolitan Public Corporation for Road Improvement and Management have begun providing information on parking lots with discounts and so on in accordance with driver preferences to car navigation systems throughout Tokyo.

Chart of application during FY 2004



System concept before practical application (during testing)

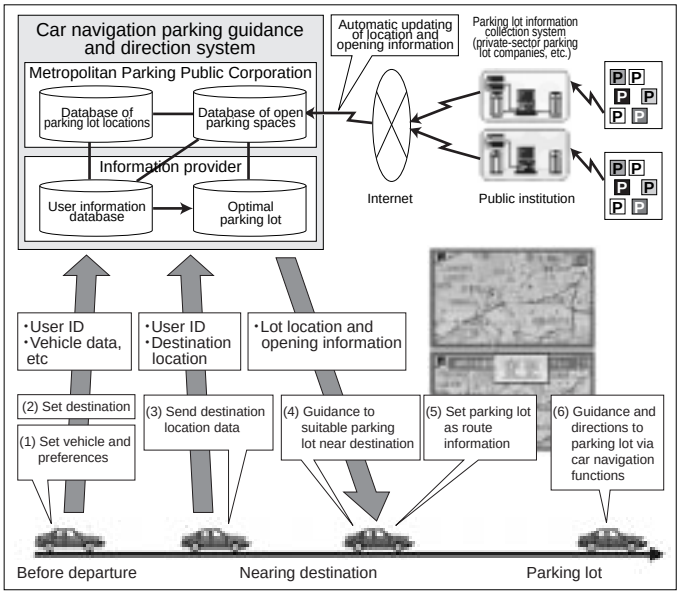
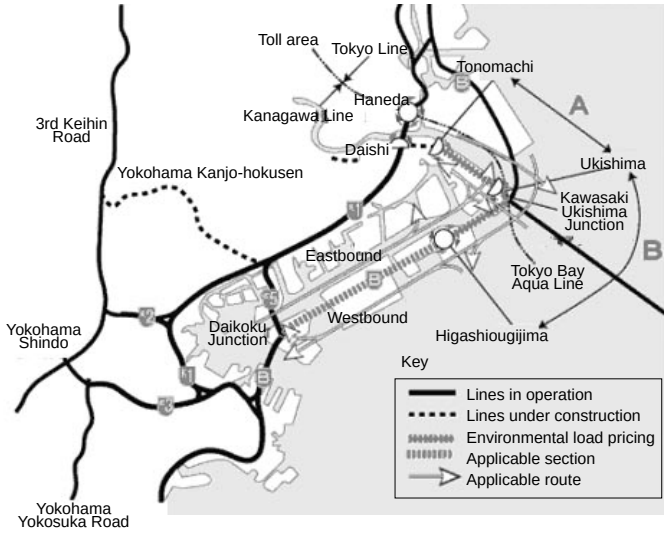
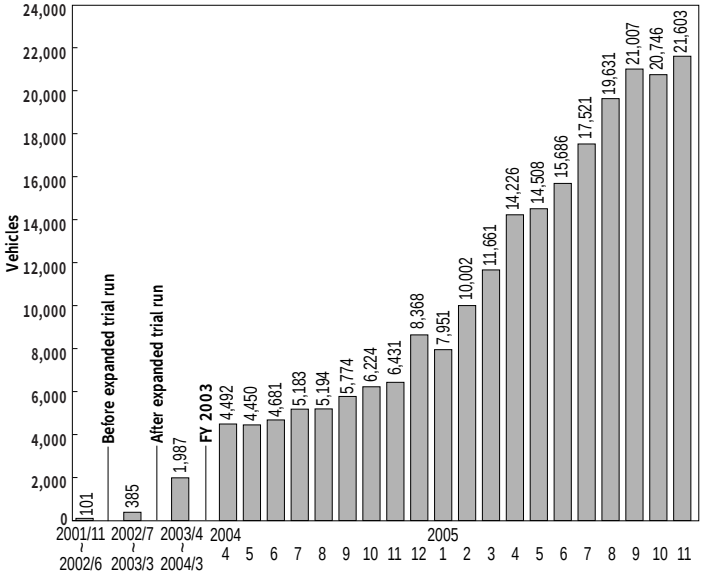


Fig.6 Increasing number of users of environmental load pricing

Use of the environmental load pricing on the Metropolitan Expressway Wangan Line is steadily increasing.



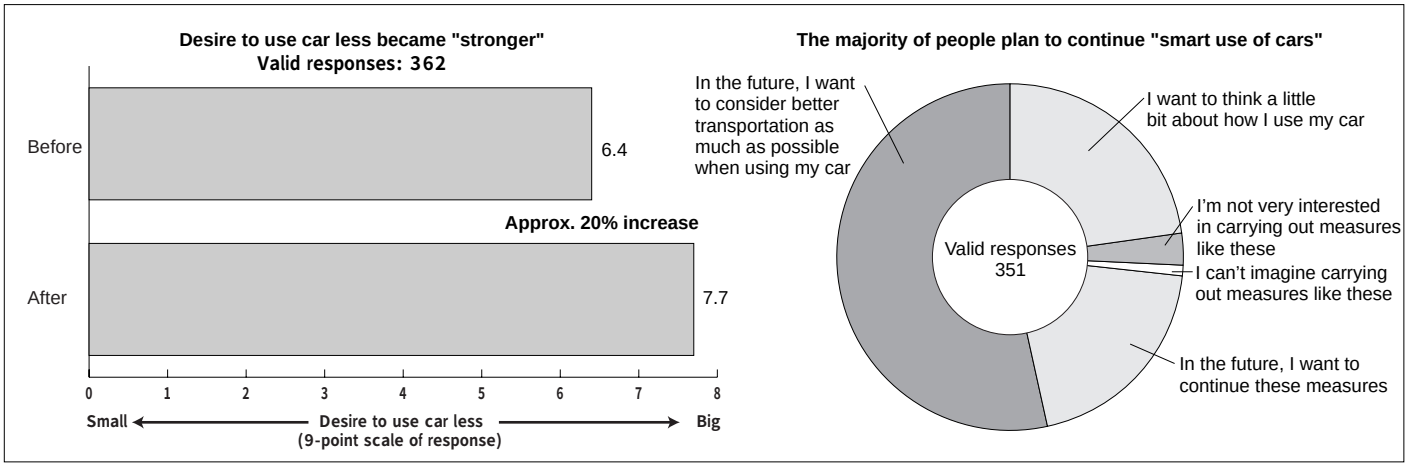
Vehicles to which environmental road pricing applied (weekday average)- Wangan Line



Source: http://www.shutoko.jp/etc/service/road/sisaku.html

Fig.7 Progress of the Travel Feedback Program (TFP)

This communication-type program combines the mobility management techniques of "behavioral planning" and "feedback" to promote voluntary behavioral change by individuals.



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

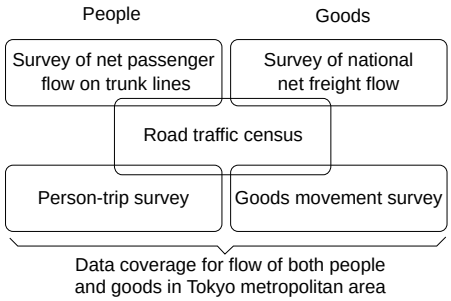
2-6 Urban Logistics from the Metropolitan Tokyo Goods Movement Survey

Professor, Faculty of Marine Technology, Tokyo University of Marine Science and Technology
Hirohito Kuse

Data on the flow of goods is said to be hard to capture. One possible cause is that the subjects of surveys vary by the purposes, but they may track the volume of flow, truck traffic, or volume of flow between industries, facilities, or regions. In addition, the characteristics of the flow of goods vary widely by type of goods. With those points in mind, the Tokyo Metropolitan Area Transportation Planning Council (see Note 1) carried out a goods movement survey of Metropolitan Tokyo in FY 2003 and 2004. It published an overview of the results in July 2005.
Along with the report on the survey's methods and findings, this section describes the direction of future study. (See Note 2.)

Fig.1 The setting of the goods movement survey of Metropolitan Tokyo

Area	Transport mode	Units
All of Japan	Rail, air, sea, etc.	Persons/tonnes
	Automobile	Persons/tonnes
		Vehicles
Tokyo metropolitan area	Automobile	Vehicles
		Persons/tonnes
	Rail, air, sea, etc.	Persons/tonnes



1) Targets and methods of goods movement survey

Transportation-related data tabulated by size of area and means of transport mode are as in Fig.1. The goods movement survey of metropolitan Tokyo focuses on the flow of goods, targeting various transport modes in the metropolitan area.
In the main survey (survey of functions, places, and business) it focuses on facilities that generate and attract goods flow. Approximately 120,000 business units interest in the Tokyo metropolitan areas engaged in logistics-related enterprises such as manufacturing, wholesale, transport, and storage were surveyed by mail. Approximately 30,000 of them responded.

2) Survey systems and characteristics

The survey of business function ascertained the volume of flow of goods (OD) between facilities (factories, distribution centers, stores, etc.) by type of goods for each business unit. The survey was also designed to ascertain the volumes of flow (OD) between types of businesses (e.g. between manufacturers and wholesalers) and between areas (e.g., between North Saitama and South Kanagawa).
In addition, supplemental surveys on corporate attitudes (by interview and questionnaire) and on large trucks (routes and traffic volume counts) were carried out. Finally, an area (terminal) distribution study was carried out in the form of case studies in five areas.

Fig.2 Volume of goods flow generated and trucks dispatched

Tabulation based on departure location of the volume of goods flow between facilities (OD) makes clear the volume carried out from enterprises and the number of trucks used. The result shows that about 30 percent by weight and around 50 percent by number of trucks are goods related to daily necessities such as foods.

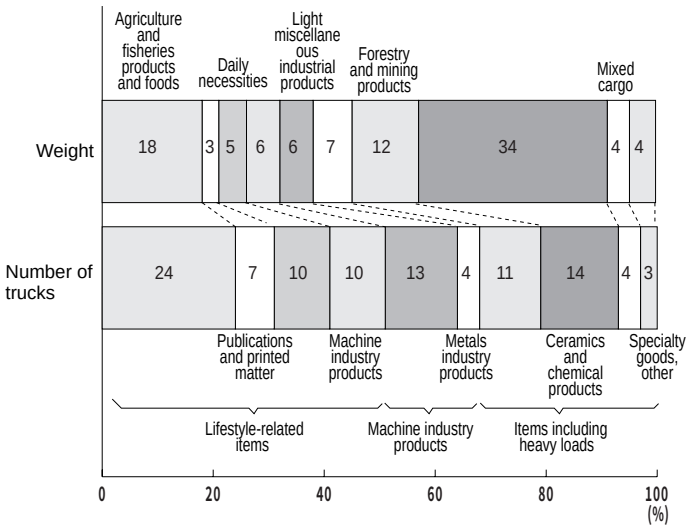


Fig.3 OD flow between areas by type of goods

The volume (OD) of lifestyle related goods flowing between neighboring prefectures, especially Tokyo, is high.

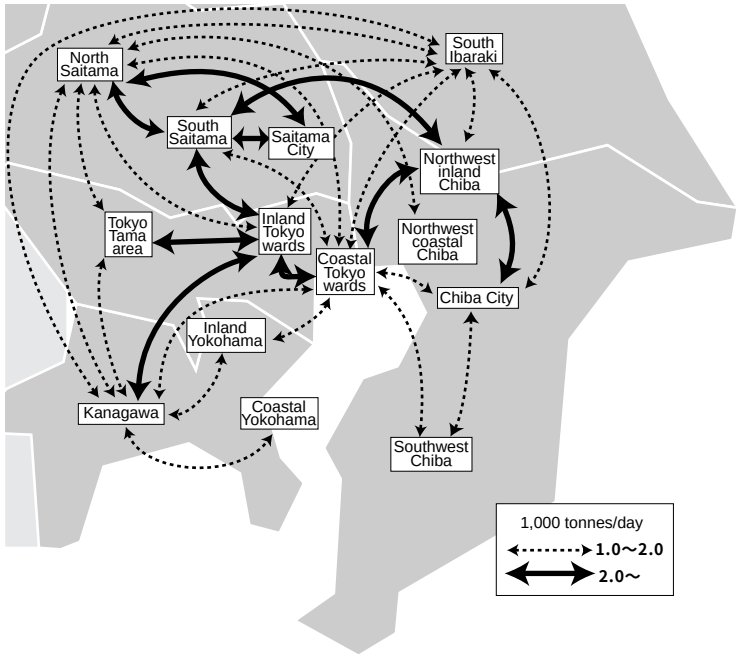


Fig.4 Ownership patterns of logistics facilities by date of opening year

When ownership patterns of logistics facilities (warehouses, distribution centers, etc.) are classified by date of opening, many that opened before the 1970s are owned by the companies that operate them. However, the percentage rented steadily increases until only 24 percent of those opening in the 1990s or later is owned by the companies that use them. This is largely due to the influence of third party logistics (3PL) and other forms of logistics outsourcing. Such rental demand can be expected to increase in the future.

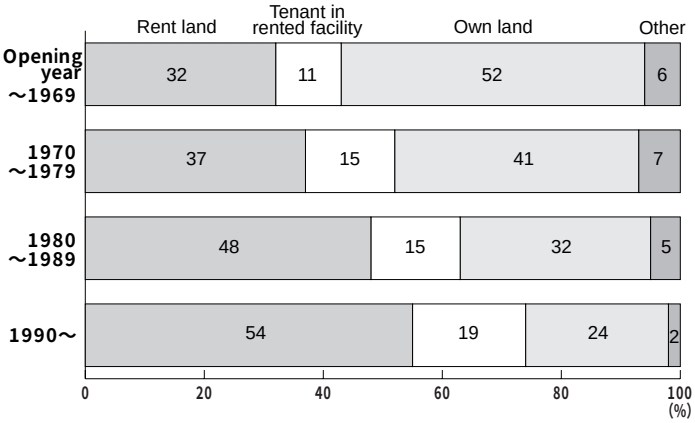


Fig.5 Logistics function by date facility opened

Looking at the functions of logistics facilities, collection/delivery and logistics processing are increasing. This indicates that the goods in the logistics process are changing, and facilities are not just for transport and storage, but are taking on more characteristics of collection/delivery and processing hubs.

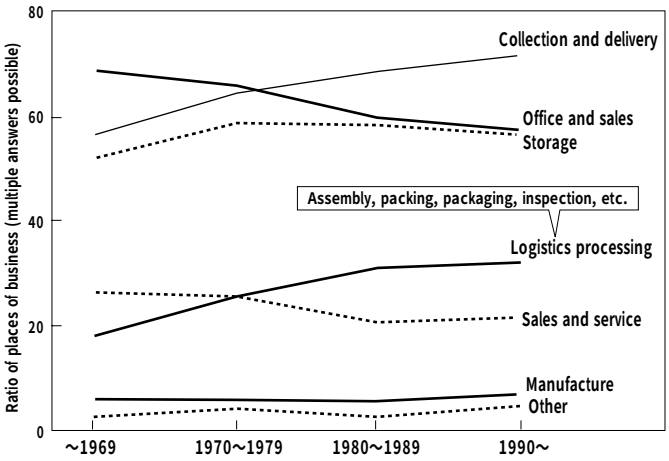
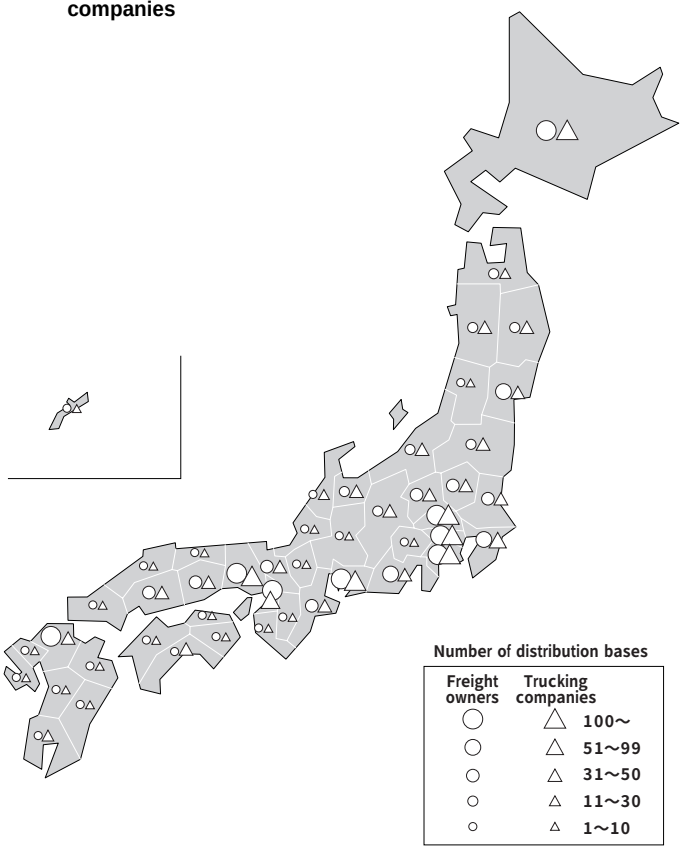


Table 1 Downloadable data

No.	Tabulation category	Unit
1	Volume of flow (OD) by transport method between areas	Tonnes/day
2-A	Flow of goods generated, by area	Tonnes/day
2-B	Flow of goods generated, by area and by type	Tonnes/day
3	Volume of flow (OD table) between areas, by type of goods	Tonnes/day
4	Volume of flow (OD table) between facilities, by type of goods	Tonnes/day
5	Volume of flow (OD table) between industries, by type of goods	Tonnes/day
6	Number of places of business, by industry and type of facility	Number of places of business
7	Number of logistics facilities, by date of opening and industry	Number of places of business
8	Number of logistics facilities, by date of opening and land ownership pattern	Number of places of business
9	Number of logistics facilities, by date of opening and area	Number of places of business
10	Number of trucks used and volume of goods flow generated, by truck size	Number of trucks/day, tonnes/day
11	Loading ratio, by truck size	%
12	Number of trucks, by type of goods and load ratio constraints	Number of trucks/day
13	Volume of goods flow generated, by type of goods and existence of designated time of delivery	Tonnes/day

The goods movement survey of Metropolitan Tokyo provides information on the attraction and generation volumes of logistics facilities as well as the volumes of goods flows (OD) between industries, facilities, and areas by type of goods. This should make it useful for both urban planning and transportation planning.
An overview of these data can be downloaded from the website of the Tokyo Metropolitan Area Transportation Planning Council. The data are now being prepared for release to permitt more detailed analysis without allowing individual businesses to be identified. (http://www.tokyo-pt.jp/)
Utilization of the survey results and data is expected to further develop research and planning in the field of logistics.

Fig.6 Distribution of logistics bases of freight owners and trucking companies



Source: Survey on the Net Freight Flow in Japan (2000)
(Note 1) The Regional Development Bureau of the Ministry of Land, Infrastructure, and Transport. Ibaraki, Saitama, Chiba, Tokyo, and Kanagawa Prefectures, the Cities of Yokohama, Kawasaki, Chiba, and Saitama, the Urban Renaissance Agency, the Japan Highway Public Corp., and the Metropolitan Expressway Public Corp.
(Note 2) The author participates as Chairman of the Logistics Survey Research Committee of the Tokyo Metropolitan Area Transportation Planning Council.

2-7 Renewed Interest in Bicycle Transport

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

Fumihiko Nakamura

The bicycle is once again attracting attention as a non-polluting vehicle which is beneficial to health. Outside of Japan, there have been schemes for securing bicycle lanes, schemes for linking bicycles with public transport or for carrying bicycles on public transport, and cases where bicycles have been given priority in urban improvement plans. In Japan, we have finally started to study ways to provide space for cyclists, and bicycles can now be carried on the railways in some regional cities. Many problems remain to be solved through programs to be carried out in future.

Table 1 State of improvements of bicycle paths

Japan has many problems concerning bicycles, such as how to provide space for cyclists, and the problem of bicycles abandoned at station plazas and along roadsides, etc. However, many people use bicycles, and new technologies for bicycles are spreading.

Category		Total growth by year (km)		Extension by type of road (April 1, 2003)		International comparison of dedicated bicycle space Overseas data are 1997 data from the International Association of Traffic and Safety Sciences. Numbers in parentheses are the percentage of all road extensions.			
		1998	2003	National road, principal local road	Prefectural, municipal road				
Bicycle/pedestrian paths		93,172	99,102	40,505	58,497				
Dedicated bicycle space	Bicycle paths	1,978	1,622	461	1,161				
	Bicycle/pedestrian roads	4,163	5,071	135	4,936	Japan	Germany	Netherlands	USA
	Total	6,141	6,693	596	6,097	6,097 (0.6%)	23,100 (4.7%)	14,500 (8.6%)	24,000 (0.4%)

Note: Bicycle path: the part of a road that is a path for bicycles built alongside a vehicular road or footpath
Bicycle/pedestrian path: The part of a road that is a path for bicycles and pedestrians built alongside that road
Bicycle/pedestrian road: a separate road built solely for the use of bicycles and pedestrians
Source: Created from materials on the website of the Japan Bicycle Promotion Institute

Table 2 Countermeasures for bicycles abandoned at station plazas and along roadsides

Classification	Countermeasures menu
Bicycle parking demand control	Guidance for conversion to other means. Adjustment of parking fees. Introduction of "Rent-A-Cycle" system.
Maintaining supply quantity	Constructing bicycle parking places
Effective use of existing facilities	Transfer of existing facilities to more convenient locations. Lengthening of business hours. Intensification of management including crime prevention. Improvement of facilities including roofs. Improvement of access running tracks.
Strengthening of regulations and supervision regarding bicycles left at station plaza and along roadsides	Reviewing areas where bicycles are parked in the wrong places. Posting parking wardens. Stronger measures to remove bicycles (frequency, methods). Higher fees when collecting removed bicycles
More public relations activities	PR on the nuisance caused by bicycles parked in the wrong places. PR on the expense of removing bicycles parked in the wrong places.

Fig.1 Social experiment for bicycle-town based on private-public partnership in Itabashi & Toshima, Tokyo

Placement of a bike lane along the pedestrian path on the east side of Gekijo Dori.
Placement of guide signs for bicycle parking around the station.
Passing of pamphlets prohibiting illegal bike parking and intensive educational activities (December 4, 2001-January 12, 2002).

Prevention of illegal bicycle parking
Guidance of motorcycles to parking lots.

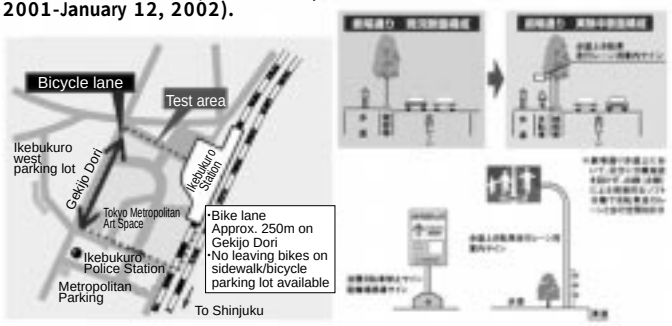


Table 3 Bicycle ownership and utilization rates

	Number of bicycles owned(10thousand bicycles)	Ownership rate (bicycles/100 people)	Utilization rate (%)
Japan	7,297	58	15.3
USA	12,000	44	0.7
England	2,300	40	2.3
Germany	6,400	78	11.0
Denmark	450	84	18.0
The Netherlands	1,650	105	27.0
Sweden	600	67	10.0
Switzerland	380	52	15.0

Source: Katsutoshi Ohta (2001): Environment and bicycles, "National Development and Training" Vol. 92, pp. 12-15

Table 4 Bicycle-related pilot programs of the Ministry of Land, Infrastructure and Transport

	2000	2001	2002	2003
Number of cities	5	7	9	8
Bicycle spaces	1	1	2	3
Bicycle parking lots	1	2	3	3
Rentals	4	4	8	4
Measures against illegal bike parking	0	2	1	1
Cycle and ride	3	0	1	0
Park and cycle	1	1	1	0

There are many cases where multiple measures are carried out in a single program, so the totals in each column will not equal the number of cities.
Source: Website of the Ministry of Land, Infrastructure and Transport

■ The various good practices of bicycle use range from the microscopic level to the macroscopic level.

Fig.2 Cycle path

A cycle path network separated from pedestrian paths has been completed in Narita New Town.

Fig.3 "Rent-A-Cycle" in Futatsuimachi, Akita prefecture ("Cycle stations" are located everywhere in the town.)

Photographed by Katsutoshi Ohta

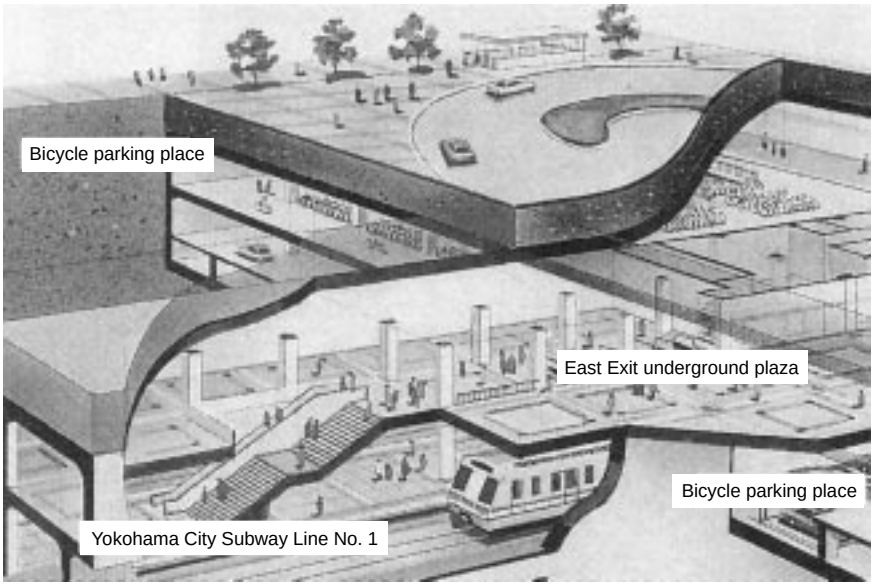
Fig.4 Space for cyclists in Futatsui-machi, Akita Prefecture (Bicycle passing zone is physically separated.)

Photographed by Katsutoshi Ohta

Fig. 5 Bicycle rack on front of bus

A rack that can carry two bicycles is attached to the front of a standard specification local bus in North America.
(Photograph shows a bus in the city of Ottawa.)

Fig.6 Bicycle parking place directly connected to ticket barrier area (Shonandai)



Bicycle parking places were constructed in the public passageway sections on the first underground level near the ticket gates for three lines: Odakyu Line (ground level), Sotetsu Line (underground) and Yokohama City Subway (underground). People can go from the bicycle parking site to the Odakyu Line ticket barrier simply by walking 50 or 60m horizontally.

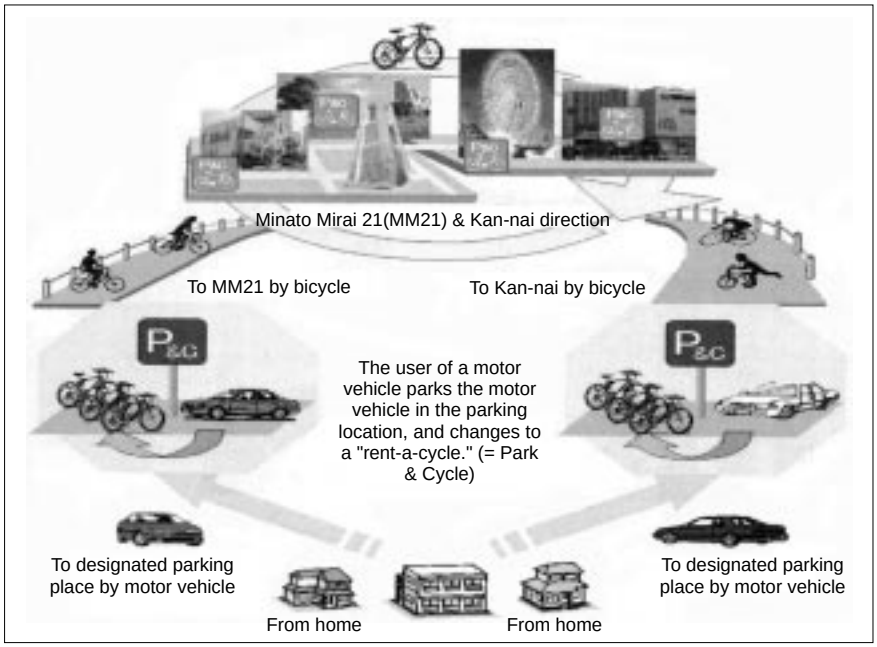
Table5 Cycling Path Plan in Davis (United States)

Category	Goal
Road	Have bicycle lanes on all trunk roads and feeder arterial roads Bicycle-friendly intersection design and traffic signal control Securing passages in districts prohibiting private vehicle traffic
Land use coordination	Access to greenery areas and recreation facilities Connections to college facilities
Others	Developing bicycle parking facilities and ensuring security Providing maps and other information Strengthened safety education from elementary school

Fig.7 City "rent-a-cycle" in Copenhagen

Photographed by Masahiro Sugiyama

Fig.8 Conceptual diagram of Park-and-Cycle Experiment (Yokohama)

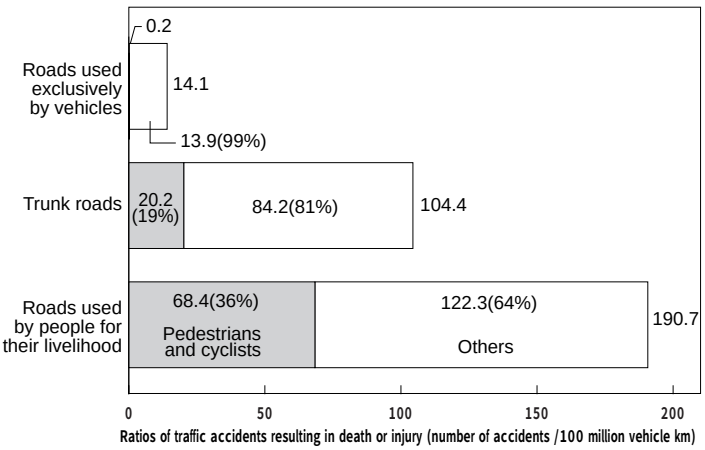


2-8 Efforts for Traffic Calming Measures

Senior Researcher,
Toyota Transportation Research Institute
Seiji Hashimoto

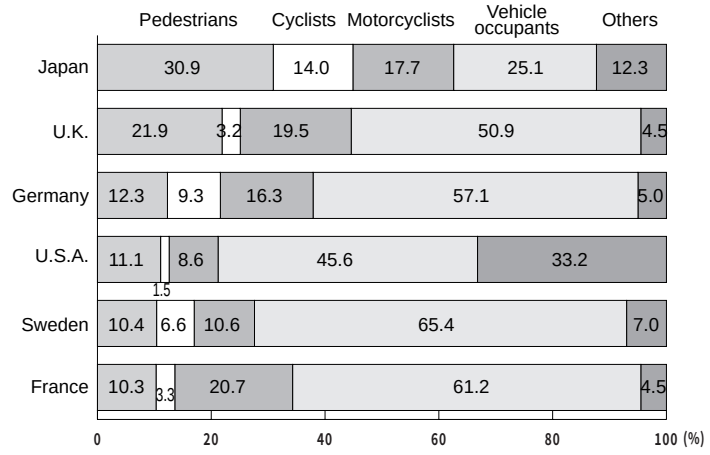
The increasing coexistence of pedestrians, cyclists, and automobile is a new concept in traffic that has become indispensable for addressing issues associated with urban automobile transportation. The idea of a ''Community Zone,'' introduced in various parts of the nation since 1996, has been seen as an effective way of ensuring traffic safety in community space. Measures based on this concept have contributed greatly to increasing traffic safety as the number of traffic accidents declined in areas where such zones were introduced. In addition, ''Road Rejuvenation'' programs have been introduced in Japan since fiscal 2002 as a means of enhancing traffic safety in city areas including commercial districts. The ''Road Rejuvenation'' concept was later extended, and new programs such as ''Livelihood Road Zones'' and ''Safe-to-Walk Areas'' were created in fiscal 2003. As these examples show, efforts to promote coexistence among pedestrians, cyclists, and automobiles are being made in various parts of Japan in a manner that meets local needs and traffic situations.

Fig.1 Road-by-road breakdown of traffic accidents for pedestrians and bicyclists



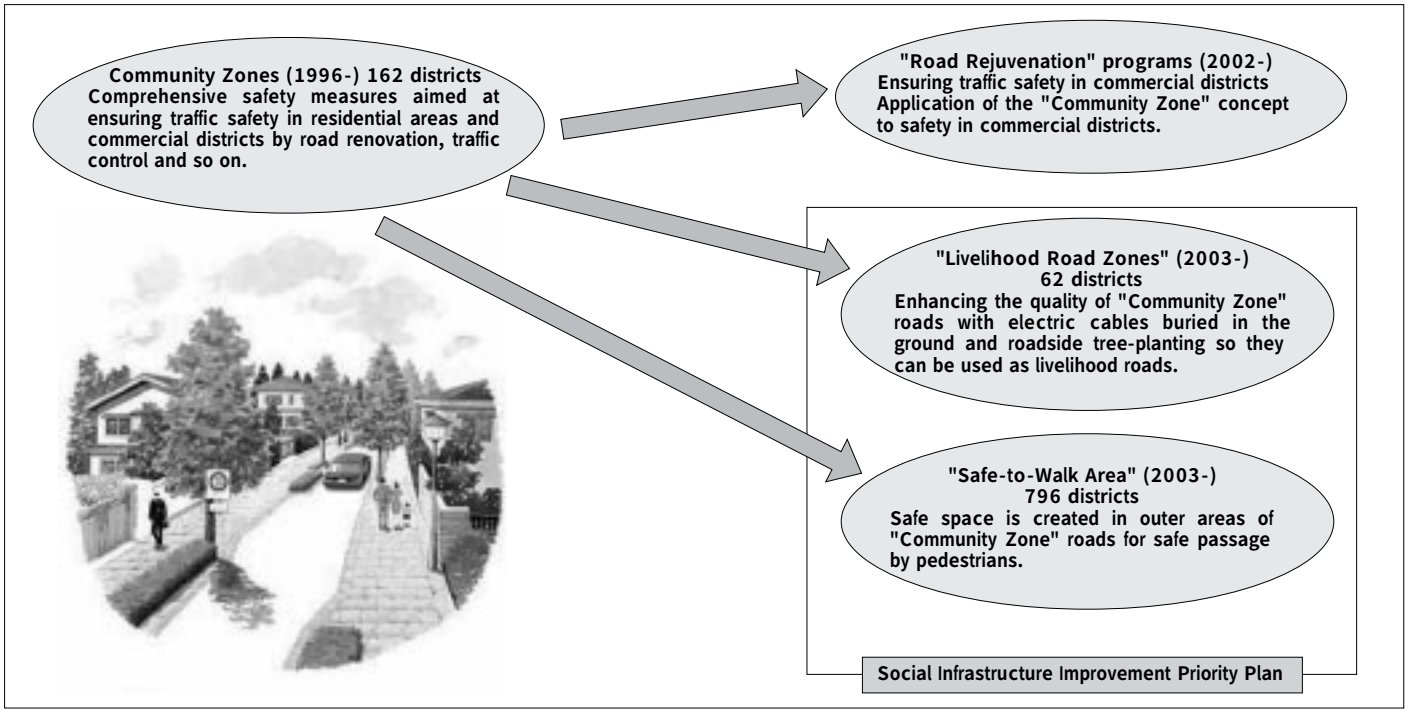
Sources: Administrative Road Policy Fiscal 2003
Note: Ratios of accidents resulting in death or injury is the number of such accidents divided by total vehicle-km traveled.
Trunk roads are prefectural roads, main roads in cities designated by ordinance.
Livelihood roads are all roads, excluding expressways and trunk roads.

Fig.2 Situation-by-situation breakdown of traffic deaths occurring within 30 days in each country (2000)



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

Fig. 3 Safety measures in community space



Sources: Website of Ministry of Land, Infrastructure and Transport (http://www.mlit.go.jp/road/road/traffic/comzone/comtop.him)

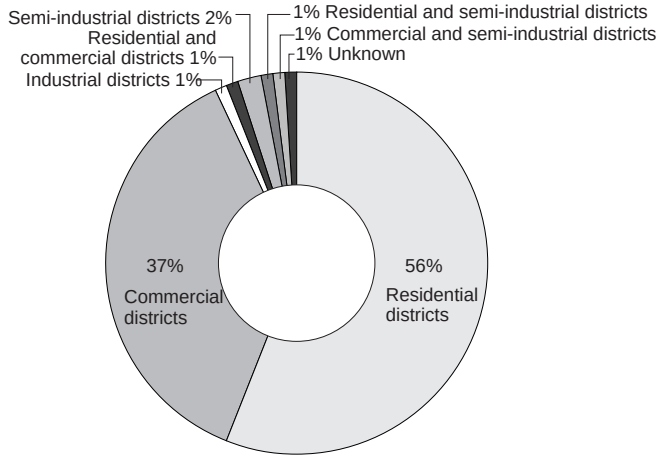
Table 1 Changes in traffic calming measures

In Europe, there has been a shift away from road improvements such as woonerfs and other programs on pedestrian-car road space sharing to Zone 30 and similar inexpensive, widespread surface improvements. The UK, however, carries out route improvements to form higher-quality spaces as part of Home Zone community renewal programs.

	Europe		Japan	
	Route improvements	Area improvements	Route improvements	Area improvements
1970's	Woonerf (Netherlands)			
	Road improvements for sharing of roads by pedestrians and cars are common.			
1980's		Zone 30 (West Germany, Netherlands), Zone 20 (UK)	"Forming Community Roads" program (1981)	"Comprehensive Neighborhood Traffic Safety"program ("Roadpia" concept 1984)"
1990's	Surface improvements become a staple. Road sharing dies down due to costs.			"Forming Community Zones" program(1996)
2000's	Home Zones (UK)			"Road Rejuvenation" (2002) "Forming Livelihood Road Zones" (2003) "Safe-to-Walk Areas" (2003) programs

Fig. 4 Land use in Community Zone improvement areas

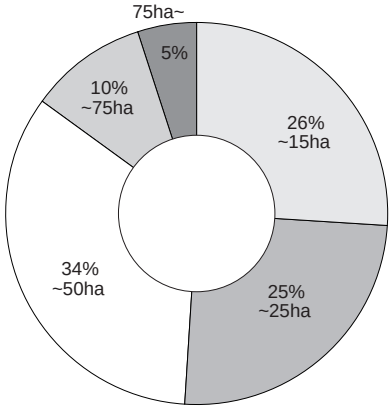
Residential and commercial districts are most common.



Source: Data taken from the Ministry of Land, Infrastructure and Transport, and the National Police Agency

Fig.5 Land area in Community Zone improvements

The majority is in small plots of 25 ha or less.



Source: Data taken from the Ministry of Land, Infrastructure and Transport, and the National Police Agency

Table 2 Typical methods used in "Community Zones"

Physical devices		**Speed humps** **A speed hump is designed to force vehicles to curb their driving speed by creating a bump on the road. Speed humps are categorized into several types according to their shape. The flat top of a speed hump with a trapezoidal shaped section is often used as a pedestrian crossing.**
		**Road narrowing** **A stenosis is designed to force vehicles to curb their driving speed by placing bollards or trees on a road that narrows the width of the road or makes it appea narrower.** **A stenosis is often used along with a speed hump.**
		**Chicane** **Chicane is a sharp double bend in a road to prevent vehicles from going too fast by forcing the driver to concentrate on maneuvering the vehicle. This method has been frequently used on existing community roads.**
Traffic regulations		**Maximum speed of 30 km per hour for traffic in designated areas** **A maximum speed of 30 km per hour is imposed on drivers of vehicles on designated roads that stretch out for a certain distance. Signs indicating the speed limit are usually set up at the entrance and exit of Community Zones.**
	Other traffic regulations	**One-way streets and designation of traffic direction are intended to enhance traffic safety by preventing the passage of vehicles into Community Zone areas.**

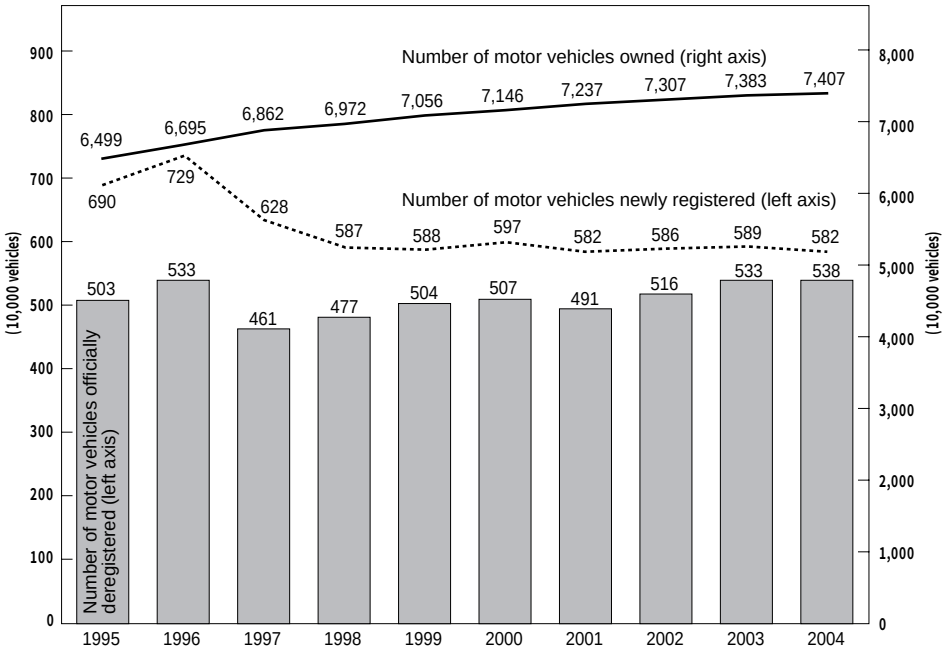
3-1 Efforts for Vehicle Recycling

Group Leader, Environment Department,
Japan Automobile
Manufacturers Association

Tadashi Kotake

Japan's new Automobile Recycling Law has been in force since January 2005. Promoting the recycling of used motor vehicles has become an important issue because of problems related to appropriate disposal methods for deregistered motor vehicles and a shortage of final disposal sites.
To resolve this problem, government, the automobile industry, and consumers are each playing their own roles in promoting the success of this recycling program as a movement towards a recycling-oriented society.

Fig.1 Number of motor vehicles deregistered in Japan

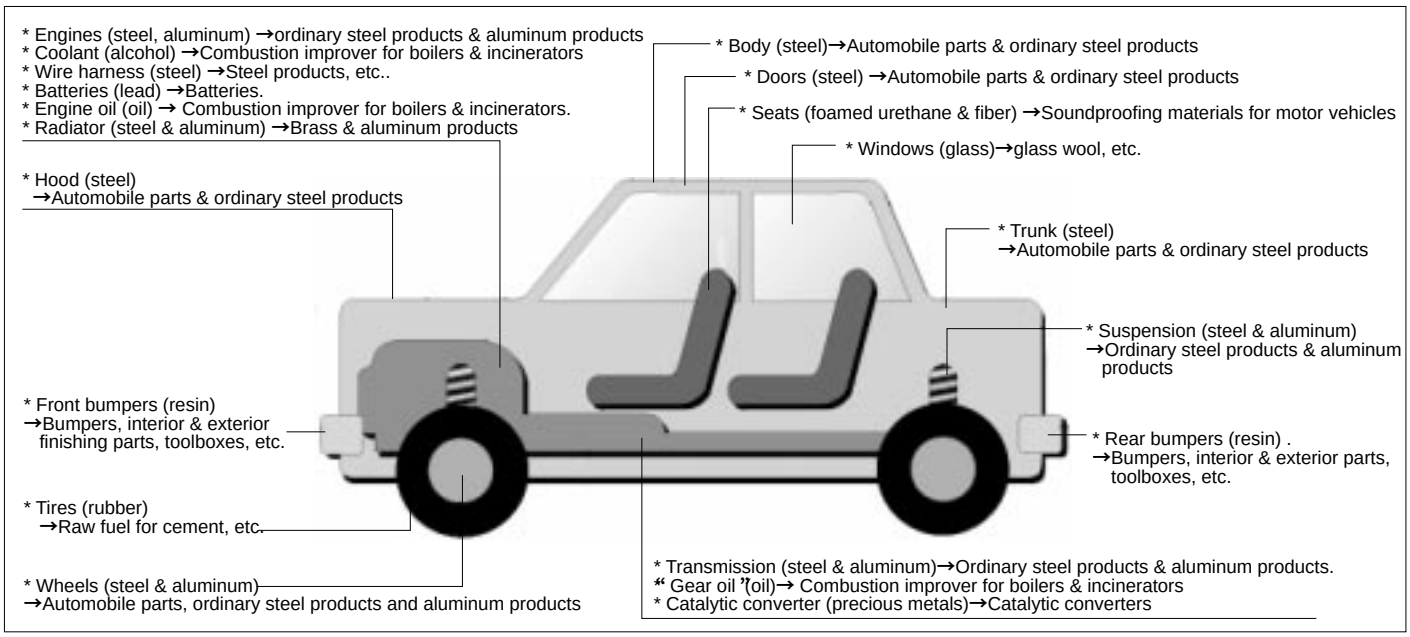


Source: Japan Automobile Manufacturers Association

Table 1 Average years of use

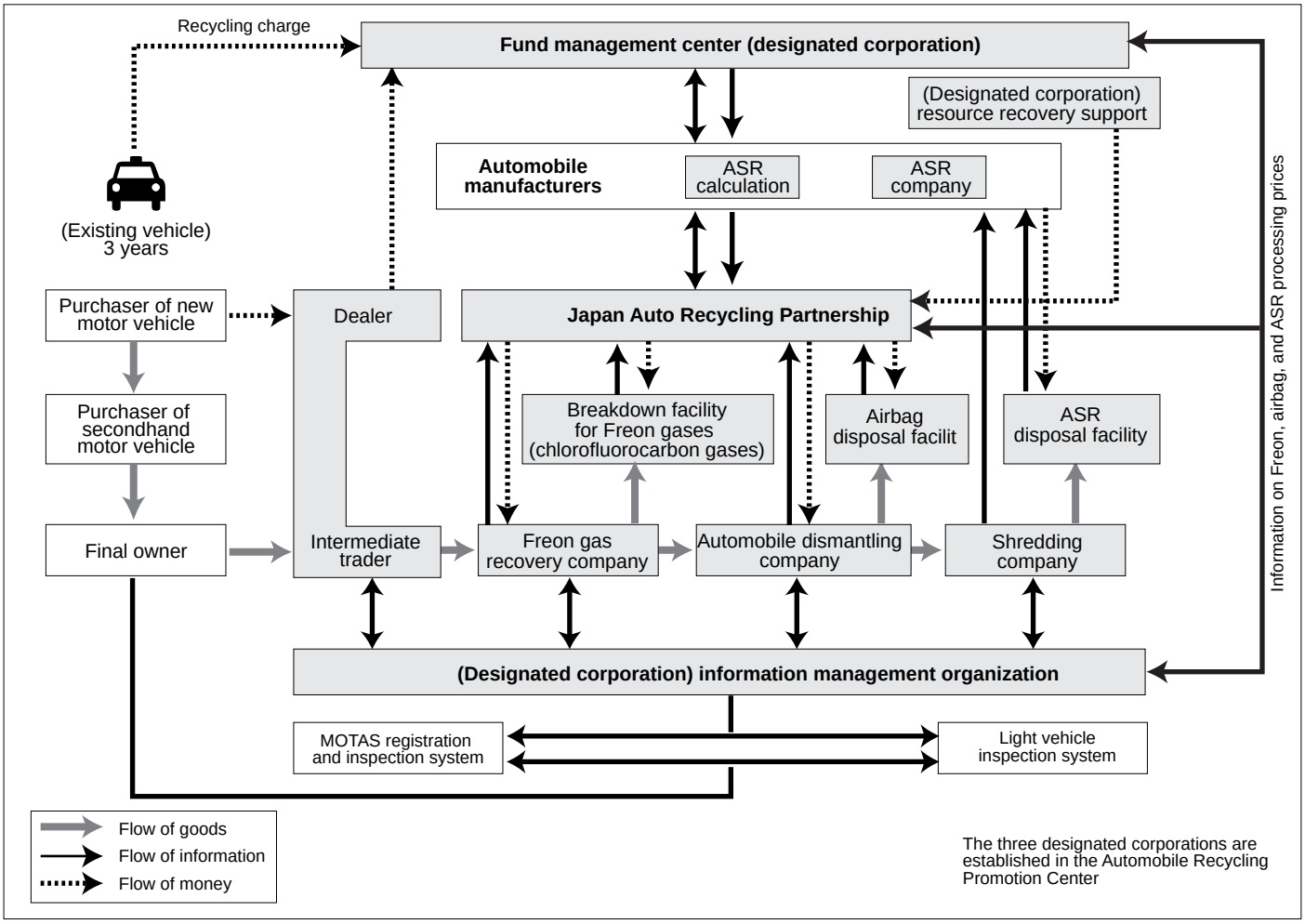
Year	Passenger cars (standard, compact)	Trucks (standard, small)
1980	8.29	7.77
1990	9.26	9.28
1995	9.43	9.60
1997	9.28	9.61
1998	9.44	9.48
1999	9.63	9.84
2000	9.96	10.53
2001	10.40	10.68
2002	10.55	10.92
2003	10.77	11.23
2004	10.97	11.84

Fig.2 Flow of treatment and recycling for officially-deregistered motor vehicles



Source: Japan Automobile Manufacturers Association

Fig.3 Measures under the Automobile Recycling Law



Source: Japan Automobile Manufacturers Association
Note:ASR-Automobile Shredder Residue

Table 2 Target percentage for recycling of automobile shredder dust

The recycling rate for all deregistered motor vehicles has already reached about 80%. The recycling rate for shredder dust will be increased gradually in order to achieve the 95% recycling rate for all deregistered motor vehicles from 2015. (the same as the target level set in EU Deregistered Vehicles Directive)

	From 2005	From 2010	From 2015
ASR recycling rate	30% or more	50% or more	70% or more

2 teams; receiving of ASR, and recycle and proper disposal.
ART: Isuzu, Suzuki, DaimlerChrysler Japan, Nissan, Nissan Diesel, P.A.G. Imports, Ford Japan, Fuji Heavy Industries, Mazda, Mitsubishi, Mitsubishi Fuso Truck & Bus
TH team: Daihatsu, Toyota, Hino, Honda, Audi Japan, BMW, Peugeot Japon, Volkswagen Group Japan
Source: Law for the Recycling of End-of-Life Vehicles

Table 3 Reduction targets for environmental impact substances for new motor vehicle models (Japan Automobile Manufacturers Association)

	Targets for four-wheeled motor vehicles	
	Four-wheeled	Two-wheeled
Lead	After January 2006, reduce lead use to 1/10 or less of amount used in the average vehicle in 1966 (1,850 g, not including battery) For large commercial vehicles (including buses), 1/4 or less	With amount of lead used in 1996 (about 80 g for a 210-kg class bike, not including battery) as the standard, (1) Do not increase the amount and (2) Reduce it to less than 60 g after January 2006
Mercury	After implementation of the Automobile Recycling Law (January 2005), use is prohibited except in the following parts. Infinitesimal use in the following parts needed for safety is exempt *Liquid crystal displays for navigation, etc. *Combination meters *Discharge headlamps *Interior fluorescent lights	After implementation of voluntary motorbike recycling measures (October 2004), use is prohibited except in the following parts Infinitesimal use in the following parts needed for safety is exempt *Liquid crystal displays for navigation, etc. *Combination meters *Discharge headlamps
Hexavalent chromium	Use of hexavalent chromium will be prohibited from January 2008	Use of hexavalent chromium will be prohibited from January 2008
Cadmium	Use of cadmium will be prohibited from January 2007	Use of cadmium will be prohibited from January 2007

Source: Japan Automobile Manufacturers Association

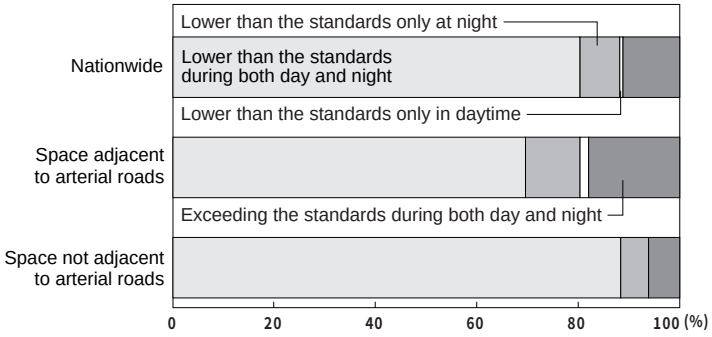
3-2 Traffic Noise Reduction Measures

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

Yasunori Muromachi

Evaluation of FY 2003 shows that environmental standards for noise both day and night were met about 80% of the time nationally and around 70% of the time in spaces adjacent to arterial roads. This is a major improvement. Comprehensive measures such as noise barriers, low-noise pavement, free nighttime driving on toll bypasses, active noise control, and so on are progressing.

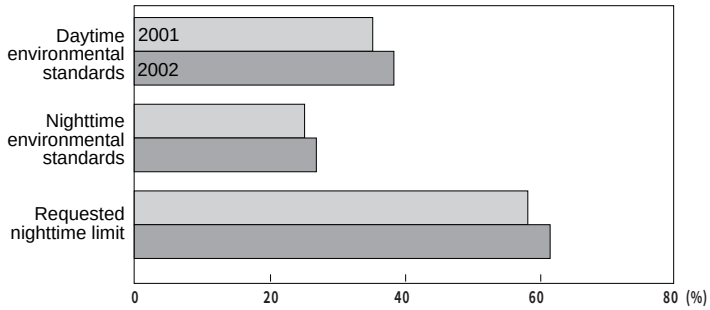
Fig.1 Results of evaluation of attainment levels for environmental standards for noise (overall, FY 2003)



Note: Roads bearing arterial traffic" are national expressways, urban expressways, national roads, prefectural roads, and municipal roads with at least four lanes.
Note: The range of "space adjacent to arterial roads" is specified according to number of lanes and distance from the road, as follows.
・ Roads with two or fewer lanes on routes bearing arterial traffic: 15 m
・ Roads with more than two lanes on routes bearing arterial traffic: 20 m
Source: http://www.env.go.jp/air/car/noise/noise_h15/index.html

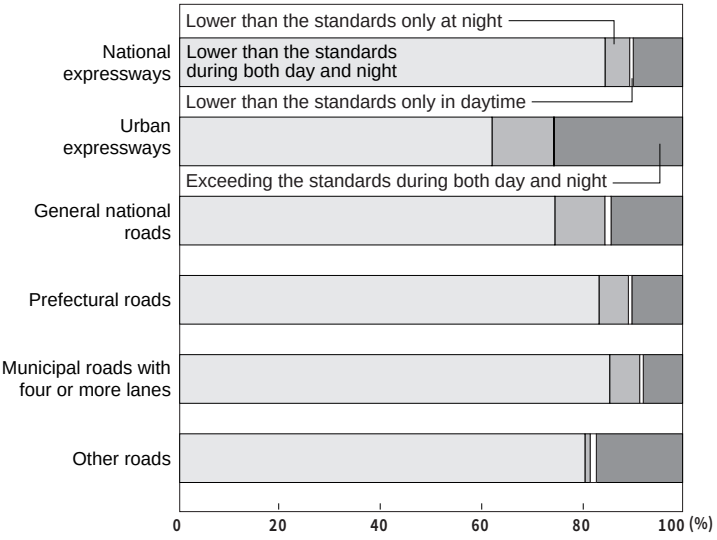
Fig.2 Attainment of environmental standards and requested limits for noise according to Road Environmental Census

The percentages of roads that meet environmental standards according to Road Environmental Census on national highways under the direct control of the government, are slightly less than 40% in daytime, and slightly less than 30% at night. The percentage that meet the requested limits at night is slightly over 60%.



Note: The assessment unit (road length) used for Road Environmental Census is different from that used for the survey by the Ministry of the Environment (number of housing units).

Fig.3 Results of evaluation of attainment levels for environmental standards for noise (by type of road and overall, FY 2003)



Source: http://www.env.go.jp/air/car/noise/noise_h15/index.html

Table 1 Environmental standards and requested limits for noise

Classification of area	Environmental standards (Leq)	
	Daytime	Nighttime
General areas		
AA areas	50	40
A areas and B areas	55	45
C areas	60	50
Areas facing roads		
A areas (2 or more lanes)	60	55
B areas (2 or more lanes) and C areas	65	60
Special case of space adjacent to road carrying arterial traffic		
Space adjacent to arterial road	70	65

Classification of area	Environmental standards (Leq)	
	Daytime	Nighttime
Areas facing road		
A areas and B areas (1 lane).	65	55
A areas (2 or more lanes).	70	65
B areas (2 or more lanes) and C areas	75	70
Special case of space adjacent to road carrying arterial traffic	75	70

AA area (zone) - Area (zone) that must be particularly quiet
A area (zone) - Area (zone) to be used exclusively for dwellings
B area (zone) - Area (zone) to be used mainly for dwellings
C area (zone) - Area (zone) to be used for purposes of commerce and industry together with a considerable number of dwellings

Fig.4 Illustration of road traffic noise control measures

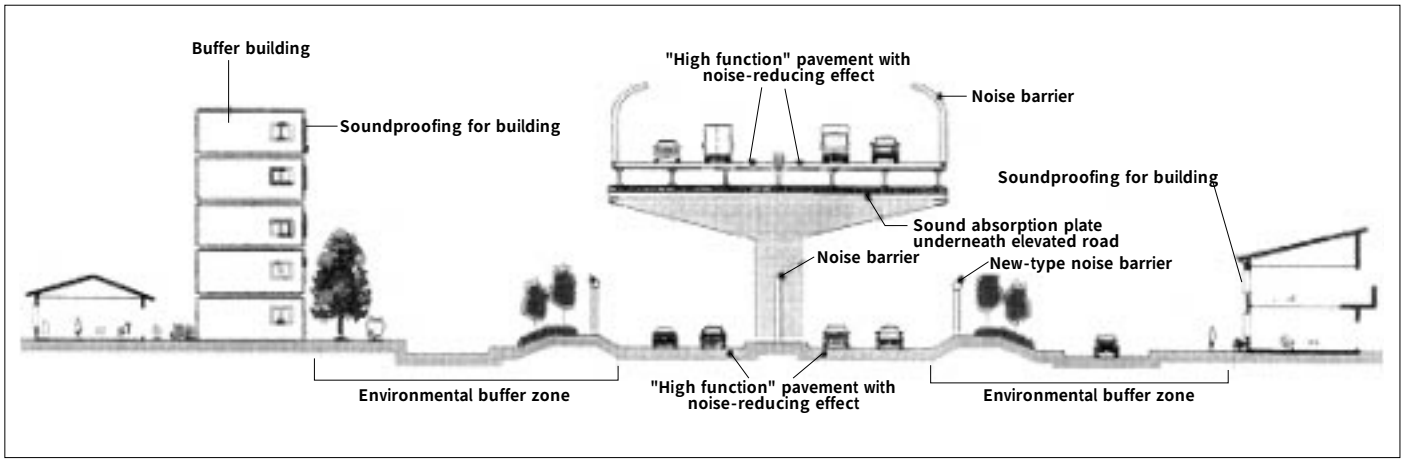
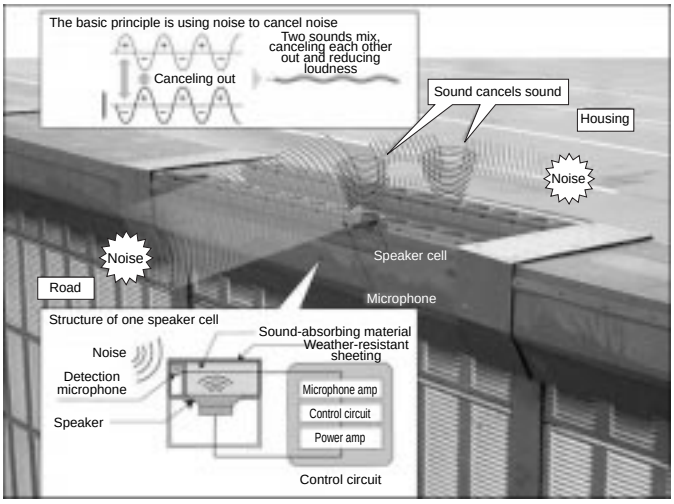


Fig.5 Experimental installation of a new type of noise barrier (active noise control)



Overview of installation:

A new type of speaker-equipped noise barrier that uses the recently developed principle of "sound cancellation" has been installed as an experiment on National Road 43 in Seidocho, Ashiya City, Hyogo Prefecture. The new noise barrier is equipped with microphones to detect external sound, control circuits to reverse the phase of the sound waves, and speakers to generate the control sound. It is installed on top of an existing noise barrier.

Operating principle:

At intervals, the microphone captures the sound of cars passing on Route 43 and sends that signal to the control circuit. The circuit creates a sound with the opposite phase of the highway noise and sends it out from the speakers. Sounds with opposite phases cancel each other out, reducing noise.

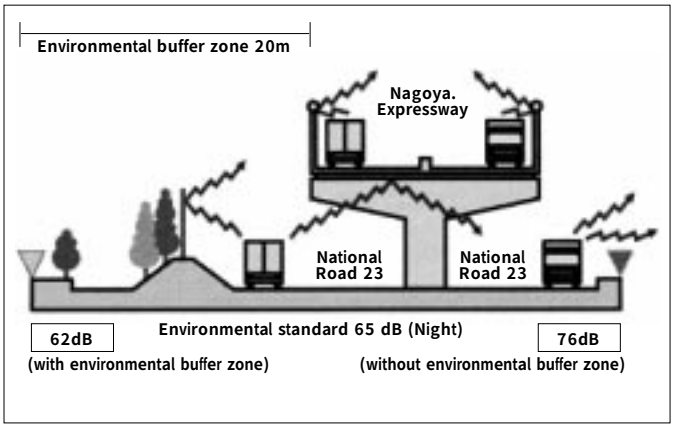
Location of installation:

The noise barrier is installed on a 250-meter stretch of National Road 43 in front of Seido Elementary School in Seidocho, Ashiya City, Hyogo Prefecture. It runs 150 meters along the Tokyo-bound lanes and 100 meters on the opposite side.

Source: http://www.hyogo-wo.go.jp/news/technical/press040209.html

Fig.6 Noise-reducing effect of environmental buffer zone (Example: Minami-ku, Nagoya City)

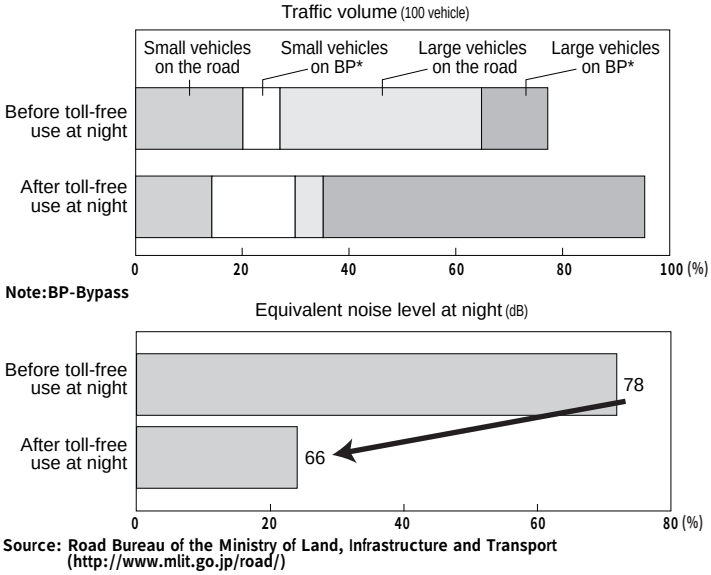
Example of environmental buffer zone installed as a zone between an arterial road and the roadside area for conservation of the roadside environment in an urban area.



Source: Website of the Ministry of Land, Infrastructure and Transport, Nagoya National Highway Office

Fig.7 Environmental improvement by toll-freeing night use of Kakegawa Bypass (Route 1)

The majority of large-vehicle traffic has been diverted to the bypass, because the bypass is toll free at night, and the nighttime noise level on the road through the urban area has now been dramatically improved.



Source: Road Bureau of the Ministry of Land, Infrastructure and Transport (http://www.mlit.go.jp/road/)

3-3 Air Pollution Reduction Measures Today

Associate Professor,
Faculty of Urban Environmental Sciences,
Tokyo Metropolitan University

Hiroyuki Oneyama

Air pollution has been improving since about 1999. In particular, the achievement rate of environmental quality standard for suspended particulate matter (SPM) had been declining, but in 2003 it improved markedly. However, there are still many locations, especially along arterial roads in the Tokyo area, where SPM levels are far above environmental quality standard. It is therefore necessary to undertake multiple measures such as strengthening regulations of automobile exhaust emissions, strengthening fuel regulations, promotion of low-emission vehicles, improving traffic flow, and development of roadside air cleaning technology.

■ The achievement rate of environmental quality standard for nitrogen dioxide (NO_2) has been improving since 1999. The rate had been declining for suspended particulate matter (SPM), but it improved markedly in 2003.

Fig.1 Changes in Achievement Rate of environmental quality standard for nitrogen dioxide (NO_2)

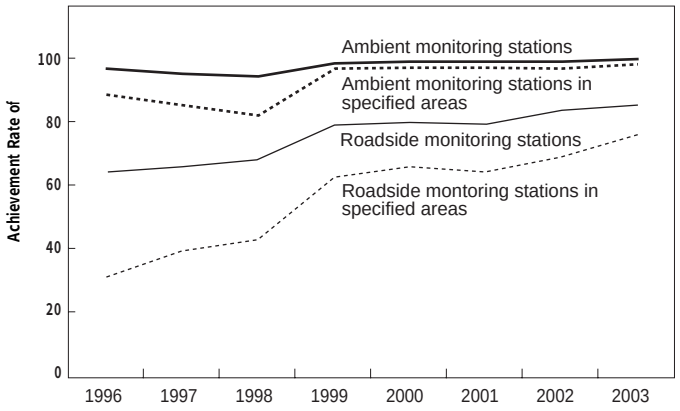
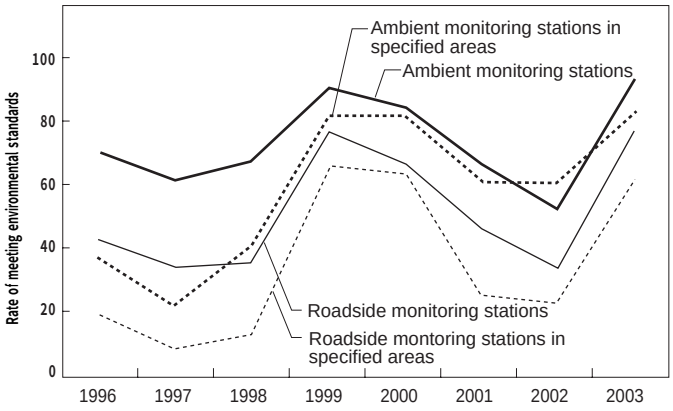


Fig.2 Changes in Achievement Rate of environmental quality standard for suspended particulate matter (SPM)



Source: Prepared based on materials released by the Ministry of the Environment regarding air pollution in FY 2003.
Note: Specified areas are parts of Tokyo, Kanagawa, Saitama, Chiba, Aichi, Mie, Osaka, and Hyogo Prefectures where measures are taken against nitrogen oxides and particulate matter under the Automobile NOx and PM Law.

■ Regulation of diesel vehicles by ordinance was jointly implemented in October 2003 by eight cities and prefectures in the Greater Tokyo area to combat particulate matter (PM).

Table 1 Outline of ordinances adopted in Tokyo and surrounding seven cities and prefectures to reduce exhaust gas emissions from diesel vehicles

Items	Content
Enforcement day	October 1, 2003
Matter subject to emission control	Particulate matter (PM)
Restriction areas	All areas in four prefectures (Tokyo, Kanagawa, Chiba, Saitama) Not including outlying islands
Specific restrictions	Diesel vehicles not achieving PM exhaust emission standards are prohibited from operating
Vehicle types subject to restrictions	Trucks, vans, buses, special purpose vehicles (including freezer cars) *Passenger cars are not covered by restrictions
Grace period	The first seven years following initial vehicle registration
Use of designated emission control devices	Vehicles with PM-reducing devices designated by the Governor are deemed as achieving the regulation under the ordinance
Penalty	A party in charge of operating violating vehicles is prohibited from using the vehicles for its business operation. When a violating party does not obey authorities' order regarding the violation, its name will be disclosed to the public and it will face up to \500,000 in fines

Source: Environmental White Paper 2004 for Tokyo, (revised and corrected)

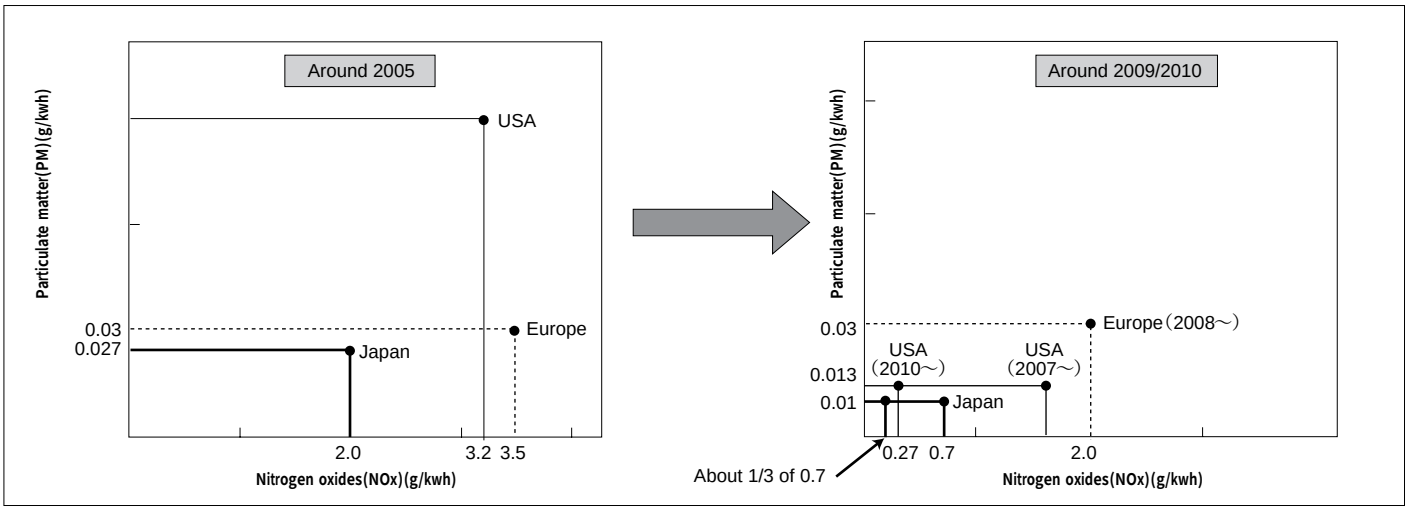
Fig.3 Poster by eight cities and prefectures in the Greater Tokyo area to publicize the start of diesel-emission regulation

Table 2 Measures against automobile-related air pollution

		Concrete measures		
		PM countermeasures	NOx countermeasures	CO_2 countermeasures
Measures to reduce exhaust gas emissions	(1) Low-emission, high fuel economy vehicles	*Support for the introduction of Diesel Particulate Filter (DPF) and oxidation catalysts *Lowering the sulfur content of diesel *Crackdown of illegal diesel oil		*Promotion of the spread of vehicles that achieve energy-conservation standards (taxation, administrative guidance, etc.)
		*Strengthening vehicle exhaust emission standards *Development of low-emission heavy diesel vehicles		
		*Promotion of the adoption of CNG vehicles and other low-emisson automobiles (taxation, early adoption by public agencies, etc.) *Promotion of the establishment of fuel supply facilities for low-emission vehicles *Promotion of practical use of fuel-cell vehicles		
	(2) Controlling traffic demand	*Environmental road pricing *Traffic restrictions		*Road pricing
		*Promotion of park and ride *Improvement of pedestrian and bicycle paths *Improvement of train station plazas *Promotion of staggered commuting and flextime *Improvement of public transportation facilities such as LRT and streetcars *Enhanced provision of information to drivers through promotion of the spread of VICS, etc. *More efficient logistics through freight of joint collection/delivery system, etc. *Promotion of rail and ship transport *Promotion of the "idling stop" movement *Requiring businesses to make detours avoiding sensitive routes		
	(3) Increasing traffic capacity	*Improvement of arterial road networks with ring roads, bypasses, etc. *Bottleneck countermeasures such as grade-seperated intersection, improved rail crossings, etc. *Promotion of the spread of ETC *Reduction of roadwork *Enforcement of illegal parking *Enhancement of traffic safety facilities, etc.		

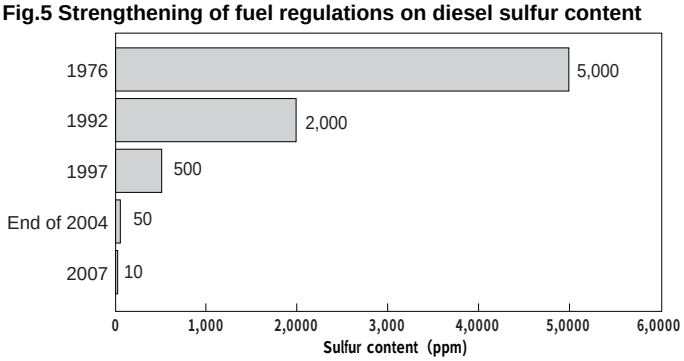
Source: Website of the Road Bureau, the Ministry of Land, Infrastructure, and Transport (http://www.mlit.go.jp/road/sisaku/k2.html)

Fig.4 Comparison of diesel vehicle emission regulations in Japan, USA, and Europe



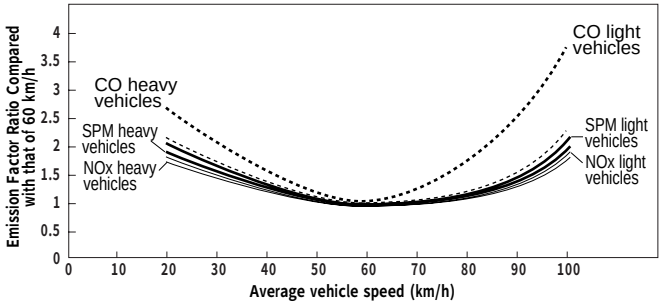
Source: Ministry of the Environment

Fig.5 Strengthening of fuel regulations on diesel sulfur content



Source: "Quality of the Environment in Japan, 2004"

Fig.6 Relation between average vehicle speed and emission factor of air pollutants



3-4 Efforts for Global Warming Prevention

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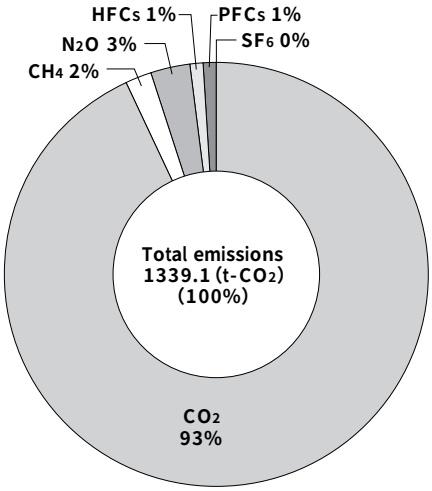
Yasunori Muromachi

The Kyoto Protocol went into effect in February 2005. Japan must earnestly attempt to meet its goals for the reduction of greenhouse gas emissions. Japan set a plan for meeting its goals on emissions cuts under the Protocol in April 2005. They require sharp reduction in the transportation sector as well, but that is still not an easy task.

Fig.1 Emissions of green house gases in Japan (FY 2003)

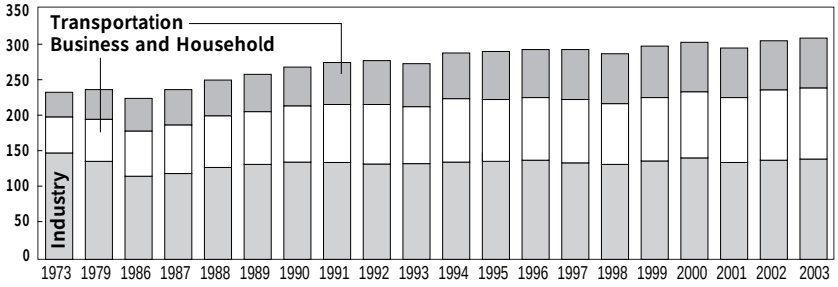
CO_2 comprises about 90% of total emissions.



Source: http://www.env.go.jp/earth/ondanka/ghg/2003ghg.pgf

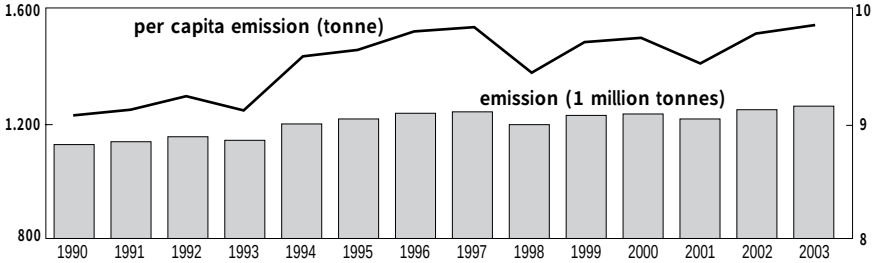
Fig.2 Transition of CO_2 generation by category at final consumption (million tonnes carbon equivalent)

CO_2 generation at final consumption increased 1% in FY 2003.



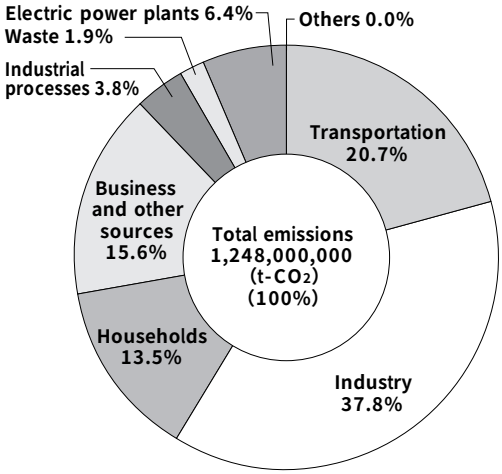
Source: Energy & Economy Handbook, 2005, Energy Conservation Center, Japan

Fig.4 Transition of CO_2 emissions in Japan (t-CO_2)



Source: http://www.env.go.jp/earth/ondanka/ghg/2003ghg.pgf

Fig.3 Itemized CO_2 emissions by category in Japan (FY 2003)



Source:http://www.env.go.jp/earth/ondanka/ghg/2003ghg.pgf

Table 1 Annual change in energy efficiency rate by transport mode-Passenger (KJ/person-kilometer), Freight (KJ/tonne-kilometer)

Passengers	1990	1997	1998	1999	2000	2001	2002	2003	03/90
Railways	423	445	453	441	434	428	433	425	1.00
Buses	650	779	789	813	810	820	807	806	1.24
Passenger motor vehicles	2,376	2,759	2,742	2,827	2,784	2,846	2,837	2,794	1.18
Private trucks	1,351	1,547	1,574	1,611	1,678	1,739	1,764	1,752	1.30
Passenger ships	10,453	18,759	17,115	17,128	18,135	17,342	20,653	19,290	1.85
Air transport	1,625	1,644	1,719	1,628	1,656	1,655	1,644	1,664	1.02
Freight	**1990**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2103**	**03/90**
Railways	471	485	496	505	474	482	484	459	0.98
Motor vehicles	4,269	4,444	4,422	4,340	4,311	4,239	4,196	3,937	0.92
Ships	504	548	549	549	541	542	539	555	1.10
Air	21,675	21,933	22,938	21,705	22,078	22,057	21,914	22,186	1.02

Source: Ministry of Land, Infrastructure and Transport, Transportation-related Energy List, 2005

Table 2 New fuel efficiency targets based on the "Top Runner Method" (introduced by an amendment to the Energy Saving Law)
Targeted standard values for gasoline engine passenger vehicles (FY 2010)

Classification (vehicle weight in kg)	-720	721-827	828-1015	1016-1265	1266-1515	1516-1765	1766-2015	2016-2265	2266-	Average
Targeted standards value (km/l)	21.2	18.8	17.9	16.0	13.0	10.5	8.9	7.8	6.4	15.1
Improvement rate (compared to FY 1995 value: %)	11.0	11.9	14.0	24.0	30.0	23.5	20.3	18.2	12.3	22.8

Targeted standard values for diesel engine passenger vehicles (FY 2005)

Classification (vehicle weight in kg)			-1015	1016-1265	1266-1515	1516-1765	1766-2015	2016-2265	2266-	Average
Targeted standards value (km/l)			18.9	16.2	13.2	11.9	10.8	9.8	8.7	11.6
Improvement rate (compared to FY 1995 value: %)			2.7	10.2	12.8	13.3	17.4	16.7	14.5	14.9

Note 1: Different targeted standard values are set for trucks with a total vehicle weight of 2.5t or less for each type, AT and MT.
Note 2: Top Runner Method: This concept sets the target based on the level of the product with the best energy efficiency or even better.
Note 3: Average: The value assuring the ratio of the number of vehicles shipped being the same as in FY 1995.
Source: Advisory Committee for Energy
http://www.eccj.or.jp/toprunner/interim/iscar00j.html

Table 3 Overview of Japan's plan for meeting emission-reduction goals under the Kyoto Protocol (10,000 t-CO_2)

Measure	guideline (1998)	guideline (2002)	guideline (2005)	Overview (parentheses show numerical premises; figures are breakdowns of reduction volume)
Vehicle technology in total	**1,797**	**2,020**	**2,750**	
-Improved automobile fuel through Top Runner standards	1,283	1,390	2,100	*Gasoline 2059, diesel 18, LPG 23
(Additional technological measures for motor vehicles)		260		
-Promoting the use of clean-energy motor vehicles	330	220	300	*Hybrid vehicles, etc. (2.33 million) 300
-Adoption of sulfur-free fuel and vehicles that run on it			120	*Sulfur-free vehicles (gasoline 8%, diesel 100%) 120
-Improvement of energy efficiency for railways & aircrafts	147	150	230	*Railways 40, aviation 190
(Improvement of consumption for ships)	37			
Development of efficient logistics in total	**917**	**910**	**1,260**	
-Modal shift to railway transportation	110	150	90	*Modal shift to rail transport 3.2 billion tonne-kilometers, about 8% of the truck unit load) 90
(Increased convenience of railways by reinforcing capacity)		30		
-Comprehensive measures on environmentally friendly marine transportation		260	140	*Shift from trucks to ships (5.4 billion tonne-kilometers, about 13% of the truck unit load) 140
-Reduction of land transport distance of international cargos	147	180	270	*Reduction of land shipping distances for international cargo 270
-Increase in efficiency of truck transportation	477	290	760	*Increased vehicle size 370, commercial/private truck conversion 300, Increased load ratios 90
(development of larger vehicles, etc.)	183			
Other measures in total	**2,053**	**1,600**	**1,480**	
-Promotion of public transportation	587	520	380	*Promotion of use of public transportation 290 *Commuter travel management (approx. 10% conversion) 85
-Transportation Demand Management	37	70	30	*Necessary extensions of bike paths to meet goals (about 30,000 km) 30
-Promotion of intelligent transportation systems (ITS)	403	370		
ETC・VICS			260	*ETC 20, VICS 240
Central control of traffic signals			100	*Centralized control of traffic signals (about 40,000) 100
Leveling up of traffic signals	73	70	50	*Upgraded traffic signals (about 20,000) 50
-Reduction in road works	37	40	50	*Reduction of congestion through decreased roadwork 50
(Measures to control stopping and parking on street)		—		
(construction of parking facilities)	—			
-Promotion of the alternatives to transport by information technology such as teleworking, etc.	403	340	340	*Alternatives to commuting for the entire telecommuting population (25% of those employed, about 16.3 million people) 117, alternatives to work movement 223
-Restriction of top speed of trucks on expressways		80	80	*Reduced fuel consumption (about 13%) 80
-Promotion of use of environmentally friendly vehicles				*Adoption of "idling stop" vehicles (5-10% improvement in fuel economy) 60
Support for adoption of "idling stop" vehicles		110	60	
Making automobile transport businesses more environmentally friendly through promotion of "eco driving," etc.	513		130	*Adoption of equipment related to "eco-driving" (15% reduction) 123 *Adoption of advanced GPS-AVM systems (approx. 1-km reduction of delivery distances) 4
Total	**4,766**	**4,530**	**5,490**	

Note: Measures are summarized where appropriate. Parentheses indicate items that are not directly covered by a plan category or that are summarized in another category.
Source:http://www.env.go.jp/press/

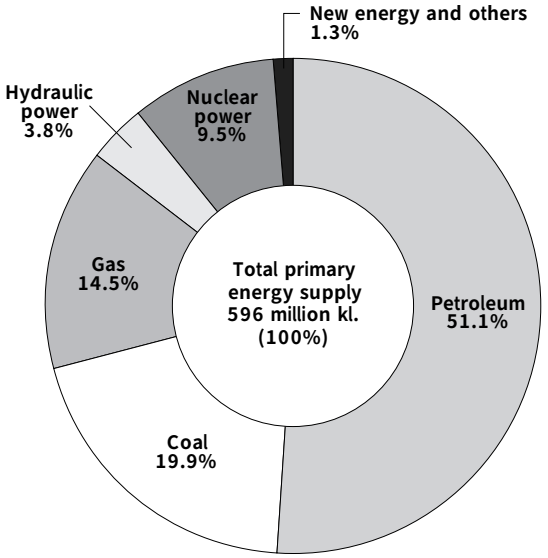
3-5 Improving Energy Efficiency

General Manager, Research 2 Department,
the Energy Conservation Center, Japan
Masaaki Taniguchi

Most modes of transportation are highly dependent on petroleum as their energy source: therefore improvements in the energy efficiency of each transport mode, particularly for motor vehicles, has become an important theme from the viewpoints of both energy security and the prevention of global warming. Improvement in fuel efficiency for all motor vehicles has been progressing steadily, and the effects of this are starting to appear. On the other hand, together with improvements in the road running environment, much attention has been focused recently on improvements in driving styles. It is already known that energy-efficient driving is effective, and the following task is to make drivers aware of, and knowledgeable about, the way of energy-efficient driving.

Fig.1 Primary energy supply in Japan (FY 2003)

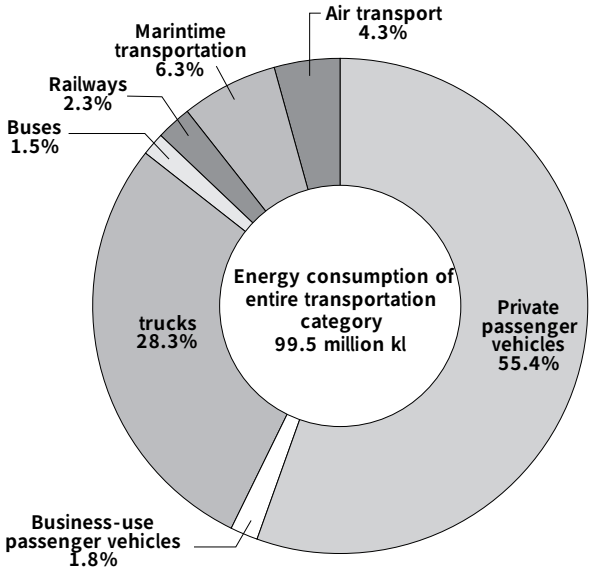
Petroleum is the source of more than half of Japan's energy supplies. Almost all modes of transportation in Japan use petroleum as their energy source.



Note: Values have been converted to crude oil equivalents
Source: Prepared from "Energy & Economy Statistics Handbook 2005" Energy Conservation Center, Japan

Fig. 2 Energy consumption of different modes of transportation (FY 2003)

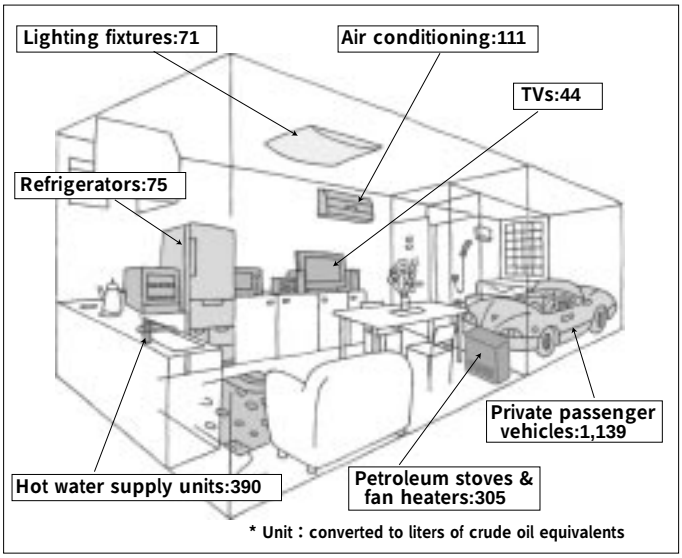
87% of energy used is consumed in areas related to motor vehicles. Reduction of energy consumption in these areas remains to be achieved.



Note: Values have been converted to crude oil equivalents
Source: Prepared from "Energy & Economy Statistics Handbook 2005" Energy Conservation Center, Japan

Fig.3 Annual energy consumption per household (FY 2001)

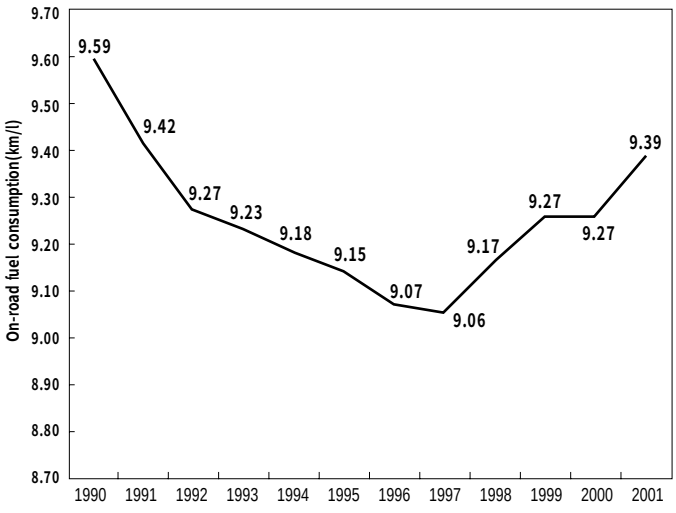
More than half of the energy (2,135 kl) used by each ordinary household is consumed by motor vehicles.



Source: Agency of Natural Resources and Energy "Future Energy saving Measures" (March 2003)

Fig.4 Transition in on-road fuel consumption figures for private gasoline-engine passenger vehicles

On-road fuel consumption figures have been gradually improving since 1997.



Source: Energy-saving Committee, Comprehensive Natural Resources & Energy Research Council (February 24, 2004)

Fig.5 Encouraging and educating drivers for energy-saving driving

Four ministries and agencies have been cooperating in encouraging energy- saving driving with "Eco Drive Declaration" stickers.

" Eco Drive 10 "advice

1. No unnecessary idling ("idling stop")
2. No unnecessary no-load engine revving
3. No haste starts or haste acceleration
4. Make every effort to drive your motor vehicle safely and at low speeds according to the traffic conditions
5. Change to a higher gear as soon as possible
6. Use engine braking for deceleration whenever possible
7. Carry out careful inspection and maintenance of motor vehicles (tire pressure, air filter elements, etc.)
8. Do not carry unnecessary things around in your vehicle Do not fill the fuel tank completely full (Fill with enough fuel for the distance you are traveling, to avoid running out of fuel)
9. Only use the air-conditioning unit when necessary
10. Plan your journey well

National Police Agency, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure and Transport, Ministry of the Environment

Source: Eco Drive Declaration Sticker (fiscal 2003)

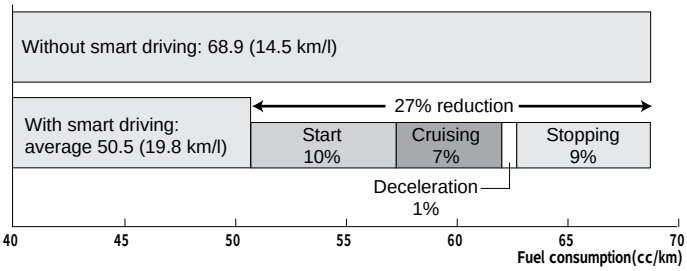
Fig.6 A Japan Automobile Federation (JAF) Clinic on energy-saving driving

Clinics for the general motorist on saving energy were held.

Source: JAF materials

Fig.7 The fuel economy effect of energy-saving driving

Motorists practice energy-saving driving (smart driving) on a course that runs almost 60 km long around Tokyo. They reduce fuel consumption by more than 20%.



Source: The Energy Conservation Center, Japan, "Smart Driving Contest Results (2004)"

Fig.8 Increase in air resistance

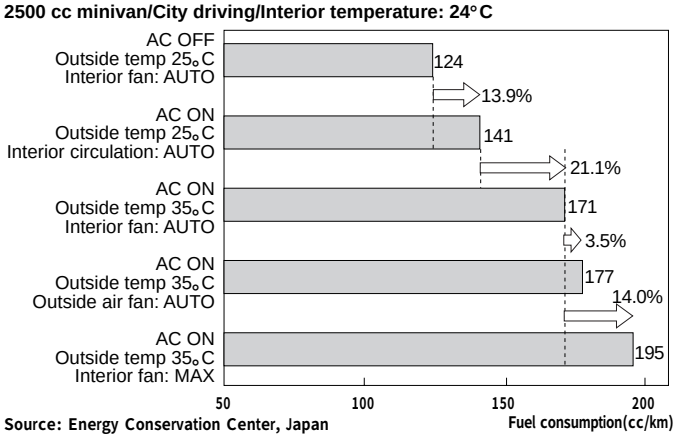
When the air resistance increases by 10%, the fuel consumption deteriorates by 5.5% (when the motor vehicle is running at a speed of 75 km/h).

Measuring conditions	Air resistance (%)
Standards	0.0
Ski rack attached	40.8
Four sets of skis on the rack	46.6
Roof box attached	25.5
Driver's window fully open	2.5
All windows fully open	10.6

Source: Energy Conservation Center, Japan

Fig.9 The influence of air conditioner use on fuel consumption

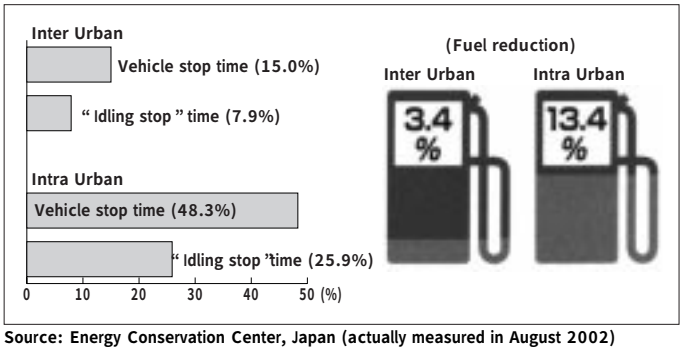
Fuel consumption increases by 14%when the air conditioner is on in warm spring and summer weather (city driving).



Source: Energy Conservation Center, Japan

Fig.10 Effect of idling stop while waiting for the signal to change

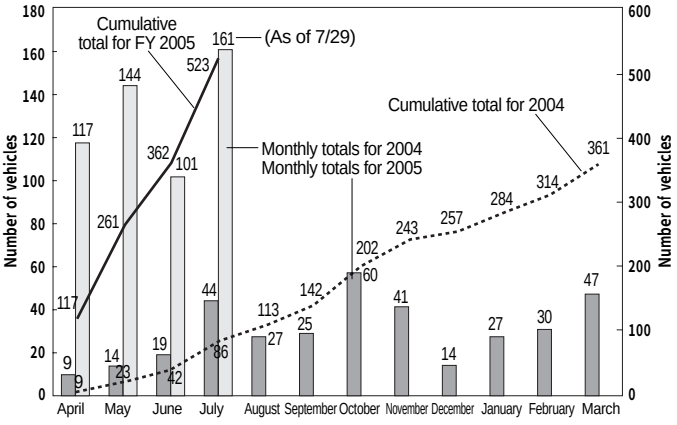
Results of driving a motor vehicle through Japan (National highway 3,700 km).



Source: Energy Conservation Center, Japan (actually measured in August 2002)

Fig.11 Applications for subsidy for the purchase of "idling stop" vehicles

The system provides a subsidy of a maximum of 50% of the difference between the price of the motor vehicle when purchased with idling stop and the price of the basic motor vehicle.



Source: Energy Conservation Center, Japan

3-6 Environmentally Friendly Institutional Measures

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

Yasunori Muromachi

The adoption of environmentally friendly institutional measures, such as considering the environment in cost-benefit analyses when investing social capital, has become an international practice. With Japan having passed the Landscape Law in 2004, environmental impact assessment for landscape in road projects is becoming more important.

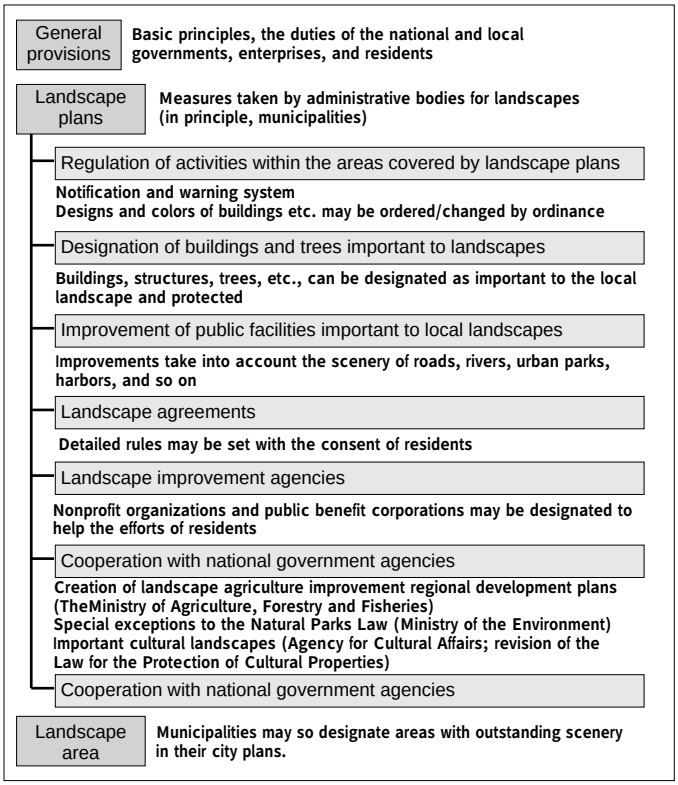
Fig.1 Consideration of landscape in road projects

Stages of environmental impact assessment

(1) Survey: Ascertain the status of each important view point, scenery resource, and landscape view
(2) Forecast: Use methods of visual expression such as photo montages and computer graphics to ascertain the degree of change that would take place in landscape views
(3) Examine environmental protection mechanisms: If necessary based on the results of forecasting, examine mechanisms to protect the environment
(4) Assess: Based on the results of the forecast and examination of environmental conservation mechanisms, assess whether the enterprise is doing everything possible to avoid and reduce the impact of the road's existence on the landscape

Source: Eiji Takahata, "Landscapes in environmental impact assessments of road projects," Douro, no. 2, pp. 25-28, 2005, etc

The Landscape Law system



Sources: Landscape Law Study Group, the Landscape Law, Gyousei, 2004

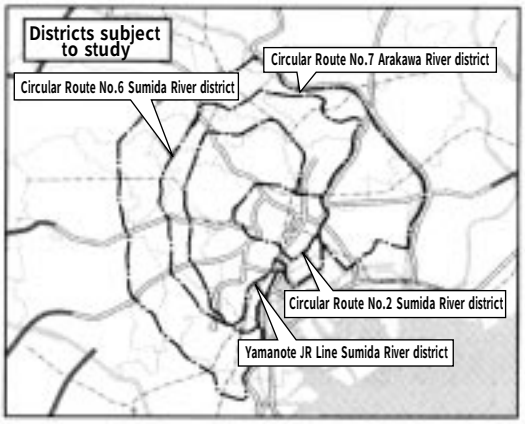
Table 1 Assessment items in various European countries (environmental impact only)

	AUS	BEL road	DEN road	FIN	FRS	GER	GRE road	IRL	ITA	NRL	POR	SPA	SWE road	UK road
Noise	M	M					M	*		M				
Vibration		M		*				*						
Local air	M	M					M	*		M		*		
Global air	M	M					M		*					
Separation	M			*						*		*		
Visual impairment				*			M			*				
Loss of important sites		M		*	*		*	*		*	*			
Resource consumption							M			*				
Scenery	M			*		*	*	*		*			*	
Soil pollution Water quality degradation	M						M			*				

Note: Darkly shaded cells indicate the items included in cost-benefit analysis (monetary analysis), Lightly shaded cells indicate quantitative analysis. * indicates qualitative analysis, and M indicates multi-criteria analysis.
Source: Grant-Muller.S.M.et al,Economic appraisal of European transport projects:the state of the art revisited,Transport Reviews,Vol.21,No.2,pp.237-261.2001

Fig.2 Tokyo Metropolitan Government studying introduction of "road pricing" (Tokyo Metropolitan Government Road Pricing Study Committee)

Districts subject to study



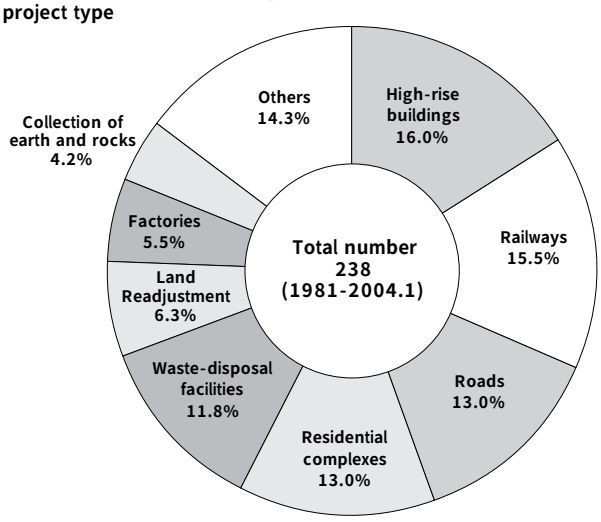
Simulation Results of 4 alternative districts

District/Areas	Circular Route No.2 Sumida River district	Yamanote JR Line Sumida River district	Circular Route No.6 Sumida River district	Circular Route No.7 Arakawa River district
Amount of NOx reduction (tons/year)	150	300	330	400
Amount of traffic flow reduction (units of 10,000 vehicle-km/12 hours)	54	121	155	196
Increase in average driving speed (km/hour)	0.8	1.6	1.8	1.9
(within districts subject to study) (km/hour)	(4.6)	(3.2)	(3.2)	(2.2)

Sources: Environment in Tokyo 2004, compiled by the Tokyo Metropolitan Government Environment

Fig.3 Introduction of strategic environmental impact assessment at the Tokyo Metropolitan Government

Number of environmental impact assessments made for each project type



Total number of assessments:238 cases

Introduction of strategic environmental impact assessment at the Tokyo Metropolitan Government.
Based on an ordinance, the Tokyo Metropolitan Government introduced a system intended to assess the environmental impacts of certain projects from the planning stage, the first of its kind in Japan. Large-scale projects sponsored by the Tokyo Metropolitan Government became subject to such assessments from January 2003. The system is intended to have the Tokyo government reflect the assessment's findings in its project planning.
Under the system, for a certain large-scale public works project in Tokyo it obligated to draw up several alternative plans for the project so that possible environmental impacts can be thoroughly examined by comparing the results of environmental impact assessment among alternative plans.

1.Projects subject to strategic environmental impact assessment
  1) Individual projects (Projects that are twice the scale of those subject to environmental impact assessment are covered by strategic environmental impact assessment)
  2) Regional complex development projects (30 hectare or more)
2.The project's environmental impacts are assessed by comparing several alternative plans at an early planning stage of the project
3.The party which manages the new strategic environmental impact assessment system: Tokyo Metropolitan Government

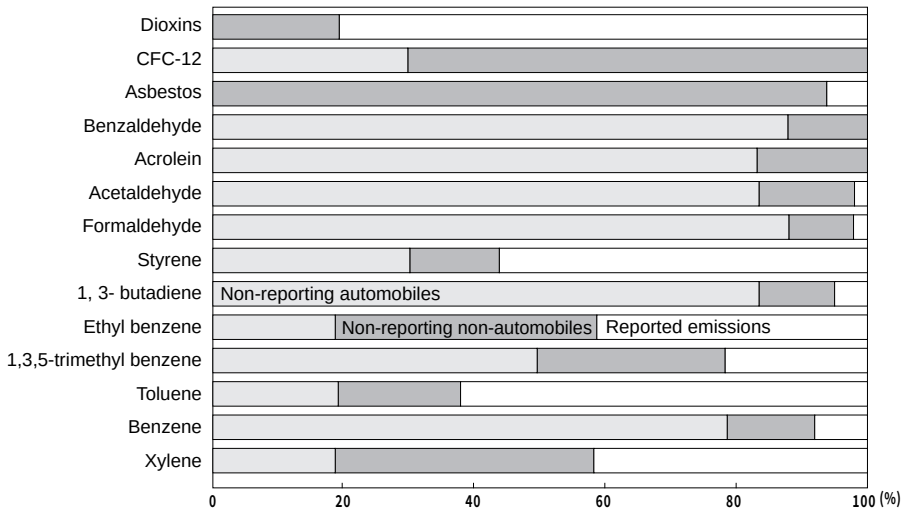
Sources: 2004 White Paper on Environment in Tokyo, compiled by the Tokyo Metropolitan Government

Fig.4 Introduction of PRTR (Pollutant Release and Transfer Register)

Definition of PRTR

PRTR is a system designed to collect, compile and publicize data concerning harmful chemical products-the origins of such chemicals, and how much of them was emitted into the environment or brought outside the plant as waste. Business establishments that manufacture chemicals subject to the register system or use them for manufacturing of secondary products are supposed to maintain data on the amount of such chemicals emitted into the environment or brought outside the plant as waste. Such establishments are obligated to present the data to government agencies once every year. A government agency which has received the data compiles it for disclosure to the public. The agency also collects and compiles data on designated chemicals emitted from households, farmland and automobiles for disclosure to the public.

Estimated amount of designated chemical emissions (2003)



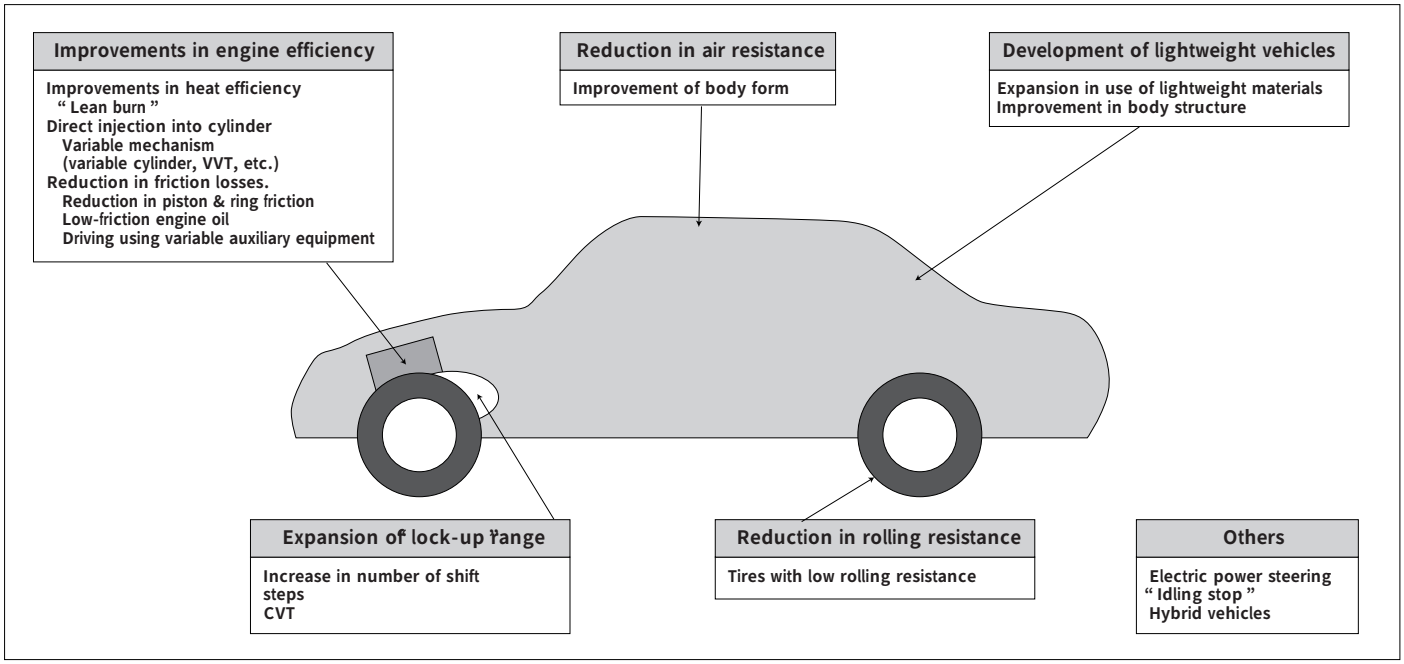
Sources: http://www.env.go.jp/chemi/prtr/risko.html

3-7 Development and Promotion of Environmentally Friendly Vehicles

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

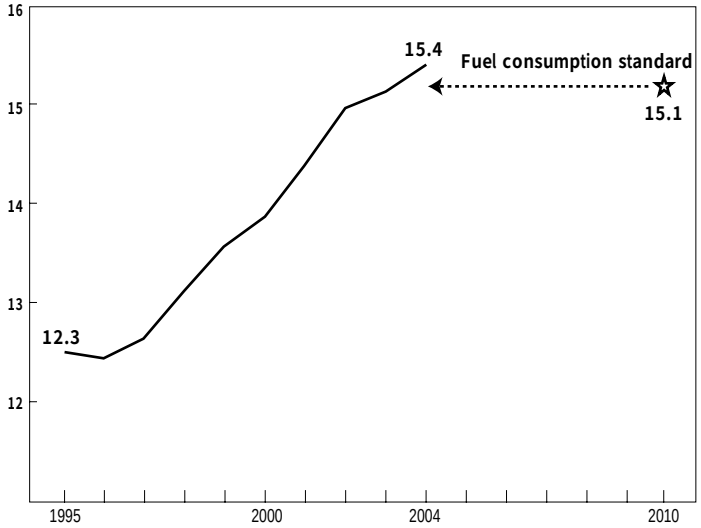
To prevent global warming, automobile manufacturers have introduced various technologies to improve fuel consumption, and have achieved 2010 fuel consumption standards stipulated by the law (Energy Conservation Law) ahead of time. Also, the number of models on the market that meet the fuel consumption standards and low-emission gasoline-powered motor vehicles has been increasing due to the synergistic effect of the "Green Taxation System." For heavy vehicles as well, manufacturers are introducing a succession of vehicles with ultra-low particulate matter emissions, vehicles complying with new long-term regulations, and other "green diesel" vehicles. Development and spread of clean-energy autos and fuel-cell vehicles are also progressing.

Fig.1 Technology to improve motor vehicle fuel consumption



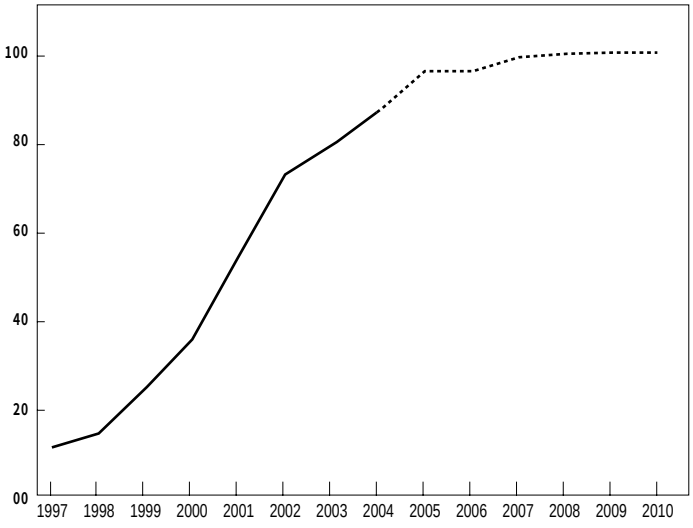
Source: Japan Automobile Manufacturers Association, Inc.

Fig.2 Transition in the average fuel consumption for gasoline-engine passenger vehicles (*Sales, 10-15 mode)



Source: Japan Automobile Manufacturers Association, Inc.

Fig.3 Transition in the average fuel consumption for gasoline-engine vehicles



Source: Japan Automobile Manufacturers Association, Inc.

Fig.4 Plan to introduce motor vehicles authorized as low emission motor vehicles

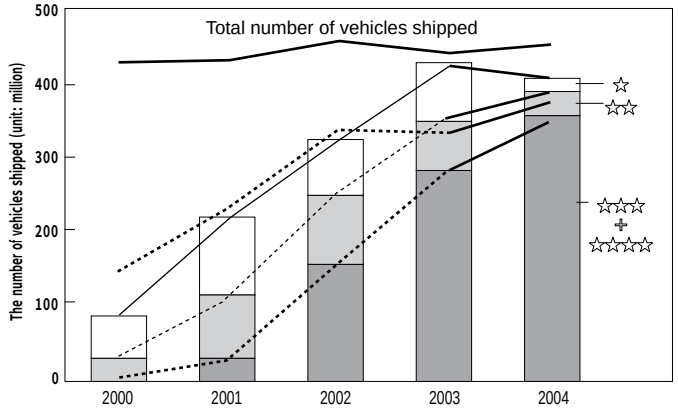


Table 1 Taxation system to accelerate spread in FY 2004 and 2005

Motor vehicle acquisition tax

	☆☆☆	☆☆☆☆
2010 fuel consumption standard + 5%	\200,000 deduction	\300,000 deduction
2010 fuel consumption standard		\200,000 deduction

* When there is a discount of \300,000 on the purchase price of a \2 million motor vehicle, the acquisition tax will be reduced by \15,000.

Motor vehicle tax

	☆☆☆	☆☆☆☆
2010 fuel consumption standard + 5%	25% reduction in tax	50% reduction in tax
2010 fuel consumption standard		25% reduction in tax

Note: 2010 fuel consumption standard: improved by 22.8% over fiscal 1995
☆☆☆☆: 75% of 2005 regulatory value
☆☆☆: 50% of 2005 regulatory value

Fig.5 Examples of environmental improvement efforts and systems for heavy vehicles

- Companies started to sell ultra-low-PM motor vehicles with DPF (compatible with the new short-term regulations)
- Started to sell hybrid motor Vehicles + DPF (comparison with new short-term regulations NOx-50%, PM-85%))
- Sales of DPNR (DPF + NSR catalyst) equivalent to ULEV (NOx-75% PM-85%) satisfying the new short-term regulation which specifies 10ppm. (authorized by the Minister)
- Motor vehicles using urea SCR catalyst which are compatible with the new long-term regulations, are expected to go on sale within this year.

DPNR Diesel Particulate-NOx Reduction system

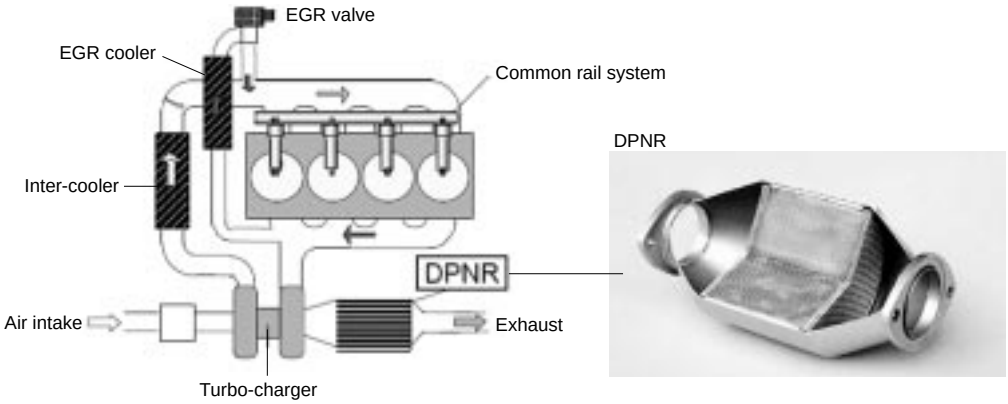
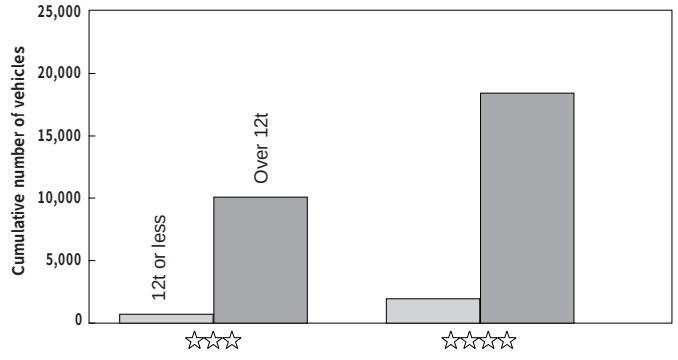
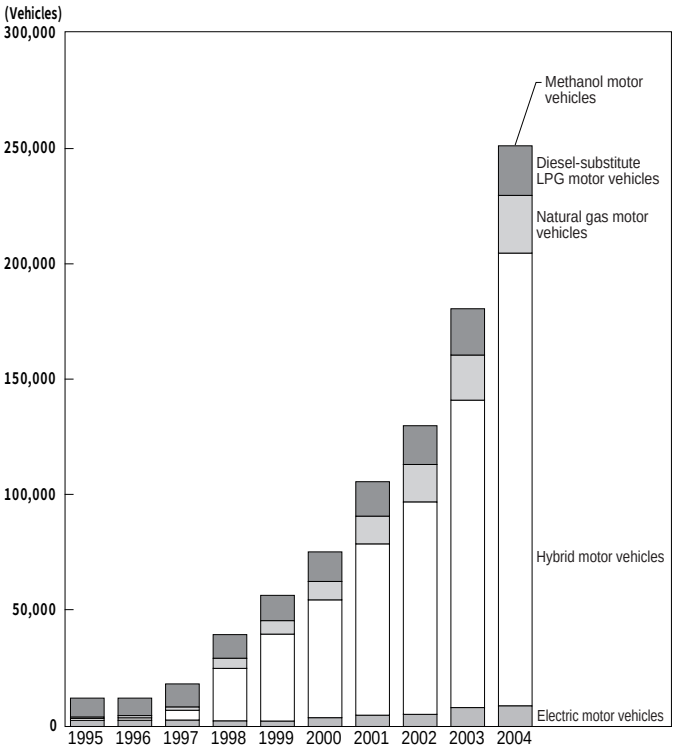


Fig.6 Actual record of introduction of "Ultra-Low-PM" motor vehicles



Actual record of shipments of" ultra-low-PM "motor vehicles
(as of the end of February 2004)

Fig.7 Changes in numbers of clean-energy motor vehicles in use



Source: Japan Automobile Manufacturers Association

Table 2 Changes in numbers of models of clean-energy motor vehicles sold

	2000	2001	2002	2003	2004
Hybrid motor vehicles	7	8	11	18	15
Natural gas motor vehicles	64	93	109	134	93
Diesel-substitute LPG motor vehicles	24	38	46	48	30
Electric motor vehicles	8	6	7	3	2
Fuel cell motor vehicles	0	0	0	3	3
Total	103	145	173	206	143

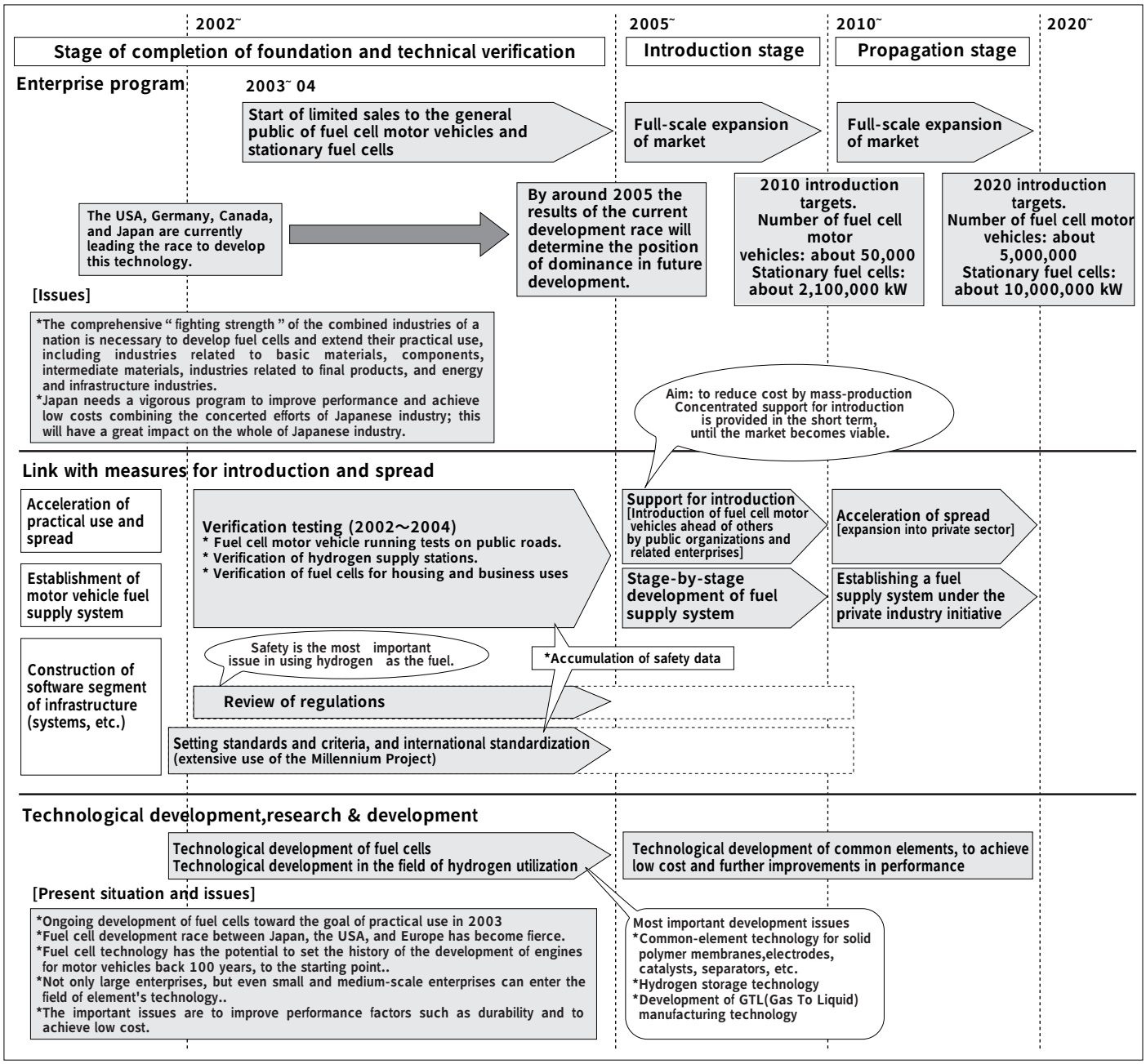
Source:Japan Automobile Manufacturers' Association (JAMA) (from:Clean Energy Vehicle Guidebook)

Table 3 Major fuel cell vehicles and their distinctive features

Manufacturer	Date announced	Vehicle name	Motor output	Fuel cell output	Maximum speed	Cruising distance	Fuel
Toyota	December 2002	Toyota FCHV	80kW	90kW	155km/h	300km	Hydrogen・high pressure 35MPa
Toyota・Hino	September 2002	FCHV-BUS	100kW	90kW×2	80km/h	—	Hydrogen・high pressure 35MPa
Nissan	December 2003	X-TRAIL-FCV	85kW	63kW	145km/h	350km	Hydrogen・high pressure 35MPa
Honda	December 2002	Honda FCX	60kW	78kW	150km/h	355km	Hydrogen・high pressure 35MPa
Mitsubishi	September 2003	MITSUBISHI FCV	65kW	68kW	140km/h	150km	Hydrogen・high pressure 35MPa
Suzuki	October 2003	wagonR-FCV	33kW	50kW	110km/h	130km	Hydrogen・high pressure 35MPa
Daihatsu	January 2003	MOVE FCV-K II	32kW	30kW	105km/h	120km	Hydrogen・high pressure 25MPa
GM	October 2001	HydroGen3	60kW	129kW	160km/h	400km	Hydrogen・high pressure 35MPa
DC	March 2003※	F-Cell	60kW	20kW	140km/h	150km	Hydrogen・high pressure 35MPa

※After obtaining ministerial authorization
Sources: JHFC public relations data, company's web sites

Fig.8 Scenario for the introduction of solid molecule type fuel cell/hydrogen energy



Source: Fuel Cell Project Team Report