

Traffic Safety Measures in Japan

**Regional Road and Environment Division
Road Bureau
Ministry of Land, Infrastructure and Transport
Japan**

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1 .Traffic Safety Measures Until Now

Transition of Road Traffic Accidents

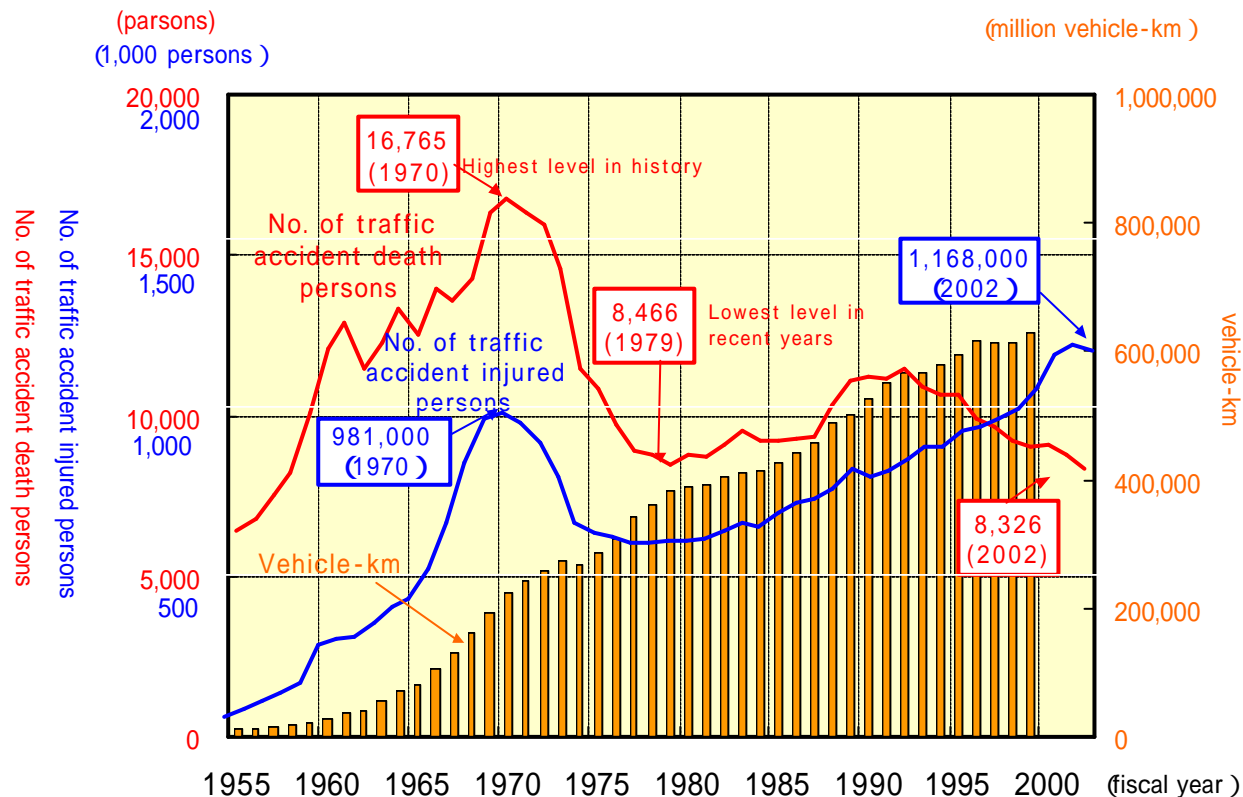
History of Traffic Safety Measures

Examples of Traffic Safety Measures

Effect of Traffic Safety Measures

Transition of Road Traffic Accidents (1)

- Until 1970, the annual number of traffic accident death persons in Japan continued to increase with the progress of motorization.
- Since 1970, the annual number of traffic accident death persons has been decreasing substantially thanks to a variety of traffic safety measures.
- Since around 1980, the annual number of traffic accident injured persons has been increasing, and it is seen as a new social issue.



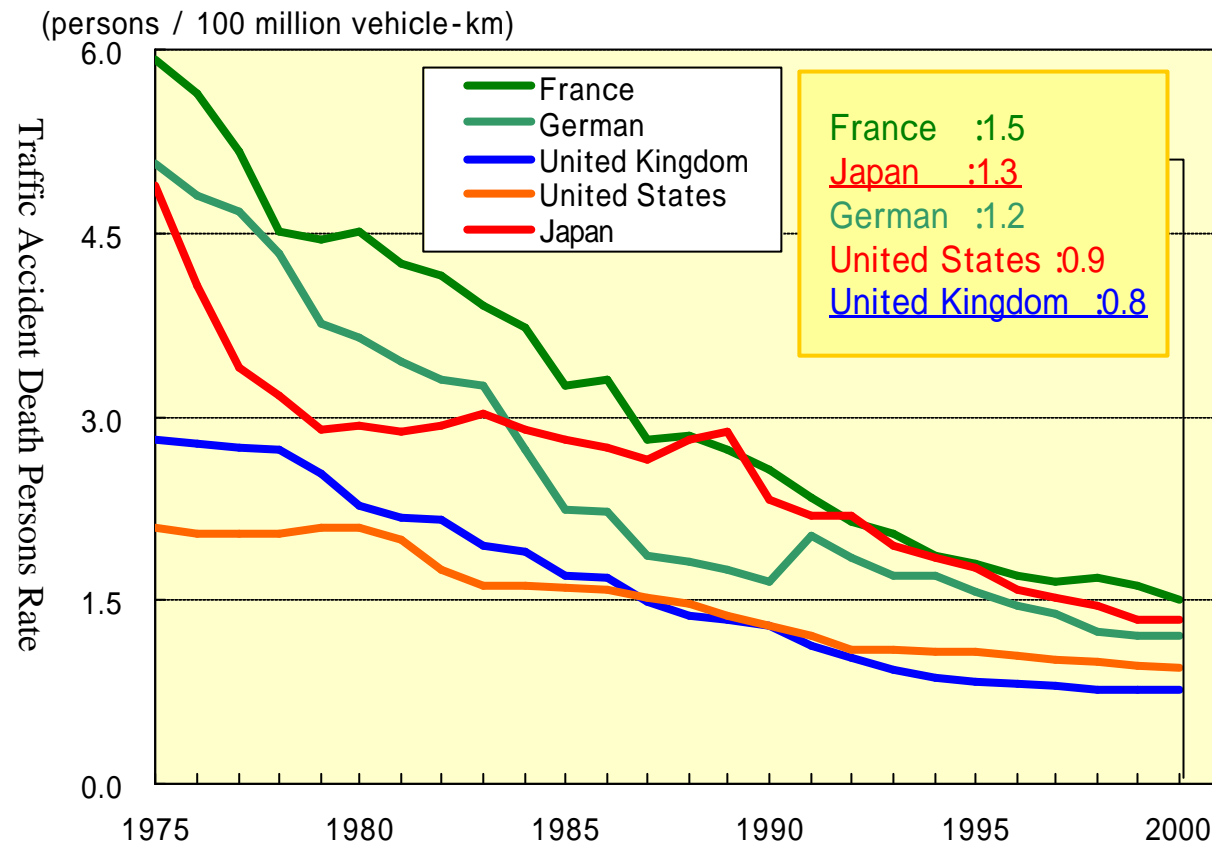
Source : No. of traffic accident death and injured persons by 2001 is from Traffic Statistics (National Police Agency)
 No. of traffic accident death and injured persons in 2002 is from Situation of Traffic Accident in 2002

(National Police Agency Website)

Vehicle-km is from Annual Statistical Reports of Roads]

Transition of Road Traffic Accidents (2)

- The rate of traffic accident death persons in Japan is high from an international point of view. The rate is 1.5 times as high as the United Kingdom.



Note: Traffic accident death rate= No. of traffic accident death/ million Vehicle-km

Source : International Road Traffic Accident Database (IRTAD)]

■ History of Traffic Safety Measures(1)

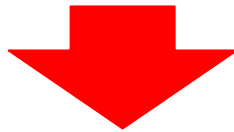
□ 1960's

- In the 1960s, because of unbalance between automobile traffic and road construction, traffic accidents increased and caused a social issue.

Road construction was unable to catch up with the rapid increase in automobile traffic in the 1960s



The sharp increase in traffic accidents became a matter of public concern.



Full-scale urgent measures to prevent traffic accidents were implemented by the government

- No. of automobiles owned
920,000 vehicles in 1960
18,160,000 vehicles in 1970 (20 times)
- Total road extension
940,000km in 1960
1,020,000 km in 1970 (1.1 time)

- No. of traffic accident death persons
6,379 persons in 1960
16,765 persons in 1970 (2.6 times)
- No. of traffic accident injured persons
76,000 persons in 1960
981,000 persons in 1970 (12.9 times)

- 1966: "Emergency Measures Law on Provision of Traffic Safety Facilities, Etc." enacted
- 1970: "Basic Law on Traffic Safety Measures" enacted

■ History of Traffic Safety Measures(2)

□ After 1970's

- In 1970, the Japanese government began to make full-scale efforts to improve traffic safety. As a result, the number of traffic accident death persons showed a substantial decrease.

Systematic development of trunk road network as drastic measures

+

Positive promotion of development of traffic safety measures etc. to secure safety of pedestrians, etc. and to prevent vehicle accidents



No. of traffic accident death persons decreased to a half of those in peak years

Drastic traffic safety measures, such as improvement of expressways, bypasses and beltways were taken

Improved safer road networks

Cooperation between road administrators and public safety committees led to:

- Safety measures for pedestrians, etc.

- Sidewalks, shared pedestrian and bicycle tracks, pedestrian overpasses and underpasses

- Accident prevention measures for vehicles

- Median strips, protective fencing for vehicles

Establishment of Urgent Measures for Black Spots and Community Zone Creation Project

The number of traffic accident death persons decreased to a half of 1970

16,765 persons in 1970

8,326 persons in 2002

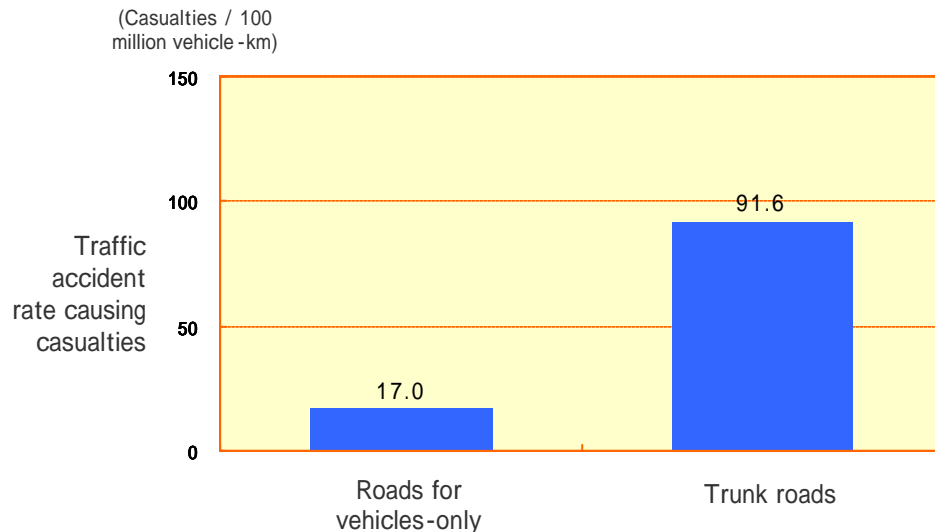
History of Traffic Safety Measures(3)

Effect of Systematic Development of Trunk Road Network

- A road for vehicles-only is safe because of separating vehicles from pedestrians and bicycle riders and eliminating traffic lights with the crossings.
- Traffic accident rate causing casualties shows remarkable reduction because of promoting a road for vehicles-only based on the road development long term plan for 12 periods.

< Traffic Accident Rate Causing Casualties on Roads for Vehicles-only and Trunk Roads (1999) >

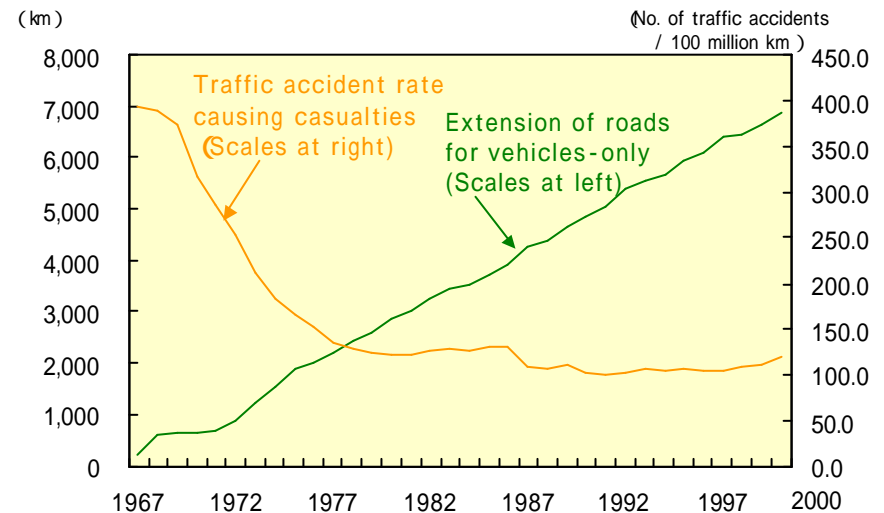
High standard roads tend to show lower traffic accident rate causing casualties.



Note: Traffic accident rate causing casualties=
 No. of traffic accident casualties / million Vehicle-km
 [Source: Ministry of Land, Infrastructure and Transport]

< Promotion of Roads for Vehicles-only and Reduction of Traffic Accident Rate Causing Casualties >

Traffic accident rate causing casualties shows remarkable reduction by promoting roads for vehicles-only.



Note1: Roads for vehicles-only is intended as National Highways

Note2: Traffic accident rate causing casualties=
 No. of traffic accident casualties / million Vehicle-km

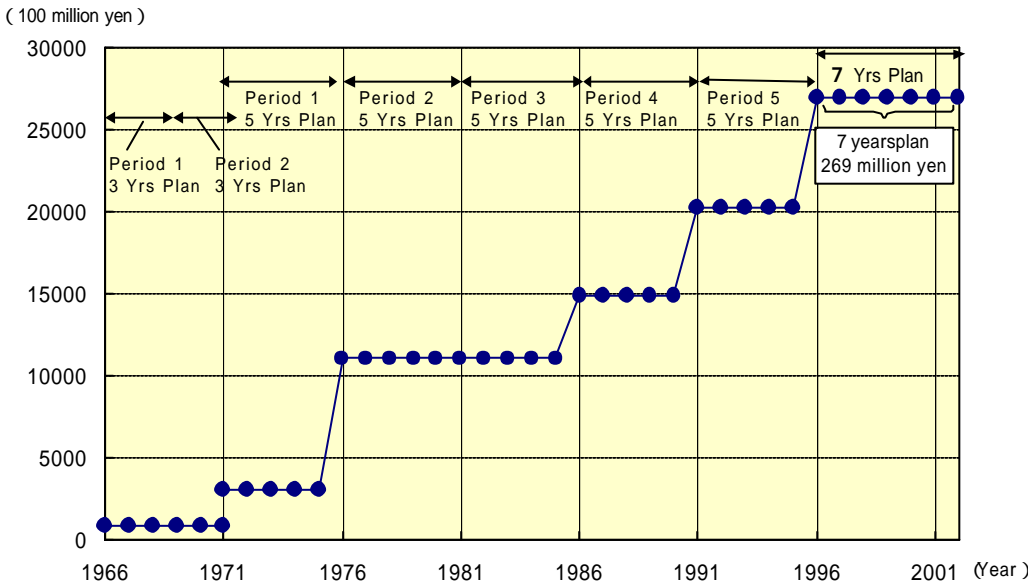
[Source : No. of traffic accidents causing casualties and vehicle-km is from Traffic Statistics (National Police Agency)
 Extension of roads for vehicles-only is from Annual Statistical Reports of Roads]

History of Traffic Safety Measures(4)

Effect of Traffic Safety Facilities Development on Existing Roads

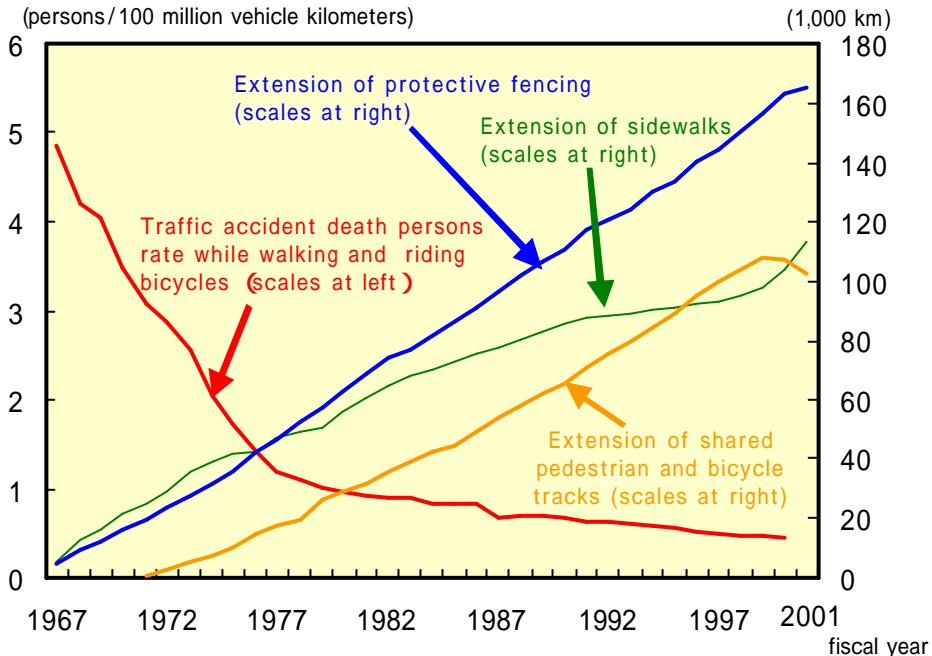
- A long term plan for 8 periods was settled based on “ Emergency Measures Law on Provision of Traffic Safety Facilities” enacted in 1966. Traffic Safety Facilities, especially for sidewalks, have been developed actively.
- As a result, the traffic accident death rate while walking and riding bicycles has shown remarkable reduction.

< Period and Investment Fee of 5 Year Plans for Traffic Safety Facilities Developments >



[Source : Road Administration]

< Progress of Traffic Safety Facilities Development and Reduction of Traffic accident death Rate >



Note 1: Extension of shared pedestrian and bicycle tracks in 2001 decreased because of adjustment of administrative ledger.
 Note 2: Traffic accident death rate while walking and riding bicycles=
 No. of traffic accident death while walking and riding bicycles / million Vehicle-km

[Source : Traffic Statistics (National Police Agency)]

■ Examples of traffic safety measures (1)

□ Examples of traffic safety measures for pedestrians (1)

● Sidewalks



- Examples of traffic safety measures (2)
 - Examples of traffic safety measures for pedestrians (2)
 - Shared pedestrian and bicycle tracks



■ Examples of traffic safety measures (3)

□ Examples of traffic safety measures for pedestrians (3)

● Pedestrian overpass or underpass road crossings



■ Examples of traffic safety measures(4)

□ Examples of vehicle accident prevention measures

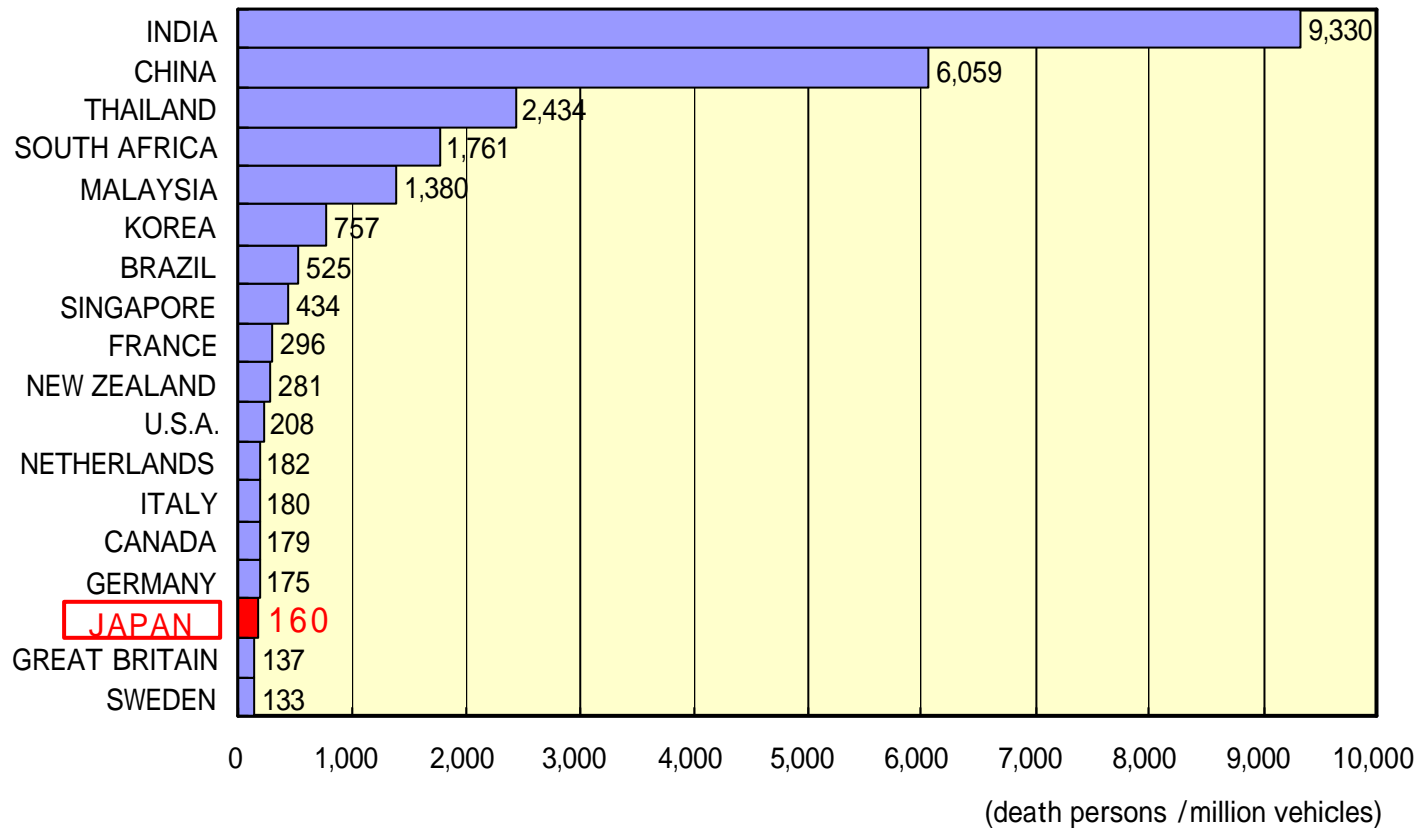
● Median strips



■ Effect of Traffic Safety Measures (1)

□ International Comparison of No. of Traffic accident death per No. of Automobiles Owned

• The number of traffic accident death persons per the number of automobiles owned in Japan is similar to that of other industrial countries.



Note 1 : No. of traffic accident death persons per no. of automobiles owned =

$$\frac{\text{No. of traffic accident death persons}}{\text{No. of automobiles owned}}$$

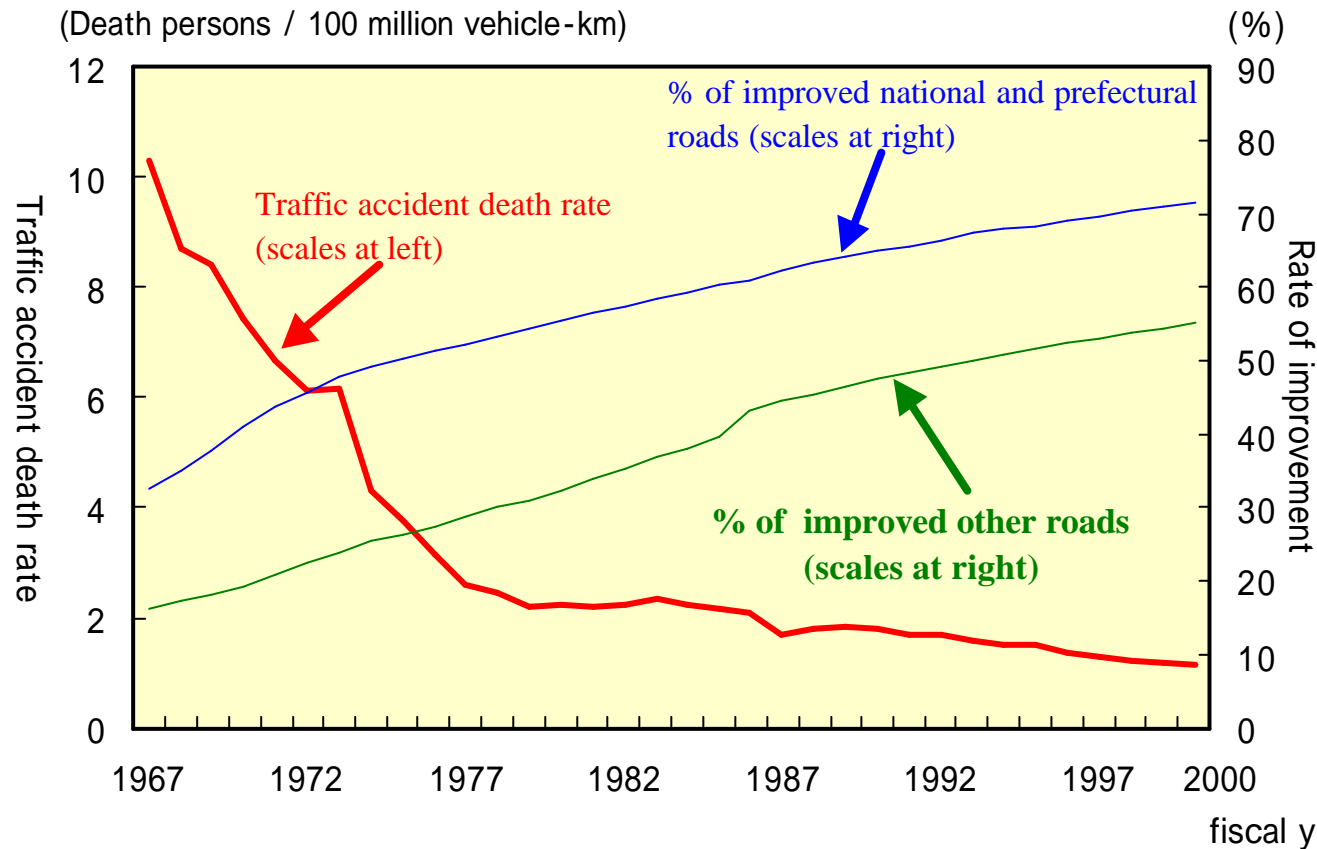
Note 2 : Figures are for 1998.

[Source: World Road Statistics (1999)]

■ Effect of Traffic Safety Measures(2)

□ Relationship Between Road Improvement Rate and Traffic Accident Death Rate

• With an increasing percentage of improved roads, the number of traffic accident death rate showed substantial decrease.



Note : Traffic accident death rate = No. of traffic accident death persons / million Vehicle-km
 [Sources: Annual Statistical Reports of Roads; Traffic Statistics (National Police Agency)]

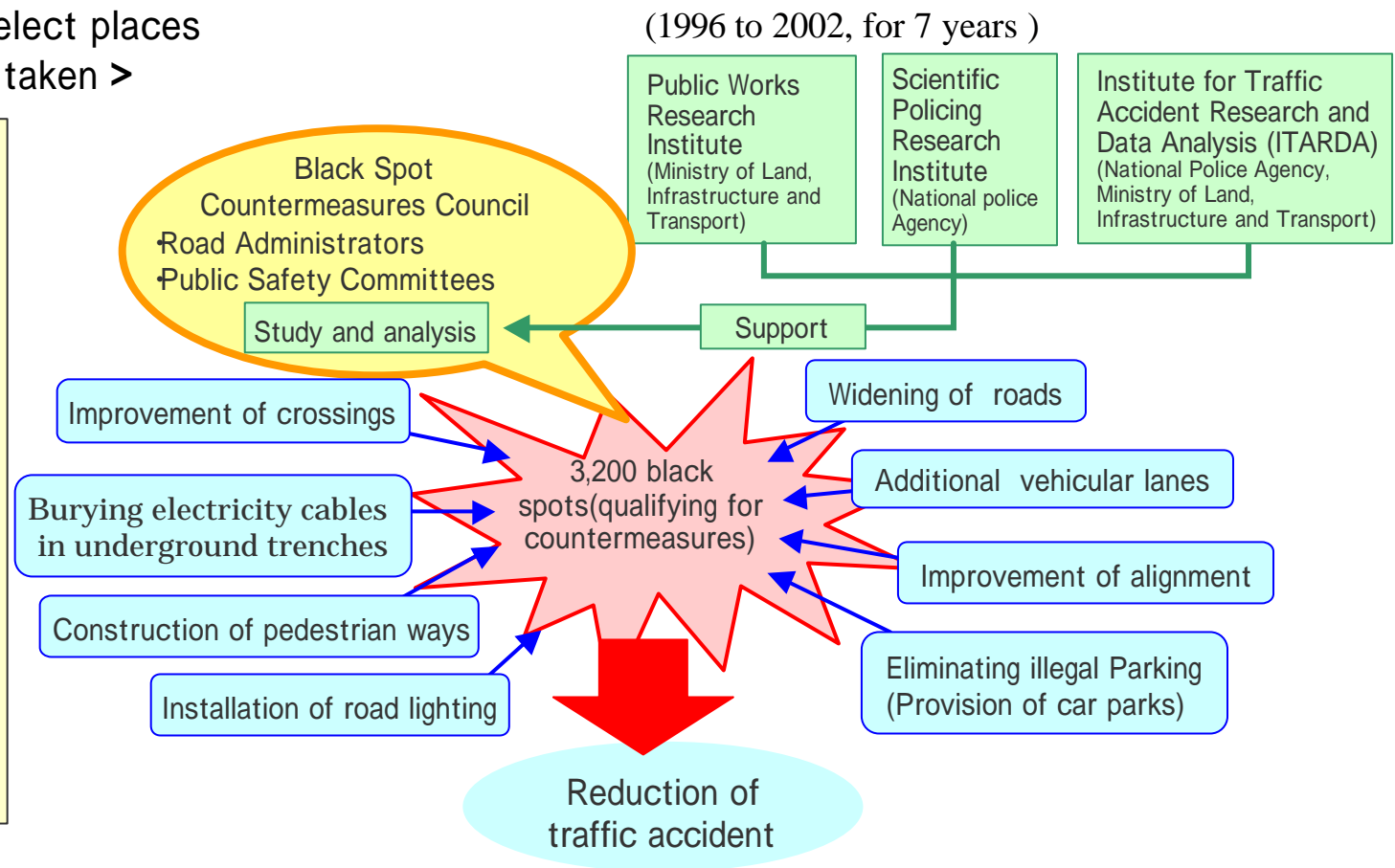
■ Effect of Urgent Measures for Accident Black Spots (1)

□ Overview of Urgent Measures for Black Spots

• Urgent measures for black spots have been implemented at 3,200 locations at trunk roads.

< Basic Concept of how to select places where measures would be taken >

- A place where occurred 24 traffic accidents causing casualties in four years.
- A place in where the number of traffic accidents causing deaths was more than 0.4 in four years. (The number is converted depending on accident types such as head-on and rear-end collisions.)
- A place where traffic accidents causing deaths have occurred more than 2 in four years. (Data is selected from Traffic Accident Database of 1990-1993.)

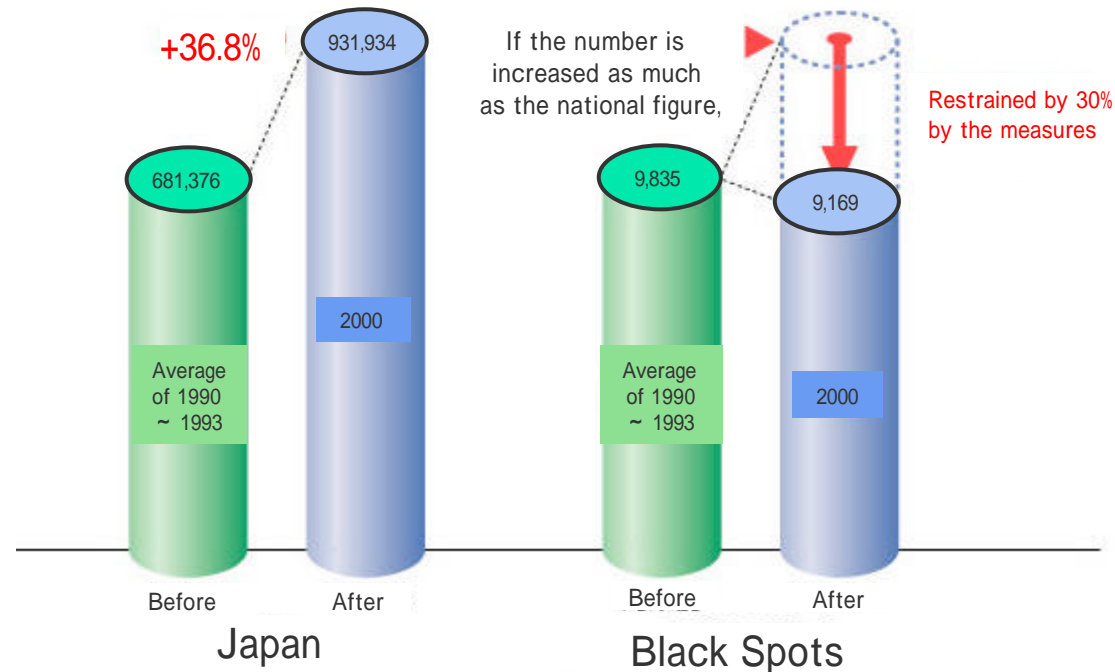


[Source: Ministry of Land, Infrastructure and Transport]

■Effect of Urgent Measures for Black Spots (2)

- the number of traffic accidents causing casualties was restrained by 30% at 1,665 places where measures were completed by 1999.

Effect of Accident Reduction by Urgent Measures for Black Spots



Note: 1,655 places where measures were completed by 1999

Restraint means accident reduction effect which assumes increase of the number of traffic accident accompanied with growth of traffic density.

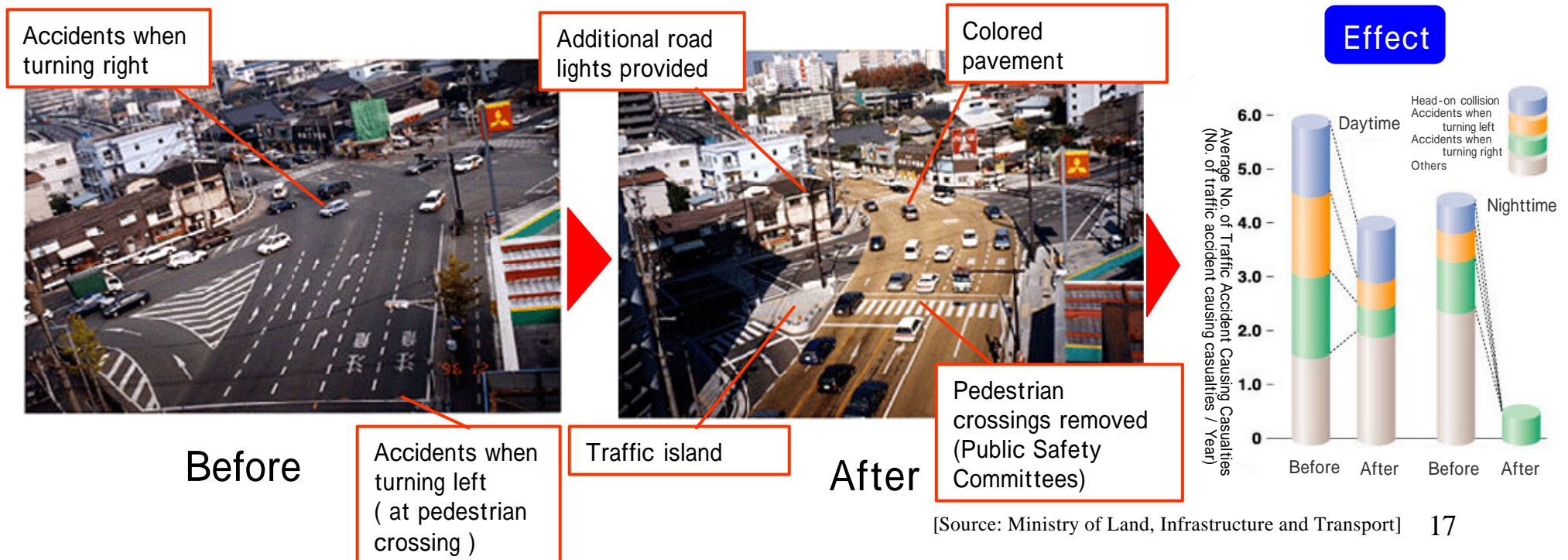
[Source: Ministry of Land, Infrastructure and Transport]

■ Effect of Urgent Measures for Black Spots(3)

□ Example 1 (Mukae-cho 2-chome intersection, Kumamoto)

- In order to lessen accidents caused by inefficient design of alignment and by poor nighttime visibility. This traffic island, colored pavement, pedestrian crossings, and stop-lines and additional traffic lights were constructed.
- The number of traffic accidents causing casualties at daytime has decreased to 2/3 and at nighttime to 1/10.

< Accident prevention measures at intersection (Mukae-cho 2-chome, Kumamoto) >

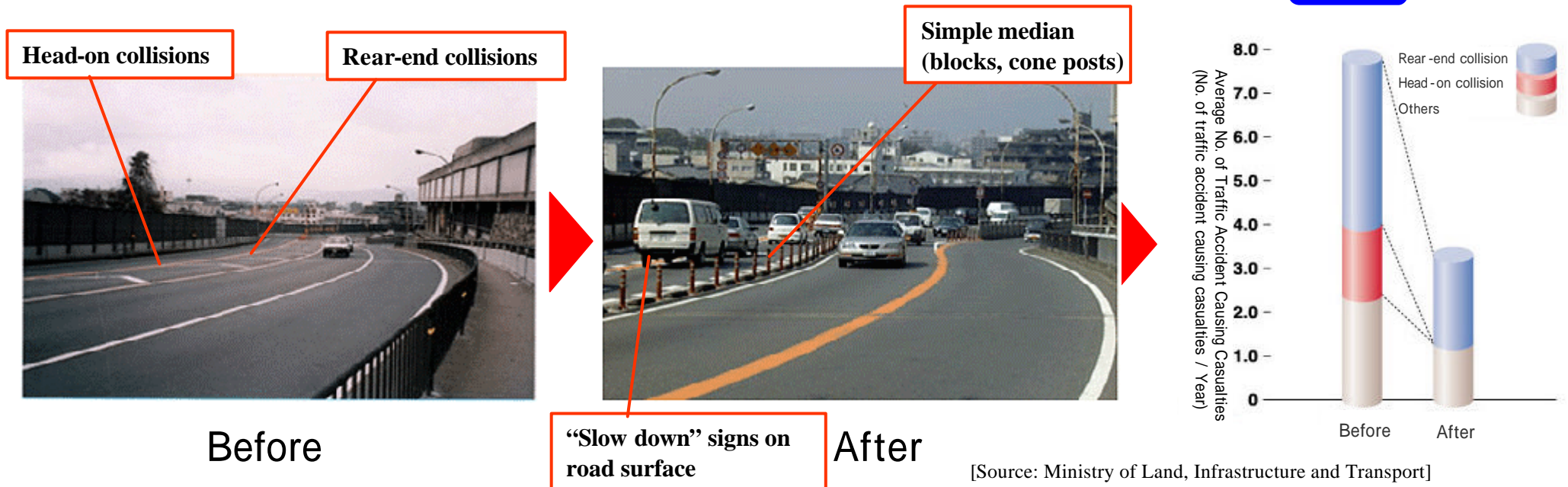


■Effect of Urgent Measures for Black Spots(4)

□Example 2 (Seikanji, Kyoto)

•Rear-end collisions and head-on collisions caused by high driving speed occurred frequently because of the curve section on a down slope road. “Slow down” signs and simple median (blocks, cone posts) were provided as measure.
 •As a result, rear-end collisions lessened to about a half, and head-on collisions disappeared.

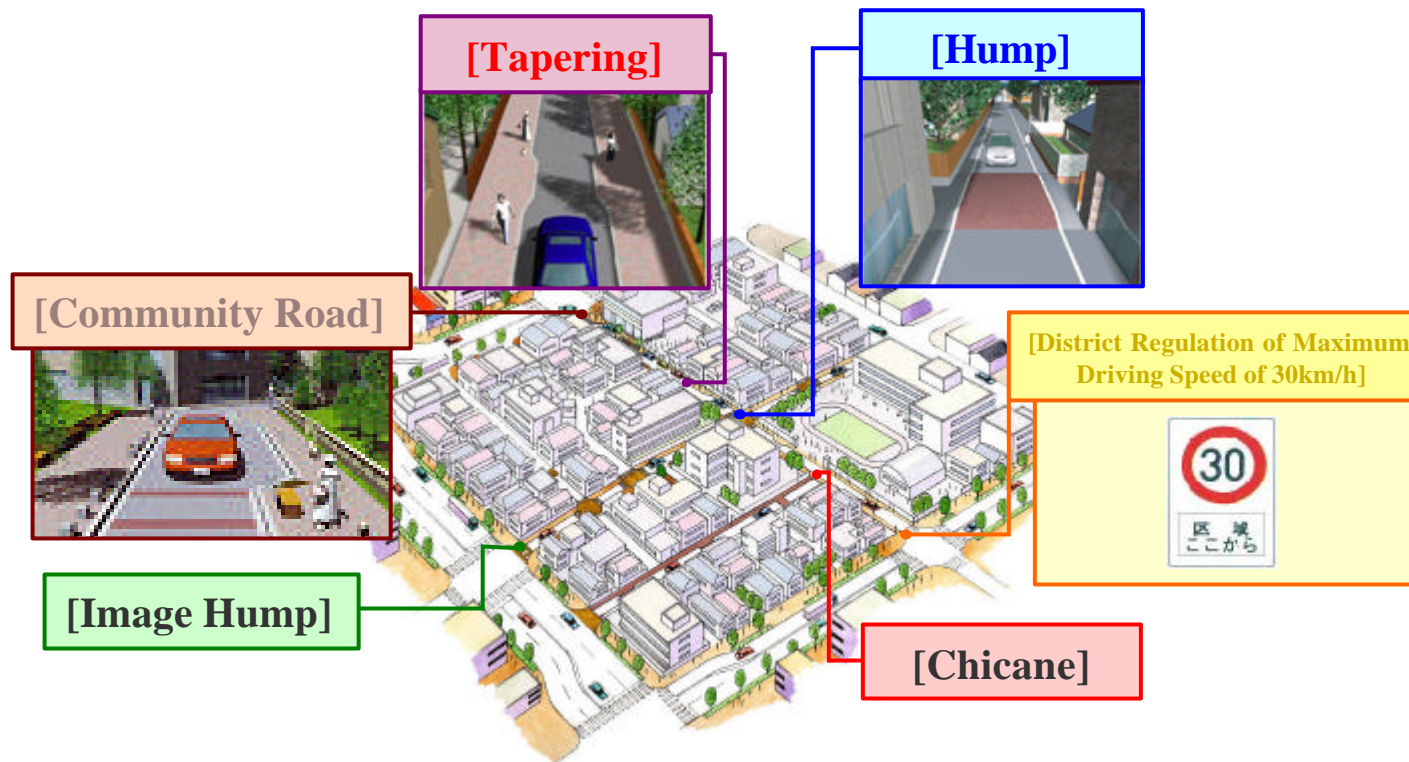
< Accident prevention measures on a single road (Seikanji, Kyoto) >



■ Effect of Community Zone Creation Projects(1)

□ Overview of Community Zone Creation Projects

• In areas where priority should be given to the pedestrian traffic, the “Community Zone Creation Project” has been promoted by road administrators from fiscal 1996 in order to curtail the intrusion of through-traffic, secure peace and safety in residential areas, area-wide developments such as community roads*1 and mixed pedestrian-vehicular roads*2 are applied in conjunction with traffic control by the Prefectural Public Safety Committees,.



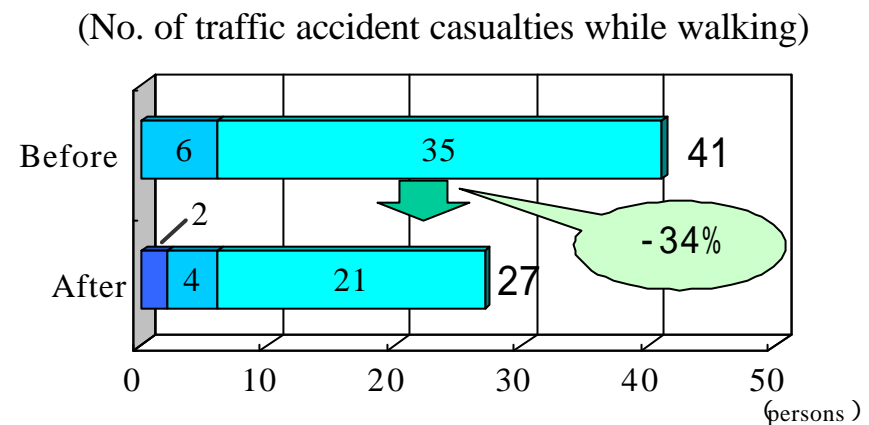
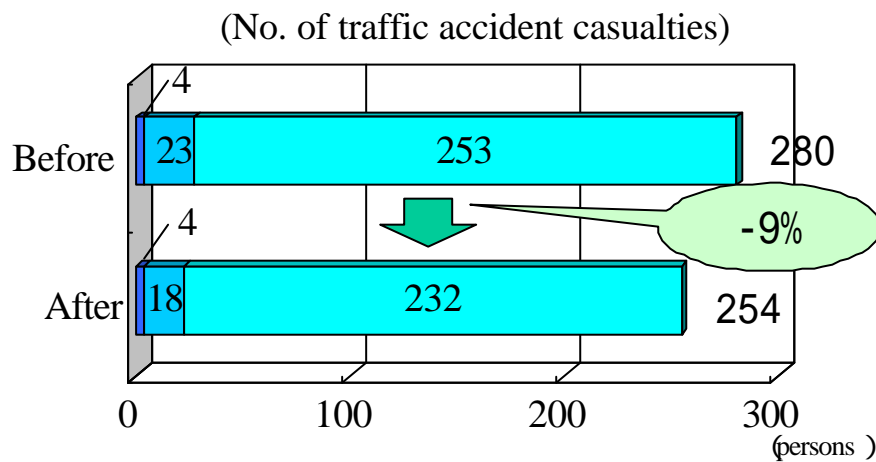
*1 community roads : Roads designed to safen pedestrians by controlling vehicle speed through procedures such as zigzag car lanes and narrow car lanes

*2 Mixed pedestrian-vehicular roads : Roads designed to safen pedestrians by controlling vehicle speed through procedures such as humps and tapering

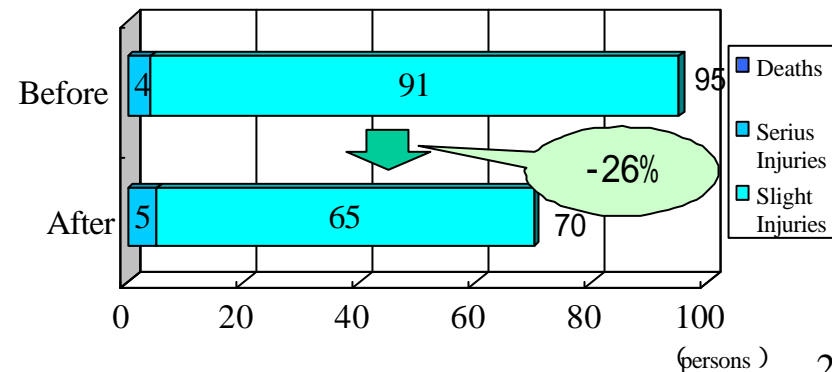
■ Effect of Community Zone Creation Project (2)

□ Effect of Community Zone Creation Project

- According to the post-evaluation of the 21 Community Zone where counter measures were conducted, the number of traffic accident casualties were decreased by about 10% as a whole and the number of traffic accident casualties while walking and riding bicycles dropped by about 30%.



(No. of traffic accident casualties while riding bicycles)



No. of districts where projects were held: 166 (March 2002)
 No. of districts where project effects were evaluated: 21
 (out of 62 where projects completed)
 Comparison of before and after the project during one year

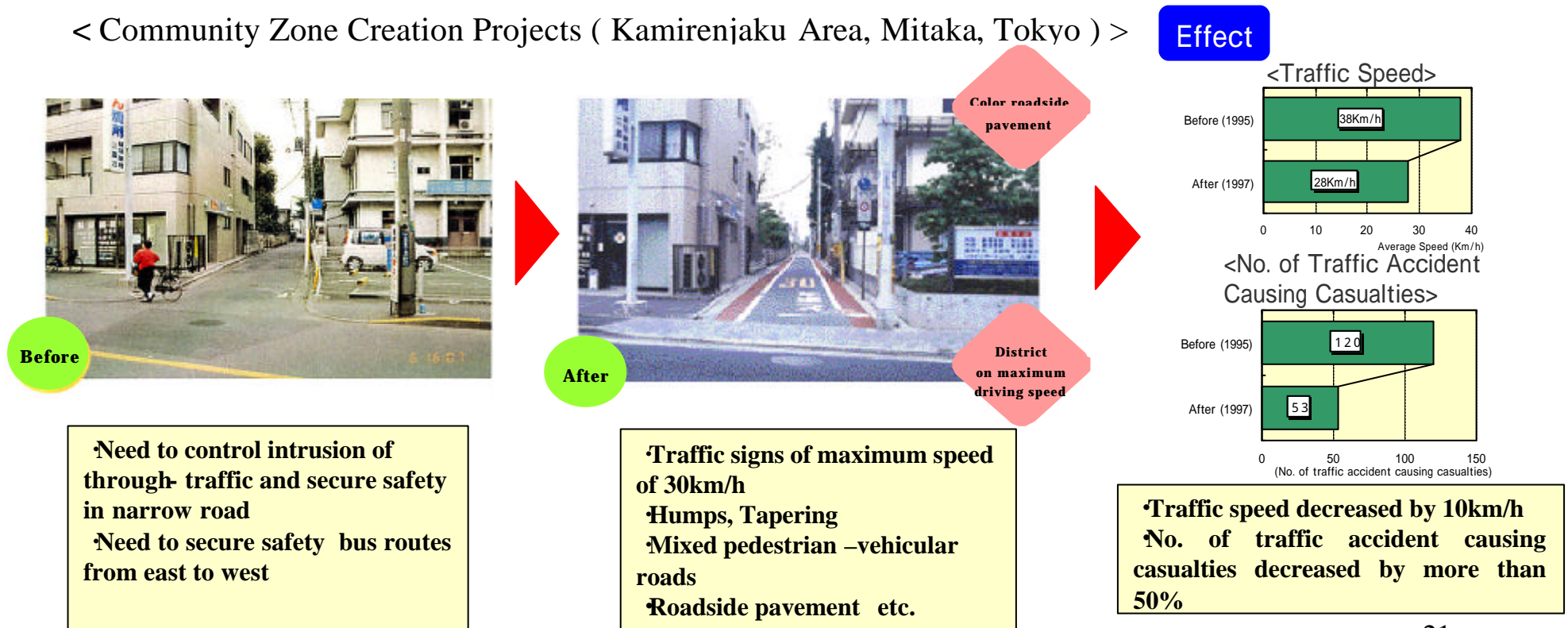
[Source :Ministry of Land, Infrastructure and Transport]

■ Effect of Community Zone Creation Projects(3)

□ Example (Kamirenjaku Area, Mitaka, Tokyo)

- The construction of mixed pedestrian-vehicular roads, the provision of humps and the introduction of maximum speed control at Kamirenjaku area, where has several schools and hospitals have helped to slow down vehicles' driving speed and to reduce traffic accidents in this area.
- As a result, driving speed was reduced by 10 km/h and the number of traffic accidents causing casualties decreased to less than a half.

< Community Zone Creation Projects (Kamirenjaku Area, Mitaka, Tokyo) >



2 .Road Traffic Safety Measures In Future

Basic Concept

Characteristics of Recent Traffic Accidents

Road Traffic Safety Measures To Be Focused In Future

Traffic Safety Measures On Trunk Road

Traffic Safety Measures Concentrated On Roads For Daily Use

Other Traffic Safety Measures

Basic Concept

- Even though the number of traffic accident death persons were decreased from its peak, the number of traffic accidents causing casualties and the number of traffic accident casualties show the worst level in recent years. It is necessary to promote traffic safety measures more actively than ever.

The number of traffic accident death was halved from its peak.
The number of traffic accidents causing casualties and the number of traffic accident casualties show the worst level in recent years.



It is necessary to promote traffic safety measures more actively than ever.

The number of traffic accident death persons was halved from its peak.

- 16,765 persons (1970) 8,326 persons (2002)

Although the number of traffic accidents causing casualties and the number of traffic accident casualties were slightly decreased after an absence of 12 years, the number is still in the worst level in recent years.

- The number of traffic accidents causing casualties :936,721 (2002)
- The number of traffic accident casualties :1,176,181 persons (2002)

The prime minister presented a long term goal which aimed to halve the number of traffic accident death furthermore. “Emergency Measures Law on Provision of Traffic Safety Facilities, Etc.” was revised to “Law on promotion for Traffic Safety Facilities, Etc”.

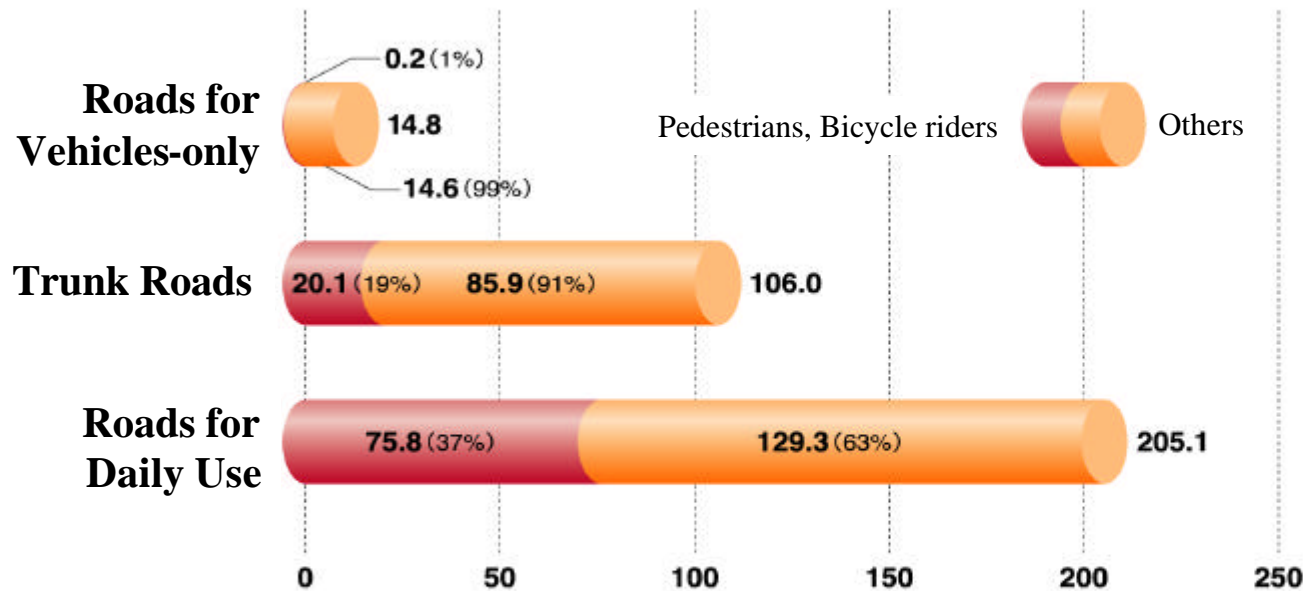
- Apply intensive work in cooperation with public safety committees.
- Change emergency measures for 5 years to be held permanently.

Characteristics of Recent Traffic Accidents (1)

High Rate of Traffic Accident Causing Casualties on Roads for Daily Use

- Traffic accident rate causing casualties on candy stripe is twice as high as the rate on trunk roads.

Comparison of Traffic Accident Rate Causing Casualties by Different Road Types (2001)



Share rate of traffic on roads for vehicles-only

	Share rate
Japan	13%
Germany	30%

Note: Share rate = Vehicle-km on roads for vehicles-only / Vehicle-km

[Source: Ministry of Land, Infrastructure and Transport]

Traffic Accident Rate Causing Casualties

(No. of traffic accident causing casualties / 100 million vehicle-km)

Note: Traffic accident rate causing casualties

= No. of traffic accident causing casualties / million Vehicle-km

Trunk roads : Roads in the administrative divisions of Japan,

in ordinance-designated city and major cities

Roads for daily use(candy stripe) : All roads – (Roads for vehicles-only + trunk roads)

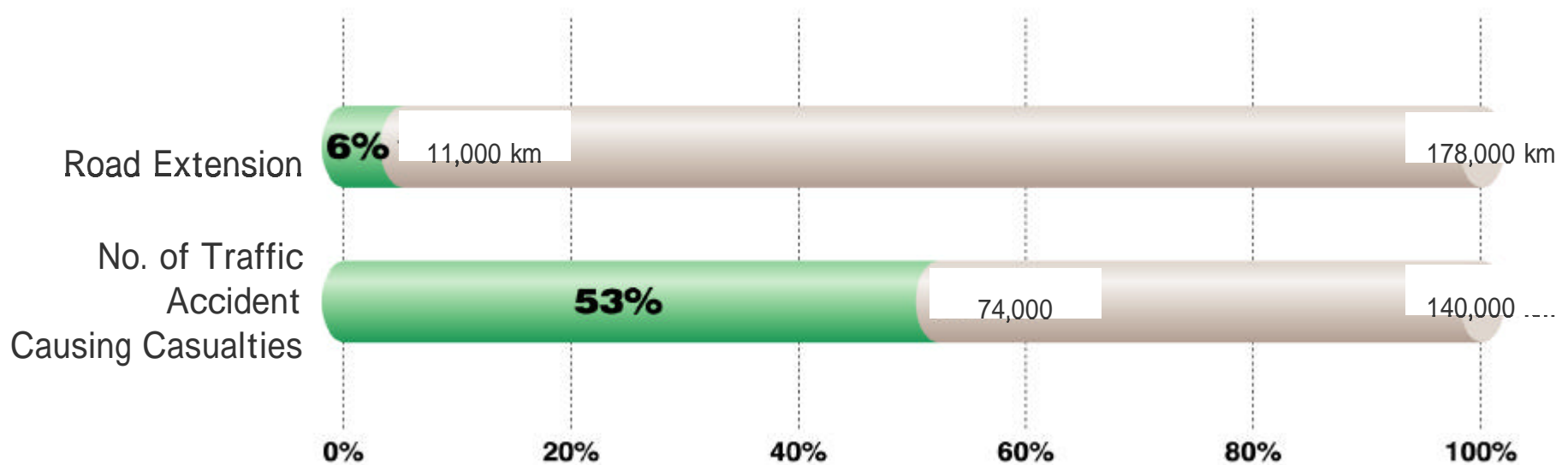
[Source :Ministry of Land, Infrastructure and Transport]

Characteristics of Recent Traffic Accidents (2)

No. of Traffic Accidents Causing Casualties on Trunk Roads Concentrated in Specific Locations

• 53 % of the number of traffic accidents causing casualties were occurred on 6 % of sections of trunk roads.

Relations between road extension and the number of accident causing casualties on single roads among trunk roads



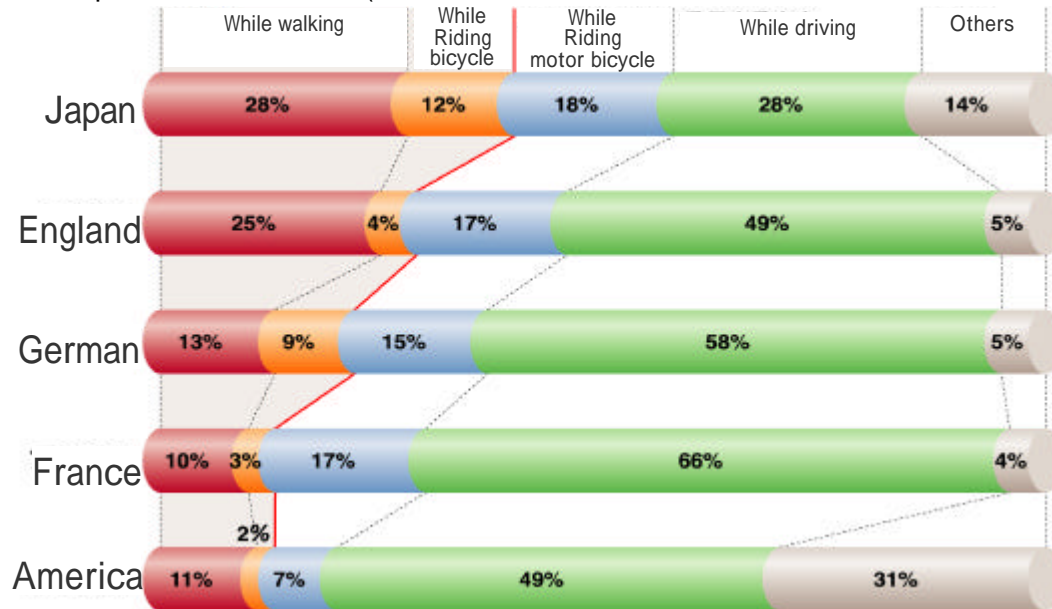
Source : Institute for Traffic Accident Research and Data Analysis (ITARDA)]
 (The number of traffic accident causing casualties is average of 1996-1998.)

Characteristics of Recent Traffic Accidents (3)

A Large Number of Traffic Accidents of Pedestrians and Bicycle Riders

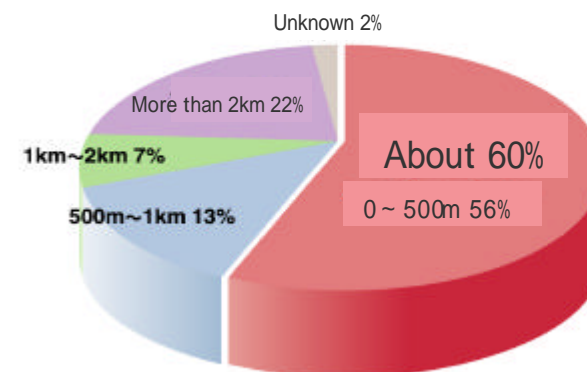
- The number of traffic accident death persons while walking and riding bicycles shows 40 % of total, which is an internationally high figure.
- 60 % of the number of traffic accident death persons while walking and riding bicycles are elderly persons.
- 60 % of the number of traffic accidents causing death while walking occurred in places within 500m from home.

International Comparison of Distribution of Traffic accident death Depends on Condition (2000)



Source : International Road Traffic Accident Database (IRTAD)

Distribution of No. of Traffic Accident Causing Deaths Depends on Distance from Home (2001)



[Source: Institute for Traffic Accident Research and Data Analysis (ITARDA)]

Road Traffic Safety Measures To Be Focused In Future

● Systematic Development of Trunk Road Network

Convert traffic to safer roads such as roads for vehicles-only

• By systematic development of trunk road network, traffic will be covered to safer roads and the safety of the whole road network will be improved.

● Urgent Safety Measures on Existing Roads

Scientific and Intensive Implementation of Traffic Accident Reduction Measures on Trunk Roads

• Intensive Measures in Accident hazardous spots

• Comprehensive and Intensive Parking Measures Combining Hard and Soft Measures

• Accident Investigation, Repletion of Analysis System and Installation of Evaluation System

Comprehensive Measures of Traffic Safety for Pedestrians and Bicycle Riders Concentrating on Roads for Daily Use

• Create Safe Pedestrian Area Project

• Promote Barrier-Free Pedestrian Spaces Around Main Stations

• Develop Safe and Comfortable Environment for Bicycle

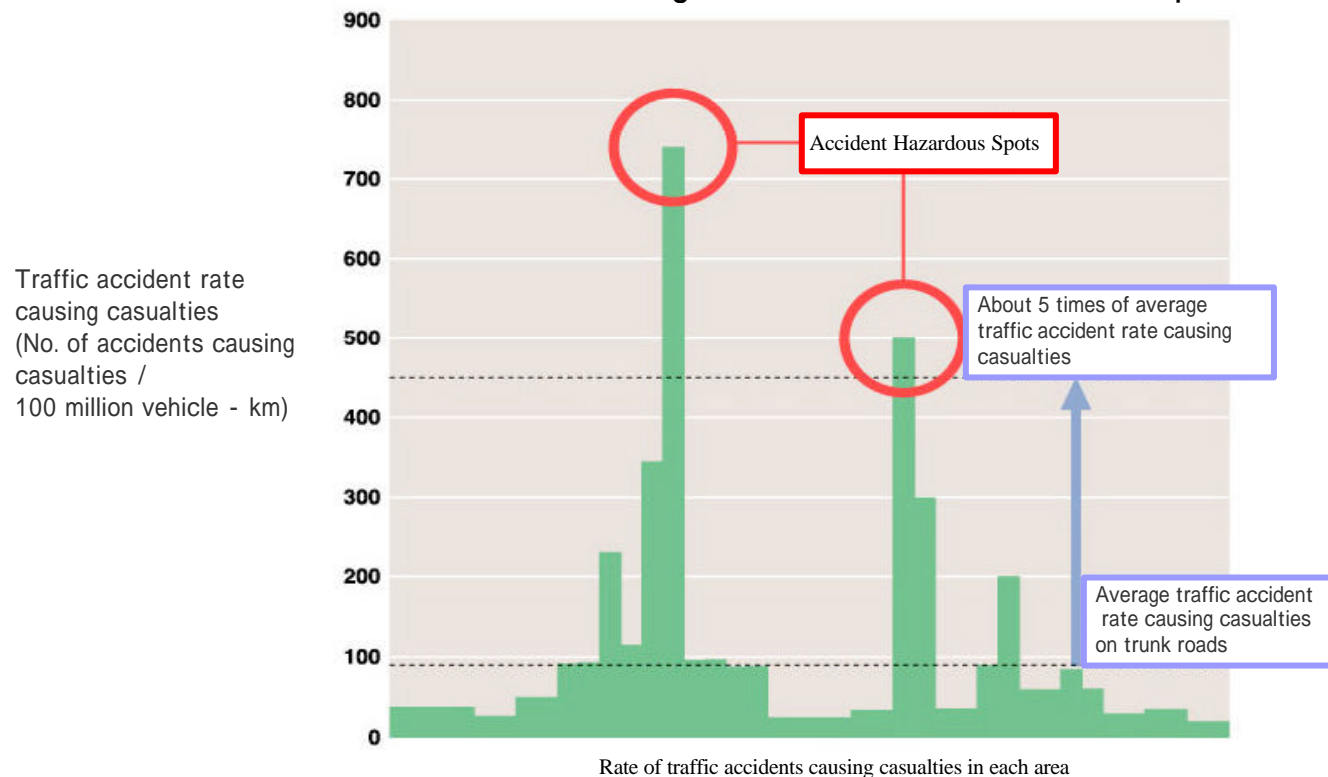
■ Traffic Safety Measures on Trunk Roads (1)

□ Urgent Measures for Accident Hazardous Spots(1)

● Overview

- At hazardous spots that show a high traffic accident rate causing casualties, reduction measures of traffic accidents, such as improved road junctions, will be placed intensively in order to carry out efficient and effective safety measures on trunk roads.

Extraction Image of Accident Hazardous Spots



[Source: Ministry of Land, Infrastructure and Transport]

■ Traffic Safety Measures on Trunk Roads (2)

□ Urgent Measures for Accident Hazardous Spots(2)

● Description of Measures

Select 4,000 spots where have 5 times of average traffic accident rate causing casualties on trunk roads and where discover their effects in earlier period

Complete Accident Investigations and Analysis System and Promote Evaluation System

- Complete accident examinations and apply and accumulate the know-how of accident measures
- Reinforce the investigation of accidents and analysis structure in cooperation with National Public Safety Committee
- Apply analysis and pre-evaluation and post-evaluation of the measures by specialists

Apply Accident Measures in Cooperation with Road Administrators and Public Safety Committees

Road Administrator	Public Safety Committee
Improvement of intersection Right-turn lanes	Traffic signals Road signs
Road lighting View guide marks	Road identification mark Traffic information board
Demarcation lines Road identification mark etc.	etc.

● Target of Measures

The Urgent Measures for Accident Hazardous Spots aims to restraint the number of traffic accidents causing casualties by 30 % at qualifying districts where the measures are taken.

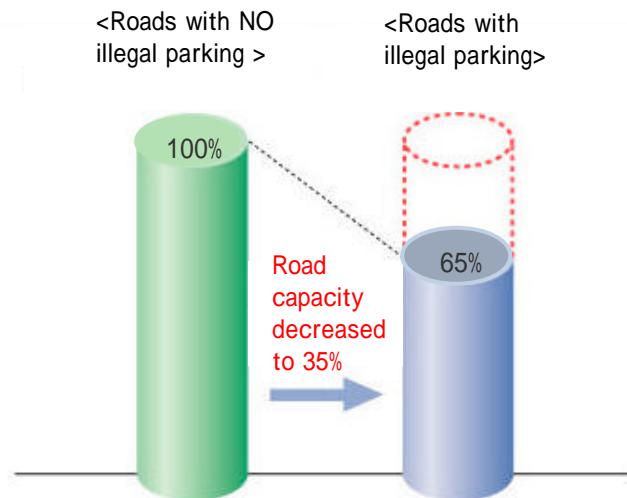
■ Traffic Safety Measures on Trunk Roads (3)

□ Composite and Intensive Parking Measures Combining Hard and Soft Measures (1)

● Overview

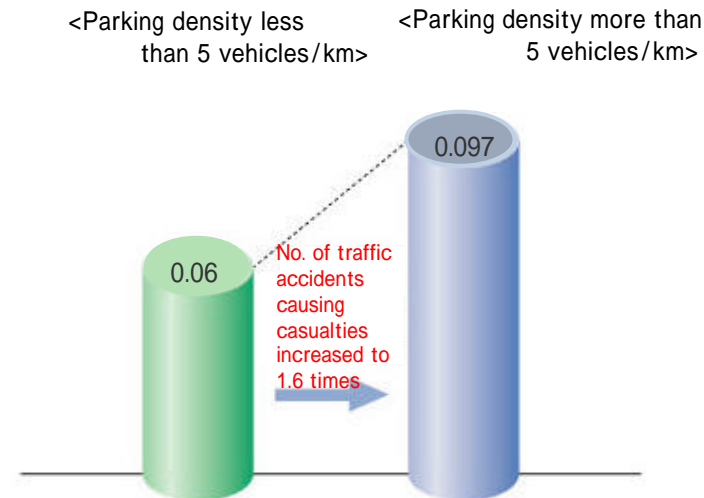
- The measures will promote the construction of strips for waiting cars and provide clear indication of illegal parking districts by introducing colored pavements in trunk roads in where many vehicles are parked illegally in three metropolitan areas. Public safety committees and other bodies will carry the measure forward by investigating illegal parking and reinforcing clamp down of illegal parking and the enlightenment movement.

<Traffic Obstructions Caused by Illegal Parking in Tokyo>



[Source: Ministry of Land, Infrastructure and Transport]

<Traffic Accidents Caused by On-street Parking>



Source : Road Traffic Census 2000]
(No. of traffic accidents is related to car parking per 1km)

■ Traffic Safety Measures on Trunk Roads (4)

□ Comprehensive and Intensive Parking Measures Combining Hard and Soft Measures (2)

● Description of Measures

Select model routes of trunk roads where many vehicles are parked illegally in three Metropolitan Areas

Proceed parking measures intensively under the cooperation of Road administrators, public safety committees and local public bodies

Classification	Main body	Measures
Hard Measures	Road Administrator	Development of strips for waiting cars
		Indication of illegal parking districts etc.
	Public Safety Committee	Construction of time-limits parking district
		Indication of illegal parking districts
Soft Measures	Road Administrator	Construction of parking information system
	Public Safety Committee	Enlightenment movement of eliminating vehicles left parked on the road
		Parking guidance by traffic information board etc.
		Install parking deterrence system
	Local Public Bodies etc.	Strengthen regulation of illegal parking etc.
		Enlightenment movement of eliminating cars left parked on the road
		Adequate use of space for waiting cars etc.

Expand support system for the construction of strips for waiting cars

● Target of Measures

- The measures aim to reduce the number of illegal parking on the road and traffic jam and prevent traffic accidents in order to realize safety and smooth road traffic environment.

■Traffic Safety Measures on Trunk Roads (5)

□Comprehensive and Intensive Parking Measures Combining Hard and Soft Measures (3)

●<Reference> Smooth Tokyo 21 (Yasukuni-dori, Ogawamachi Intersection)

The parking measures of hard and soft procedures are in effect by cooperation of City of Tokyo and Metropolitan Police Department.



The number of illegal parking cars was decreased by 63% after the measure was taken.

① Development of strips for waiting cars



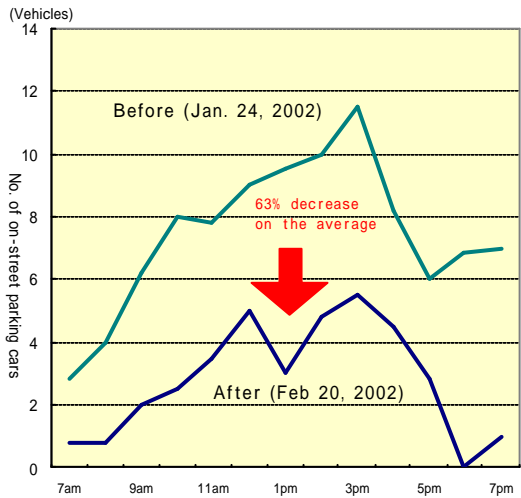
Road Administrators

② Indication of illegal parking districts by colored pavement



Public Safety Committees/ Road Administrators

③ Regulation enforcement of illegal parking, Enlightenment movement by traffic policeman

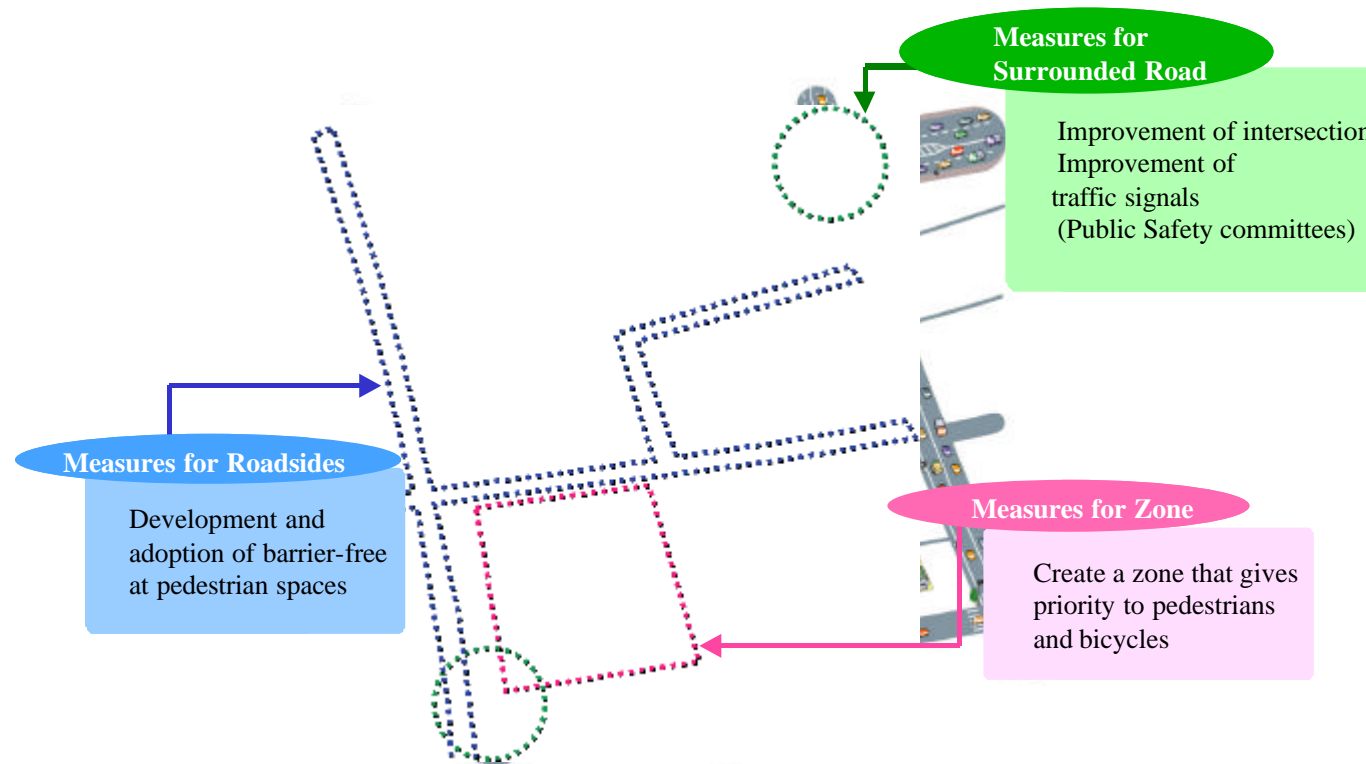


■ Traffic Safety Policies Concentrated on Roads for Daily Use (1)

□ Safe Pedestrian Area Project (1)

● Overview

• The “Safe Pedestrian Area Project”, which ensures safety for pedestrians at sidewalks by road structure, will be promoted in the areas where have a high rate of accidents in urban areas.



■ Traffic Safety Policies Concentrated on Roads for Daily Use (2)

□ Safe Pedestrian Area Project (2)

● Description of Project

Select about 1,000 areas of 1km around each, where have a high rate of accidents caused by through traffic on the roads for daily use in city areas.

Determine black spots with local communities using general traffic safety checks and near-misses map.

Cooperate with public safety committees and promote comprehensive measures

Measures for surrounding road	Make smooth traffic on surrounding roads and regulate passing vehicles driving into the areas	Road Administrator	Improvement of intersection etc.
		Public Safety Committee	Improvement of traffic signals etc.
Measures for zone	Create a zone that gives priority to pedestrians and bicycles	Road Administrator	Road formation for controlling driving speed etc.
		Public Safety Committee	Speed regulation of inside zone etc.
Measures for roadside	Develop safe pedestrian space network	Road Administrator	Development of sidewalks, Development and adoption of barrier-free at pedestrian spaces

● Target of Project

Restraint the number of traffic accidents causing casualties by about 20 %

Restraint the number of traffic accidents causing casualties of pedestrians and bicycle riders by about 30%

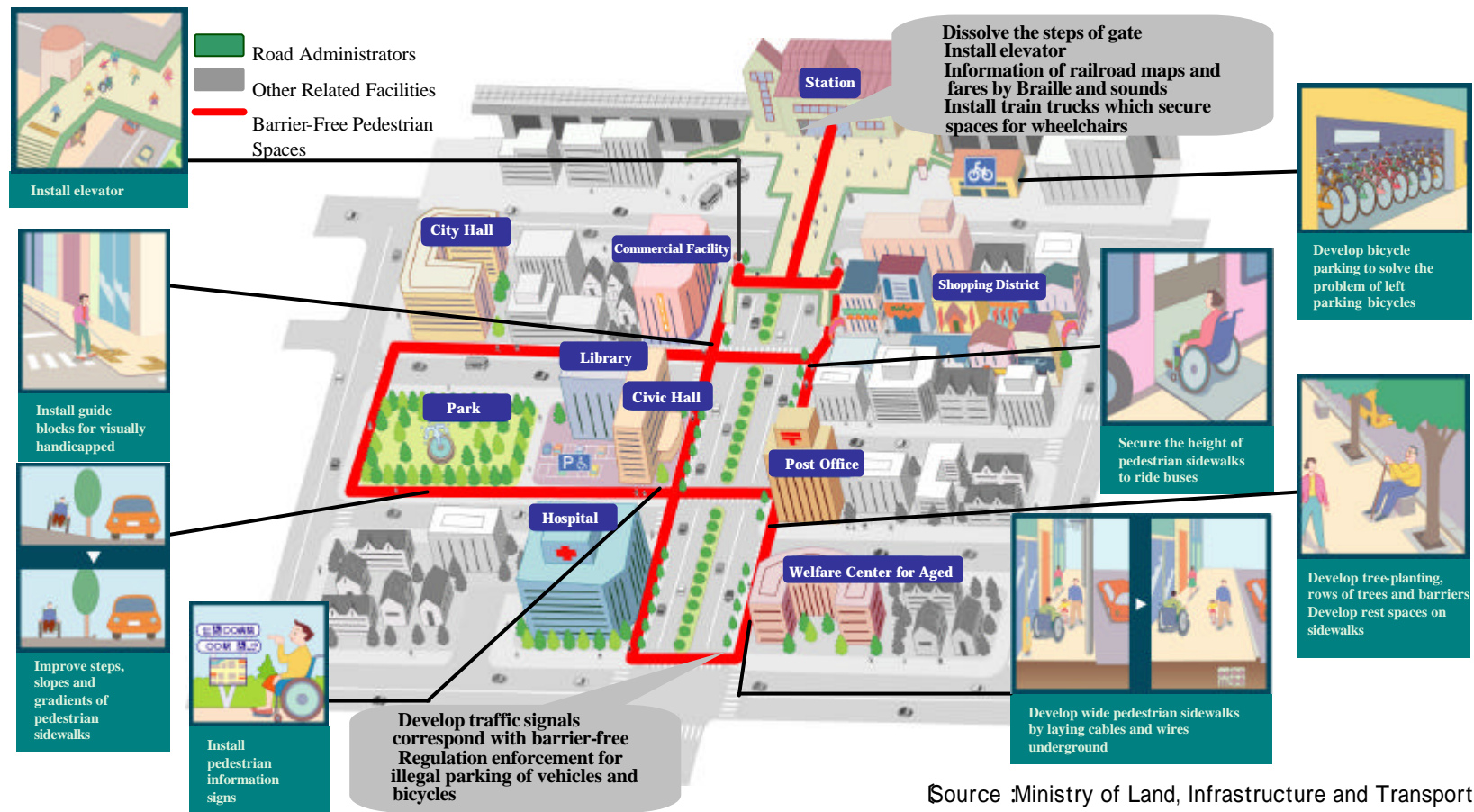
■ Traffic Safety Policies Concentrated on Roads for Daily Use (3)

□ Barrier-Free Pedestrian Spaces(1)

● Overview

Some areas where are greatly used by people such as around stations will be promoted to apply barrier-free pedestrian spaces in cooperation with public transportation bodies based on traffic barrier-free law established in May 2000.

<Image of development around station under the cooperation of various facilities based on Road Traffic Barrier-Free Law>



[Source :Ministry of Land, Infrastructure and Transport]

■ Traffic Safety Measures Concentrated on Roads for Daily Use (4)

□ Barrier-Free Pedestrian Spaces(2)

● Description of Measures

Creation of wide sidewalks

Promote development of wide sidewalks (generally 3m or more in width) to secure amenity and safety for pedestrians and bicycle riders to provide safety passage for the elderly and handicapped people.

Laying cables and wires underground

To take away telegraph, electric and telephone poles, etc. that hinder pedestrian traffic, and to use sidewalks and other spaces more effectively, laying cables and wires underground is promoted by installing underground Common Cable Boxes (C·C·Boxes).

Easy-to-use overpasses and underpasses

Easy-to-use overpasses and underpasses have been built mainly in the vicinity of facilities extensively used by elderly and handicapped people, such as stations. They include slopes, elevators, pedestrian decks and direct corridors to buildings.

● Target of Measures

This project aims to raise the rate of barrier-free on roads* around main stations from 17% to approximately 50% by fiscal 2007.

*Rate of barrier-free = developed extension of Specified route / extension of Specified route

*A specified route is a route between specified traffic facilities and government facilities or welfare facilities etc. that are recognized to be used in daily and social life by elderly and handicapped person.

* A developed extension of specified route means a road extension that is developed as a barrier-free road among in specified route.

■ Other Traffic Safety Measures

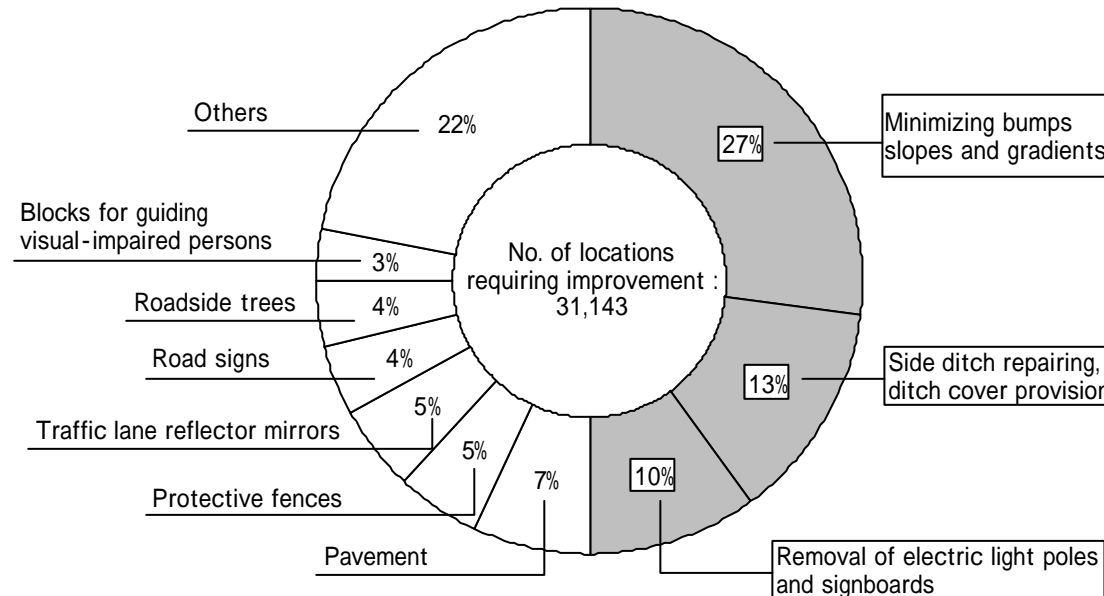
□ General Traffic Safety Checks

● Overview

- General traffic safety checks are carried out to realize a road environment where everyone can live safely and without worries. Community residents and road users are voluntarily taking part in the checks of road traffic conditions while administrative organs, residents, businesses and other members of the community are working together in the general traffic safety checks.

● Overview of Project Implementation

- Since 1997, the general traffic safety checks have been conducted nationwide as part of the traffic safety movements in spring and fall. In the 1996-2000 period, the checks were carried out in 3,459 areas of all prefectures and the results have been reflected on subsequent projects for sidewalk development and repairing, side ditch repairing and others.



Problems pointed out in the general traffic safety checks

[Source: Ministry of Land, Infrastructure and Transport]