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

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<td>Examples of Traffic Safety Measures</td>
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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.
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)

- 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

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 those in peak years
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.

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.

Note:
1. Roads for vehicles-only intended as National Highways
2. Traffic accident rate causing casualties = No. of traffic accident casualties / million Vehicle-km

[Source: Ministry of Land, Infrastructure and Transport]
History of Traffic Safety Measures(4)

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.

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: Road Administration

[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 =
No. of traffic accident death persons / No. of automobiles owned

Note 2: Figures are for 1998.

[Source: World Road Statistics (1999)]
• 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.

- 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

- Restraint means accident reduction effect which assumes increase of the number of traffic accidents 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) >

[Source: Ministry of Land, Infrastructure and Transport]
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)>
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 safely pedestrian traffic by controlling vehicle speed through procedures such as zigzag car lanes and narrow car lanes

*2 Mixed pedestrian-vehicular roads: Roads designed to safely pedestrian traffic by controlling vehicle speed through procedures such as humps and tapering
Effect of Community Zone Creation Project (2)

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%.

Effect of Community Zone Creation Project

- Number of districts where projects were held: 166 (March 2002)
- Number of districts where project effects were evaluated: 21 (out of 62 where projects completed)

Comparison of before and after the project during one year:

- No. of traffic accident casualties: 232 (Before), 253 (After) -9% decrease
- No. of traffic accident casualties while walking: 21 (Before), 18 (After) -34% decrease
- No. of traffic accident casualties while riding bicycles: 95 (Before), 70 (After) -26% decrease

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.

*Source: Ministry of Land, Infrastructure and Transport*

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
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</thead>
<tbody>
<tr>
<td><img src="image1" alt="Before" /></td>
<td><img src="image2" alt="After" /></td>
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</tbody>
</table>

- **Need to control intrusion of through traffic and secure safety in narrow road**
- **Need to secure safety bus routes from east to west**
- **Traffic signs of maximum speed of 30km/h**
- **Humps, Tapering**
- **Mixed pedestrian – vehicular roads**
- **Roadside pavement etc.**

**Traffic speed decreased by 10km/h**
**No. of traffic accident causing casualties decreased by more than 50%**
2. 道路交通安全対策の今後の重点

・基本概念
・近年の交通事故の特徴
・今後の道路交通安全対策の重点
・幹線道路での交通安全対策
・日常利用路での交通安全対策
・その他の交通安全対策
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 causalities 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.

- Although the number of traffic accidents causing casualties and the number of traffic accident causalities 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 causalities: 1,176,181 persons (2002)

- The prime minister presented a long term goal which aimed to halve the number of traffic accident death furthermore.
  - 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)

Roads for Vehicles-only
- 14.8
- 14.6 (99%)

Trunk Roads
- 20.1 (18%)
- 85.9 (91%)
- 106.0

Roads for Daily Use
- 75.8 (37%)
- 129.3 (63%)
- 205.1

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)

Share rate
Japan: 13%
Germany: 30%

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.

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

![Traffic accident death distribution graph]

Source: Institute for Traffic Accident Research and Data Analysis (ITARDA)
## Road Traffic Safety Measures To Be Focused In Future

<table>
<thead>
<tr>
<th>Systematic Development of Trunk Road Network</th>
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<tbody>
<tr>
<td>□ Convert traffic to safer roads such as roads for vehicles-only</td>
</tr>
<tr>
<td>□ 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.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Urgent Safety Measures on Existing Roads</th>
</tr>
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<tbody>
<tr>
<td>□ Scientific and Intensive Implementation of Traffic Accident Reduction Measures on Trunk Roads</td>
</tr>
<tr>
<td>□ Intensive Measures in Accident hazardous spots</td>
</tr>
<tr>
<td>□ Comprehensive and Intensive Parking Measures Combining Hard and Soft Measures</td>
</tr>
<tr>
<td>□ Accident Investigation, Repletion of Analysis System and Installation of Evaluation System</td>
</tr>
<tr>
<td>□ Comprehensive Measures of Traffic Safety for Pedestrians and Bicycle Riders Concentrating on Roads for Daily Use</td>
</tr>
<tr>
<td>□ Create Safe Pedestrian Area Project</td>
</tr>
<tr>
<td>□ Promote Barrier-Free Pedestrian Spaces Around Main Stations</td>
</tr>
<tr>
<td>□ Develop Safe and Comfortable Environment for Bicycle</td>
</tr>
</tbody>
</table>
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.

[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

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.

<table>
<thead>
<tr>
<th>Traffic Obstructions Caused by Illegal Parking in Tokyo</th>
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</table>

Road capacity decreased to 35%

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

**Traffic Accidents Caused by On-street Parking**

No. of traffic accidents causing casualties increased to 1.6 times

*Source: Ministry of Land, Infrastructure and Transport*
Traffic Safety Measures on Trunk Roads (4)

Comprehensive and Intensive Parking Measures Combining Hard and Soft Measures

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

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

- 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.

- Development of strips for waiting cars
- Indication of illegal parking districts by colored pavement
- Regulation enforcement of illegal parking, Enlightenment movement by traffic policeman

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

<table>
<thead>
<tr>
<th>Measures for surrounding road</th>
<th>Make smooth traffic on surrounding roads and regulate passing vehicles driving into the areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Administrator</td>
<td>□ 周辺道路の円滑な交通と交差車両の規制の制定</td>
</tr>
<tr>
<td>Public Safety Committee</td>
<td>□ 周辺交通の円滑化等のための規制の制定</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measures for zone</th>
<th>Create a zone that gives priority to pedestrians and bicycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Administrator</td>
<td>□ 区画内の歩行者優先交通のための制限の制定</td>
</tr>
<tr>
<td>Public Safety Committee</td>
<td>□ 区画内の歩行者優先交通のための制限の制定</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Measures for roadside</th>
<th>Develop safe pedestrian space network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Administrator</td>
<td>□ 歩行者優先空間の開発等による歩行者安全化</td>
</tr>
</tbody>
</table>

Target of Project

- Restrain the number of traffic accidents causing casualties by about 20%
- Restrain the number of traffic accidents causing casualties of pedestrians and bicycle riders by about 30%
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*
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 wired 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.

<table>
<thead>
<tr>
<th>Problem</th>
<th>No. of locations requiring improvement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimizing bumps, slopes and gradients</td>
<td>31,143</td>
<td>7%</td>
</tr>
<tr>
<td>Side ditch repairing, ditch cover provision</td>
<td>7,796</td>
<td>5%</td>
</tr>
<tr>
<td>Removal of electric light poles and signboards</td>
<td>6,339</td>
<td>5%</td>
</tr>
<tr>
<td>Pavement</td>
<td>6,252</td>
<td>4%</td>
</tr>
<tr>
<td>Protective fences</td>
<td>4,796</td>
<td>4%</td>
</tr>
<tr>
<td>Traffic lane reflector mirrors</td>
<td>3,088</td>
<td>3%</td>
</tr>
<tr>
<td>Road signs</td>
<td>2,800</td>
<td>22%</td>
</tr>
<tr>
<td>Roadside trees</td>
<td>2,500</td>
<td>19%</td>
</tr>
<tr>
<td>Blocks for guiding visual-impaired persons</td>
<td>1,800</td>
<td>13%</td>
</tr>
<tr>
<td>Others</td>
<td>1,200</td>
<td>10%</td>
</tr>
</tbody>
</table>

[Source: Ministry of Land, Infrastructure and Transport]