Policy for Cooperative ITS
- Japan’s approach for road vehicle cooperation of safety and environment -

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1. ITS Policy Measures in Japan

2. Evolution of cooperative ITS

3. Cooperative vehicle safety system enters the field operation phase
- ITS will use IT to resolve problems that could not be fully corrected by conventional policy measures.

**Traffic congestion**

![Traffic congestion map]

**Environmental burden**

Carbon dioxide emissions

- 90% comes from vehicles.

**Traffic accidents**

Chuo Expressway
- A cumulative total of 26M car navigation systems, 18M VICS units, and 17M ETC units have been shipped. (Total vehicle ownership is 79 M.)
Emerging benefits: VICS

- Appropriate route guidance ensures smoother traffic flow in a limited road network.
Emerging benefits: ETC

- 30% of congestion on expressways occurs at tollgates.
- Congestion at tollgates on the Tokyo Metropolitan Expressway has been eliminated through an increased rate of ETC utilization.

Fig. Cause of traffic congestion on expressways

Fig. Status of traffic congestion

Traffic congestion (km/hour/day)

<table>
<thead>
<tr>
<th>Year</th>
<th>Traffic congestion</th>
<th>ETC use rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>21.2</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>2.8</td>
<td></td>
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</tbody>
</table>

Elimination of traffic congestion

ETC use rate

(10,000 t-CO2/year)

Fig. ETC utilization rates and reduction in carbon dioxide emissions

Prior to ETC

60% ETC utilization rate

140,000 t reduction
Emerging benefits: Safety

- Roadside sensors are used to detect stopped vehicles beyond a curve, and drivers are alerted by road-vehicle communications.
- Accidents have been reduced by about 80%, B/C=10.
We are building a platform for the realization of road-vehicle cooperation services through stepwise development.
We are promoting an open platform to integrate the common functions needed to support a variety of applications.
ITS on-board units

- A variety of applications can be provided using a single OBU.
- These OBU use a communications format which has been popularized through ETC, and a HMI that has been popularized through car navigation systems.
Next-generation road services

- Two types of ITS OBU: Single ITS OBU provide information as audio only; and ITS OBU linked with car navigation systems provide information in both audio and visual form.

**ITS on-board unit**

**Driving assistance systems**

- Providing information on obstacles ahead
- Merging assistance
- Providing information on conditions ahead

Beep! Congestion ahead

Beep! Congestion ahead!
Our goal is to reduce the number of traffic accident fatalities to fewer than 5,000 by the end of 2012.
The world's safest road transportation through Cooperative driving safety support systems.

New IT Reform Strategy

Achieving the world's safest road transportation:
- Reducing traffic accident fatalities to fewer than 5,000.

Trends in traffic accident fatalities

Highest level of fatalities: 16,765 persons (1970)
6,352 persons (2007)

Reducing traffic accident fatalities to fewer than 5,000 by the end of 2012FY! (IT Strategic Headquarters)
- Testing began in May 2007 with the cooperation of 31 private companies.
Providing information on obstacles ahead

- Roadside sensors detect stopped vehicles beyond a curve.
- Drivers are alerted using pictures and voice announcements.
Support for merging

- The presence of vehicles approaching the merge point is detected from the roadside

Detection by traffic counters

Information on merging vehicles

Merging from the left ahead.

Merging vehicles

Main route

Merging from the left ahead.

Image analysis of vehicle behavior

3. Cooperative vehicle safety system enters the field operation phase
Providing information on conditions ahead

- Camera images of tunnels and locations of frequent congestion are provided as still images.

Audio announcement compilation
Still image processing

Approaching the Akasaka Tunnel
Technical Tour in Tokyo
Oct. 15–17, 2007

Smartway2007 demonstration
### Scenario for the deployment of new road-vehicle cooperation systems

- Active promotion of systems to support safe driving, including public road tests in Japan's three largest urban areas, based on test results.
- Successive deployment of other ITS services as well.

<table>
<thead>
<tr>
<th>Deployment of services</th>
<th>FY 2006</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 and beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo Metropolitan Expressway</td>
<td>Smartway 2007 ▼ Shinjuku Line opens</td>
<td>Public road tests on Tokyo Metropolitan Expressway</td>
<td>Trial operation on Tokyo Metropolitan Expressway</td>
<td>Operation (in the three largest urban areas, etc.)</td>
</tr>
<tr>
<td>Three largest urban areas and other locations</td>
<td></td>
<td>Public road tests in the three largest urban areas, etc.</td>
<td></td>
<td>Nationwide deployment</td>
</tr>
<tr>
<td>Other expressways throughout Japan</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Other national highways throughout Japan</td>
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<tr>
<td>Private sector utilization</td>
<td>Testing of automated fee payment at ferries and public parking facilities</td>
<td></td>
<td></td>
<td>Internet connectivity and other private sector services</td>
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<td></td>
<td>Fee payment at ferries, public and private parking facilities, etc.</td>
<td></td>
<td></td>
<td>Providing information at family restaurants, convenience stores, roadside rest areas (parking for scenic photo spots), etc.</td>
</tr>
</tbody>
</table>
1. Traffic accidents are a problem common to every country in the world. Japanese experience and technical expertise can help to reduce traffic accidents worldwide.

2. Integration through open platforms will bring about widespread use of the system and lower costs.

3. Public-private sector cooperation is indispensable for deploying a safe system that integrates various road/vehicle systems.
Thank you