SMARTWAY
- Open platform for Cooperative Vehicle Safety -

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1. Current State of ITS in Japan

1) ITS in Japan

1996 Comprehensive Plan for ITS

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- 2. ETC
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- 5. Road management
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2006 Second Stage

- Popularization of vehicle navigation systems and VICS
- Popularization of ETC
- AHS research & development
1. Current State of ITS in Japan

2) Popularization of vehicle navigation systems

Vehicle navigation systems exceeds 20 million (out of 79 million vehicles owned in Japan).

![Diagram showing cumulative number of vehicles equipped with vehicle navigation systems from 2000.3 to 2006.6.
Fig. Cumulative number of vehicles equipped with vehicle navigation systems.

Source: Smartway Project Advisory Committee]
2) Popularization of VICS

More than 15 million vehicles have been equipped with VICS.

Fig. Cumulative shipments of vehicles equipped with VICS units
1. Current State of ITS in Japan

3) ETC

5.8 GHz active DSRC was introduced. They are used on expressways nationwide.
1. Current State of ITS in Japan

3) ETC

Now, ETC’s nationwide usage rate is 60%. 70% are on expressways in the Tokyo metropolitan area.

Fig. No. of vehicles equipped with ETC on-board units
30% of the traffic congestion on expressways is occurred near tollgates. The increased use of ETC has eased congestion at tollgates.

Fig. Cause of traffic congestion on expressways

Fig. Status of traffic congestion
2. Smartway: the Integrated Systems Solution

1) ITS on-board units

Various applications can be provided by a single ITS on-board unit.

Interior of vehicle equipped with various on-board units

Less cluttered interior
(in the case of a vehicle equipped with a single ITS on-board unit)
2) Open platforms

The open platform approach ensures integration of common functions with a single ITS on-board unit.

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Common hardware
- Improved VICS beacon
- Advanced digital map
- Data infrastructure

Open Platform
2. Smartway: the Integrated Systems Solution

3) Public-Private joint research

SMARTWAY DEMO 2006 (February 22 - 24, 2006)

**Place:** National Institute for Land and Infrastructure Management (NILIM) test course

Demonstration vehicle
2. Smartway: the Integrated Systems Solution

3) Public-Private joint research

- **Voice information**: "Information on road freezing:"
- **Picture information**: "Construction ahead; lanes closed."
- **Warning Information**: "Caution: vehicle stopped 300 meters ahead."
- **Merging at intersections**

- **Refueling service**
- **Internet connection at highway rest area**
- **Parking area entrance**
3. Reducing Traffic Accidents

1) Current state of traffic accidents

There are limits to conventional policies. ITS is the solution to this problem.

Big Accident on Expressway (September 14, 2006)

(1,000 accidents) (No. of persons)

Source: Mainichi Shimbun
September 14, 2006
3. Reducing Traffic Accidents

2) New IT Reform Strategy

The aim is to achieve traffic fatalities reduction to under 5,000.
Through the use of Cooperative Driving Safety Support Systems.

Objective
1. The Pursuit of IT Structural Reform Capabilities
(2) Realization of Safe and Secure Society
- The world’s safest road traffic environment
- Reducing traffic fatalities to 5,000 or below

Concrete policy
- Form a joint committee from the public and private sectors in early 2006 to work towards the realization of Cooperative Driving Safety Support Systems
- Conduct large-scale verification testing, verification, evaluation, of Driving Safety Support Systems by FY 2008.
- Deploy Driving Safety Support Systems throughout the country focusing on roads prove to traffic accidents
3. Reducing Traffic Accidents

Road-Vehicle Cooperative System

Vehicle-To-Vehicle Communication System

Support for Pedestrians
3) Causes of traffic accidents

75% of traffic accidents are caused by human error

Fig. Causes of traffic accidents

Source: Fiscal 2000 tabulated data for traffic accidents (Institute for Traffic Accident Research and Data Analysis (ITARDA))
3. Reducing Traffic Accidents

4) Test of Cooperative Safety Support Systems (AHS)

Pilot tests on the Metropolitan Expressway Route 4 (Shinjuku Route).

- To downtown Tokyo
- Infrared sensor
- Roughly 300 m
- VICS beacon
- To Hachioji
- Outbound

Sensors detect traffic congestion, standing vehicles, and slow-traveling vehicles.

Message sign: Installed on April 27

Simple diagram display of conditions at the start of a curve

Car navigation display

Test Period:
March 1 to May 31, 2005

Roughly 10% of vehicles are equipped with three-media VICS-compatible car navigation systems.
3. Reducing Traffic Accidents

4) Test of Cooperative Safety Support Systems (AHS)

Traffic accidents decreased dramatically.

<table>
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<th>No. of traffic accidents (incidents and year)</th>
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- **other accident**
- **Collisions (other)**
- **Secondary accidents**
- **Collisions (with low-speed vehicles)**

63% decrease compared with the previous year

Start of pilot program

Fig. Traffic accidents at the Sangubashi Curve, the Metropolitan Expressway Route 4 (Shinjuku Route)

Source: AHSRA
3. Reducing Traffic Accidents

5) Services to be deployed

Platform, audio, still images, etc., will be used to deploy advanced services.

[Still image data]

[Audio data]
3. Reducing Traffic Accidents

5) Services to be deployed

a. Information Provision on forward obstacles

b. Information Provision on unusual conditions ahead
3. Reducing Traffic Accidents

5) Services to be deployed

c. Information Provision on the road environment
d. Support for merging (evaluation of feasibility)
3. Reducing Traffic Accidents

5) Services to be deployed

e. Information Provision with digital road map data
   (Evaluation of feasibility)

Support for prevention of hazards when entering curves

Providing information on intersections
4. Conclusion

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

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

3. Traffic accidents are a problem common to every country in the world. Japanese experience and technical expertise can help to reduce traffic accidents worldwide.
Next year, Pilot program will be implemented on TOKYO, etc. Please visit Japan after ITS Beijing Congress.
Thank you