Smartway Project

SS26, 12th ITS World Congress in San Francisco

National Institute for Land and Infrastructure Management, Japan

Hiroshi MAKINO
1. Smartway Project

1) ITS Enter the Second Stage

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>August 2004</td>
<td>Smartway Project Advisory Committee - &quot;Proposal “ITS Enter the Second Stage - Smart Mobility for All - &quot; To realize a platform capable of various ITS services. Those services to be realized in 2007.</td>
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<td>October 2004</td>
<td>Japan ITS Promotional Conference - &quot;ITS Promotion Guideline&quot;</td>
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<td>March 2005</td>
<td>Development Bank of Japan - &quot;Present State and Future Outlook for Advancing ITS&quot;</td>
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<tr>
<td>July 2005</td>
<td>Japan Society of Civil Engineers - &quot;Towards ITS Effective for Roadways (Interim Report) – From Seeds to Public Benefits&quot;</td>
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<tr>
<td>July 2005</td>
<td>Smartway Project Advisory Committee - Announcement of &quot;Follow-up Proposal and Interim summery of Joint Research&quot;</td>
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</table>
1. Smartway Project

2) Overall Picture of Smartway: positioning, mapping and communication
1. Smartway Project

3) Platform Deployment Strategy “Key is common OBU for ITS”

- Car navigation
- VICS (2.4GHz beacons)
- ETC (5.8GHz DSRC)
- Digital Road Map

Services promoted by the public sector:
- Next-generation roadway services
- Information provision services along roadways
- Information connection services at rest areas
- Public parking lot settlement services

Deployment of private services:
- Information services
- Payment services for gasoline stations, drive-thru establishments, etc.
- Recreational services
- Vehicle diagnostic services
- and many others

- 1995
- 2001
- 2007

Diverse media

Information provision

Fee collection

Next-generation roadway services
1. Smartway Project

4) Spread of services on platform

- Reversing the negative legacy of motorization
- Ensuring mobility for the elderly
- Developing affluent communities and lifestyles
- Improving the business climate

**Leading on all areas of ITS**

1. Advances in navigation systems
2. Electronic toll collection systems
3. Assistance for safe driving
4. Optimized traffic management
5. Increasing efficiency in road management
6. Support for public transport
7. Increased fuel efficiency in commercial vehicle operations
8. Support for fleet management
9. Support for emergency vehicle operations

**Smartway Platform**
1. Smartway Project

5) Smartway Project concerned organizations

Public and Private sectors Joint Research

Study of technologies for providing government services using DSRC

MLIT
Ministry of Land, Infrastructure, and Transport

NILIM
The National Institute for Land and Infrastructure Management

Private corporations

ITS Japan
ITS (Intelligent Transport Systems) Japan

AHSRA
Advanced Cruise-Assist Highway System Research Association

HIDO
Highway Industry Development Organization

ARIB
Association of Radio Industries and Businesses

JARI
Japan Automobile Research Institute

JAMA
Japan Automobile Manufacturers Association

ASV
Advanced Safety Vehicle

JEITA
Japan Electronics and Information Technology Industries Association

DSRC Forum Japan
Examination and proposal of specific policies for proliferation of DSRC application services

23 partners

223 partners
2. Joint Research for Next-Generation Services

1) Schedule of the Joint Research

- Feb. 2005: Joint research Start
- July 2005: Interim report
- March 2006: Final report

23 Partners

- Aisin AW Co., Ltd.
- Clarion
- Denso
- Fujitsu
- Fujitsu Ten
- Fujitsu Laboratories
- JRC
- Japan Radio Co., Ltd.
- Kenwood
- Mitsubishi Electric
- Mitsubishi Heavy Industries, Ltd.
- NEC
- Nissan
- NTT DoCoMo
- OKI
- Panasonic
- Park 24 Co., Ltd.
- Pioneer
- Sumitomo Electric
- Tokico Technology Ltd.
- Toshiba
- Toyota
- Xanavi
2. Joint Research for Next-Generation Services

2) Realization of ITS services by 2007

- **Joint research**
- Development of standards and specifications
- Installation of RSE and manufacture of OBU
- Realization of ITS services

<table>
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<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2004</td>
<td>Joint Research office</td>
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<tr>
<td>2005</td>
<td>Deployment of RSE &amp; OBU</td>
</tr>
<tr>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>2007</td>
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2. Joint Research for Next-Generation Services

3) Configuration of the Platform

- GPS

- ITS OBU: Car Navigation Function, Digital Road Map, Basic API, Road-to-Vehicle Communication Functions

- 5.8GHz DSRC

- Road-to-Vehicle Communication

- RSU: Applications, Basic API, Road-to-Vehicle Communication Functions
### 4) Characteristics of 5.8 GHz DSRC

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Summary</th>
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<tbody>
<tr>
<td>Already used for ETC</td>
<td>8.6 million vehicles equipped Usage rate around 50% “Spreading in the future”</td>
</tr>
<tr>
<td>High level of security</td>
<td>Enabling payment services</td>
</tr>
<tr>
<td>High speed &amp; large capacity</td>
<td>Enabling safety services</td>
</tr>
<tr>
<td>Internet connection</td>
<td>Enabling various services</td>
</tr>
<tr>
<td>Two-way communication</td>
<td>Enabling information collection by uplink function</td>
</tr>
<tr>
<td>Spot communication</td>
<td>Enabling easy development and deployment</td>
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</tbody>
</table>
2. Joint Research for Next-Generation Services

5) Basic API on DSRC

<table>
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<tr>
<th>Function Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Command &amp; response</td>
<td>Notification of instruction information from RSU to OBU, and response by OBU</td>
</tr>
<tr>
<td>Memory access</td>
<td>Reading and writing of memory from RSU to OBU</td>
</tr>
<tr>
<td>ID communications</td>
<td>Identification of OBU by RSU and response by OBU</td>
</tr>
<tr>
<td>Card access</td>
<td>Sending and receiving of IC card settlement information between OBU and RSU</td>
</tr>
<tr>
<td>“Push-Type” information</td>
<td>Provision information from roadside units to on-board units</td>
</tr>
<tr>
<td>Security</td>
<td>“Mutual authentication,” “Data authentication,” and “Encoding” functions to ensure application reliability and safety</td>
</tr>
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Combination of Basic API functions makes various ITS services on public and private.
2. Joint Research for Next-Generation Services

6) Realization of ITS services by 2007
(1) Information provision services / “Improvement of VICS”

- Wide range of information
- Information by static image
- Information by voice
- High speed and large capacity communication
- Collection of Probe data
- Information on greater numbers of jam routes

Congestion 2 km ahead due to an accident between Urayasu and Makuhari.
6) Realization of ITS services by 2007

(2) Information connection services at rest area / “Internet Connection”

Top page of WEB

Road traffic information

Road surface conditions

Local news

Internet connection

Testing at Showa Michi-no-eki
May 3–5, 2005
2. Joint Research for Next-Generation Services

6) Realization of ITS services by 2007

(3) Public parking lot settlement services / “IC credit card payment”

- High speed and secure communication
- IC credit card access

Fee payment testing at Ozone parking facility
3. Developing new services on the platform

ITS into the 2nd Stage!

- Private parking facilities
- Gas stations
- Map downloads
- Cashless payment
- AHS
- More efficient road administration
- Creating business opportunities
- Greater business efficiency
- Restaurants
- Convenience stores and supermarkets
- Dispatch control
- Traffic control

ITS services in 2007
- Information provision along roadways
- Information connection at rest areas
- Public parking lot settlement

Platform
Thank you very much for your attention.

Contact information

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