

Progress of the Smartway

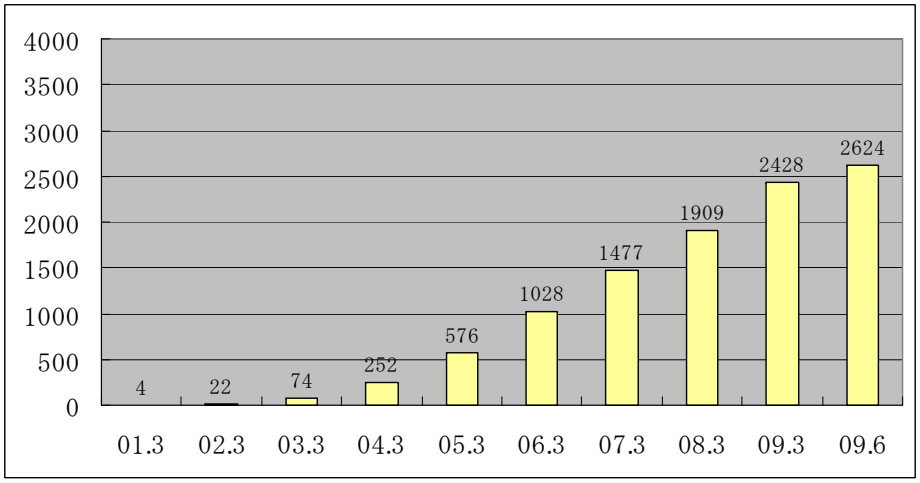
January, 2010

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Ministry of Land, Infrastructure, Transport and Tourism Government of JAPAN

Background (Penetration of ITS Technology for Car Users in Japan)
- Electronic Toll Collection System (ETC)

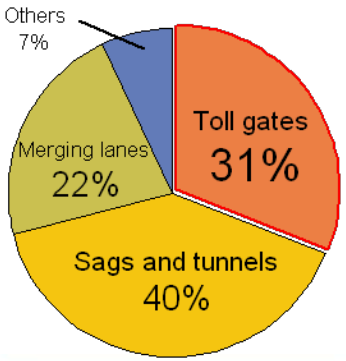
- About 26 million ETC on-board units have been marked in.
- The nationwide utilization rate is 80.5%. (85.3% are on the Tokyo Metropolitan Expressway.)
- Enables non-stop, cashless toll collection at expressway tollbooths, whose capacity shortage causes about a third of traffic jams on expressways:

Total numbers of ETC on-board units



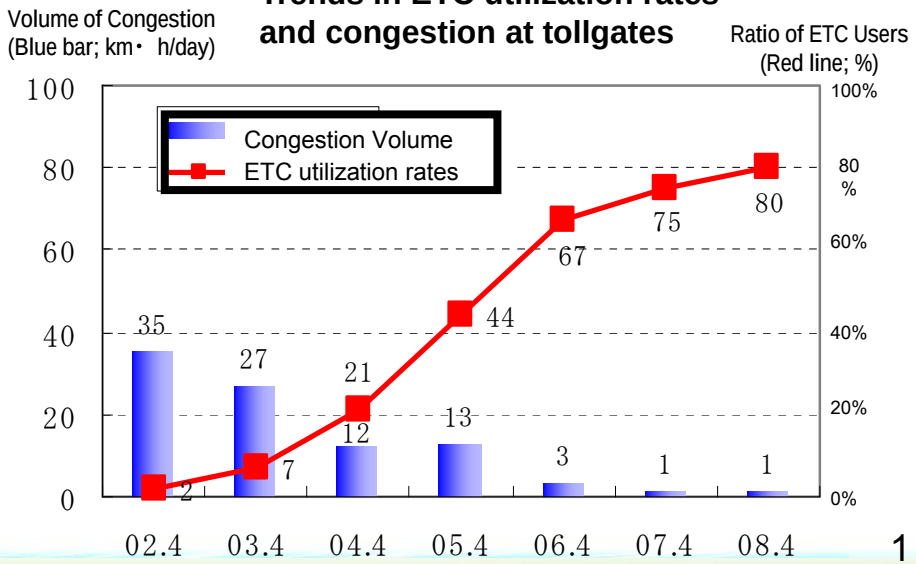






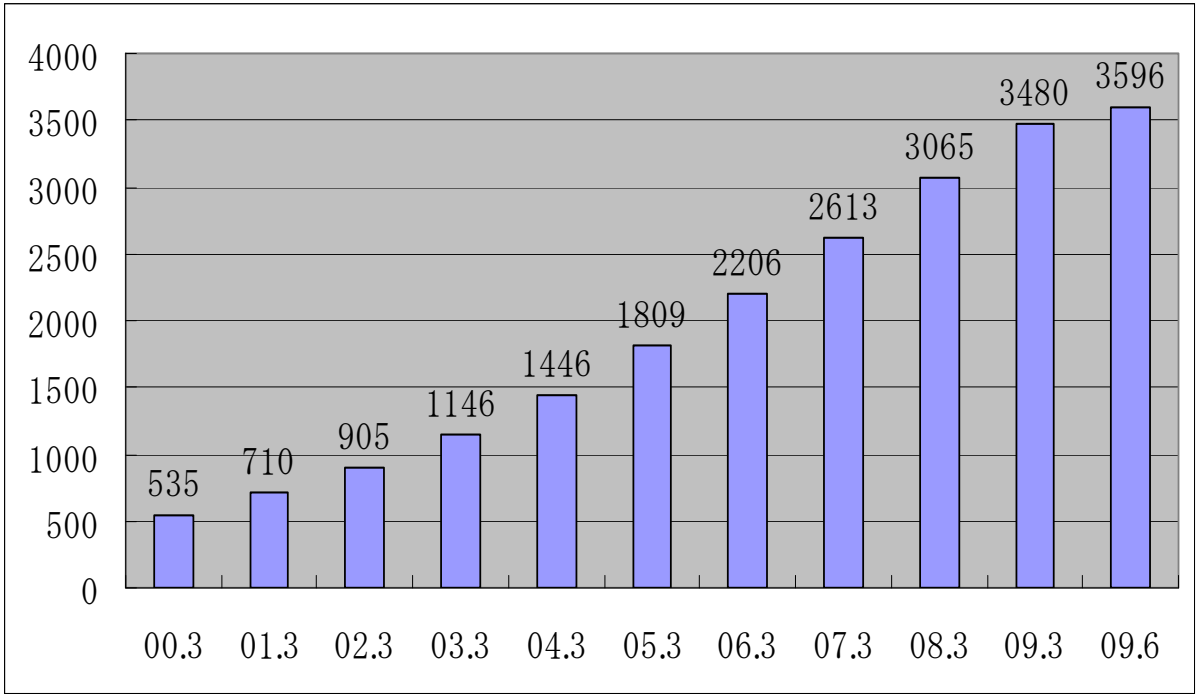
Causes of congestion on expressways

Trends in ETC utilization rates and congestion at tollgates

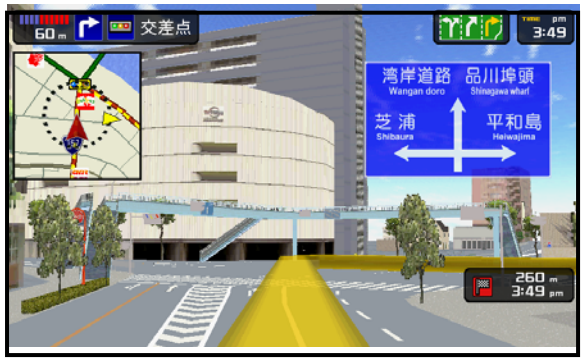


Background (Penetration of ITS Technology for Car Users in Japan)
- Car Navigation service

- In 1989, the standard national digital road map development was completed, and the distribution was started.
- In 1990, car navigation units have started to load with the digital road map.
- In 2009, more than 35 million car navigation units are shipped.



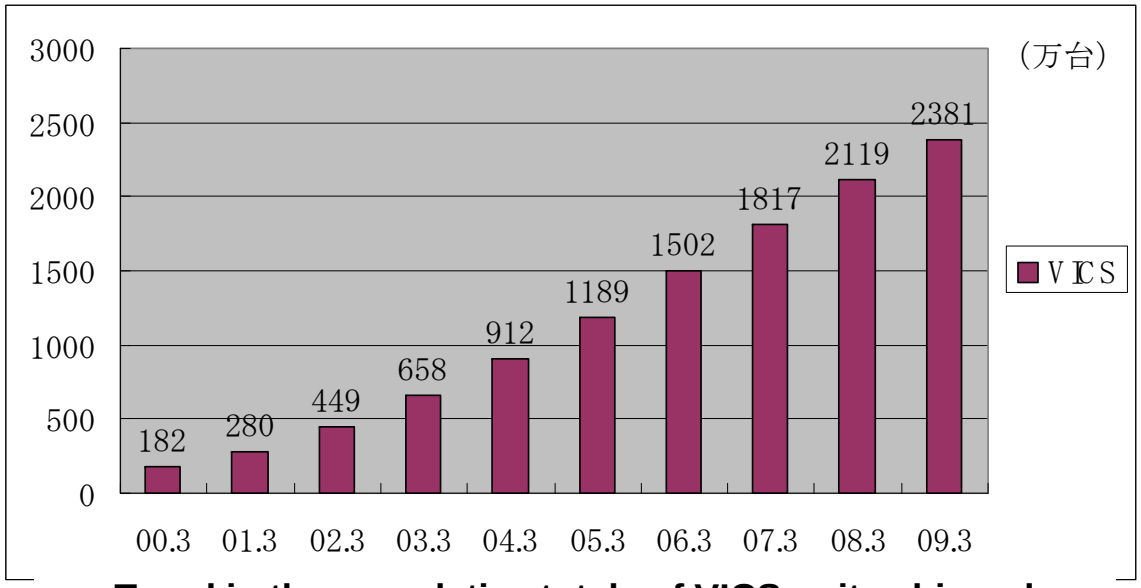
Trend in the cumulative totals of Car navigation system units shipped





Background (Penetration of ITS Technology for Car Users in Japan)
- Vehicle Information Communication System (VICS)

- In 1996, VICS service started.
- In 2009, accumulative total of nearly 24 million VICS units have been shipped.
- In 2012, VICS will be expected to contribute to achieve the objective of Kyoto Protocol by reducing 2.5 million tons of CO_2 emission per year.

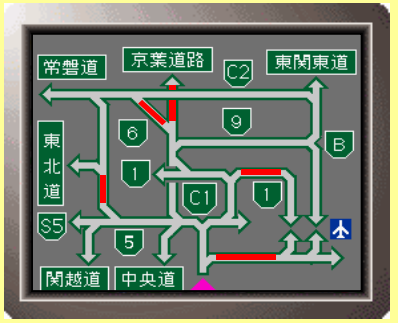


Trend in the cumulative totals of VICS units shipped

数



Image of the information provided by VICS



Information provided on simbolized map



Information provided on digital road map

Promotion of the Smartway by Public-Private Partnership

2004 — Smartway promotion conference, proposed “For the second stage of ITS development”

To further accelerate and promote the smartway that is a common foundation for ITS development, in the scope of national strategy.

It is expected that the following ITS services will be available by means of an ITS on-board device from 2007.
1) Providing timely information for supporting driving
2) District guide responding to on-the-spot needs
3) Easy passage through any gates

2005 — Started public-private collaborative research

The National Institute for Land and Infrastructure Management and 23 private enterprises jointly made research for the next generation road service system.

Based on the proposal, public-private collaborative research with 23 private enterprises was made on the next-generation road service system.

国土交通省 国土技術政策総合研究所

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2007 — Establishment of standards and specifications of on-board devices and roadside devices

Smartway 2007 experiments and demonstration tests on public roads

Using demonstration cars running on the Metropolitan Expressway, trial riding for experiencing various new ITS services, and a symposium and an exhibition were also held.

New IT innovation strategy (2005)
Building the road traffic society the safest in the world.
Reducing road fatalities to less than 5,000

2008 — ITS-Safety 2010: Large-scale demonstration test of FY2008

Expanded services to the three major metropolitan areas.

・Innovative strategy for the new digital age - Three-year emergency plan - (2009)
・i-Japan strategy 2015 (2009)

In the ITS area, reduction of environmental impact and traffic accidents, and streamlining of physical distribution are expected. In the circumstances, efforts shall be made for widespread use of the next-generation on-board devices and development of roadside devices.

2009～ — Nationwide deployment of the smartway

New cooperative vehicle-highway system

Smartway: New cooperative vehicle-highway system

ITS on-board units

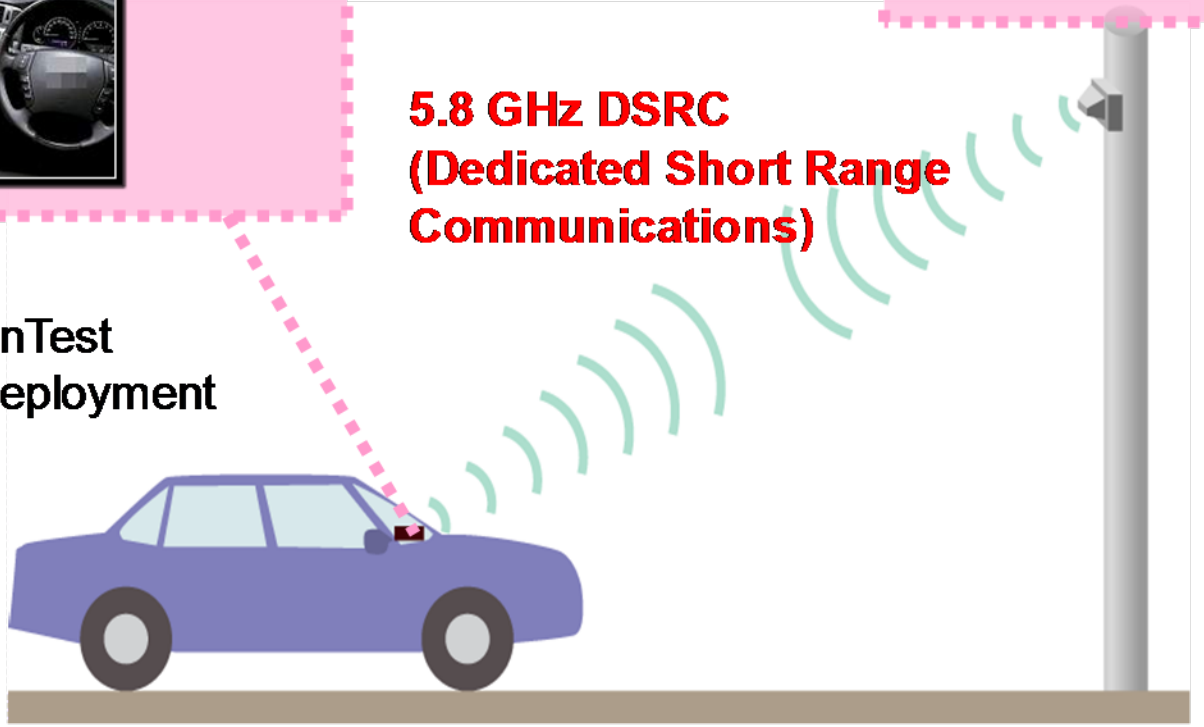




DSRC roadside unit



5.8 GHz DSRC (Dedicated Short Range Communications)



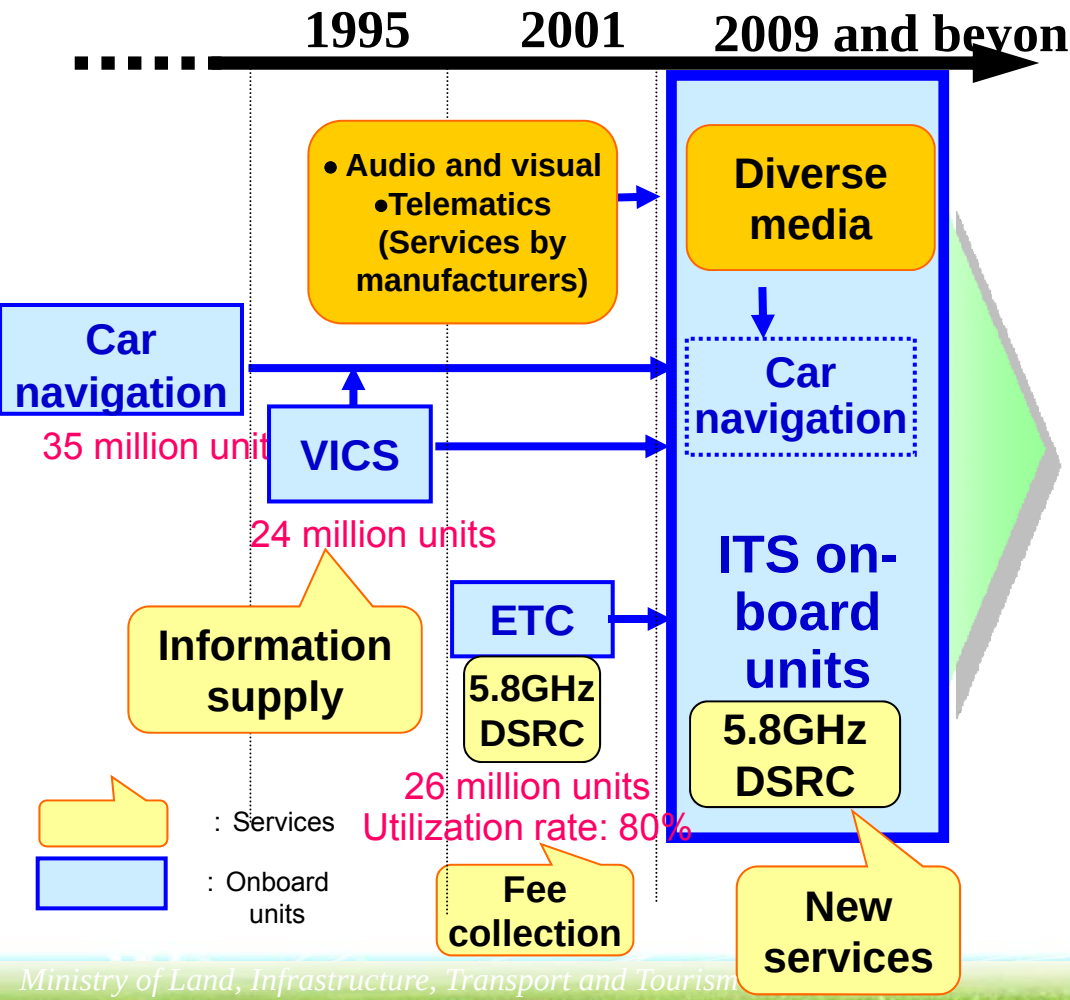
2007 Field OperationTest
2009 Nation-wide Deployment

Outline of ITS Onboard Unit

◆Multiplatform: Diverse services (e.g., provision of traffic information, ETC, various private sector services) with a common infrastructure

◆Spot-type Communication with International Standard DSRC of ETC

* DSRC: 5.8GHz Dedicated Short Range Communication



＜Diverse applications＞

- Providing wide-area traffic information
- Providing traffic information in easily understandable audio forms
- Providing information to support safe driving
- Providing information at service areas, parking areas, and rest areas

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ETC

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Private sector services

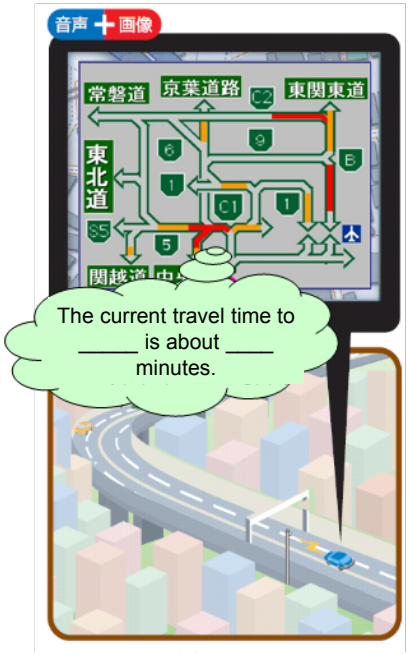
- Providing information based on requests
- Cashless payments

Service examples (1)

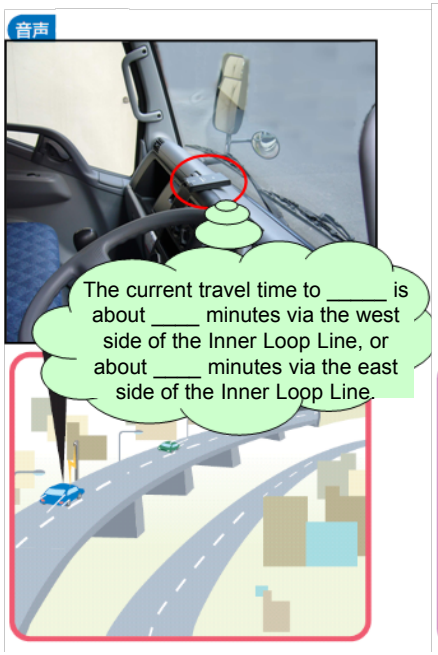
Nationwide deployment starting in 2009

Demonstration starting in 2009

Wide-area traffic information



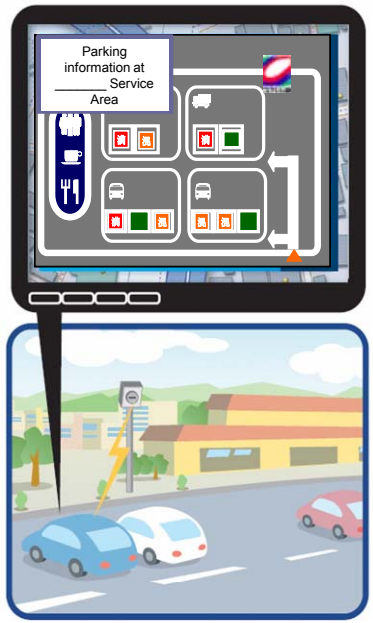
Traffic information by audio forms



Information on assisting safe driving



Information access at service, parking, and rest areas



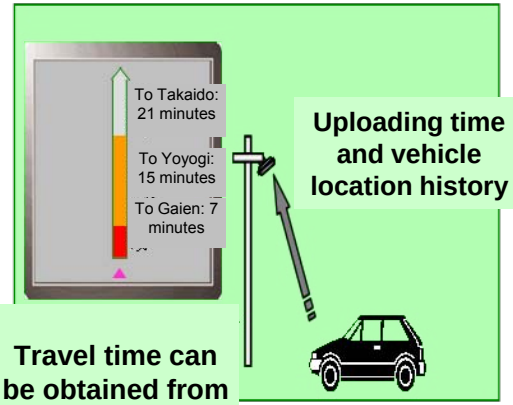
Example: Providing information on obstacles ahead

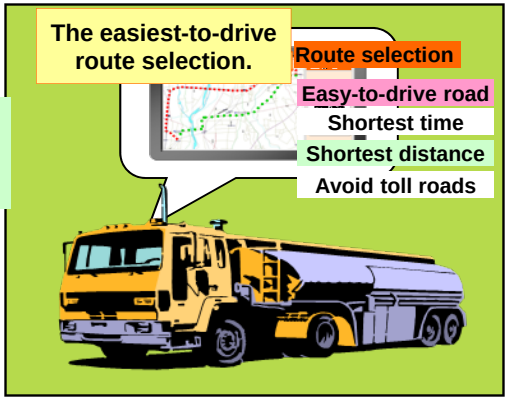
Service examples (2)

Preparations will be considered in the future for these services:

Fee collection at parking facilities, etc.	Uploading	Supporting for more efficient logistics







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Developing On-board Units by Private Companies

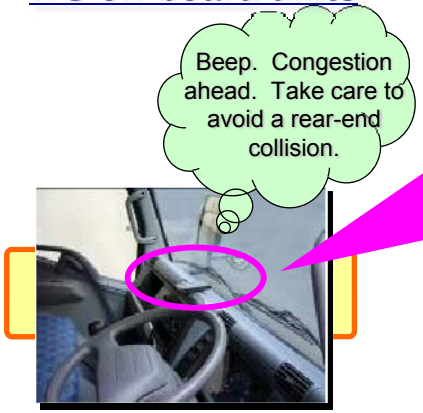
On-board Units for realizing Smartway services

ITS on-board units linked to car navigation systems





Speech-only ITS on-board units



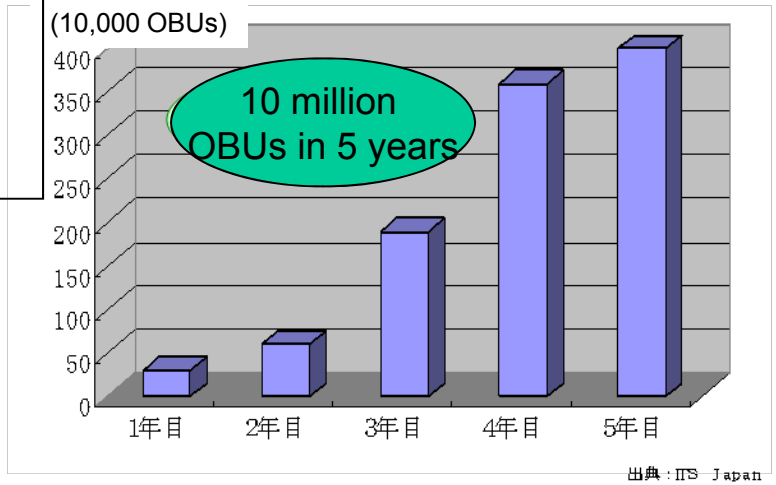


New type of ETC on-board unit with speech capability



Development & Sale of ITS OBUs by the Private Sector

Release of new ITS OBUs last October by private companies, which can provide various services including metro-wide road traffic information



* Press Release of ITS OBU
  Pioneer (2009, May) Toyota (2009, Sep)
  Mitsubishi Electric (2009, Sep)

* Estimated Number of ITS OBUs: 10 million OBUs in 5 years (estimate of Non-profit Organization, ITS-Japan)

Toyota


次世代型DSRC受信機
トヨタが開発
トヨタ自動車は3日、国が整備する次世代型DSRC（狭域無線通信）情報を受信する車載ユニットを開発したと発表した。近く一部改良する車両や発売する「前方障害物情報提供」や、インターチェンジで合流車の接近を知らせる「合流支援情報提供」などの機能を持つ。このほか、発信地点や状況を画像や音声で知らせる機能もある。トヨタは順次、搭載車を増やしていく考えだ。
DSRC ユニット
カーナビゲーション

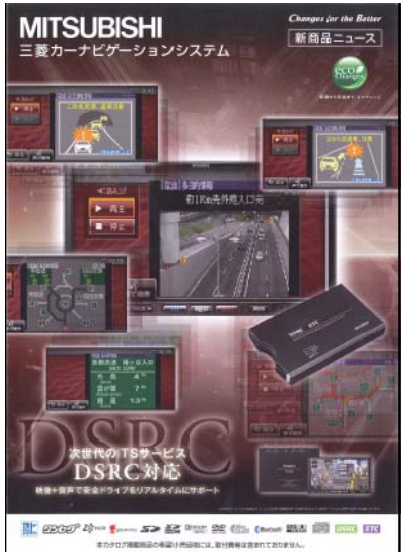
Released on 16 Oct. 2009

Pioneer



Released on 14 Oct. 2009

Mitsubishi Electric



Released on 28 Oct. 2009

Nationwide deployment of Smartway

- We are installing roadside equipment, primarily on expressways, and are taking the lead by introducing public services such as providing wide area traffic information.
- We are developing means of verification and response, such as monitor surveys, for the effects of services as well as issues of facility establishment, management, and operation.

○ Anticipated Benefits

- To reduce congestion and promote low-carbon innovation through the sophisticated provision of information, including appropriate route guidance
- To provide economic benefits including the sale of ITS onboard units and ripple effects in content-related markets

Future Plan

2009
- ○ Providing information on road traffic and assisting safe driving on the Tokyo Metropolitan Expressway, Hanshin Expressway, and Nagoya Expressway
- ○ Starting installing around1,000 roadside equipment (RSE) throughout Japan
- ○ Expanding providing traffic information by voice message on the Tokyo, and Osaka area

2010
- ○ Starting full-scale services primarily on expressways nationwide and conducting proving tests at highway rest area by 1,000 RSE

2013
- ○ITS World Congress to be held in Tokyo

Deployment of Smartway Services

Extensive services by the private sector are provided through ITS OBUs (with a high-performance, open platform including multi-application capability).



Provision of information on tourism and leisure facilities.



Management of Logistics

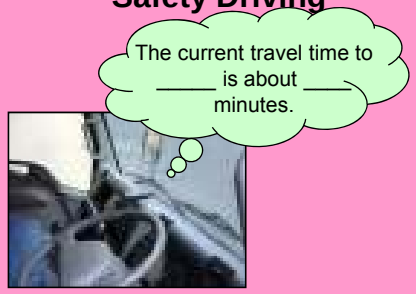
Provision of services and adoption of ITS OBUs, primarily on expressways



Regional Road Traffic Information



Assistance System for Safety Driving



Providing traffic information in audio form (highway radio)

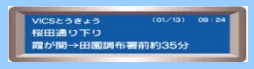


Distributing electronic ads, etc. for outlet stores

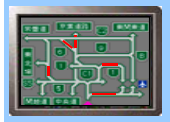
Improved security at entrances

Client management

Existing VICS services (24 million VICS)



Text Display



Simple Diagram Display



Map Display

ETC
(26 million ETCs)
(Utilization rate: 80%)

