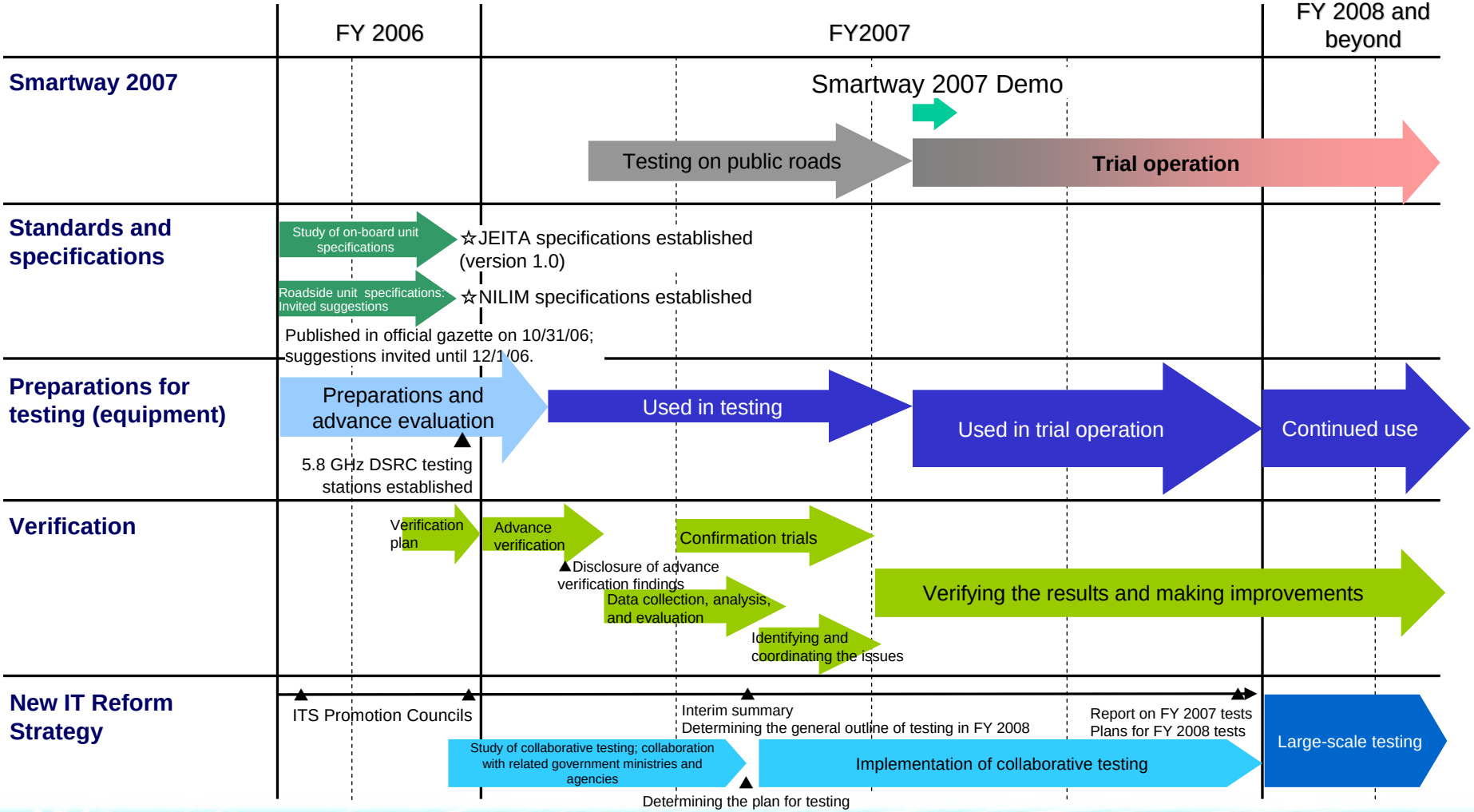
Smartway 2007 Demo, Trial Operation on Metropolitan Expressway & Spread of Smartway Project

Outline

- Activities toward Smartway 2007 Demo
- Testing on Public Roads
- Contents of Smartway 2007 Demo
  - Overview
  - Test Ride on Tokyo Metropolitan Expressway
  - Symposiums
  - Exhibition
  - Evaluation of Demonstrated Services
- Spread of Smartway Project

Activities toward Smartway 2007 Demo

- Preparations for testing are conducted in cooperation with expressway companies, private businesses, and other organizations.
- Testing began on May 14, 2007.



Testing on Public Roads

SMARTWAY 2007

1) Flow Chart of Testing

1. Selection of the routes and locations needing countermeasures
- Identifying the locations in need of countermeasures
- Analyzing the reasons

2. Studying the lineup of services
- Identifying the locations in need of countermeasures
- Analyzing the reasons

3. Testing plan

4. Preparations for testing

FY 2006

FY 2007

5. Testing and evaluation

Collaboration with related government ministries and agencies

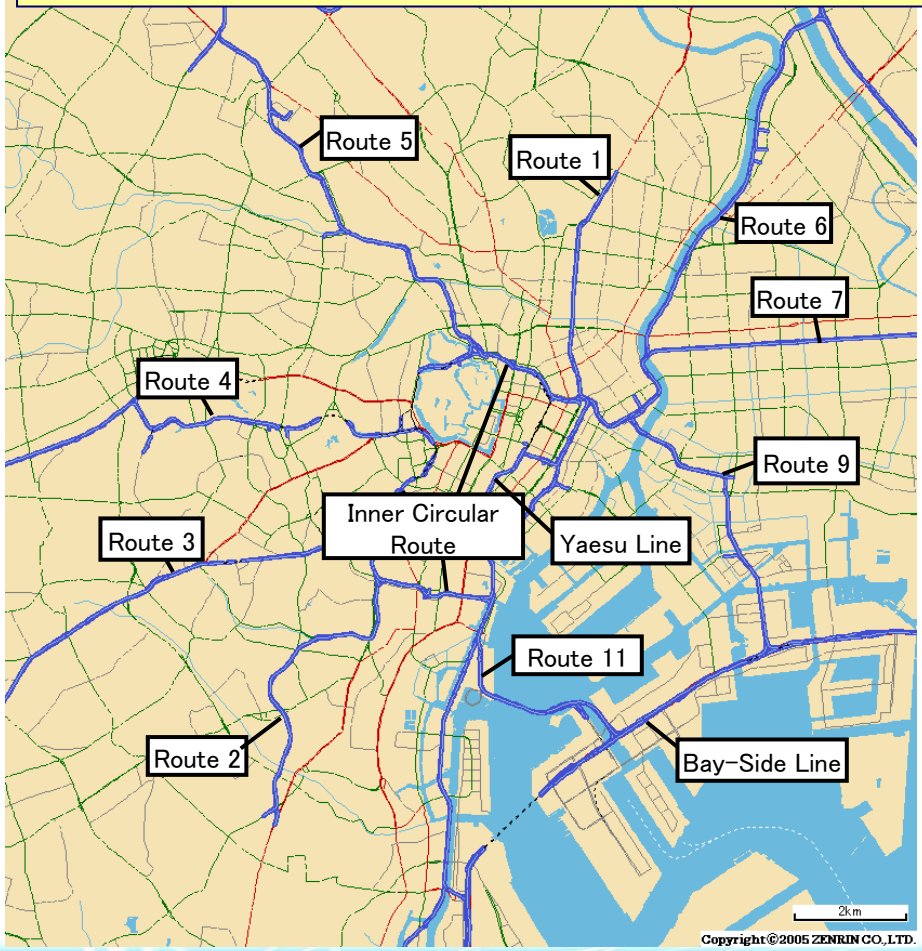
Scale of testing

- **Testing to begin on May 14, 2007**
- **29 participating companies as of July, 2007 (11 car manufacturers and 18 manufacturers of on-board units and appliances)**
- **Total of 60 vehicles are used for about 2000 runs.**

Testing on Public Roads

2) Overview of the Metropolitan Expressway

- The Metropolitan Expressway includes nine radial roads linked to a loop line.
- Average daily traffic volume is approximately 1.2 million vehicles (as of September 2006).
- The number of accidents is 11,944 (fiscal 2006).



Routes with high accident rates (cases per 100,000,000 vehicle-km)

Accident rates in descending order	1	2	3	4	5
Total accidents	Yaesu Line	Inner Circular Route	Route 6 Misato Line	Route 4 Shinjuku Line	Kanagawa Route 5 Daikoku Line
Fatal and injury accidents	Yaesu Line	Inner Circular Route	Route 11 Daiba Line	Route 2 Meguro Line	Route 4 Shinjuku Line

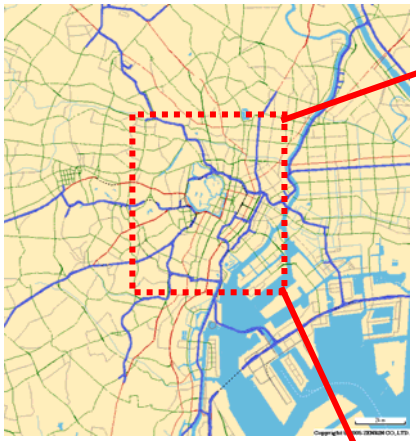
Routes with greater accident density (cases / km / year)

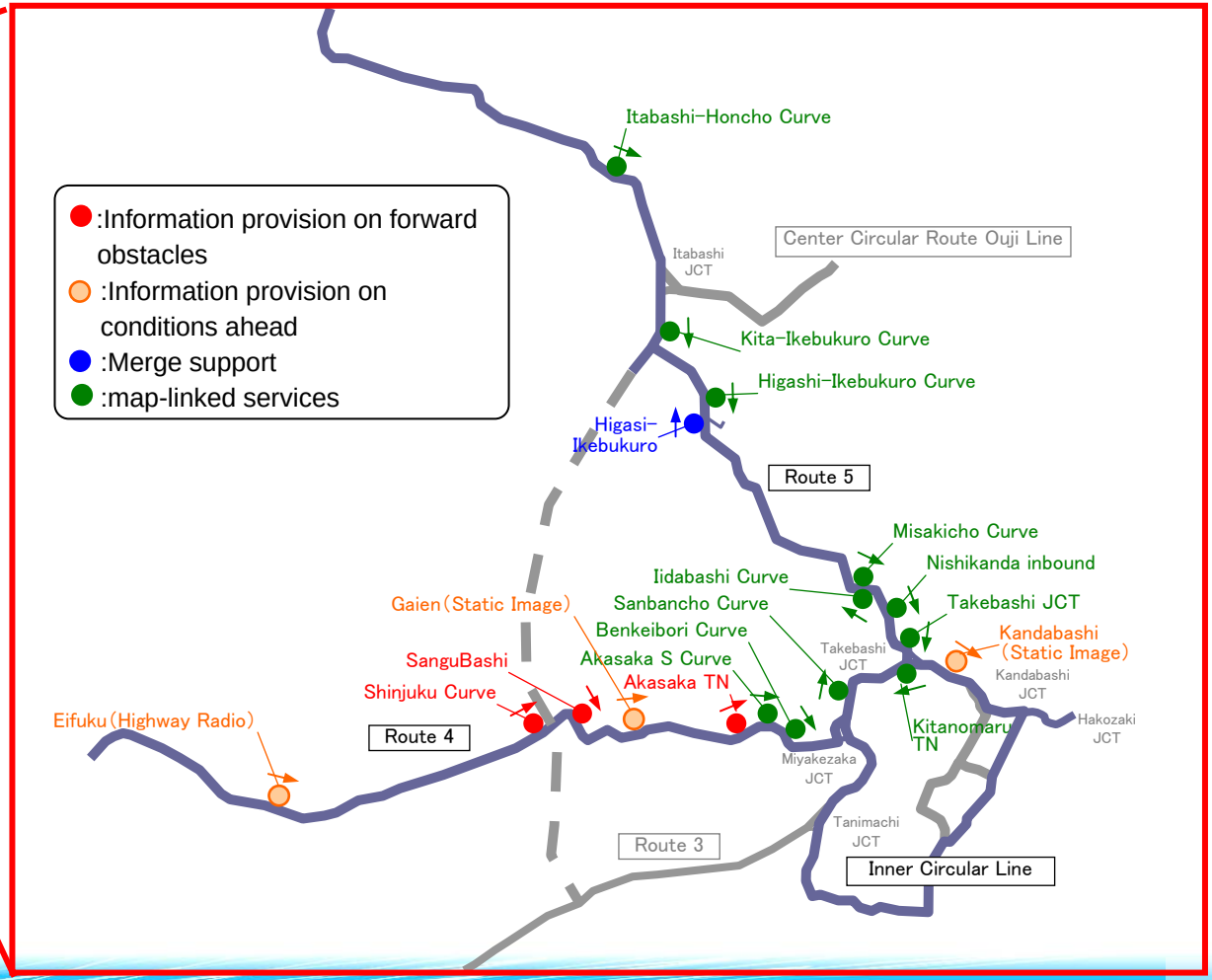
Accident rates in descending order	1	2	3	4	5
Total accidents	Inner Circular Route	Route 4 Shinjuku Line	Route 5 Ikebukuro Line	Route 1 Haneda Line	Route 11 Daiba Line
Fatal and injury accidents	Inner Circular Route	Route 4 Shinjuku Line	Route 6 Misato Line	Route 5 Ikebukuro Line	Route 1 Haneda Line

Testing on Public Roads

3) Test locations on the Metropolitan Expressway

- On the Metropolitan Expressway, tests were conducted on the Loop Line, Route 4, and Route 5, which have high rates and high densities of accident occurrence.





Testing on Public Roads

SMARTWAY 2007

4) Concept of Evaluation

1. Verifying system functions

- Determining whether roadside units and on-board units are functioning as required with regard to data collection, processing, and supply functions.
- Determining whether multiple ways of detecting phenomena, having different implementation costs, are capable of adequate detection of phenomena.

(Evaluation indices) Detection rates by sensors and interpretation software, etc.

2. Verifying system effectiveness based on vehicle behavior

- Determining whether drivers adequately follow the expected behavior upon receiving information.

(Evaluation indices) Presence of sudden braking, abrupt steering, etc.

3. Verifying system effectiveness based on driver opinions

- Determining whether drivers actually perceive the system's intended effects.

(Evaluation indices) Perceived level of effectiveness, willingness to pay, effectiveness of information supply, desire to continue using the system, etc.

Overview of Smartway 2007 Demo

SMARTWAY 2007

■Smartway 2007 Demo held at Tokyo International Forum & on Metropolitan Expressway from October 14 to 17, 2007.

Test Ride on Metropolitan Expressway
- 14 test cars
- English voice announce

Exhibitions
- ITS On-Board & Roadside Units
- Equipped cars
- Panels

Symposiums
- Smartway Symposium
- AHS & JSCE Symposium
  (opened at the same time)

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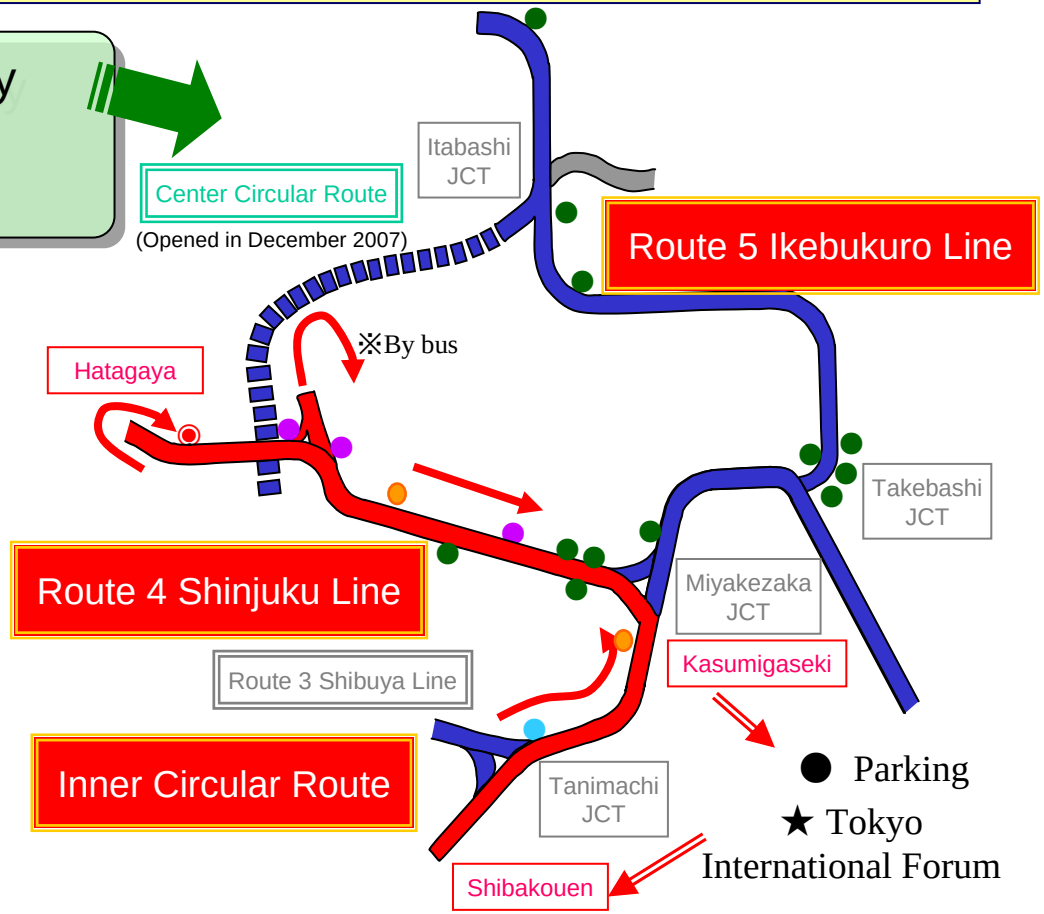

Demonstrated Services
- ●:Information provision on forward obstacles
- ●:Information provision on conditions ahead
- ●:Merge support
- ◉:Providing Positional Information
- ●:map-linked services

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	Number of Partcipants
Opening Ceremony	400
Test Ride on MEX	666 (54 from abroad)
Smartway Symposium	350
No Prior Registration (Exhibition Only)	201
Press	35
TOTAL	1,652

Test Ride on Tokyo Metropolitan Expressway

SMARTWAY 2007

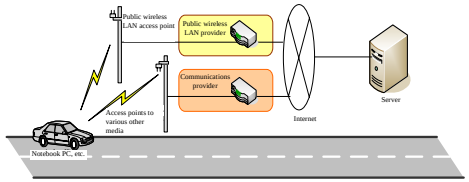
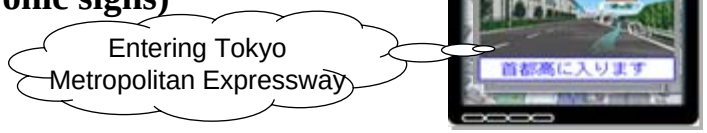
3) Lineup of Demonstrated Services(1/2)

System	System summary
Providing information on obstacles ahead **Audio＋Visual** Beep! Congestion ahead. Drive carefully! 	• Roadside sensors detect stopped vehicles or congestion beyond a curve with poor visibility and warn drivers entering the curve by visual and audio information.
Providing information on conditions ahead **Audio＋Visual** Traffic is congested in the direction of XXX. 	• Road conditions ahead are communicated to drivers in visual form to call their attention.
Providing information on conditions ahead **Audio only** The current travel time from xxx to xxx is about xxx minutes. 	• Road traffic information on congestion, etc., is supplied in audio form by highway radio.
Merging assistance **Audio + Visual** Beep! Vehicles merging from the left. Drive carefully! 	• Roadside sensors detect vehicles approaching a merge point. Just before the merge point, drivers are alerted to the presence of merging vehicles by visual and audio information.

Test Ride on Tokyo Metropolitan Expressway

SMARTWAY 2007

3) Lineup of Demonstrated Services(2/2)

System	System summary
Information provision (IP data link) 	• Using 5.8 GHz DSRC, wireless LAN, etc. to provide Internet connectivity to vehicles parked at service areas, parking areas, etc.
Use of various Communications media 	• Using various communications media, including public wireless LAN. • Studying uses such as simple bus location services in rural areas, based on the results of proving tests.
Map-linked services to call attention and provide information 	• Calling attention to speed, etc. while driving, based on map databases in car navigation systems, including road curvature data. • Providing information on locations with frequent accidents, as well.
Smart parking 	• Using ETC user vehicle numbers to provide parking fee payment services based on ETC on-board units.
Information provision (electronic signs) 	• Support for determining one's location at entrance ramps, etc. • Providing simple sign information as well.

Exhibition

- ITS On-Board Units
  - Two kinds of ITS On-Board Units

    1) ITS OBU Integrated with Car Navigation Syetems (Visual and Audio Information)

    2) Single-type ITS OBU for Trucks and Light Automobiles that are not installed with Car Navigation (Audio Information Only)
- Roadsides Units
  - 5.8GHz DSRC-Antenna, Detection Sensors
- Others
  - Driving Simulator for Experience of Demonstrated Services
  - Panels, Image for introducing Theme of Smartway, Services and Systems Summary
  - Cars Equipped with ITS OBU

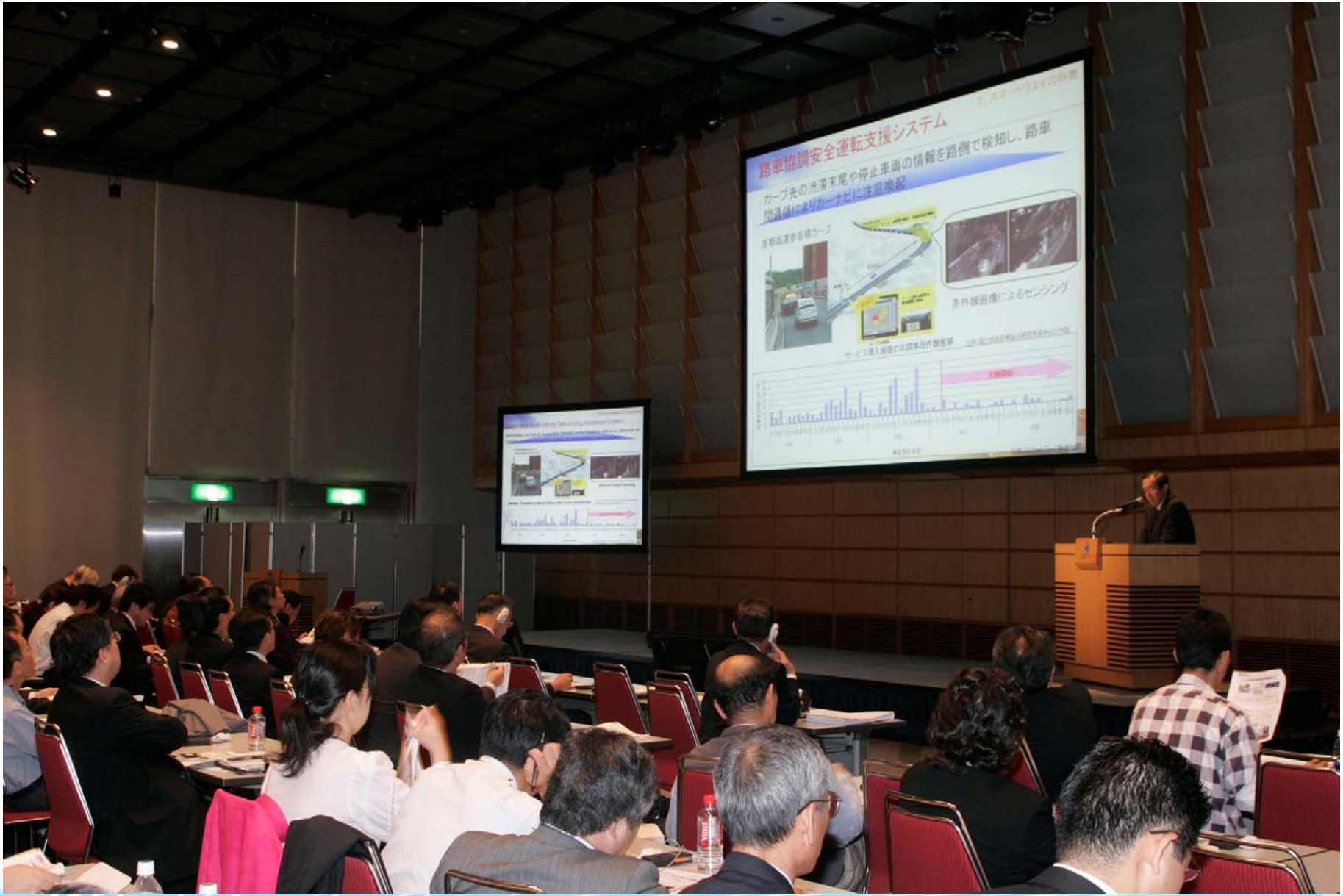
Exhibition

Symposiums

- Smartway Symposium
  - –Keynote Address
    : “ITS Enter the Second Stage, Contribute to the Resolution of Social Issues on Road Traffic”
  - –Special Speeches
    : “Policy for Cooperative ITS”
    : “Cooperative Systems in Europe, The Process of Convergence”
  - –Panel Discussion
    : “Smartway changes Safety, Security, and Environment on Road Traffic”
- AHS Symposium (sponsored by AHS Research Association)
  - – Reports of researches on AHS Services based on Smartway Project
- JSCE Symposium (sponsored by Japan Society of Civil Engineers)
  - – Provision of Topics from Professors at local University and Panel Discussion about “How do we proceed with the practice of Regional ITS ?”

Symposiums

SMARTWAY 2007



Symposiums

Hironao Kawashima (Professor of Keio Univ.)

Shelly Row (Director of ITS JPO ,US DOT)

Timo Kosch (Team & Project Manager of BMW Group Research and Technology)

Symposiums

Symposiums

Coordinator

- Toshihiro Toritsuka (Chief editor of JAF Mate, JAFMATE Co., Ltd.)

Panelists

- Rumiko Iwasada (Motor journalist)
- Hajime Amano (Chairman of the Telematics Services Promotion Committee, ITS Japan)
- Takashi Oguchi (Professor of Tokyo Metropolitan Univ.)
- Satoru Nakajima (General manager of a racing team)

Evaluation by Participants

- Questionnaire Survey was conducted, to which 511 (accounting for about 83% of all people who experienced services in four days) answered.

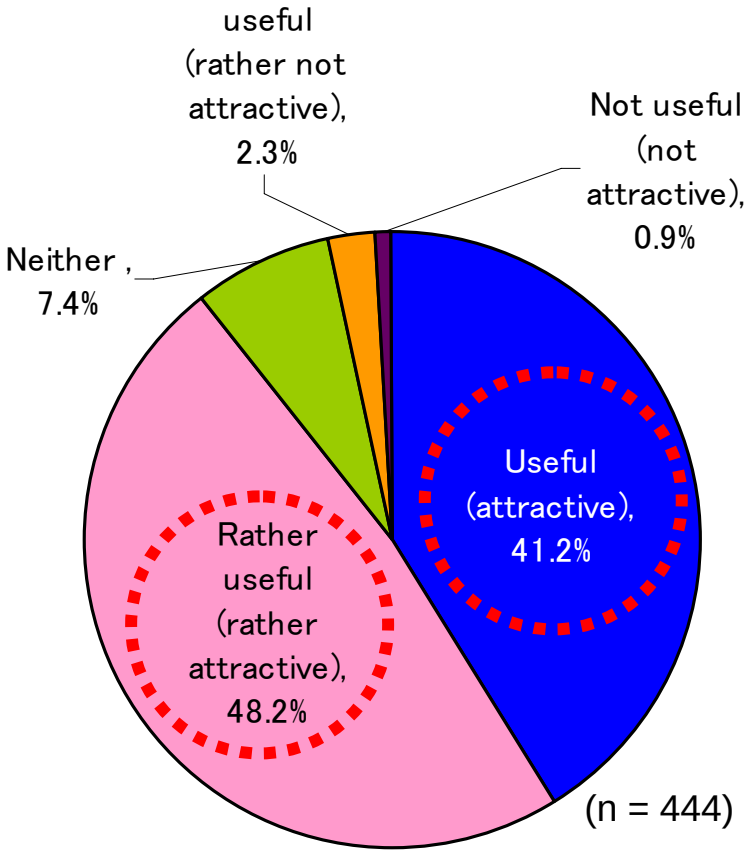


Fig. General Evaluation of the Demonstrated Services

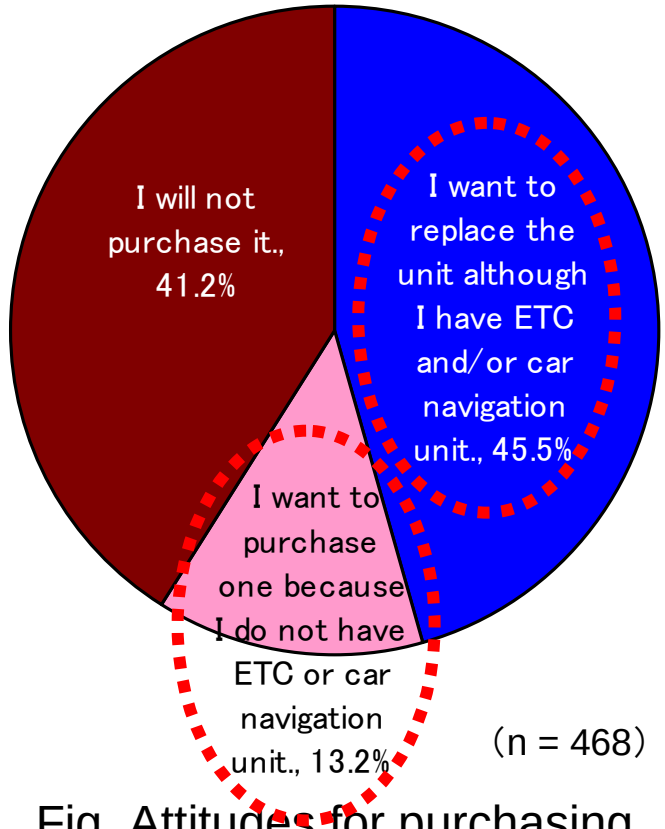
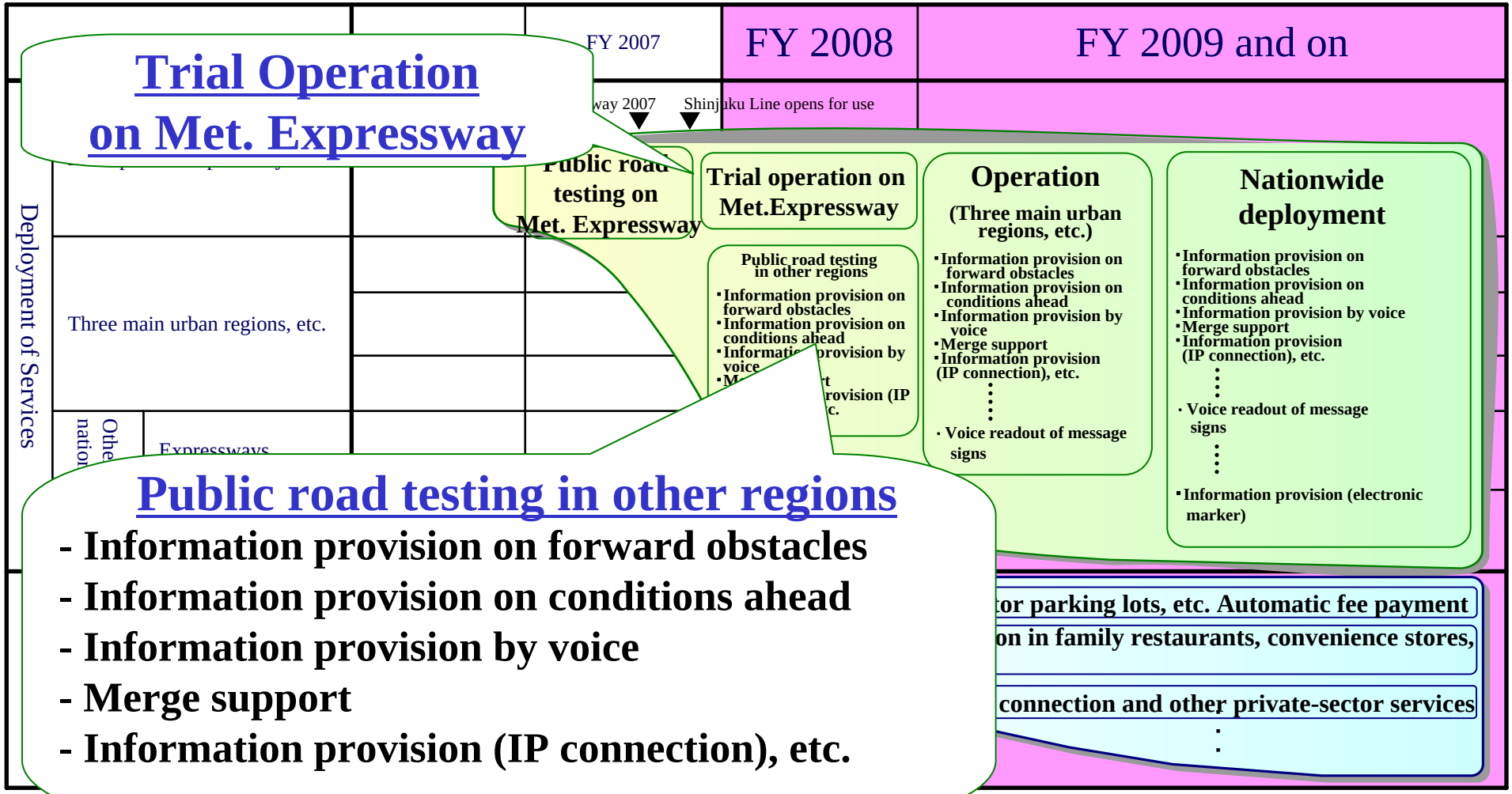


Fig. Attitudes for purchasing (replacing) ITS on-board unit

Spread of Smartway Project

■After these tests on the Tokyo Metropolitan Expressway, testing will be expanded to regions throughout Japan.



Trial Operation on Met. Expressway

Public road testing in other regions

- **Information provision on forward obstacles**
- **Information provision on conditions ahead**
- **Information provision by voice**
- **Merge support**
- **Information provision (IP connection), etc.**