

4. 付録 (APPENDIX)

4.2 地図利用走行支援 (Digital Road Map for Advanced Driver Assist Systems) : Japan

12th U.S-Japan ITS Workshop

Plan for R&D of Digital Road Map

Ministry of Land, Infrastructure and Transport
National Institute for Land and Infrastructure Management

Hiroshi MAKINO

Contents of presentation

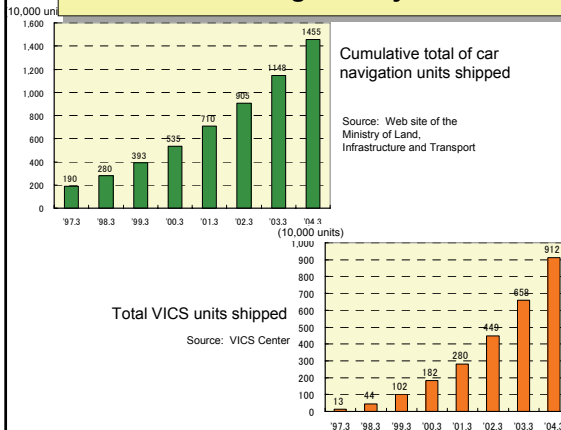
- 1.Current Car Navigation Systems
and Digital Roadmap
- 2.Issues of Digital Roadmap
- 3.Movement for
Next-generation Digital Roadmap
- 4.Future perspective of Digital Roadmap
- 5.Introduction of latest AHS Results

1.Car Navigation Systems and Digital Roadmap

(1) Background of spreading car navigation systems



- Released in 1980s, spreading with increasing of the sales of luxury car
 - VICS service, since 1996, adding the value and expanding sales
 - Over 14 million car navigation systems have been shipped,
And around 46% of new vehicles are equipped with it
- **Car Navigation systems becomes Platform**



Fiscal year		2001	2002
Car navigation systems shipped (units)		2,180	2,390
Original equipment	Total(a)	1,290	1,440
	Dealer option	330	320
	Manufacturer option	960	1,120
Number of new vehicle registrations & inspections (sales)(b)		5,906	5,792
Of which, number of passenger vehicles(c)		3,016	3,134
New vehicle installation ratio			
Ratio for all new vehicles(=a/b)		21.8%	24.9%
Ratio for passenger vehicles(=a/c)		42.8%	45.9%

Notes:

- All values calculated on the basis of unit volume.
- Car navigation system shipment figures published 28 June 2002 in "2002-03 Car Navigation/On-board Information Communications Systems Market" by Yano Research Institute Ltd.
- Vehicle registration & inspection (sales) unit figures from materials compiled by the Japan Automobile Dealers Association.

2

1.Car Navigation Systems and Digital Roadmap

(2) Changes in car navigation systems and the future



- Private sector is developing new driving support functions.



Fig. Curve warning
Source: SONY NVX-MV8100

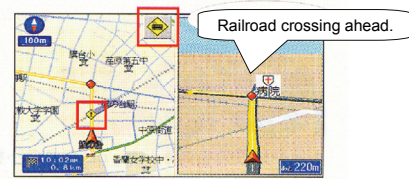


Fig. Railroad crossing warning
Source: SONY NVX-MV8100

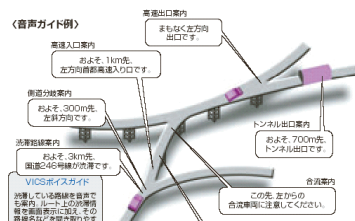


Fig. Junction warning
Source: xanavi B8270-79910

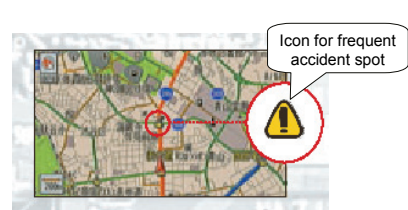


Fig. frequent accident spot warning
Source: xanavi B8270-79910

3

2. Issues for Digital Roadmap

(1) Current issues



Users needs for Digital Roadmap

- Frequent update
- Detail information
- Proper route guidance

Users complains for car navigation systems

Roadmaps are old, and new roads are not displayed

Lack of detailed information about hazardous:
intersection layouts, poor visibility curve, downhill, etc

Route guidance: not avoiding difficult driving roads

Lack of traffic congestion information area

Inaccurate traffic congestion information

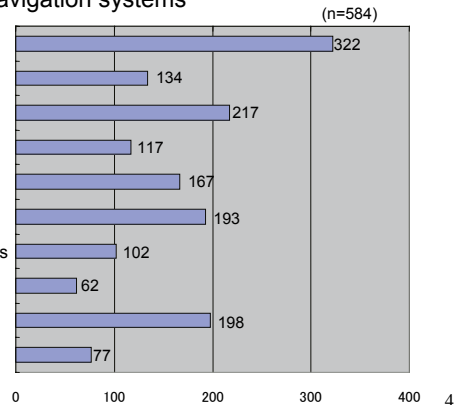
Insufficient or old information of shops

Lack of information of shops; operating hours, products/services

Lack of Information on entertainment such as movies

Lack of navigation to the pinpoint destination

No particular dissatisfaction.



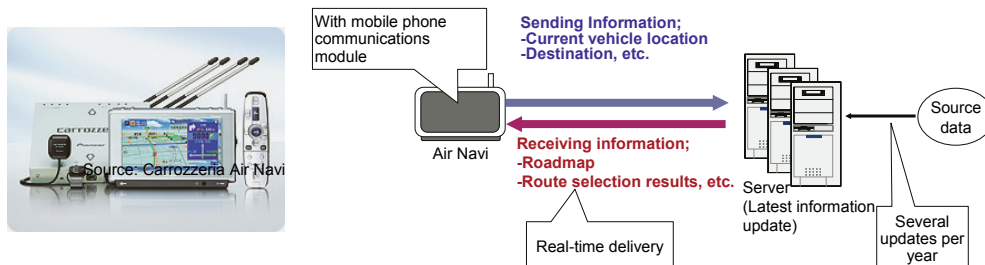
2. Issues for Digital Roadmap

(2) New requirements



[1] Progress on road map information delivery

- Communication type navigation systems have already released
- Source data still update per year
→ **real-time information delivery is possible; next is source**



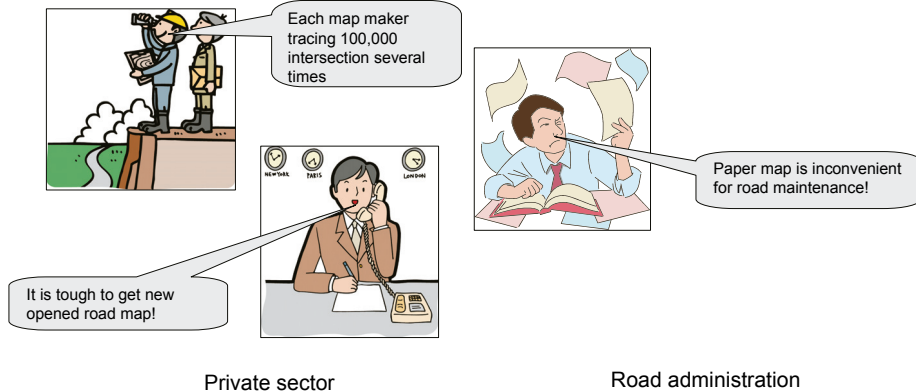
2. Issues for Digital Roadmap

(2) New requirements



[2] Elimination of social inefficiencies

- Responding user needs, each roadmap makers are making tremendous efforts to collect roadmap data by themselves.
- On the other hand, road administration bodies are making road digital maps for improving their management level.



6

3. Movement for Next-generation Digital Roadmap



- ITS Japan handed "**Suggestions for Next-generation Digital Roadmaps**" to the Smartway Project Advisory Committee in July 2004.

Outline of ITS-Japan Suggestion for Next-generation Digital Roadmaps

Advancement in digital roadmaps is necessary, since communications and positioning technologies are advancing, which are **platform of ITS**.



In order to utilize digital roadmaps as common platform, It is necessary to **update timely** as soon as road construction is finished.

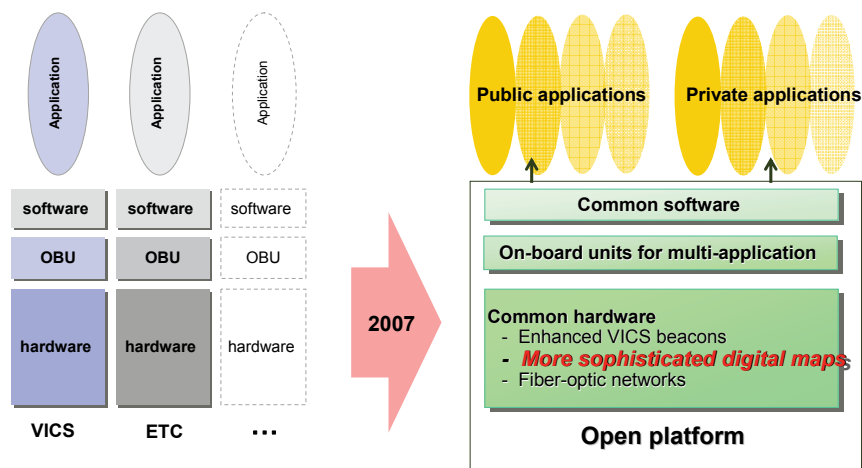


Next-generation digital roadmaps requirements are followings;
Contents of information including **Richness, Accuracy and Freshness**
Advancing of **Collection, Updating and Maintenance**

7

3. Movement for Next-generation Digital Roadmap

- Smartway Project Advisory Committee (Chairman: Shoichiro Toyoda) proposed “ITS Enter the Second Stage” in August 2004.



8

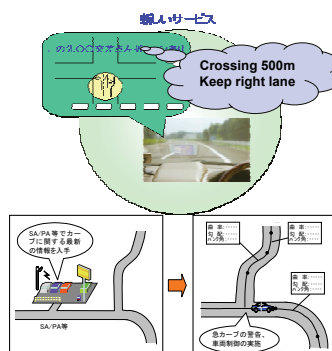
4. Future perspective of Digital Roadmap

- Provision driving support information: road linear shape, intersection shape
- Provision information & warning of hazardous spots: curve, intersection



Route guidance in detail
(display intersection)

Source: SONY NV-XYZ



Information of road linear shape

Fig. example: Provision information & warning
in coordination with digital roadmap

9

4. Future perspective of Digital Roadmap

- Creating new digital Roadmap which has functions: real-time updating, rich contents and enhanced accuracy

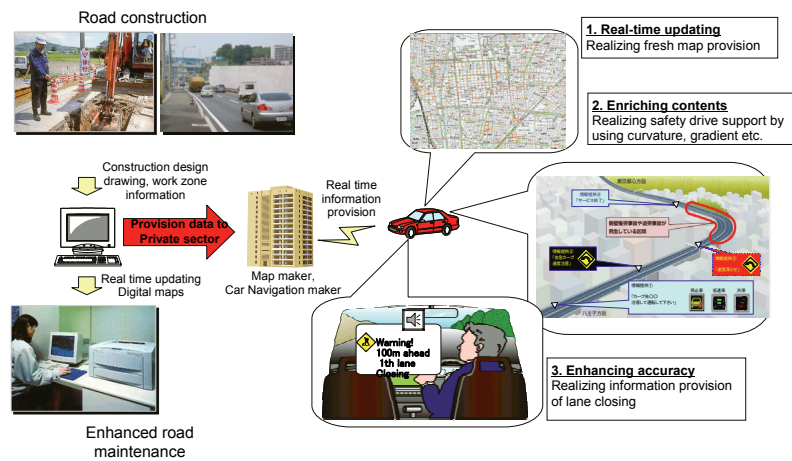
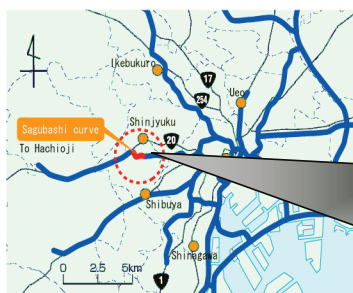


Fig. Advanced Utilization of Digital Roadmap

10

5. Introduction of latest AHS Results

- Field operation test on Sangubashi curve in Tokyo Metropolitan Express way 2003 - 2004



This Curve Feature:

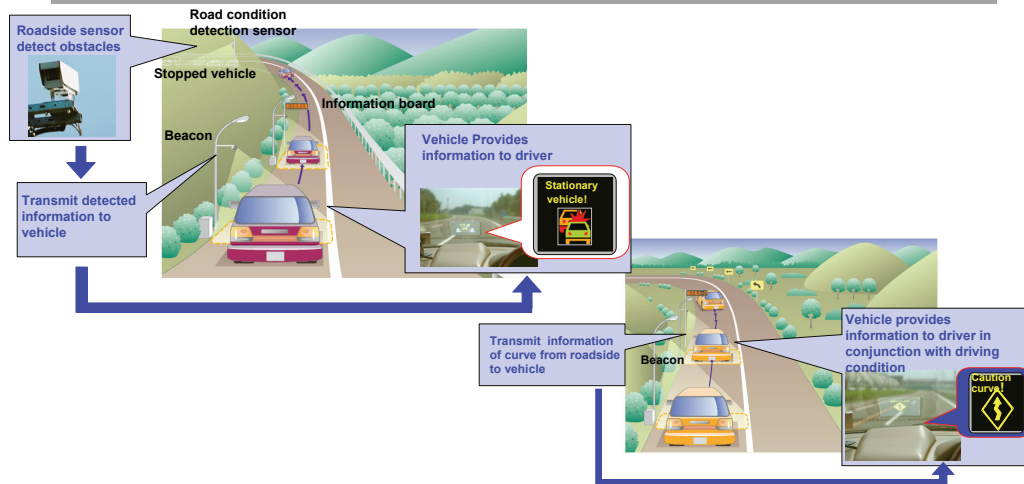
Highway Curve and so sharp; curvature is 88m radius
140 accidents were occurred in 2002
Accidents were almost rear end crashes

11

5. Introduction of latest AHS Results

Tested Services:

Support system for provision information of obstacles
Support system for prevention of over-shooting on curve



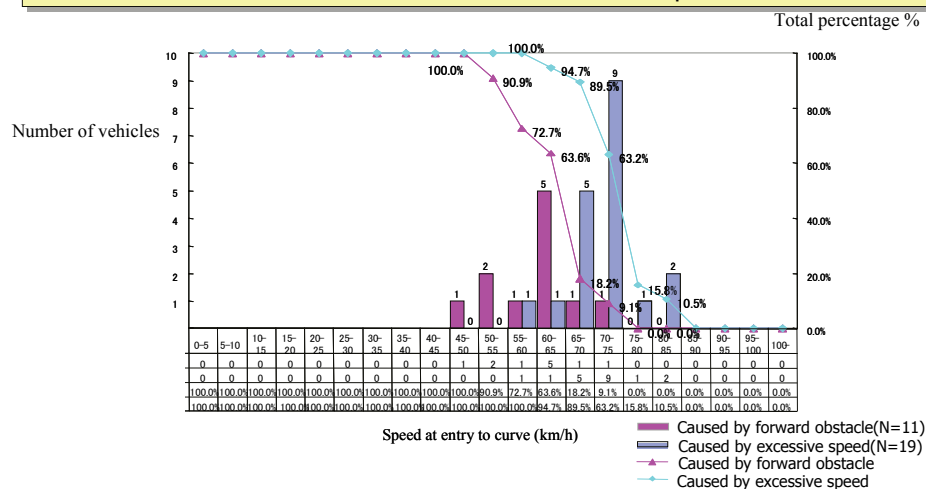
12

5. Introduction of latest AHS Results

30 accidents occurred during one month test period.

11 are forward obstacle concerned collision; 19 are overshooting

Forward obstacle concerned collision occurred lower speed than overshooting

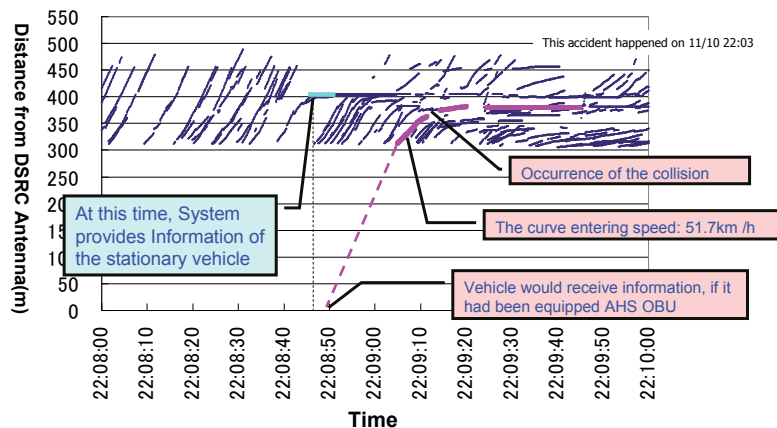


13

5. Introduction of latest AHS Results



- Analyzing the 11 accidents, AHS detected obstacles and could provide information to drivers before every accidents occurred.



- This example is rear-end collision with forward stationary vehicle stopped by overshooting.
- At the time of concerned vehicle pass the beacon, the system already detected stationary vehicle and could have informed it, if it had been equipped AHS OBU.

14



Thank you for your attention!

More information;

<http://www.mlit.go.jp/road/ITS/index.html>

<http://www.nilim.go.jp/english/eindex.html>

http://www.netpark.or.jp/ahs/eng/index_e.html