



XIII
INTERNATIONAL
WINTER ROAD
CONGRESS

QUÉBEC, FEBRUARY 8 TO 11, 2010



Québec 

SUSTAINABLE WINTER SERVICE FOR ROAD USERS

*Discussion on the practical application of DSRC
in measures to counter visibility hazards
in cold areas with heavy snowfall*

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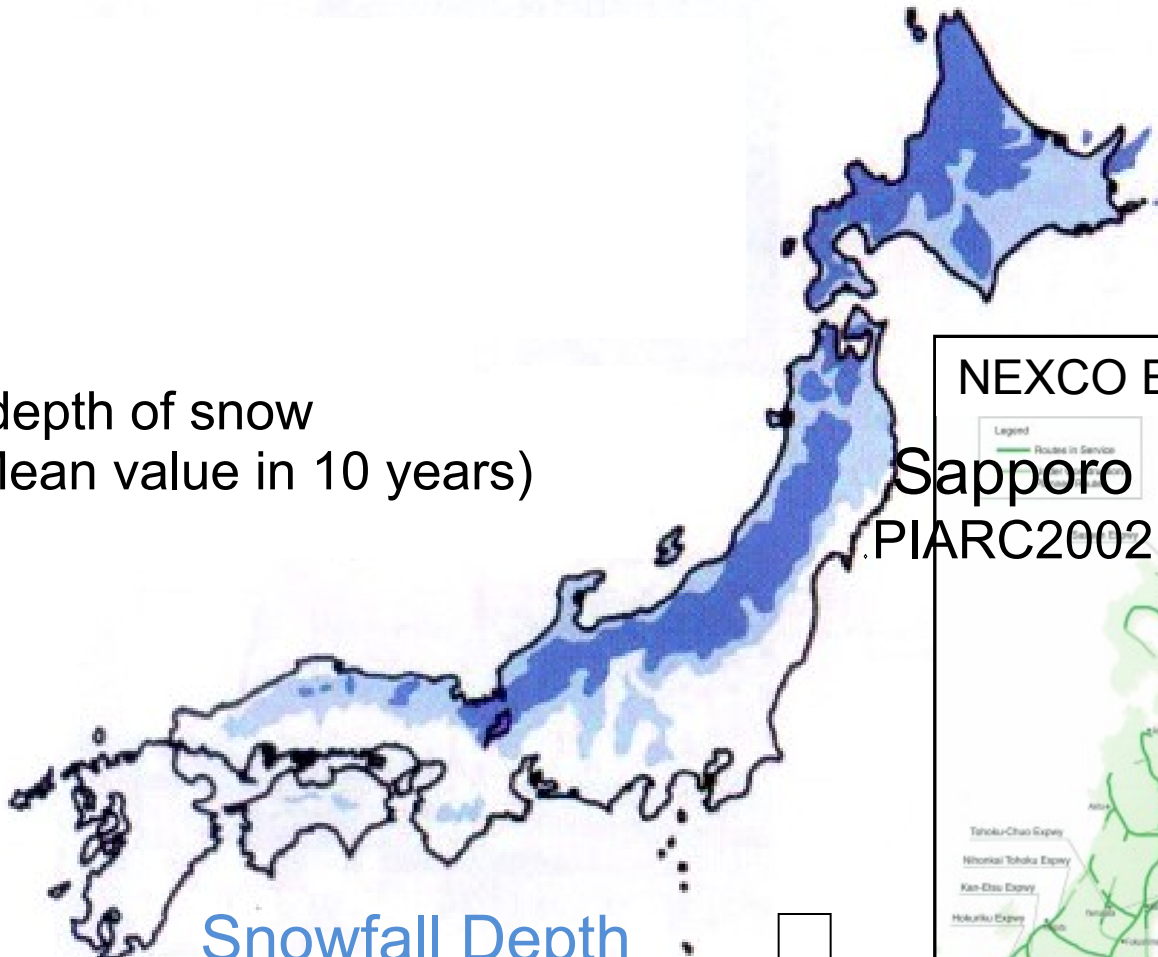
..The Weather Situation in Japan

..Hazard Condition and Countermeasures

..Practical Application of ITS (DSRC)

Snowy Regions in Japan

Maximum depth of snow per year (Mean value in 10 years)



Snowfall Depth

Higher than 1.0m

0.3m~1.0m

lower than 0.3m



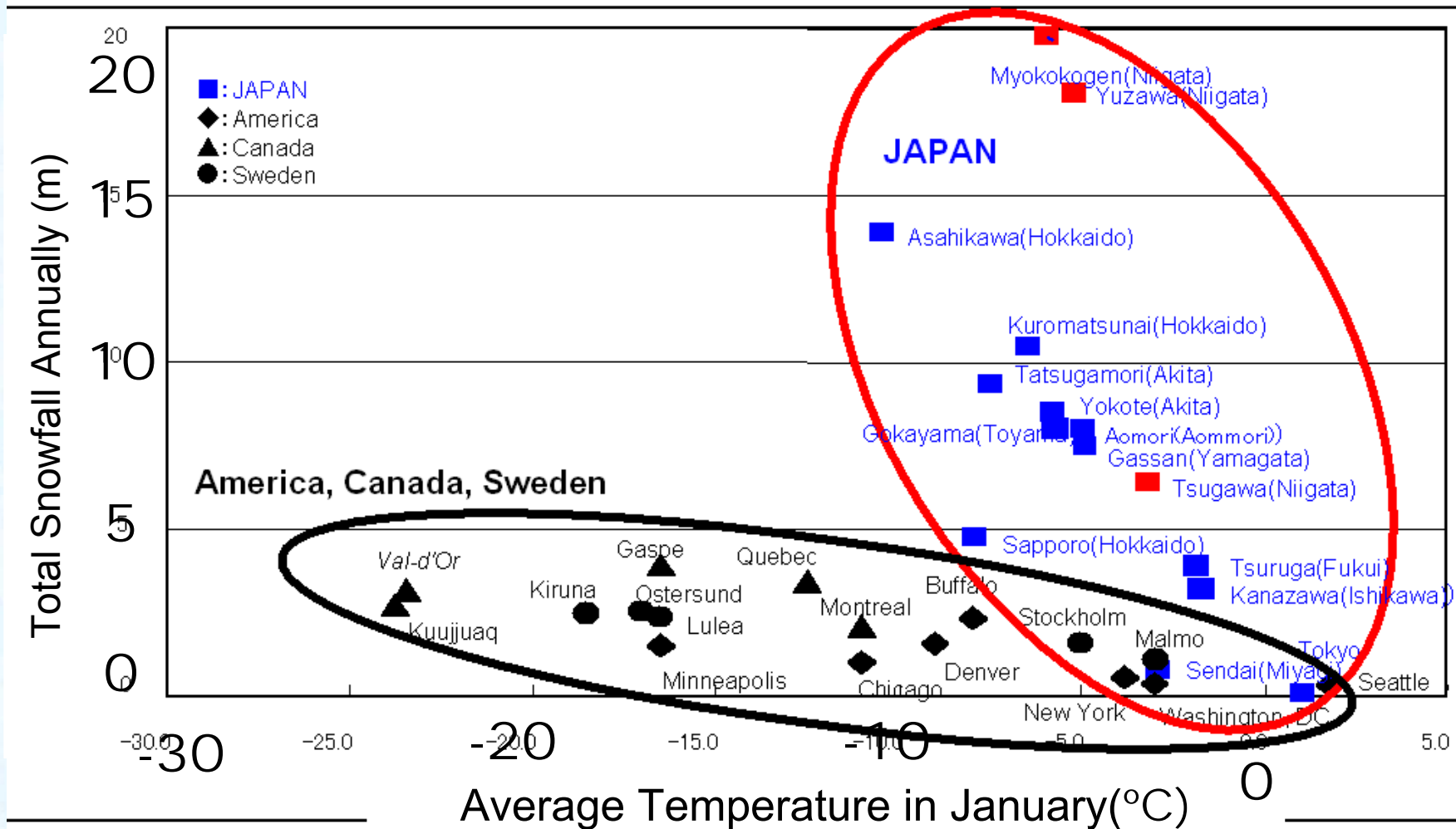
NEXCO East Operation Area

Sapporo

PIARC2002



Total Annual Snowfalls (m) and Average Temperatures in January (°C)



Snowfall obviously deeper in Japan than other Countries

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.. The Weather Situation in Japan

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Heavy Snowfall Conditions in Japan



More than 2.0 in height is piling

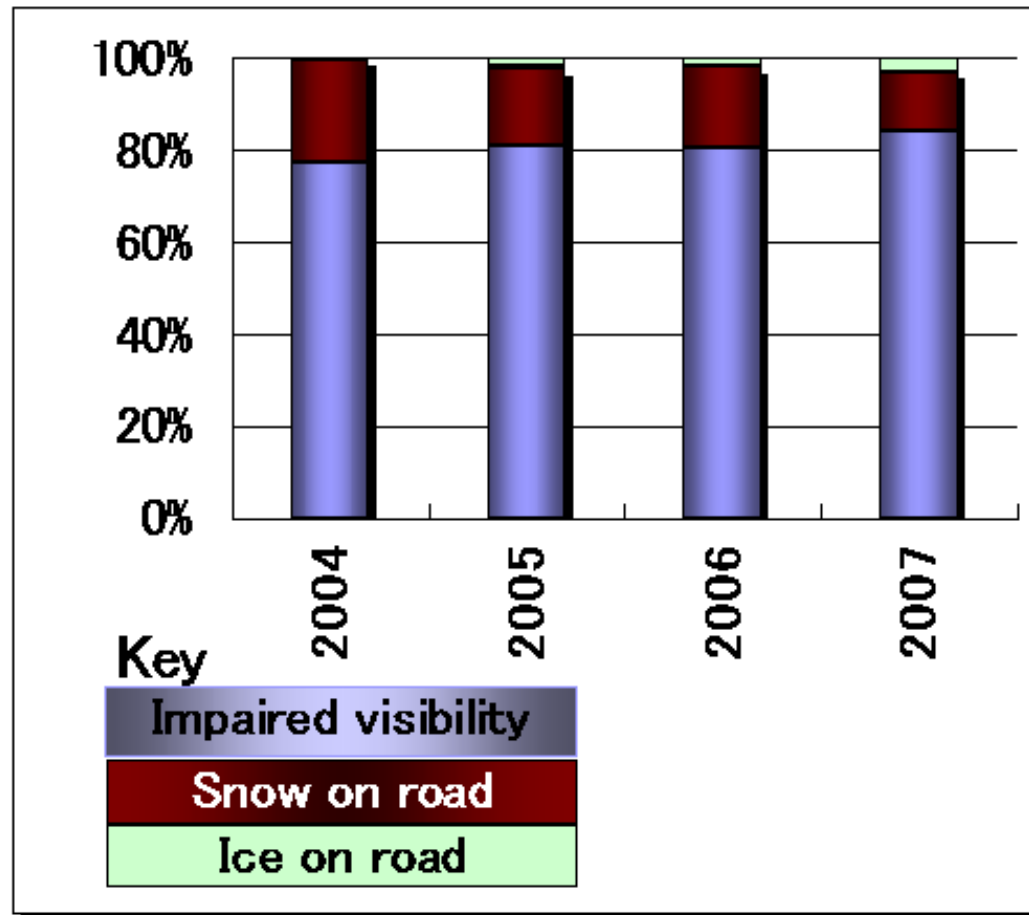
Snowfall of over 1.0m
within only one night



Mechanical Snow Removal

Snow accumulates on road
in only 10 minutes

Causes and Road Closures (km-hrs) (Causes related to snow and ice)



80% of road closures are
due to visibility hazards

Main Countermeasures conducted on Japanese Expwys



Snow Removal



Delineator □ flag type and cylinder type □



and Snow Fence



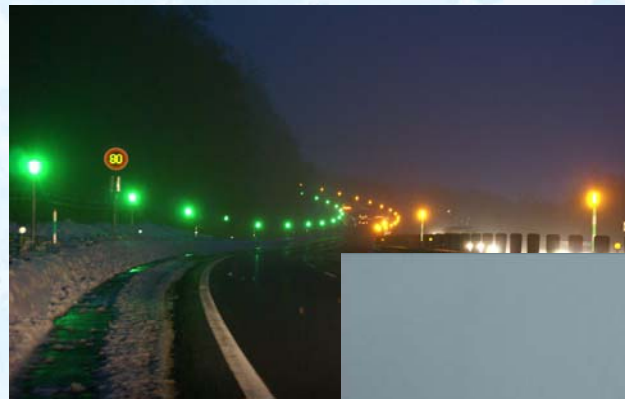
CCTV Camera



Road Patrol Vehicle



Weather Info. Board



Different Colored
Self-emitting Delineator(@50m)



Traffic Information Board

Further Improvement of Countermeasures by Utilizing ITS

Effective Countermeasures
to resolve Impaired Visibility

Speed Control (Raising Attention)

Obstacle Avoidance (Raising Attention)

Collecting Information by DSRC

ITS could be
the Essential tool

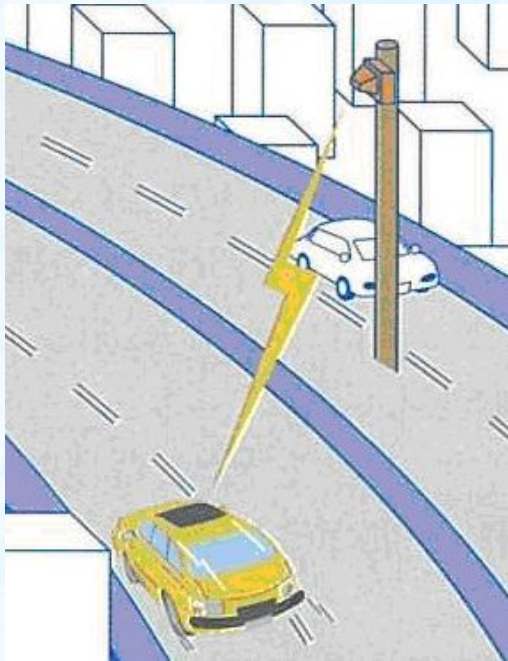


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- .. The Weather Situation in Japan
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Former Technology (from 1998)

VICS (Vehicle Information and Communications System)



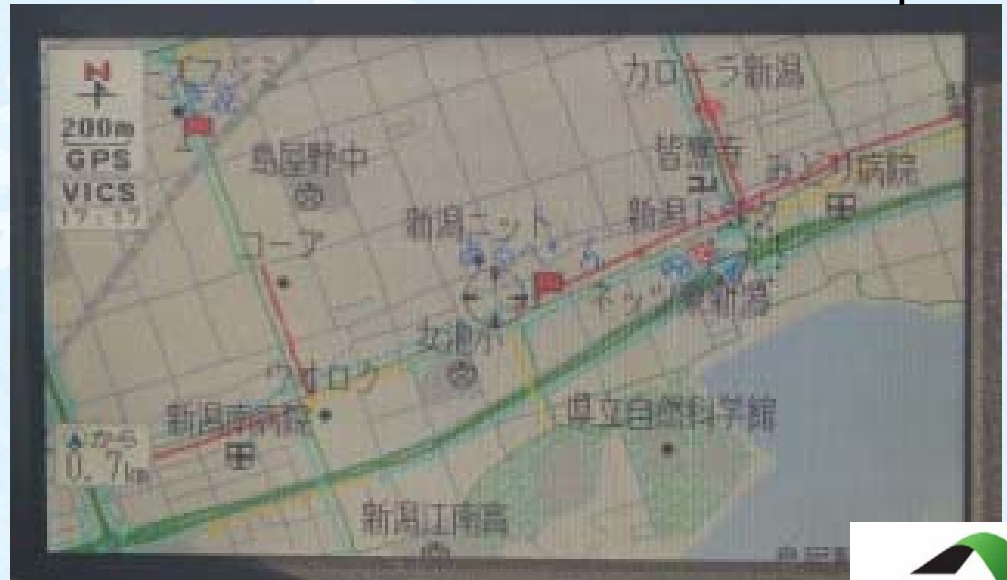
Electric Wave Beacon



Traffic Info. on the Deformed Map



Monitor of car Navigation System



Traffic Info. on a Digital Map

New Functions by Smartway Service(from 2009)

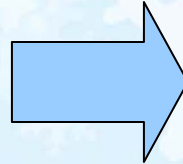
Former Technology(from1998) New Technology(from2009)

Smartway Service

....

Providing Traffic Info.

Deformed Map
Degital Map



Providing Traffic Info.

Deformed Map
Digital Map

Voice announce (Slide 1)
Graphic Info. (Slide 1)
Photo Info. (Slide 1)
Accumulation .Slide 2.
Probe vehicle Info. (Slide 3)

DSRC Smartway Service (Slide 1)



カーナビ連携型 ITS車載器

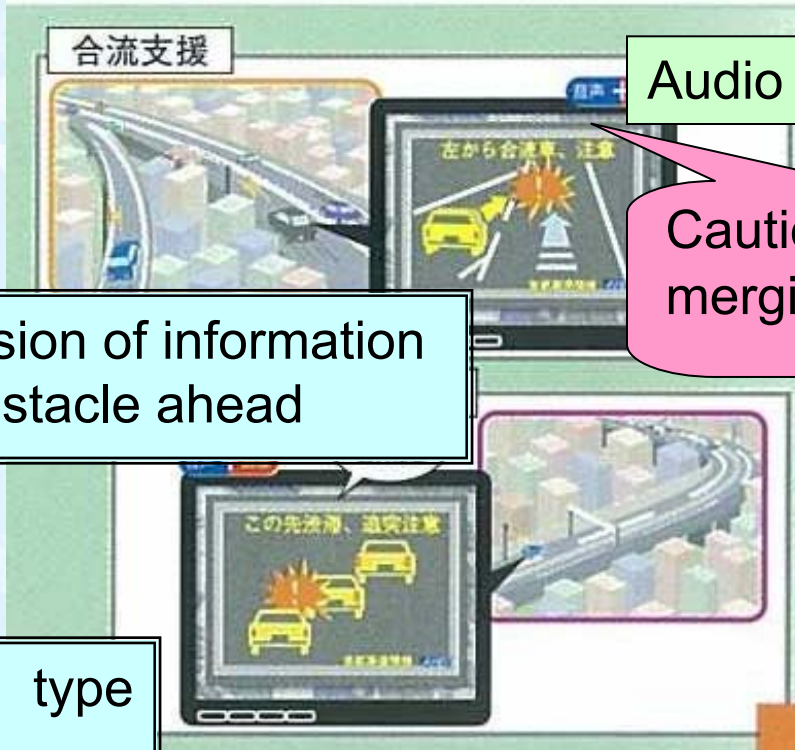


Car navigation combination type
ITS vehicle-mounted unit

Voice announce



Caution. Congestion 2km ahead

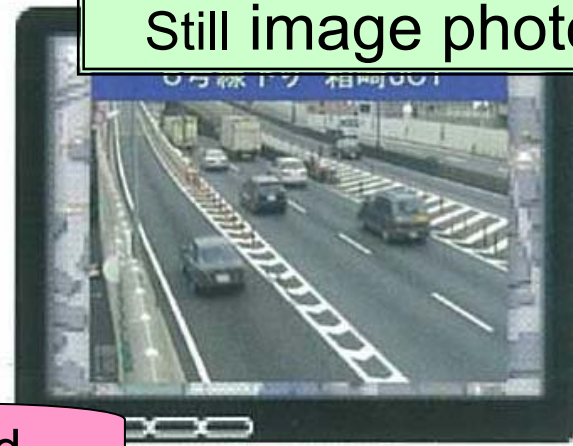


Provision of information
on obstacle ahead

Audio + visual

Caution. Vehicles
merging from left

Still image photo

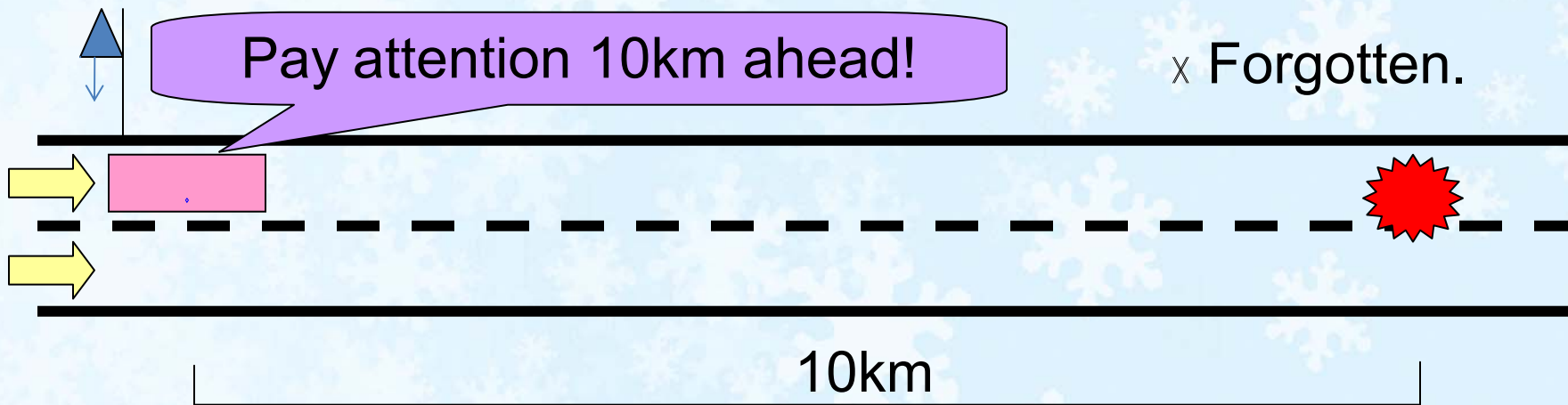


静止画

DSRC Smartway Service (Slide 2)

Effectiveness of raising attention by accumulation function

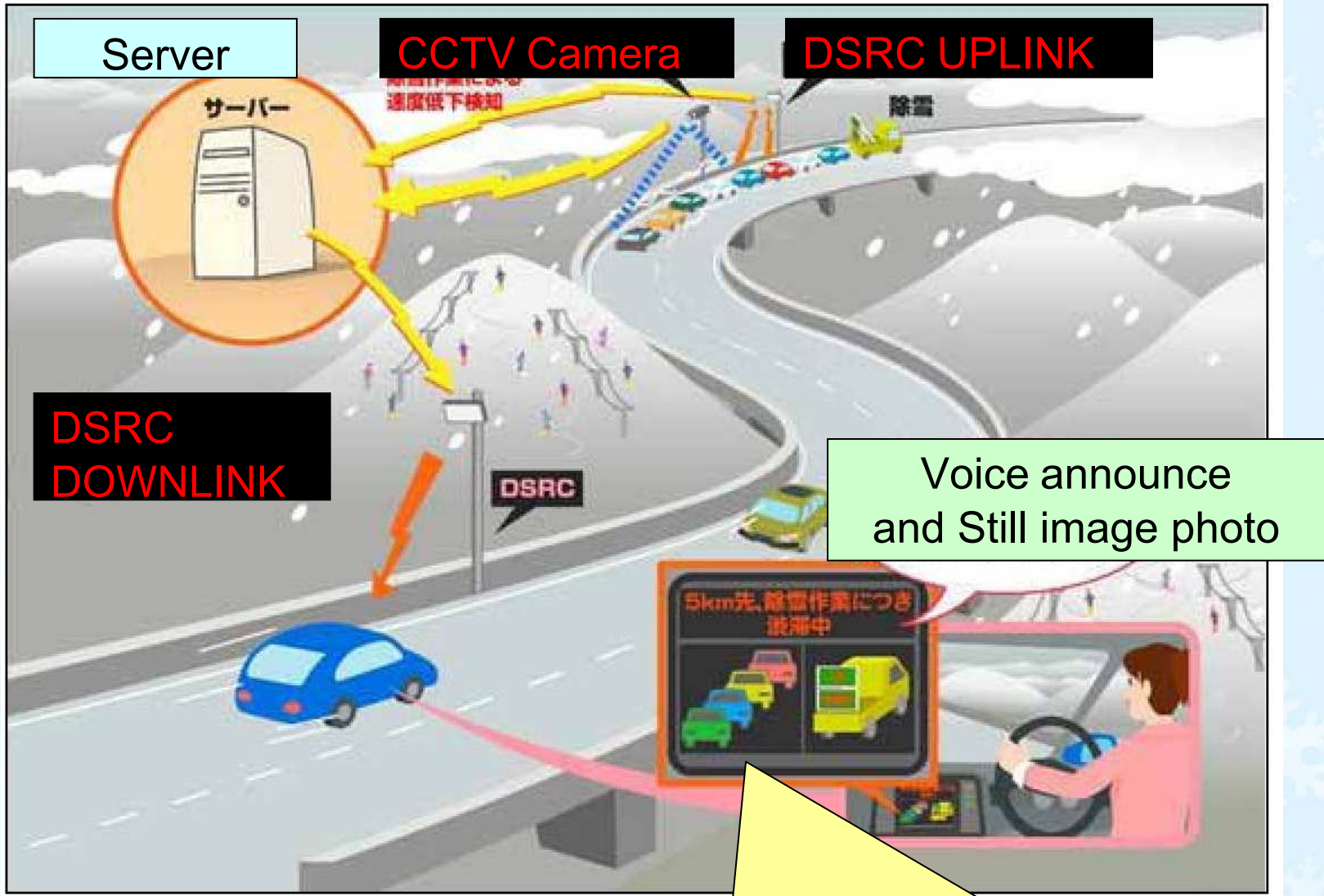
When the Function not Provided



When the Function Provided.



Future Improvement of Probe Vehicle Information System



Congestion 5 km ahead due to snow removal operations. Proceed with caution.

Thank you for kind attention.

East Nippon Expressway Company Limited, Japan

