



10th ITS World Congress Special Sessions 16
ITS Radiocommunications : New Technologies and Deployment
Part1: New Technology

**"SmartGateway :
A Platform for Seamless Communication
over DSRC Spots"**

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**"SmartGateway :
A Platform for Seamless Communication
over DSRC Spots"**

Commissioned by TAO (Telecommunications Advancement Organizations)

Fiscal 2000 ~ Fiscal 2002

KDDI CORPORATION

KDDI R&D Laboratories

NEC Corporation

TOYOTA MOTOR CORPORATION

NTT DATA CORPORATION

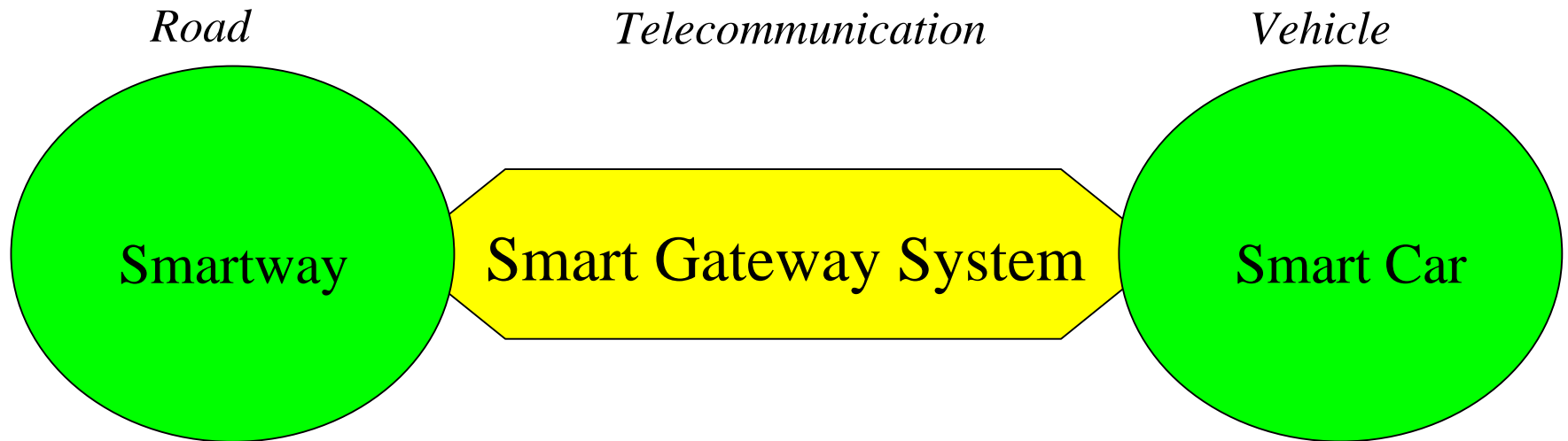
Hitachi, Ltd.

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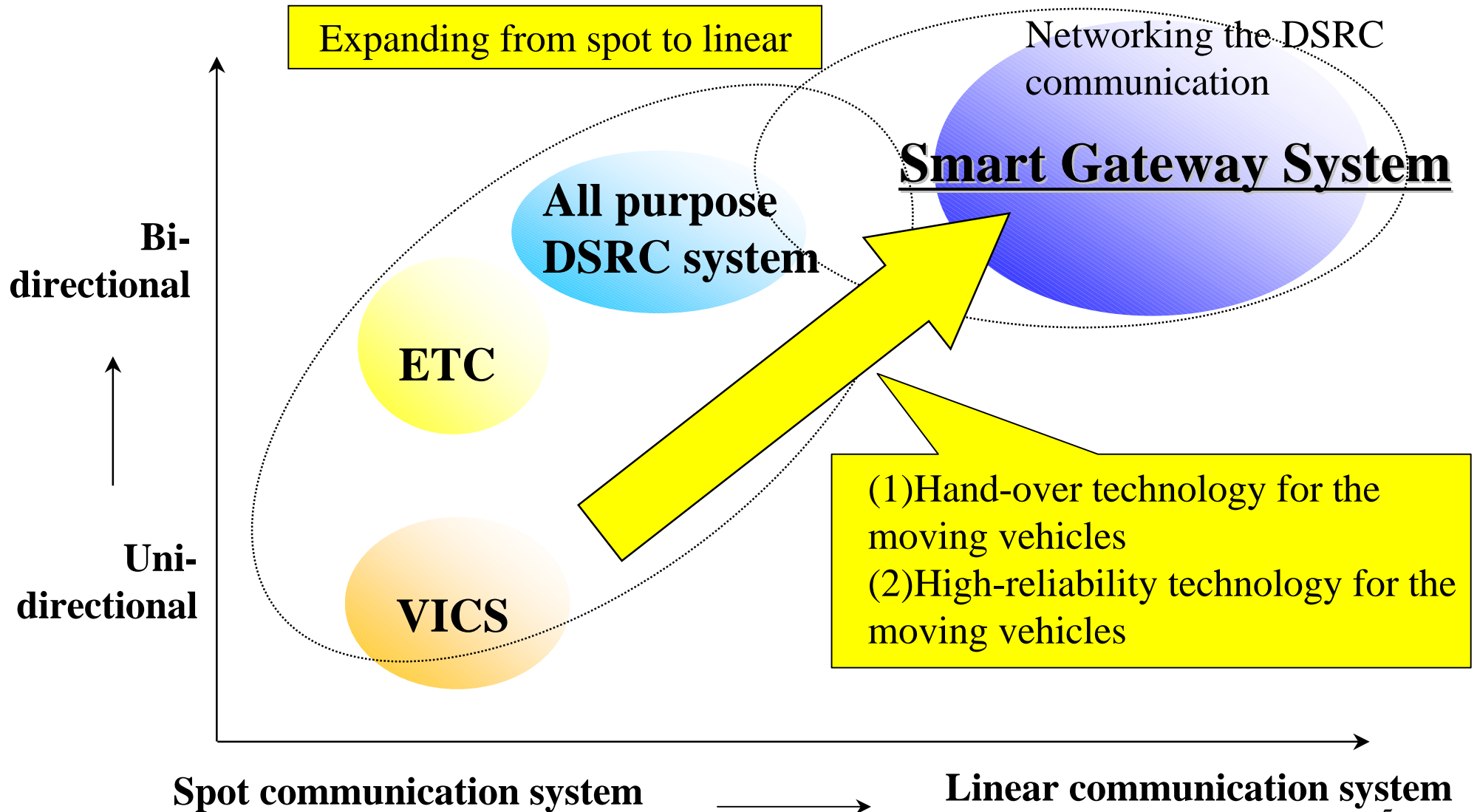


1. Definition of The Smart Gateway System



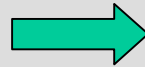
Smart Gateway System can connect and communicate between Smartway and Smart Car via various communication systems, i.e. DSRC, Wireless-LAN, etc.

2. Advancement to The Smart Gateway System



3-1. Requirements for The Smart Gateway System

Smart Gateway System



Cruise Assist Services and Supply for Multiple Applications

(1) To realize hand-over function

Quick establishment of radio connection for moving vehicles

R&D for the new network using DSRC radio wave



【R&D for new technology】

(2) To realize highly reliable communication

The high speed verification between the moving vehicles and the base stations

R&D for the security and the verification system



【Advancement for utility】

3-2. Requirements for The Smart Gateway System

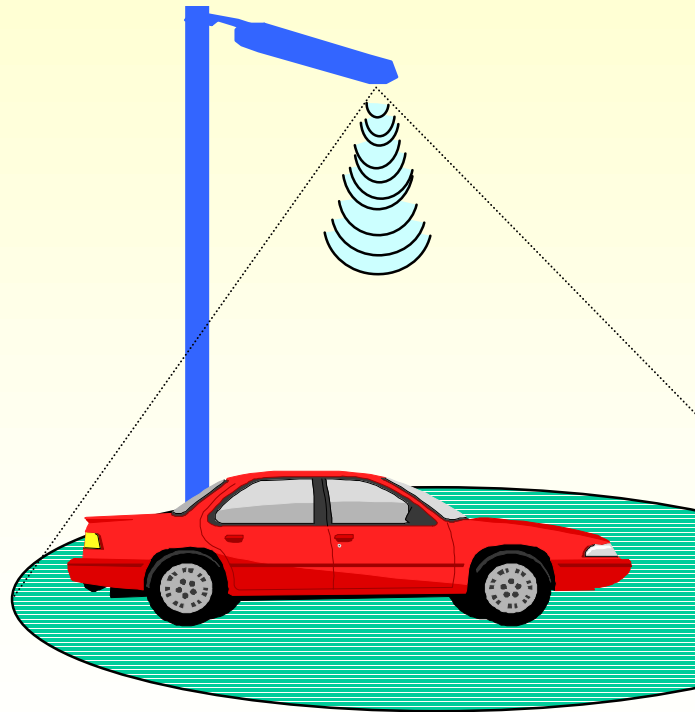
Specific Research Goals

Hand-over Function

- Hand-over Continuing Connection (for Cruise Assist)
- Hand-over Keeping Information (for Multiple Application)
- Hand-over within 100ms
- Keeping up Stable Communication Quality

Highly Reliable Communication

- Initial Verification within 100ms
- Sequential Verification within 10ms with Hand-over
- Warranty for Justice of Users and Terminals
- Proxy Function for Common Payment



30m Spot (about 1second passage by 100km/h)

4-1. Technical Elements of The Smart Gateway System

[Lower Layer]

Difficulty to Communicate Continuously

Hand-over Function

With Continuous Communication,
•To Provide Information of Cruise Assist
•To Transmit Large Size of Data

NW-Handover Tech

DSRC-NW

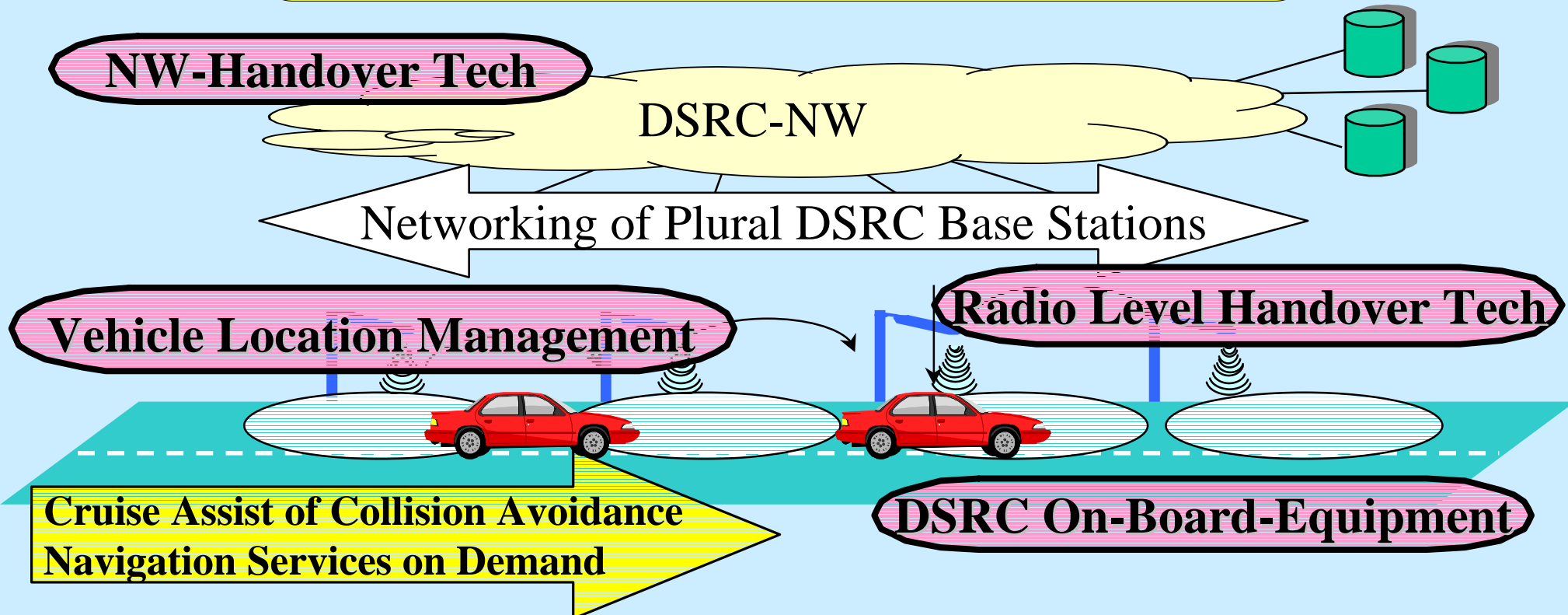
Networking of Plural DSRC Base Stations

Vehicle Location Management

Radio Level Handover Tech

**Cruise Assist of Collision Avoidance
Navigation Services on Demand**

DSRC On-Board-Equipment



4-2. Technical Elements of The Smart Gateway System

[Higher Layer]

Difficulty to Verify continuously

Highly Reliable Communication

With Secure Communication

- To Reject Pretenders
- To Improve Userbility

IP-NW

High level security

Transferring Information

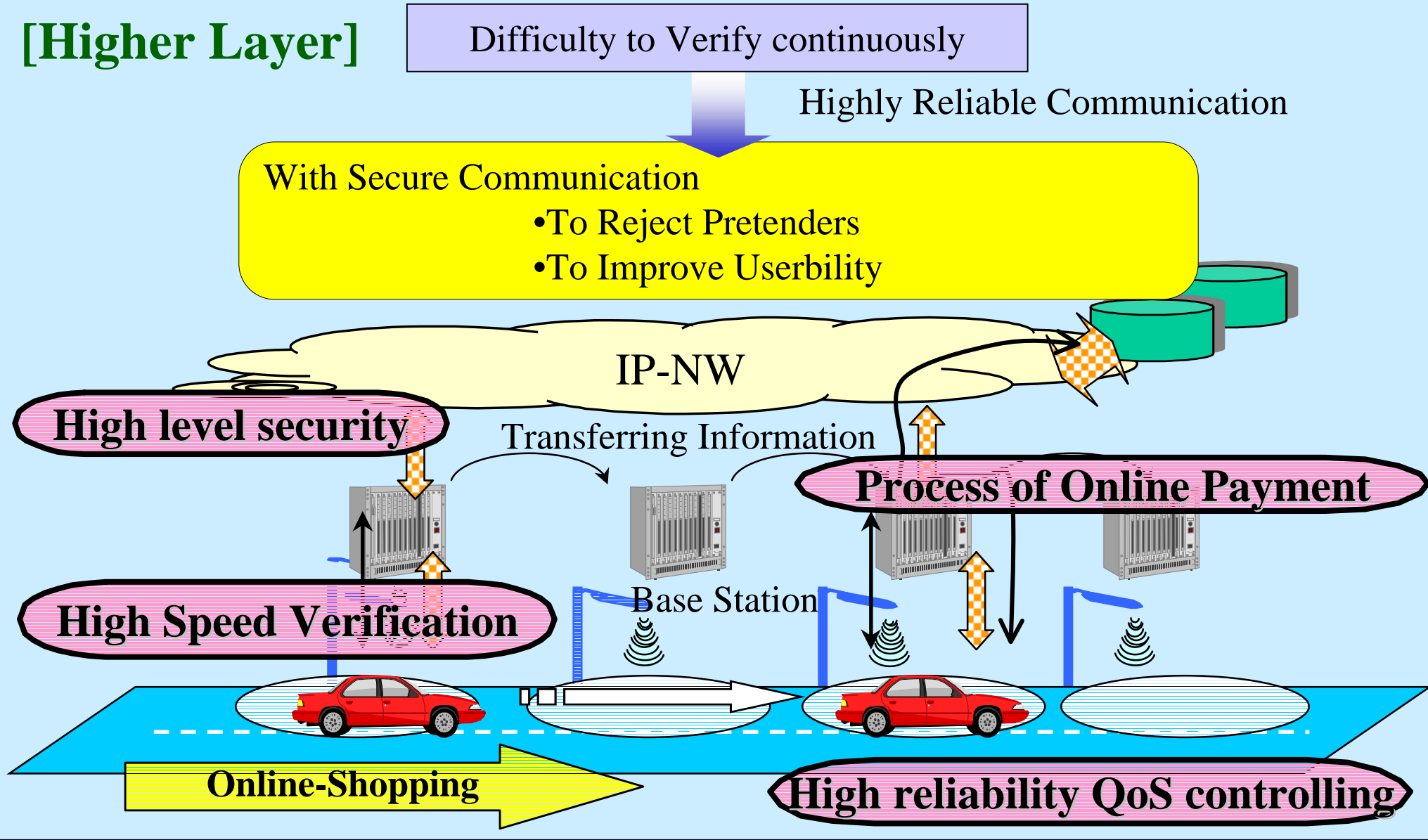
Process of Online Payment

High Speed Verification

Base Station

Online-Shopping

High reliability QoS controlling



5-1. Correlation between Research Goals and Demonstration

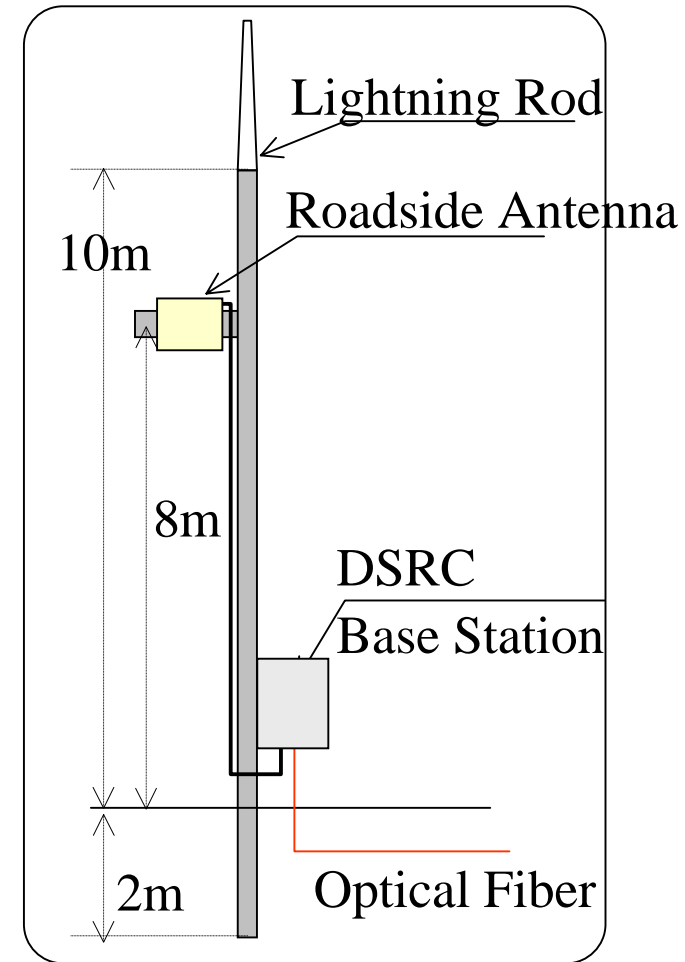
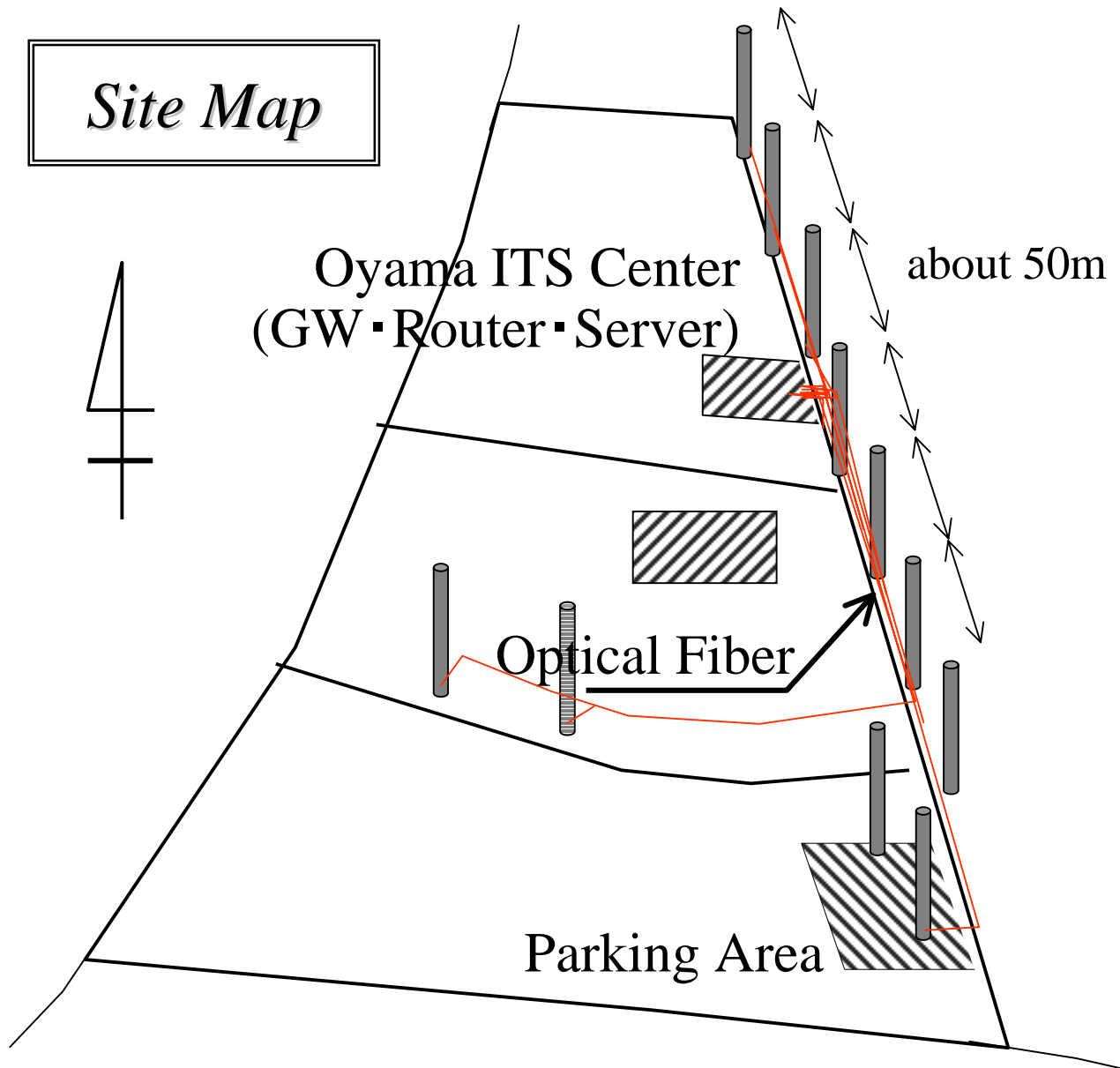
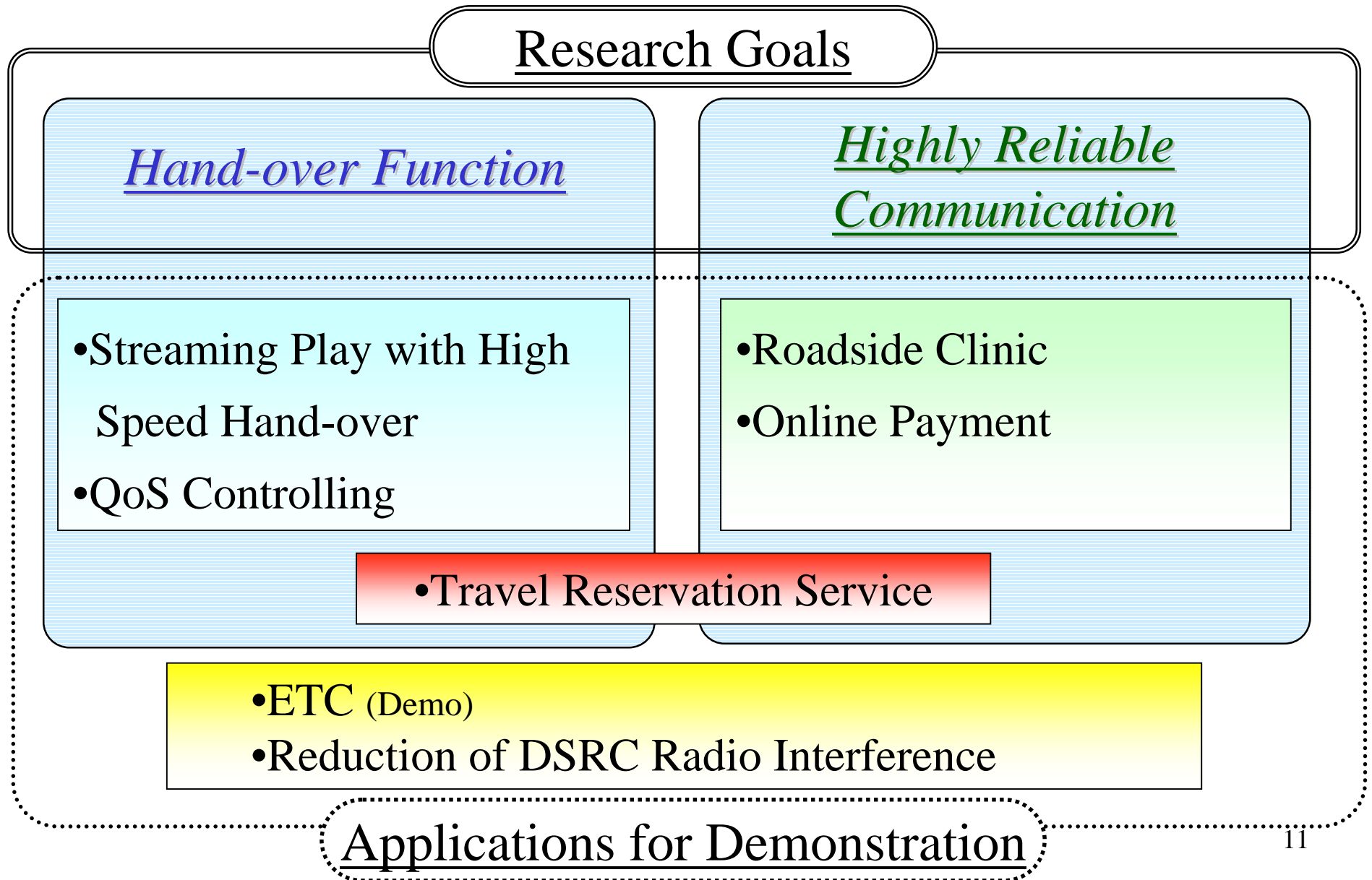


Figure of Base Station

5-2. Correlation between Research Goals and Demonstration



6. Conclusion

- *Hand-over Function*

Accomplishment of Hand-over within 100ms



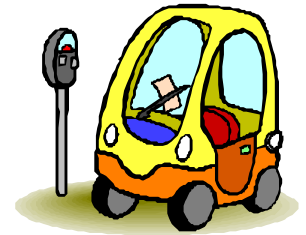
- *Highly Reliable Communication*

Accomplishment of Initial Verification within 100ms

(The Verification at The First Base Station under The GW)

Accomplishment of Sequential Verification within 10ms

(The Verification after The Second Base Stations under The GW)



***Realization of “Hand-over Function” and
“Highly Reliable Communication”
under the Sequential or Dispersive DSRC Network,
Shows One of The Possibility for ITS Communication Systems.***

Thank You for Your Kind Attention!!



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