SINGAPORE 2019

26th ITS World Congress
21–25 October

Smart Mobility, Empowering Cities

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MIC's Recent Activities on ITS

IGARASHI Hirokazu

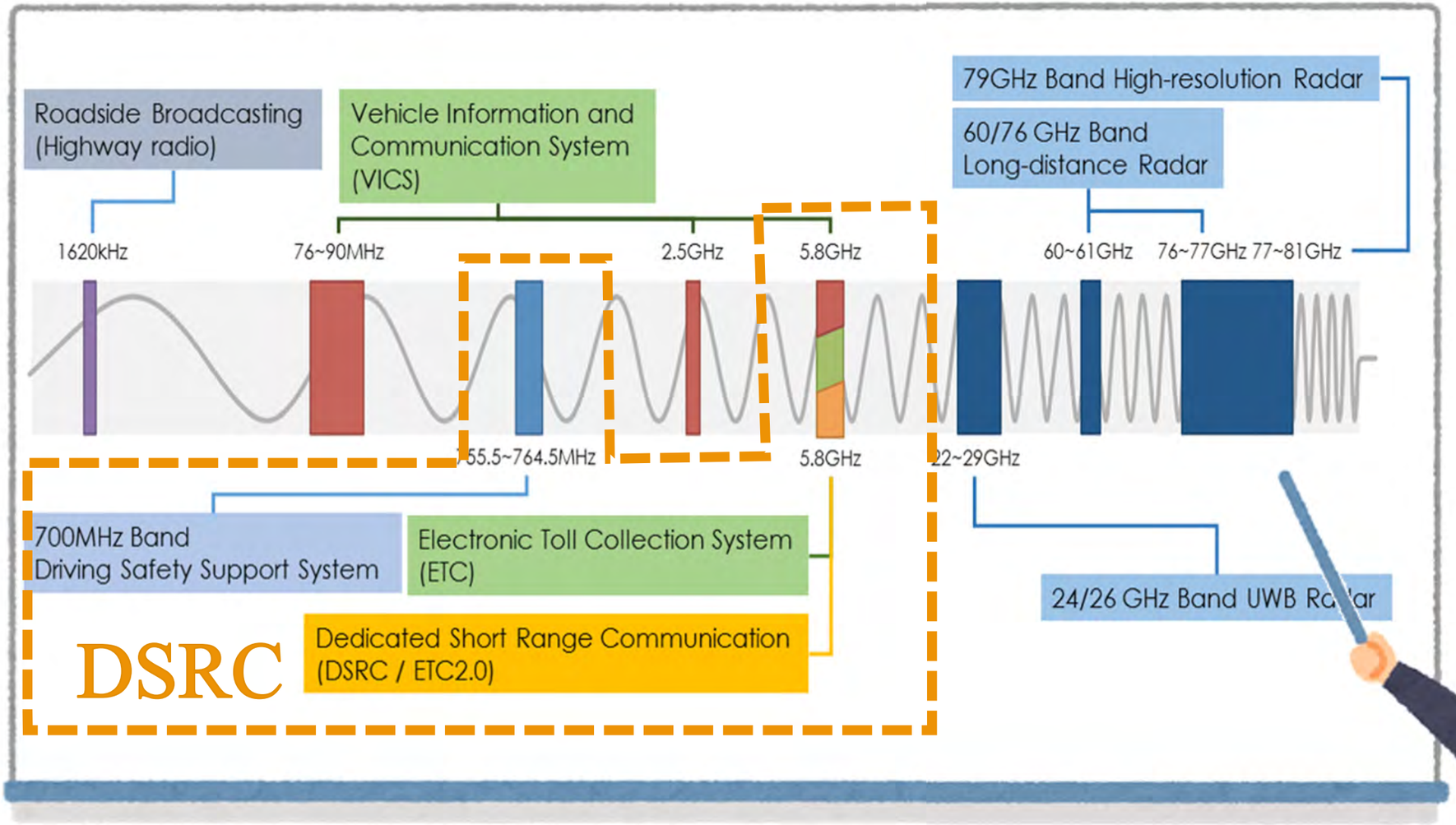
Director, ITS Promotion Office, Ministry of Internal Affairs and Communications, Japan

Co-operative ITS

ITS related radio systems in Japan and their Frequency Allocation

ETC is the Electronic Toll Collection System using **DSRC** in **5.8 GHz** band.

ITS Connect is the Driving Safety Support System using **DSRC** in **760 MHz** band.



Data of ETC (5.8GHz DSRC)

The ETC service started in Japan in 2001.

89,684,000 ETC units have been installed.

In 2018, ETC was used

~8,000,000 times per day

=

2,950,000,000 times per year

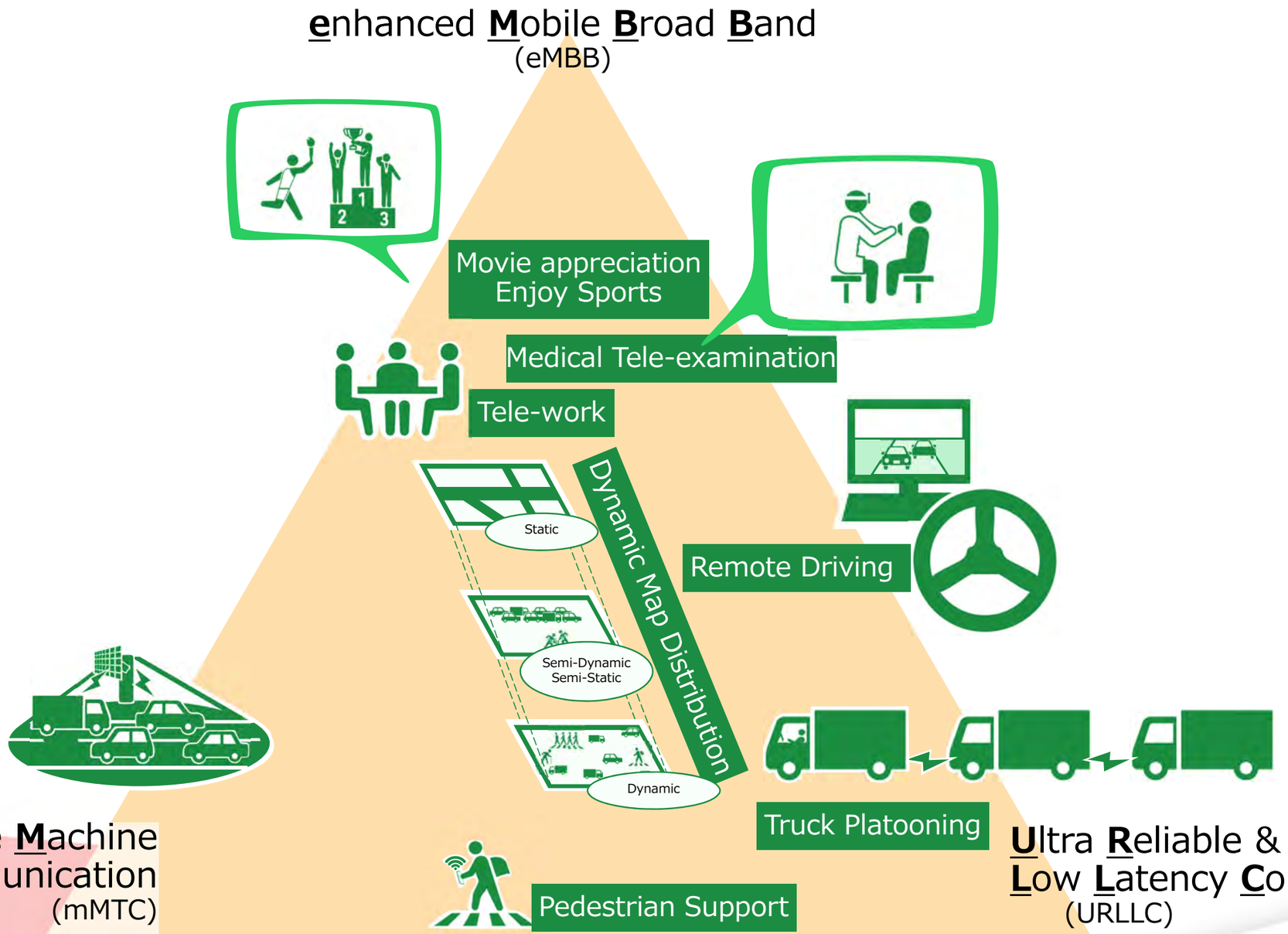
cf. Population In Japan

age 15 – 64: 76 million
age 65+ : 35 million

700MHz Safety Driving Support System (ITS Connect)

5G and Automated driving

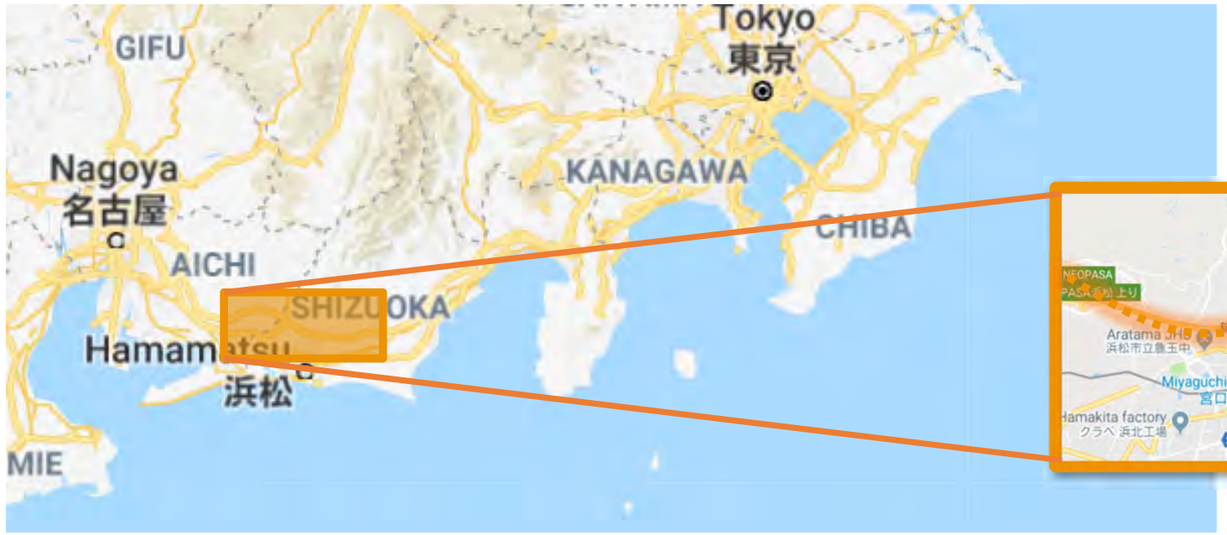
Mobility Services to be realized by 5G



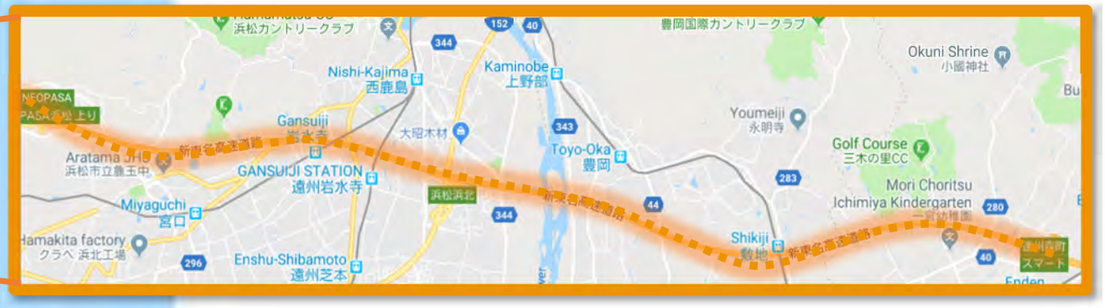
5G Trials in FY2018

Technology	Responsible Organization	Main Partners	Trial Overview	Main Trial Locations
eMBB (4.5GHz, 28GHz)	NTT DOCOMO	• TOBU TOWER SKYTREE • ALSOK (Security) • Fukui Pref. • Wakayama Pref. • Aizu-Wakamatsu City	• AR･VR content • Monitoring and Security • Medical Services	• Kyoto • Gunma • Tokushima • Wakayama
eMBB (4.5GHz, 28GHz)	NTT Communications	• Tobu Railways • West Japan Railway Company • Infocity (Contents Company)	• Transport (High speed railway)	• Ibaraki • Tokyo
eMBB (28GHz)	ATR (Research Corporation)	• Kyushu Institute of Tech. • Keikyu Railways • Waseda Univ. • Maehara elementary school	• Smart factory • Station • School education	• Fukuoka • Haneda Airport International Terminal Station
URLLC (4.5, 28GHz)	Softbank	• Advanced Smart Mobility Corp.	• **Transport** • **Car remote control**	• Shizuoka
URLLC ×eMBB (3.7/4.5, 28GHz)	KDDI	• Obayashi Corp. (Construction) • NEC (Appliance manufacturer) • The Univ. of Tokyo.	• Remote Construction • Drone surveillance	• Osaka • Nagano • Hiroshima
mMTC (4.5GHz)	Wireless City Planning	• Pacific Consultants (Construction consultant) • NICT (National Institute) • Higashi-hiroshima City	• Smart highway • Smart office	• Aichi • Hiroshima

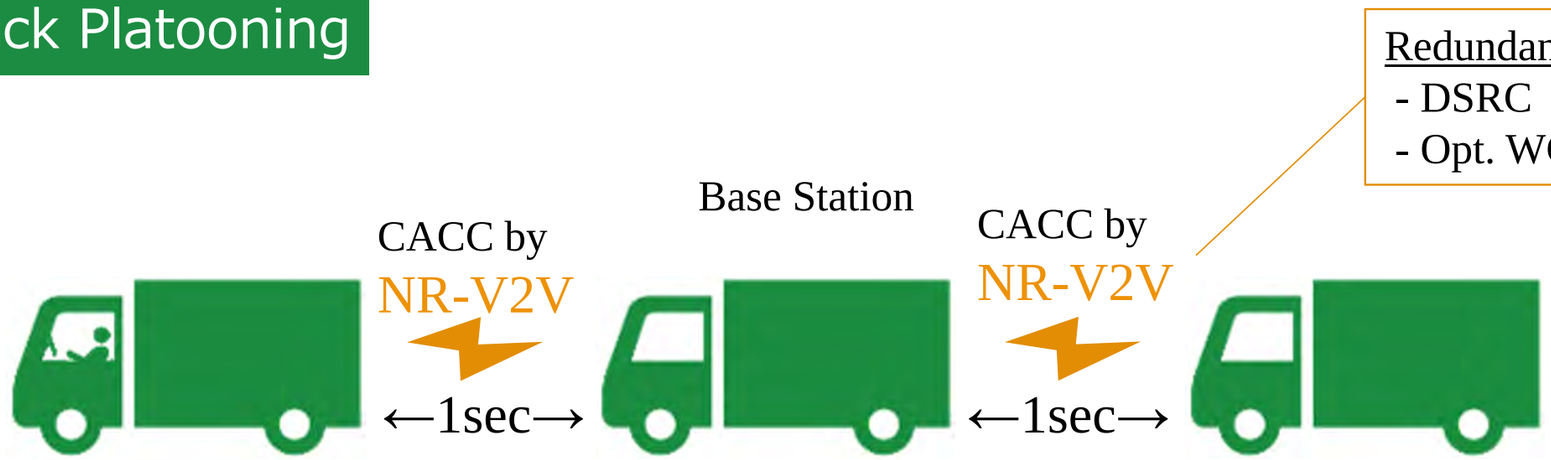
5G Trials: Truck Platooning



Shin-Tomei Highway
(New Tokyo-Nagoya Highway)



5G Truck Platooning

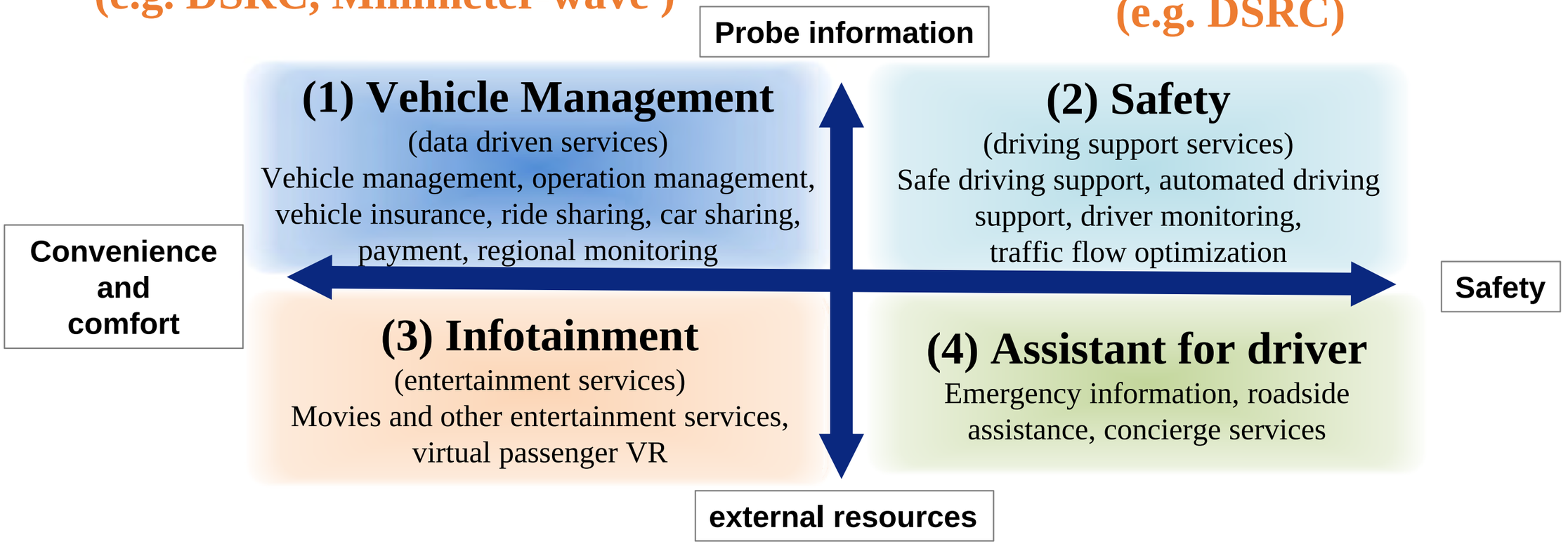


Technological Examination toward the Connected Car Society

Services around Connected Cars

High speed/
hot-spot communications
(e.g. DSRC, Millimeter-wave)

Highly reliable/
direct communications
(e.g. DSRC)



Wide area communications
(LTE, 5G, etc.)

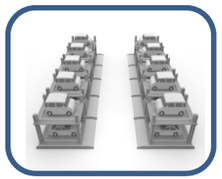
Millimeter-Wave V2X (WiGig for V2X)

- To realize new communications (e.g. image exchange, video, 3D map), demands for large capacity communications for connected vehicles are increasing. This project will investigate the possibility of large capacity millimeter-wave communications for V2X.

V2I (Vehicle to Infrastructure)

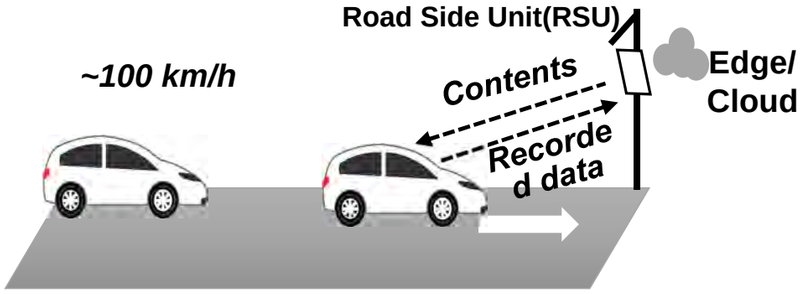
- Safety support; blind spot video shearing
- Instant contents delivery; 3D map etc.
- Huge data collecting; recorded driving data

Blind spot obstacles



3D map

Recorded sensor data



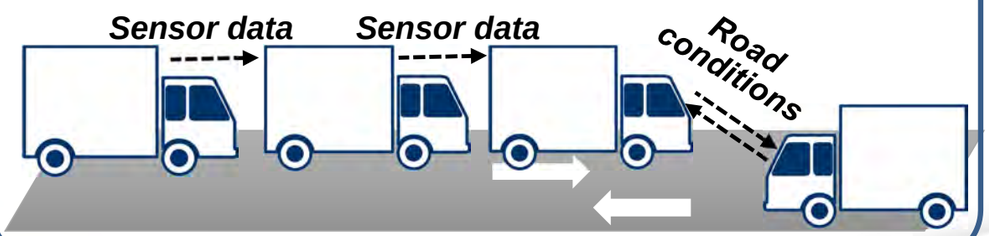
V2V (Vehicle to Vehicle)

- HD image/sensor sharing; platooning trucks
- Instant data sharing; surrounding road conditions

Radar/Lidar Sensor sharing

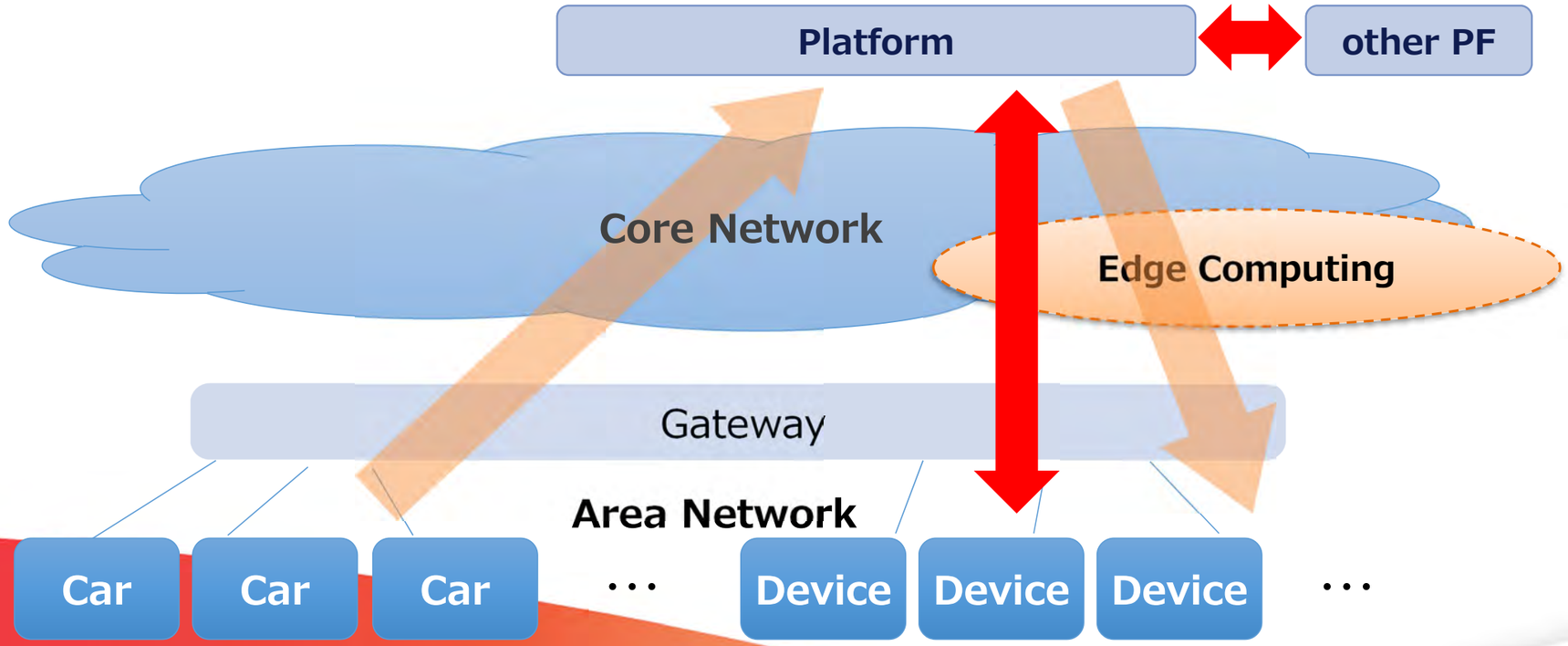
HD Video streaming

Forehand Road conditions

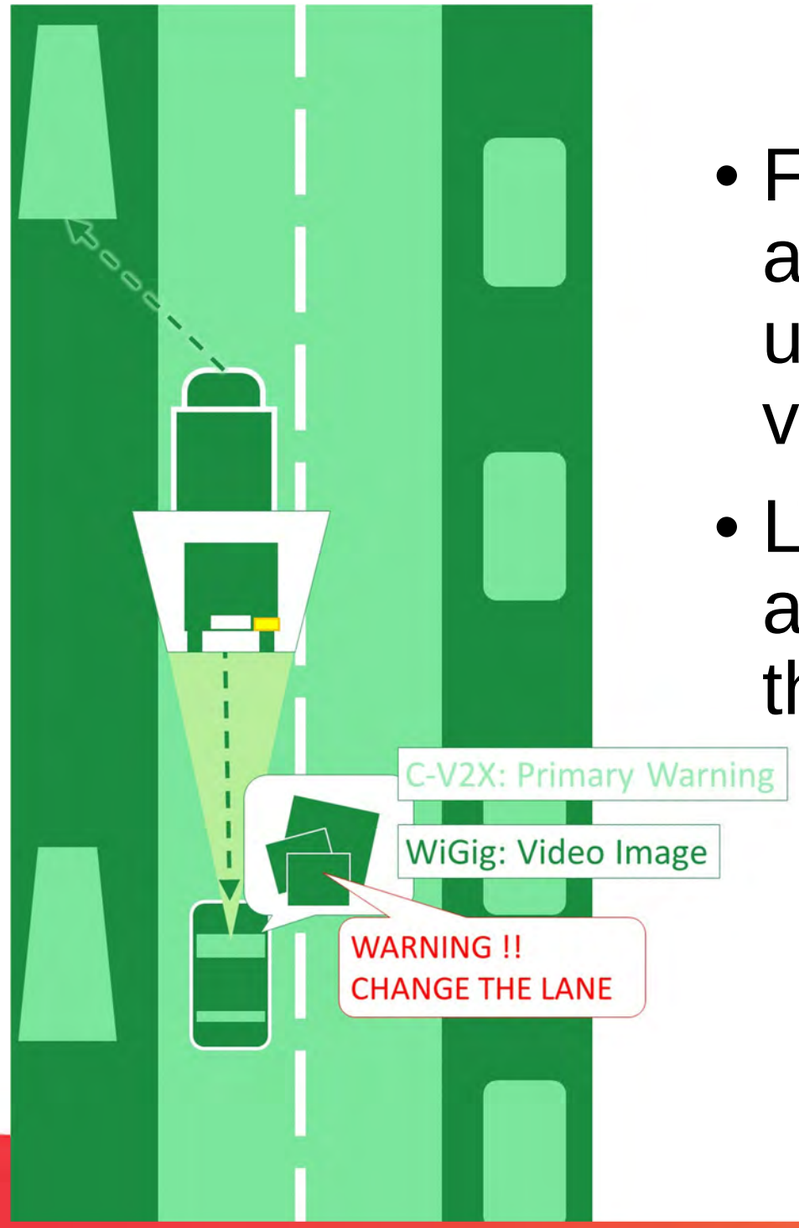


Data & Platform

- One of the big themes to realize connected-vehicle society is how to manage data. We will have to manage growing volume of data for new services to be provided in Connected Car society.
- For Connected Car society, a new platform to integrate various data collected through various wireless systems is necessary. This project investigates, develops and demonstrates the prototype of such platform.



Warning obstacle to Following Vehicle



- Feasibility of new cellular-based system and WiGig for V2X will be verified in the use case “Warning obstacle to following vehicles.”
- LTE-V2X warns following vehicles by V2V and V2I, WiGig sends the video image through V2V and V2I.

Thank you for listening!

If you have any questions, contact us at
itsradio@ml.soumu.go.jp

Ministry of Internal Affairs and Communications, Japan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Empowering Cities