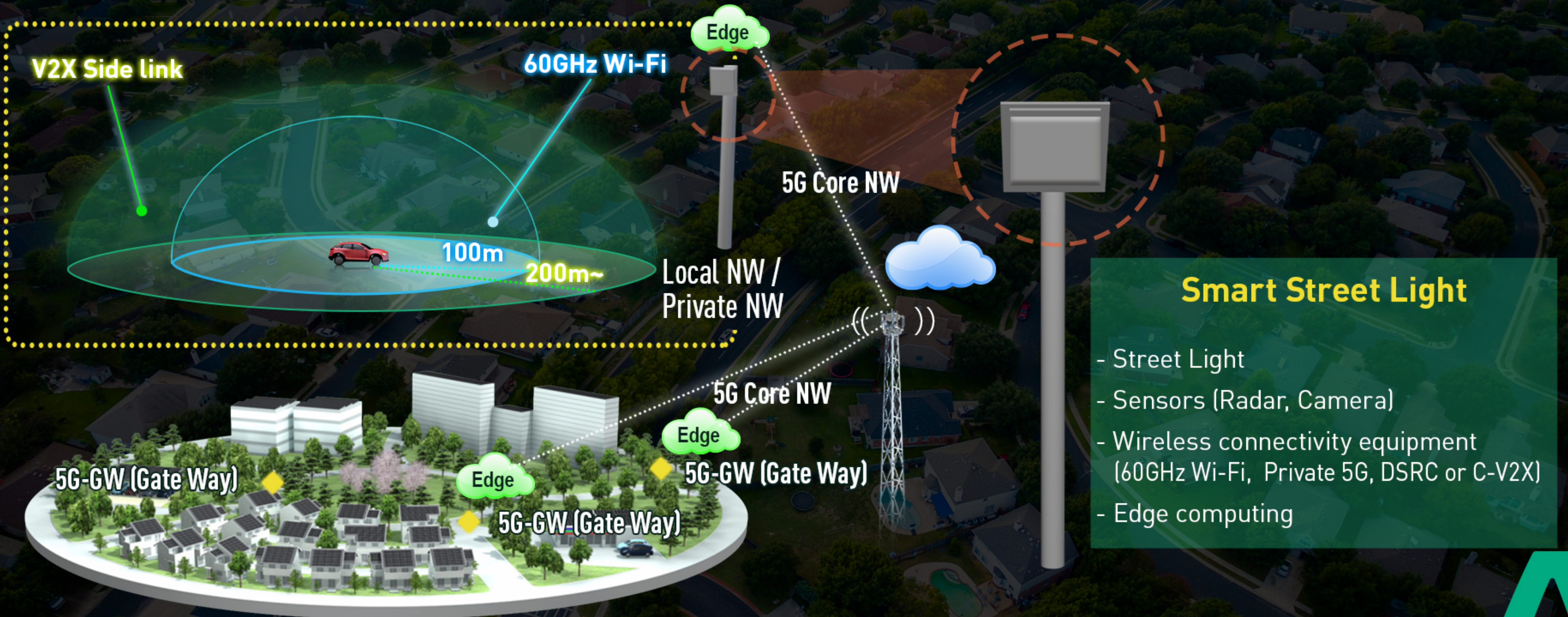


60 GHz Wi-Fi instant connectivity for visualizing blind spots at intersection

Vision : Visualized city coordinating 5G core and local network



Visualized City Roadmap

Aim for zero accidents and digitization in the town through local network and edge computing from on-board to roadside

60 GHz Wi-Fi instant connectivity

Benefits

- Simple and easy installation
- Multi-gigabit connectivity



Accident measures for pedestrian and bicycle

Jan-2019

Advanced support at intersections

Oct-2019

Smart pole ITS

Benefits

- Risk prediction of pedestrian in blind spot
- Inform appropriate warning to drivers



5G-GW and Edge computing

Benefits

- Proper handling huge traffic
- Preprocessing information by edge



MaaS
For Smart City

2025~

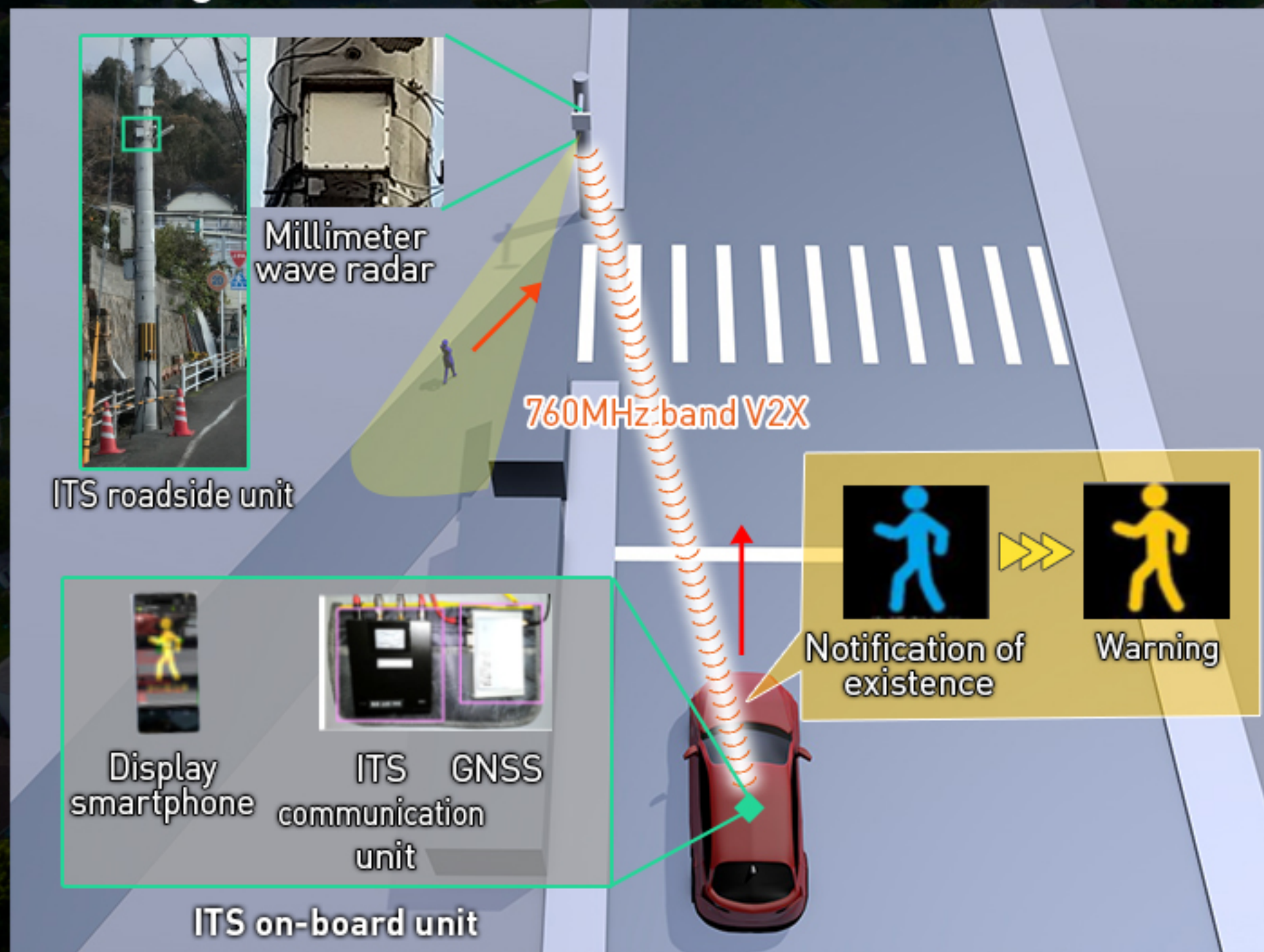


Smart pole ITS

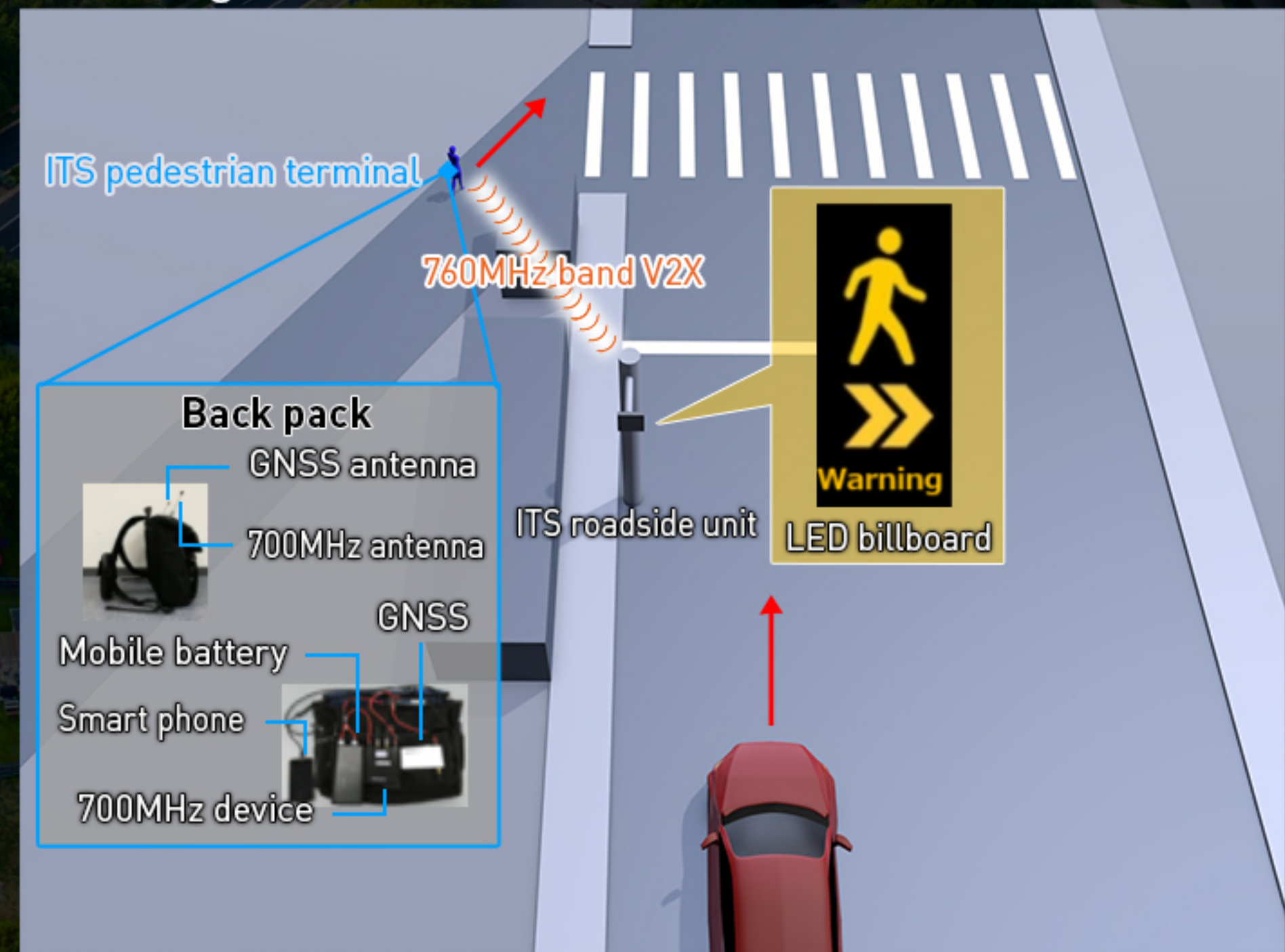
Technical advantages

Object detection by infrastructure Radar and appropriate notification by 760MHz band V2X

Demo 1
Providing information to vehicles with ITS on-board unit



Demo 2
Providing Information to Vehicles without ITS means



This demonstration is a technical verification content by TEPCO Power Grit, Incorporated., Panasonic Corporation, and Toyota Motor Corporation, It is technical verification contents by The Kansai Electric Power Company, Incorporated, Panasonic Corporation, ZERO-SUM™ LTD, Toyota Motor Corporation In addition, we utilize the results of the Ministry of Internal Affairs and Communications R & D "establishment of next-generation ITS using ICT" in the Strategic Innovation Creation Program (SIP)



60GHz Wi-Fi instant connectivity for visualizing blind spot at intersection

Technical advantages

Fast link setup in mobility state

Free use of unlicensed 60 GHz frequency band in global

Use case #1: High-speed contents sharing



Sharing instantly

Sharing between RSU and OBU



60GHz Wi-Fi

Edge

RSU: Road Side Unit
OBU: On Board Unit

Use case #2: Visualization of blocked view



Object recognition at following car



Front car's camera view



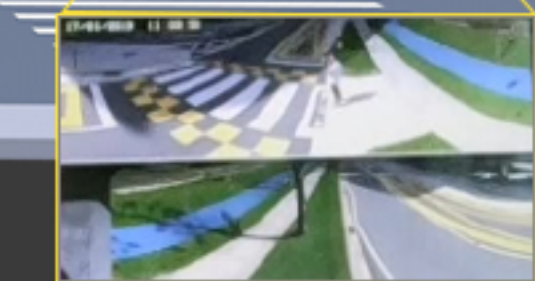
60GHz Wi-Fi



60GHz Wi-Fi

Front car's camera feed

Edge



Roadside camera view

5G-GW and edge computing

Data integration using 5G gateway and edge computing to handle huge traffic (utilizing new R&D projects promoted by Japanese ministries)

Outline

The second phase of SIP-adus (Support automated driving cars)

Collecting, integrating and distributing of dynamic traffic environment information in narrow area (intersection)

Technology to establish

- Gathering information from sources
- Identification and integration of collected objects
- Information delivery control technology

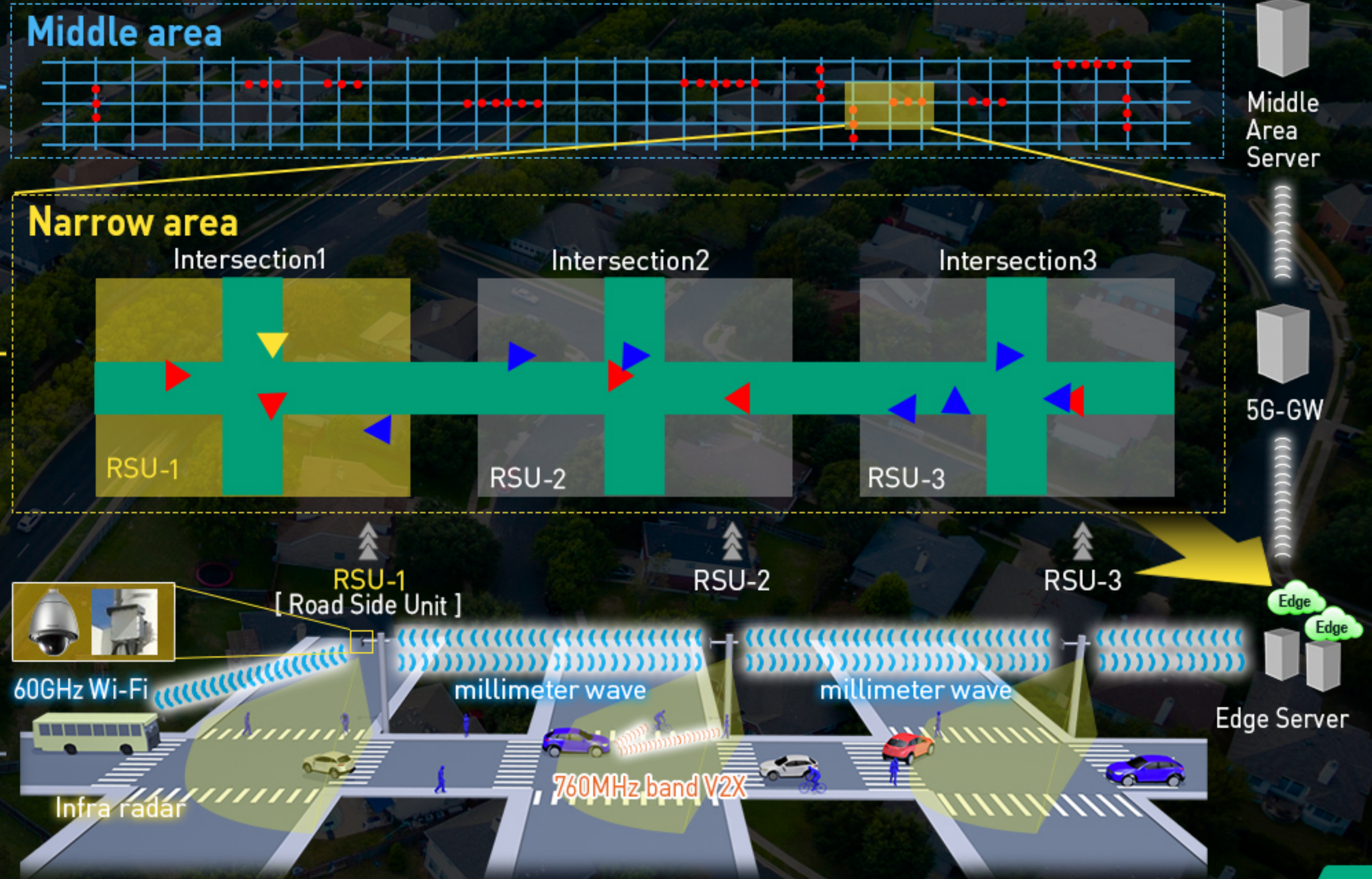
Outline

5.5G

Research and development of high energy efficient and QoS aware wireless multi-hop relayintg for local service in millimeter wave band.

Technology to establish

- Highly efficient terminal accommodation technology
- Multi-hop connection technology using millimeter wave
- Core NW, Application server cooperation technology



SIP-adus : Innovation of Automated Driving for Universal Systems. This is one of the projects out of the Cross-ministerial Strategic Innovation Promotion Program owned by Cabinet Office, Government of Japan, managed by New Energy and Industry Technology Development Organization (NEDO). 「Research and development on the collection, integration, and delivery of data of narrow-area and mid-sized-area」
 5.5G : Ministry of Internal Affairs and Communications Outsourcing work 「Research and development for further advancement of the 5th generation mobile communication system」