



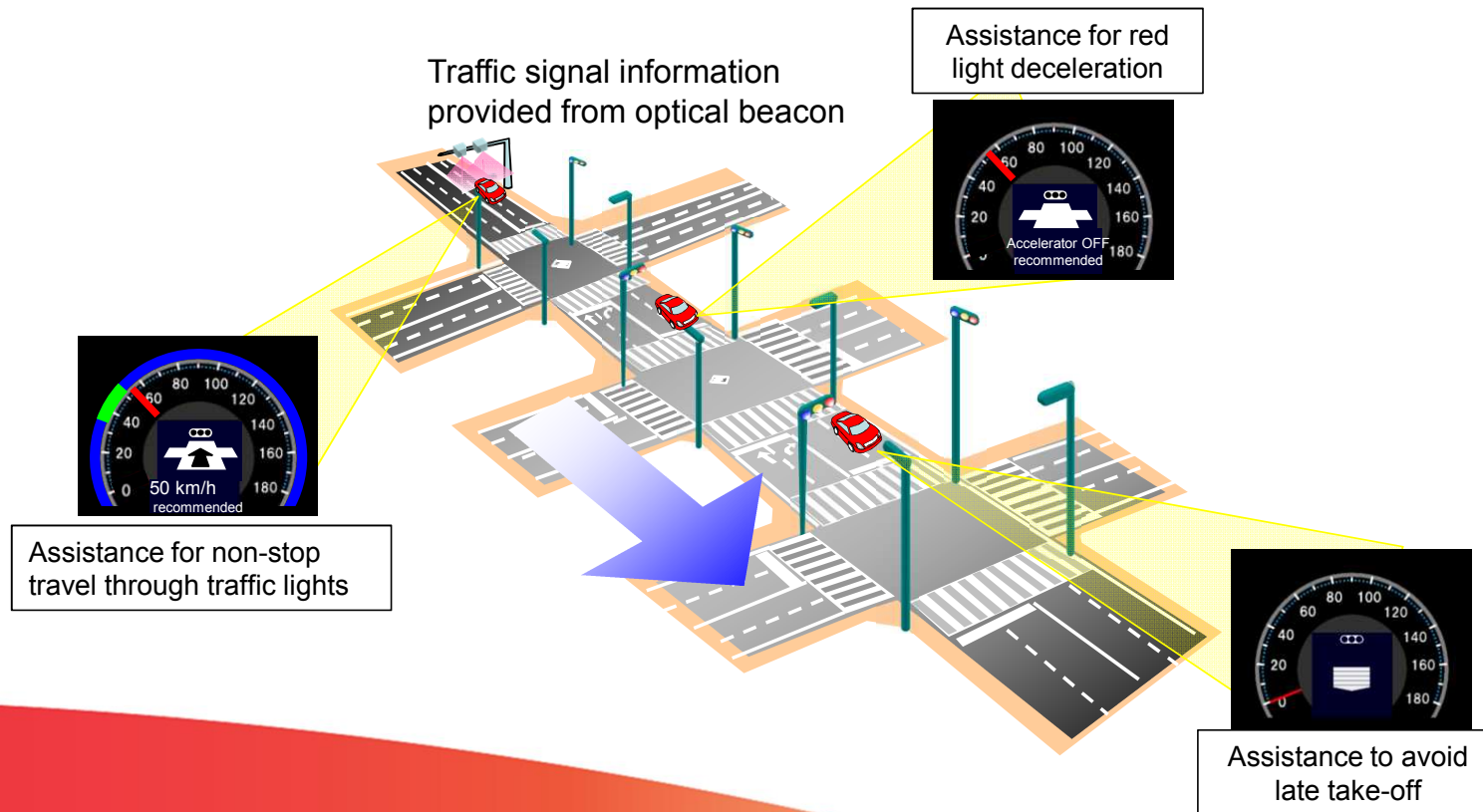
The deployment of V-I Cooperative systems and development of Automated Driving Systems in Japan

Nakaba IZUMOTO

Traffic Planning Division, Traffic Bureau,
National Police Agency, Japan

Outline of TSPS (Traffic Signal Prediction Systems)

TSPS provide traffic signal information (cycle, splits, offset,...) to vehicles for smooth and efficient driving.



Deployment of TSPS

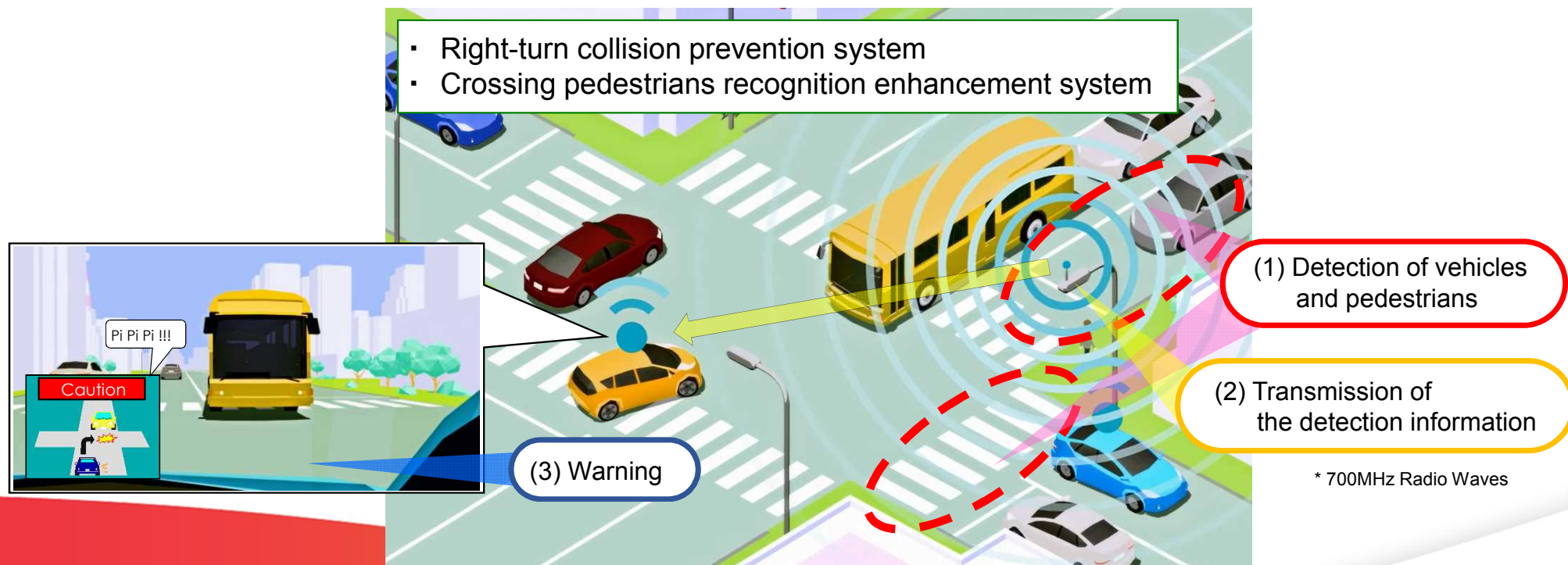


- 42 prefectures
- Target : 11,782 traffic lights
: 3,679 km

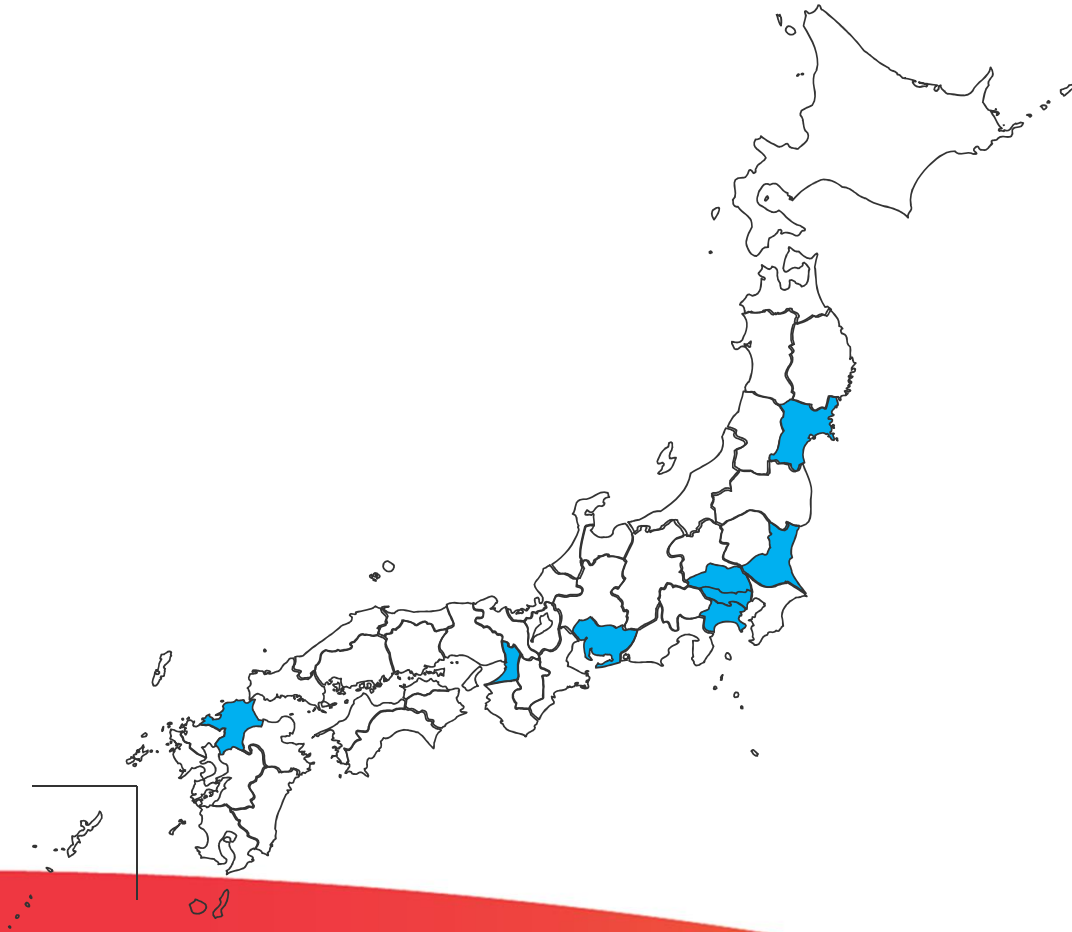
All prefectures will start TSPS until the end of this year.

Outline of DSSS (Driving Safety Support Systems)

DSSS grasp traffic situations of an area which is hard to see from driver's position using roadside sensors and alert drivers via on-board units.



Deployment of DSSS

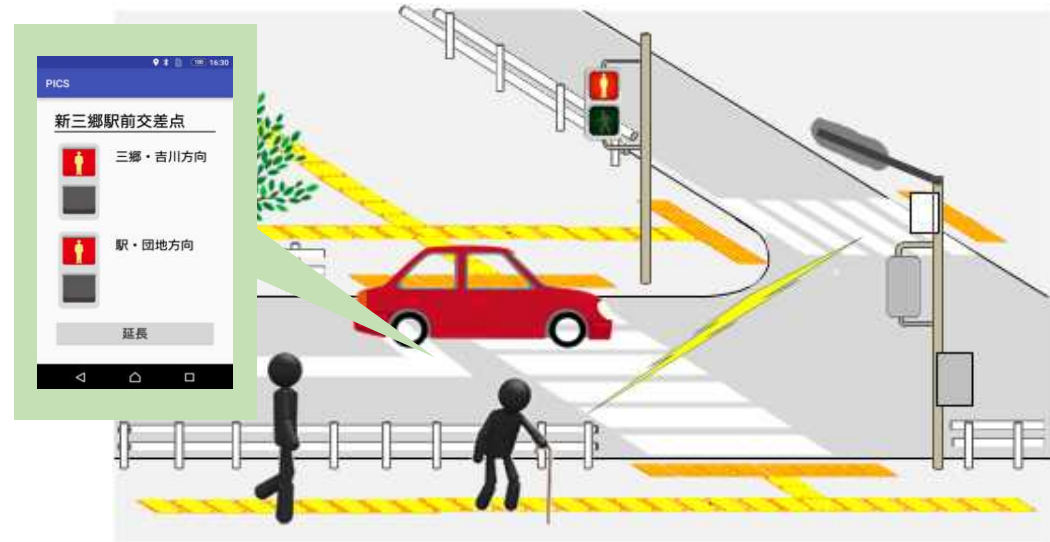


- 8 prefectures
- 86 intersections

Outline of PICS (Pedestrian Information and Communication Systems)

PICS facilitate safe crossing of intersections by pedestrians including the elderly and people with disabilities by providing information by voice, on the name of intersection and the pedestrian signal status.

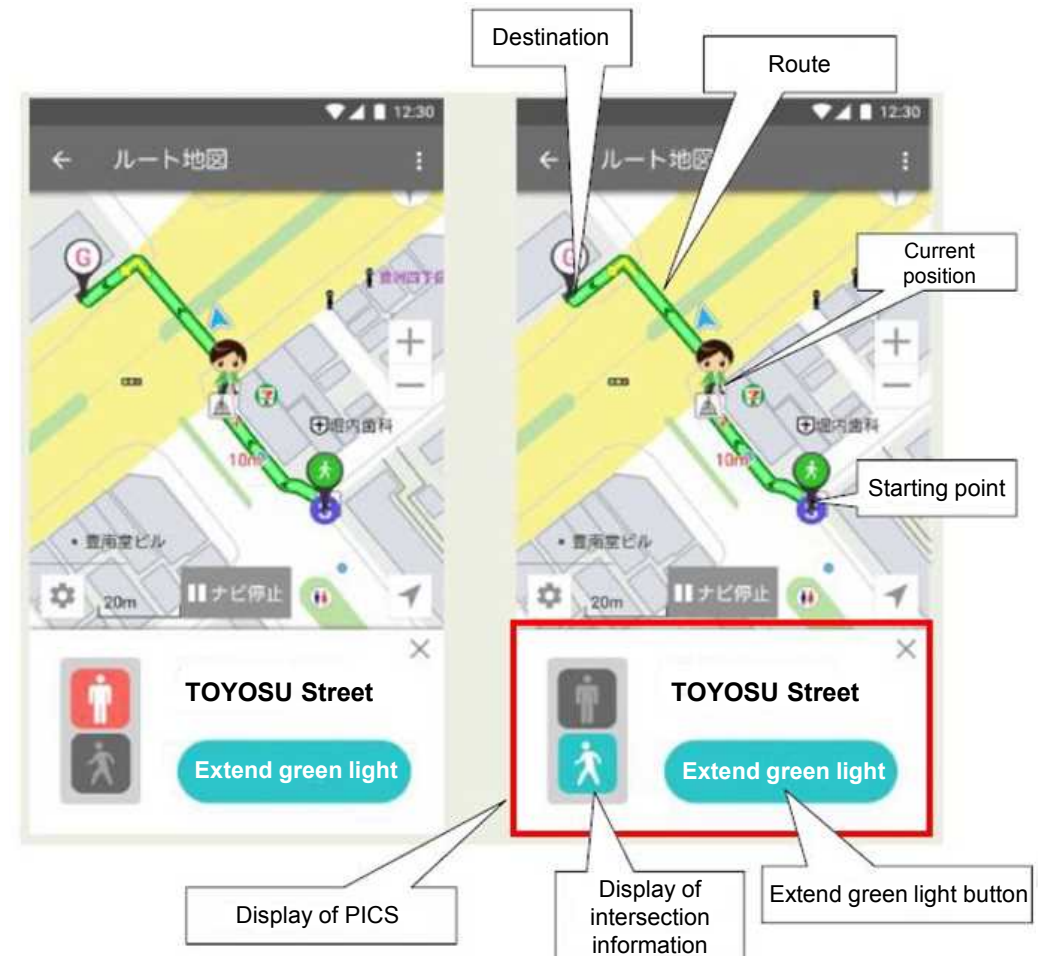
Pedestrians can receive information by smartphone from signal controller via Bluetooth.



Cooperate with various applications

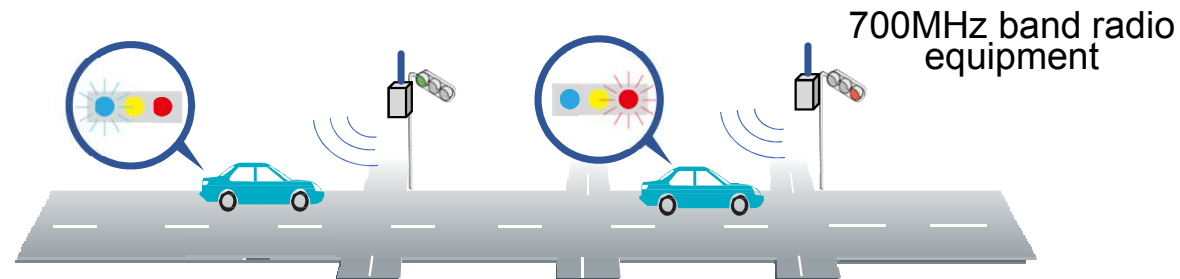
PICS can cooperate with various applications. Especially, if PICS cooperated with navigate application, it allows PICS to provide the best route to pedestrians in light of traffic signal information.

Those applications provide several means(Display, Voices and Vibrations) to give traffic signal information, so the users of the applications can choose the best way to receive it.

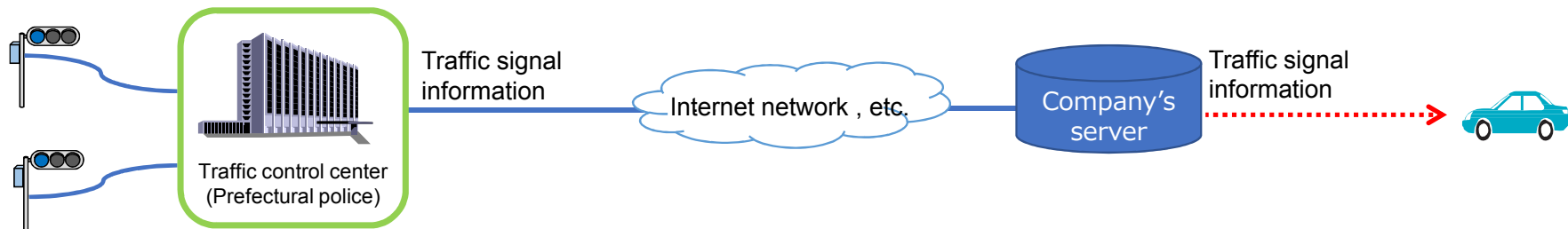


Development of Automated Driving Systems

- ① Provide traffic signal information by V-I

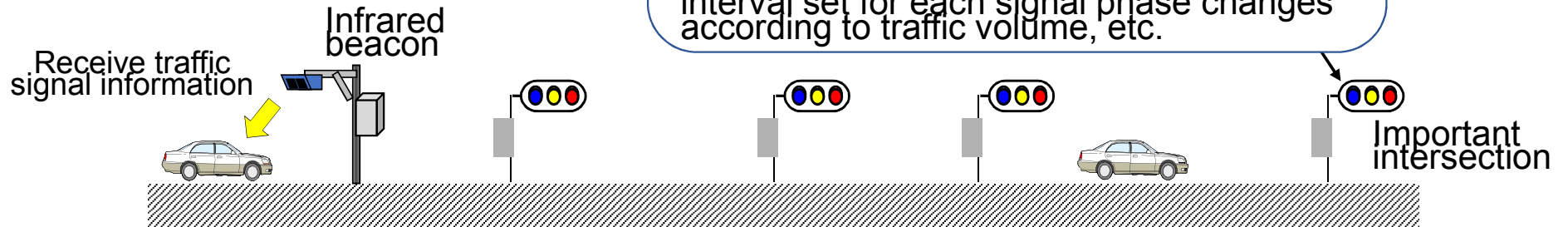


- ② Provide traffic signal information by V-N



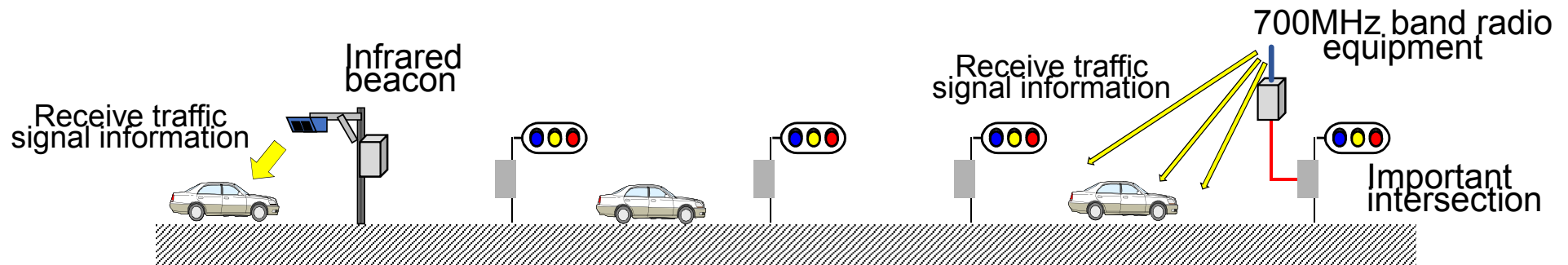
Development of Automated Driving Systems (provide signal information by V-I)

Issue of
TSPS



Unable to provide definite signal information in the intersections and traffic-actuated intersections.

Solution



By using the 700MHz band radio communication, it becomes possible to provide stable and highly-accurate traffic signal information.

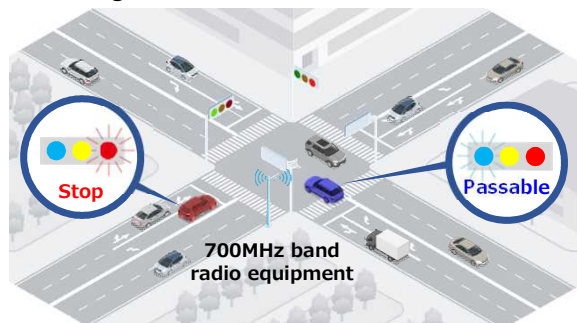
FoTs in the Tokyo Waterfront Area

FoTs are conducted from October 2019 in the Tokyo waterfront city area (general roads and Metropolitan Expressway in the Tokyo Waterfront City area / Haneda area) toward the Olympic and Paralympic Games Tokyo 2020 (in cooperation with Japan Automobile Manufacturers Association). R&D in cooperative areas will be promoted to achieve early implementation of automated driving (L2 to L4 on highways and general public roads). Efforts will also be made to increase social acceptance by involving local government, the general public, etc.

Details of FoTs

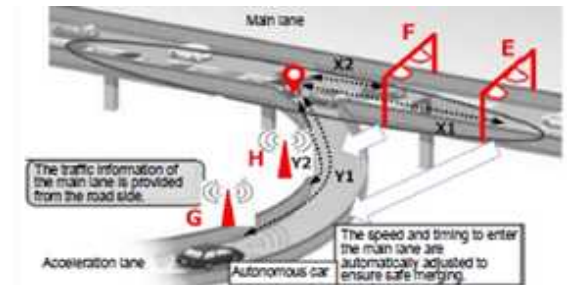
Providing traffic signal information

Vehicles are allowed to pass through intersections safely and smoothly based on the signal display and change timing information even in environments where recognition is difficult using in-vehicle cameras.



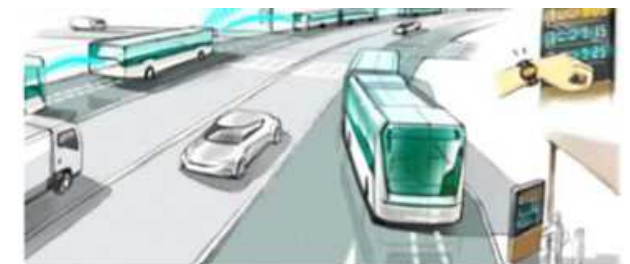
Merging assistance on the main lane of highways

Providing vehicle information on the main lane

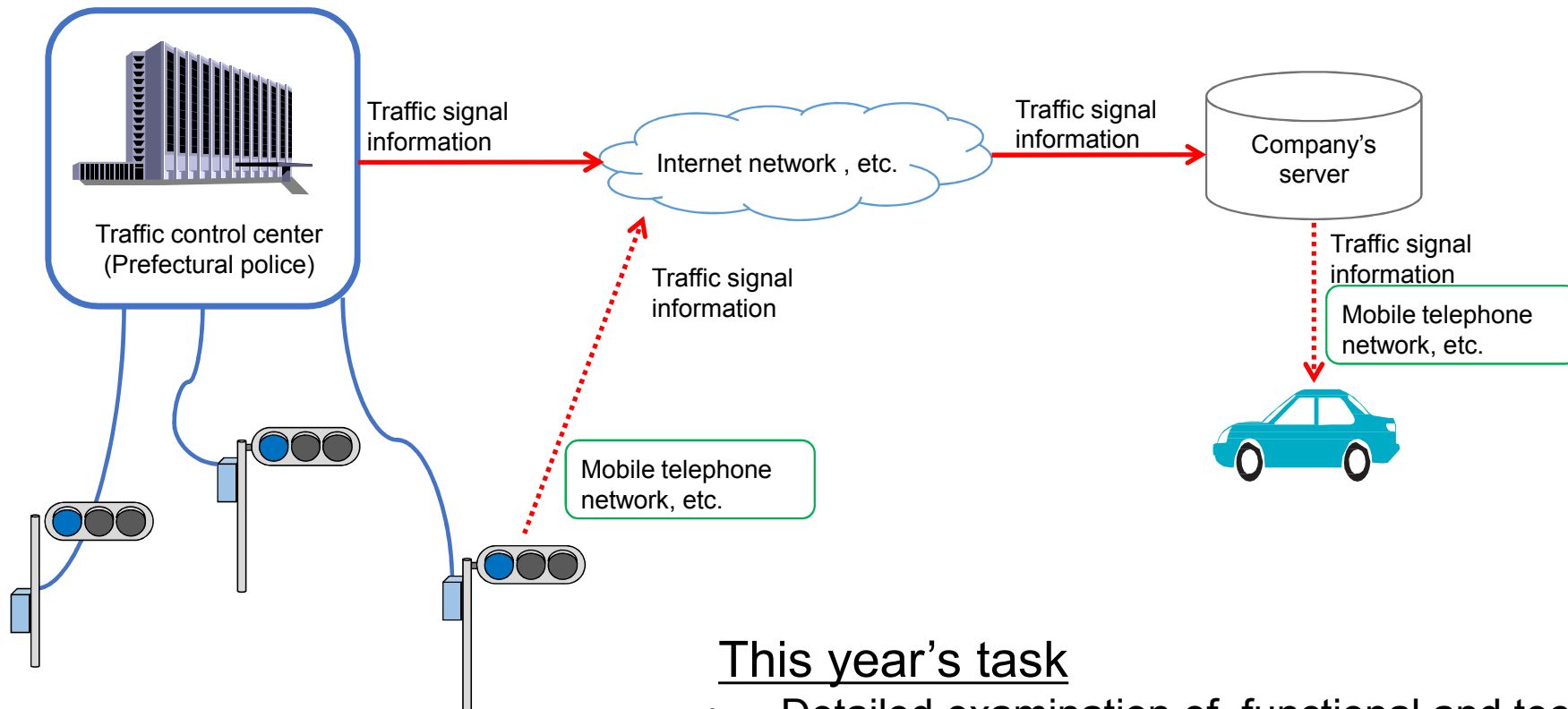


Public transport system (self-driving buses)

FoTs for the next-generation ART will be implemented on public roads by using automated driving technology in mixed traffic flow.



Development of Automated Driving Systems (provide signal information by V-N)



This year's task

- Detailed examination of functional and technical requirements of provision means, etc.

The image features a solid red background with a vertical gradient, transitioning from a darker red at the top to a lighter orange-red at the bottom. Three stylized trees are positioned across the frame. Each tree has a thick, light-colored trunk that tapers slightly towards the top. The canopy of each tree is composed of a dense, intricate network of thin, white lines that radiate from the top of the trunk, resembling a complex network or a tree's root system. The trees are arranged with two larger ones on the left and right sides, and a smaller one centered between them.

**Smart Mobility,
Empowering Cities**